

# **New Pipes, Old Ways: Water Infrastructure Failure, Power, and the State in Nigeria**

A thesis by

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## Candidate's Declaration

This thesis, titled, “New Pipes, Old Ways: Water Infrastructure Failure, Power, and the State in Nigeria”, is presented as a “Thesis by compilation” in line with the Australian National University Procedure on Higher degree by research - thesis by compilation and creative works. This thesis contains 93,532 words (excluding footnotes, references, appendices, figures, and tables). The thesis consists of eight connected papers, each paper representing a chapter. Three of the papers are published, four are under review, and one is ready for submission at the time of thesis submission. For detailed information on status, extent of candidate’s contribution, authorship, and journal outlet, please see the “paper specification” section on page xv. The research was conducted under ethics protocol number 2016/677 approved in April, 2016 by the Australian National University Human Ethics Committee.

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university. To the best of my knowledge, it contains no material previously published or written by another person, except where due reference is made in the text.

Adégbóyèga Benedict Adéníran

Date: 08/11/2022

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*Orí pèlé,*

*Atèté níran.*

*Atètè gbe'ni k'òsà.*

*Kò sòsà tí í dá'ni í gbè*

*Léyìn Orí eni*

*Orí nikàn*

*Ló tó alásan bá r'òkun*

*Bí mo bá lówó,*

*Orí ni n ó ro fún.*

*Orìi mi, ìwo ni.*

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## Abstract

Repeated malfunction and failure of water supply infrastructure poses a critical challenge to equitable and sustainable water access, and the attainment of Sustainable Development Goals in most African countries. As part of the broader water governance problems, this challenge concerns the design and organisation of the distributive systems of water infrastructure. A governing approach that ignores power and historical relations in water infrastructure management presents interesting conceptual, theoretical, and practical problems. With Nigeria as a case study, this thesis seeks to understand some of these problems by asking the question: What are the changing effects of power on the development and governance of water infrastructure in Nigeria, and to what extent is it responsible for infrastructure failure? The thesis explores ideational, symbolic, and disciplinary power to examine this question through the Nigerian state using the Transaqua interbasin water transfer project and the *Ìgànná* water supply scheme in *Òyó* State, Nigeria.

Through a focus on the logic of resistance, the thesis argues that water infrastructure failure and inequity in Nigeria are historically produced by political knowledge (e.g., policies and theories) and discursive practices (e.g., ideas and ideologies) at different water infrastructure and governance levels. The thesis revisits theoretical concepts like the hydraulic mission, and practical concepts like infrastructure renovation because of their ability to misrepresent contextual relations of power, or to mask and perpetuate inequitable water access and distribution.

The Nigerian case shows the different motivations for state-making beyond the traditional arguments on spatial or autocratic control by the federal government, helps explain some contributing determinations of other water-related issues beyond the traditional analytical tropes of corruption, fragmentation, ethnicization, and allows us to question other analytical concepts in the political economy field that fundamentally assume the coherence of the nation-state. The *Ìgànná* study shows that the *Òyó* state government's intended household water access ratio (50 litres/day/person) cannot be guaranteed by constructing standpipes at 70 m – 100 m intervals. Similarly, individuals within communities with a high level of recognition and symbolic capital could be identified to fill community water management committees, because spatial proximity determines who garners authority for the day-to-day management of water.

Conceptually, the thesis develops a conceptual framework to study the politics of water governance, which situates power and politics at the centre of water governance and infrastructure systems. The framework recentres the state as a critical organisation of social, economic and ecological change. In addition, the thesis proposes an infrastructure renovation model as a new lens to think about water infrastructure failure. The model demonstrates the cyclical pattern of infrastructure failure as central to Nigerian society's past, present, and future plans for water infrastructure development and offers new research and policy pathways in water infrastructure financing. Proposed political, policy,

and research pathways for water infrastructure governance include: constitutional changes to concentrate water infrastructure development for potable water supply in one arm of government; reconsidering the standpipe as a model supply infrastructure; and transformative historical research to expose problematic concepts and strategies of power that have endured over time.

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## ***Paper specifications and statement of contributions***

The collaborating authors agree to include the papers listed below, and to the description of their contribution to papers.

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### Statement of Contribution

This thesis is submitted as a Thesis by Compilation in accordance with  
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I declare that the research presented in this Thesis represents original work that I carried out during my candidature at the Australian National University, except for contributions to multi-author papers incorporated in the Thesis where my contributions are specified in this Statement of Contribution.

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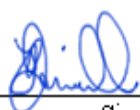
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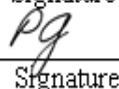


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### Statement of Contribution

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I declare that the research presented in this Thesis represents original work that I carried out during my candidature at the Australian National University, except for contributions to multi-author papers incorporated in the Thesis where my contributions are specified in this Statement of Contribution.

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## ***Positionality statement***

I write this section to inform the reader of my central role and position in producing this body of work/knowledge. It is also to declare the changing character of the study, considering how critically entwined it has been to my personal history and growth during this period. Historically, as a *Yòrùbá*<sup>1</sup> person with a deep knowledge of culture and social practices, growing up as a 14-year-old in a newly developed suburb in *Ìbàdàn*, the largest Indigenous city in West Africa, one of my non-negotiable tasks was to draw several litres of water from a 40-foot artesian well, to be carried up 19 stairs by myself and my siblings for domestic use. Coming from what was a ‘middle-income family’, it was apparent that even those who could afford to pay for water services could be dispossessed of access to water. Ensnared behind the fence and gate in a corner of our property, the well was also a source of water access for many in the community of a lesser socioeconomic position. I have since learned that the paradox of water supply infrastructure distribution and access is a question that lies at the doorstep of power relations, and that my personal experience, as well as those of countless others, must contribute to its analysis, understanding, and solution. With the changing identities that define an individual’s life’s journey and positions, my role in this project to understand and resolve, is to be the scholar, the silent activist, and most importantly, the individual who pays attention to the tensions in these multiple positions. In short, because of my deep ties to Nigeria and my intention to maintain those ties, my stance and critical style is to focus on the substantive issues and engage with the ‘state’ and the society in ways that help to move critical scholarship to policy.

Intellectually, my linguistic capacities as a person of *Yòrùbá* heritage have been valuable when translating interviews conducted in *Yòrùbá* language. However, this position has equally forced me to moderate how I internalise the challenges and passions declared by the respondents. Being an ‘Indigenous’ researcher invites a great deal of reflexive movement between ‘objectivity’ and ‘emotivity’ (Keikelame & Swartz, 2019); instances that challenge research ethics. Engaging with archival materials exposed me to complex historical issues and ideas that are still prevalent today; for example, in racial relations. Nevertheless, this research has nudged me towards deeper intellectual and ethical engagement, which sometimes led me into an intellectual rabbit hole as I tried to dodge the remnant of that history in the many theories and methods I encountered! I consider the minute processes of article publication and the efforts put into revisiting the data, re-listening, and re-assessing it to the large scale iterations of thought that led to seeking new methods and approaches, as a part of this history. Therefore, I seek to acknowledge all the emotional, concrete, and symbolic registers that a researcher’s history and ongoing transformations infuse in the research process. I have laid this bare to apprise the reader of aspects of the work, particularly in data analysis, that may appear to reflect my biases. This challenge is always

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<sup>1</sup> Second largest ethnic group in Nigeria, mainly occupying southwest Nigeria.

the burden of research – qualitative or quantitative – and I try to at least somewhat counter this challenge by making my positionality explicit.

# **INTRODUCTION**

# Introduction

Sustainable development and management of water supply infrastructure are fundamental to achieve just, equitable, and sustainable water access in most African countries, especially for water supply, sanitation and health, agricultural development, and energy production (Arimah, 2017; Mugagga & Nabaasa, 2016; The Economist Intelligence Unit, 2019; World Water Council, 2016). However, these water supply infrastructures often fail, deteriorate, or decay, denying millions of people a present and future of sustainable water access (Andres et al., 2018b, 2018a; FMWR et al., 2020; Otun et al., 2011). Such failures create spatially differentiated infrastructure inequities of levels of access and consumption between rural and urban, states and regions, and households (Akpabio & Rowan, 2021; Deshpande et al., 2020; FMWR et al., 2020; NPC & ICF, 2019).

To respond to these issues, governments and non-government institutions develop additional water infrastructure and provide new governance and policy tools that attempt to render those interventions apolitical by not considering power, governance and equity (Daniell & Barreteau, 2014). In Nigeria, such responses include expanding water storage and access capacities by building more dams and boreholes (Akpabio & Ansa, 2013; Federal Ministry of Water Resources, 2014, 2016b). These approaches to fixing the problem focus on the technical, financial, and technological manipulation and modification of governance systems, ecologies, and infrastructure (Danert et al., 2020; Lane, 2012; Moe & Rheingans, 2006; Tetra Tech, 2015). Yet, they ignore narratives, policies, and governance practices within the local context and the political attributes of water infrastructure governance and development (Akpabio, 2013). Even though it attempts to render its decisions apolitical, Nigeria as a nation-state and its institutions have become a vital link between infrastructure development, failure, and power relations.

Power analysis in water infrastructure research and practice is linked to unequal distribution and access (Olagunju et al., 2019; Özerol et al., 2018; Zwarteveen et al., 2017). The United Nations Development Programme (UNDP) stated that “the scarcity at the heart of the global water crisis is rooted in power, poverty, and inequality, not in physical inequality” (UNDP, 2006, p. 4). Beyond this, power relations affect places, individuals, communities, water management and infrastructure systems, and organising rules. For example, Daniell et al. (2014, p. 469) noted that:

Even though most water managers, and people and places with a stake in its management, tend not to acknowledge power and the role that power plays in shaping water management systems and societal structure, developing such an understanding, and of its mechanisms and enactments, and then changing current water management institutional processes based on this understanding, is necessary to develop more sustainable water and river basin management practice around the world.



To understand this pervasive effect of power in Nigeria, the Global Water Partnership-Nigeria (GWP-N) identified water governance as a critical policy area requiring priority and urgent attention. The GWP-N argued that “the underlying causal factors for infrastructure deterioration are not given sufficient attention to militate against a repeat of similar problems in the future” GWP-N (2014, p. 5). For GWP-N, to understand the causal factors requires a plan to review and identify the “main actors in water service provision, their interests and those of the stakeholders involved” GWP-N (2014, p. 5). These declarations suggest that the defining role of power in water infrastructure governance in Nigeria is less understood and needs urgent research attention. With this in mind, my thesis provides theoretical, policy, and empirical insights into how changing relations of power in Nigeria determine and contribute to water infrastructure development, failure, breakdown, or decay.

## ***Summary of literature on Nigeria, water infrastructure, the state and power***

This section summarises the literature that I elaborate on in each of the chapters and in Chapter 3, [Appendix I and J](#). A complete list of all references is provided at the end of the thesis.

### **Nigeria and the geography of cases**

Nigeria is a water-rich country (Fig 0-1a). Nevertheless, how it manages its social and political elements determines how it sustainably exploits its abundant surface and groundwater resources. Extreme regional climatic variations that define its agroecological potentials, exist from the tropical forests and wetlands of the Atlantic south to the deserts and wetlands of the Sahelian north (Figure 0-1b). On the other hand, its social composition is an assortment of cultures and ethnicities (Figure 0-1c), many of whom are large enough to be independent nation-states and effectively operate as such, at least in part (Watts, 2018). With 36 federating states and the Federal Capital Territory (FCT), the political administrative structure of the federation (Figure 0-1d) captures the overlapping social, political, ecological, and economic complexities (See [Appendix M](#) for a historical map of Nigeria). Water governance decisions are made within this context, and I firmly acknowledged this diversity of contexts during the research design process.

Nigeria’s political system has never experienced prolonged autocratic governance. Neither have its democratic governments fully embraced an explicit or ‘homegrown’ political-economic ideology as a national development strategy. Anyone willing to understand its present conditions must trace Nigeria’s peculiar history: its colonial origins and transformations to its social, economic, political, and ecological character. Yet, Nigeria’s peoples, ebullient and resolute, manage to adapt to situations often caused by the state and its agents. Nigeria's story is not only bounded by the excesses and deficits that

define it as a nation-state, but it shares political and territorial boundaries with countries of different histories and economic trajectories, whose land and water are historically and culturally entwined.

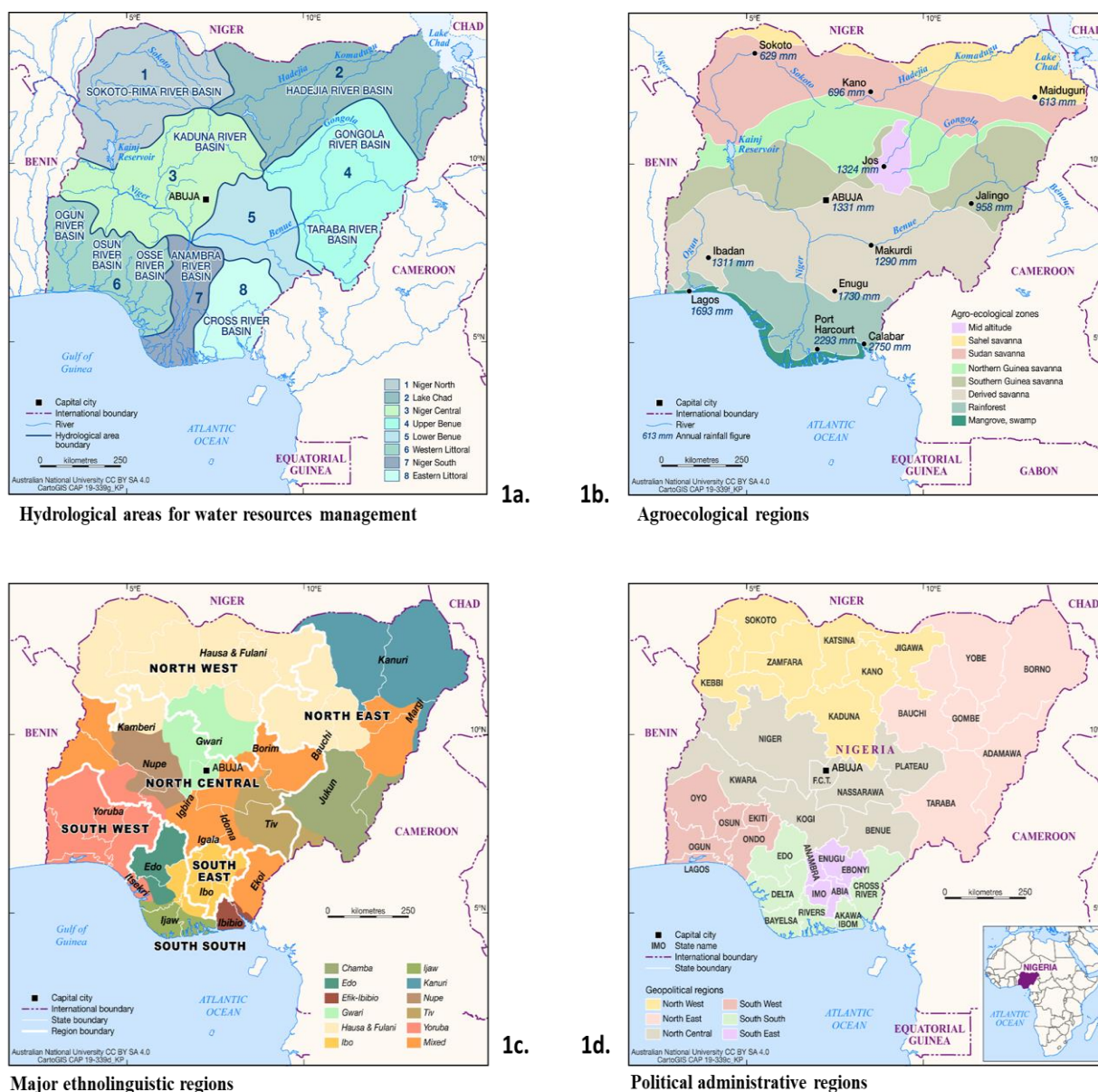


Figure 0-1: Nigeria in maps

Built into this sociopolitical system are the differentiated economic and ecological conditions across each constituent state and political region, with varying levels of poverty and access to infrastructure (Abubakar, 2019; The World Bank, 2017a) as well as ecological degradation (Abba & Onyemachi, 2020; Aghoghovwia, 2015; Watts, 2012, 2018). For example, of the 210 million Nigerians, approximately 3.5 % have pipes connected in-house or placed in a yard, the remaining 96.5 % access water from decentralized water sources such as public standpipes, boreholes and protected dug wells

(FMWR et al., 2020). Water infrastructures like standpipes remain an “important strategy” for increased access to water (Eberhard, 2019, p. 55) where the Partnership for Expanded Water Supply, Sanitation & Hygiene (PEWASH) plan will *repair* 77,693 standpipes between 2016–2030 (Federal Ministry of Water Resources, 2016b). However, in Nigeria, most of these schemes are either dysfunctional or no longer used (Andres et al., 2018).

Standpipes are components of a water infrastructure system for potable water supply where people gather around a pipe to access potable water. Of the estimated 2,041,389 water points in Nigeria, approximately 65% are located in rural areas and 35% in urban areas (FMWR et al., 2020), 55% of which were non-operational (see Figure 0-2) after 10 years. Thus, infrastructure failure of the standpipes has become a symbol of inequitable water access in many African countries at national (The World Bank, 2017; Andres et al., 2018a) and regional levels (Deshpande et al., 2020; Hope & Ballon, 2019). Water infrastructure failure in this thesis refers to a deteriorating, decaying, abandoned or failed water infrastructure (Andres et al., 2018; GWP-N, 2014; Otun et al., 2011).



**Figure 0-2: An abandoned standpipe waterpoint**

My broad concerns in this thesis are with the conditions of water infrastructure development in Africa, using Nigeria as the geographical focus. Therefore, all abstractions from the theoretical and empirical analyses attend to this purpose. The unique historical, symbolic, and material conditions of

the region, in the constitution of its present condition, is what I seek to interrogate using the Nigerian state and society. This thesis is novel in this sense because it is the first comprehensive attempt to apply a power lens to water infrastructure governance in Nigeria, connecting different governance and infrastructure levels.

## **Water infrastructure governance and African countries**

According to Olagunju et al. (2019), water governance studies in Africa generally face three main problems: (1) studies are not contextually relevant and theoretically robust; (2) application of models is very low among the studies; and (3) research outcomes are methodologically deficient. Water infrastructure governance is subsumed under the broader water governance framework. Specifically, challenges of water infrastructure governance in Nigeria and many African countries include infrastructure financing (Collier & Cust, 2015; UN-Water, 2018; WHO, 2020), systemic and repeated malfunctioning of infrastructure (Furlong, 2014; Guerrero, 2018), and the management of decentralised infrastructure types (Eberhard, 2019). Despite the cross-cutting nature of different infrastructure types (e.g., roads, telecommunications) and the growth in water governance scholarship, two principal approaches dominate water governance and infrastructure scholarship in Nigeria. First, a focus on an apolitical analysis of water systems failure, sustainability, and functionality. Second, community management and participation frameworks dominate the analysis of the management approaches. These perspectives to water governance and scholarship has a tendency to perpetuate hegemonic discourses and practices in knowledge production, use, and communication (Leong & Mukhtarov, 2018; Ngene et al., 2021).

This challenge sits broadly within the global North-South debate about the form of knowledge and power relations, and the solutions proposed to address them (Girvan, 2007; Lund, 2006; McFarlane, 2008; Mignolo, 2020; Ndlovu-Gatsheni, 2013; Nilsen, 2016). For example, Elinor Ostrom's socioecological systems (SES) framework (Ostrom, 2009) is the dominant theoretical water governance framework used in Africa, despite its poor attention to issues of power relations (Fabinyi et al., 2014; Olagunju et al., 2019). Many of these analyses use the institutional analysis framework as they view water infrastructure governance primarily through an institutional lens, mainly through the problematic application of Integrated Water Resources Management (Ngene et al., 2021).

Decentralised water supply systems in Nigeria (Eberhard, 2019) pose a challenge for defining water infrastructure. Global classifications and typologies of water infrastructure favour centralised systems, specifically large dams (Grigg, 2019; ICOLD, 2011; Tockner et al., 2016), thereby omitting a greater number of Africans who access water from decentralised sources such as bores, springs, rivers and lakes (Eberhard, 2019). This problem of defining what is a water infrastructure further intensifies the divisions between the global North and global South to maintain the distorted historical, policy, and

political frameworks of international development; specifically in knowledge management, finance, hence, power relations (Girvan, 2007).

To my knowledge, studies in the English language that critique these approaches within a critical political tradition are almost non-existent in Nigeria. To address this challenge, the thesis embraces a critical political perspective to understand the effects of power relations on water infrastructure governance and development and failure in Nigeria. My approach is closely related to what Mollinga (2019, p. 790) describes as a cultural strand of critical water studies that explores “historical investigations of water knowledges and discourses” and maps “meanings and associations of water (infrastructure)”. In essence, bringing together the political economy and political ecology intellectual traditions to attend to the structure and agency dimensions of water infrastructure governance. Most of the studies in this thesis exclude French language literature, except in the analysis of hydropolitical relations (Chapter 4).

## **Water infrastructure as state materialities mediating power and state-society relations**

Water infrastructure provides an example of how state and society relations of power are mediated (Bakker et al., 2008; Harris, 2017, 2020; Meehan & Molden, 2015; Swyngedouw, 2014). Understanding these relationships demonstrates how systems of power and governance are maintained or can be changed. In this relational sense, the state is such a complex theoretical and empirical entity that no single theoretical approach can fully capture and explain its nature and interactions (Jessop, 2008, p. 1). In Nigeria, Michael Watts’ influential work, *Silent Violence*, was the first critical study to capture the intersection of state-society relations and water infrastructure development from a historical-development perspective (Watts, 1983). Subsequent works by William Adams in *Wasting The Rains* (Adams, 1992) further expounded on the politics of dam construction (Adams, 1993). Both studies focused primarily on state-driven agricultural development through dam construction. However, they missed a critical element in the construction of the contemporary Nigerian state in their analyses: the rapid changes to the political system during this period and the role of the military.

Harris (2012) views state-water infrastructure power relations as a materially and discursively produced socio-natural construct. In Angel & Loftus’ (2019) view, social and political struggles are the essence of state form and production. Meehan (2014) and Meehan & Molden (2015) draw on the effects of embodied practices to analyse state effects, where objects and water infrastructure serve as tools of state production that delimit the extent of state power and powerlessness. As such, new scholarship seeking to study ‘power effects’ (Mitchell, 1991) on state-water infrastructure relations analyses the internal differences and contradictions within the state through Foucault’s disciplinary power (Foucault, 1972a); specifically, Foucault’s governmentality (Ahlborg & Nightingale, 2018). Under this theoretical

and analytical paradigm, attempts to uncover the "unsystematic, unintended and indeterminate" aspects of state power remain largely unresearched and under-theorised (Painter, 2006, p. 763), especially in African countries.

Accordingly, most studies have disproportionately focused on how states legitimise and consolidate space, territory, and boundaries over time, largely due to their institutional and disciplinary history. For historical materialists, state- and nation-building occur through the mobilisation of water infrastructure and political institutions (Boelens et al., 2016; Ioris, 2012; Swyngedouw, 1999). With few exceptions (e.g., Bénit-Gbaffou & Oldfield, 2011), aspects of state-making, reproduction of institutional structures and processes (legitimation and authority), and the mediating role of water infrastructure have been studied through traditional autocratic regimes that have held power for many years. In this sense, theoretical themes such as the hydraulic mission (Molle et al., 2009) have expanded their remit into African states (Rusca et al., 2018; Verhoeven, 2015). The hydraulic mission is the idea that large-scale water infrastructure development should be undertaken by the nation-state (Wester, 2008), through certain state institutions called the hydrocracy (Molle et al., 2009). It is against this orthodox view of state and society relations that Nigeria and other African countries are measured and analysed to determine what constitutes state powers, responsibilities, and boundaries within and between the state and society.

A critical objection to this perspective is that it rests on the assumption of a unilinear development model that essentially ignores these countries' colonial histories (Smith, 2013). In addition, certain theoretical concepts lose value when applied to analyse the sociopolitical conditions in these countries. For example, Watts (2018) objected to the use of the 'resource curse' concept in analysing Nigeria as the petro-capitalist state because it is inadequate to capture the different spaces and territories of power that effectively competes with state power in Nigeria. With *multiple sovereignties* and far limited governmental reach across its space, West African countries like Nigeria need additional theoretical, conceptual, and empirical work to engage and explain issues specific to their historical and cultural contexts. For example, understanding what constitutes a 'weak state' (if there is any) in relation to water infrastructure and the political attributes of such a state is a theoretical challenge for and across African countries. An improved understanding of the hazy boundaries between state and society could be achieved by using society as the reference point to better understand hegemonic order within societies. As such, using *resistance* as the analytical theme instead of *domination* will help in such an analysis.

## **Disciplinary approaches to power**

Political economy and political ecology traditions are two critical strands of literature that dominate power-governance analyses in socioecological and sociotechnical studies (Bennett et al., 2018). Political economy is inclined to structural and institutional analysis. At the same time, it seeks to integrate

individual agency into power analysis through a primary focus on ideational power and the role of ideas in governance (Bell, 2012; Carstensen & Schmidt, 2016; Schmidt, 2008, 2017). Such analysis investigates how certain individuals with authority communicate and spread specific ideas to achieve societal change through ideational elements (Carstensen & Schmidt, 2016). Recent developments in critical institutionalism have made a break with such approaches by centering sociological patterns and contextual realities within the societies and governance systems analysed. This problem of agency dates back to one of the central questions in the structure-agency debate: that is, in analysing institutional change, what level of agency should be given to individuals or actors in that process? (Emirbayer & Mische, 1998; Giddens, 1979; Larsson, 2018; McGinnis, 2016; McGinnis & Ostrom, 2014). While still grounded in the institutionalist tradition, critical institutionalist scholarship in water governance has begun adopting sociological theories that attend most suitably to the structure-agency debate by advocating for the use of Anthony Giddens (Giddens, 1979) and Pierre Bourdieu's (Bourdieu, 1977) concepts in analysing water infrastructure, power, and governance processes (Clever & Whaley, 2018; Mollinga, 2008b, 2020). As a post-structuralist account, political ecology offers a more sophisticated integration of individual agency because of its transdisciplinary approach to power analysis (Bennett et al., 2018). Political ecology's more nuanced approach blends more-than-human thinking (Latour, 1995; Jassanoff, 2015; Nabavi, 2018) through object-oriented analysis in water infrastructure governance analyses (Ahlborg & Nightingale, 2018; Meehan, 2014; Meehan & Molden, 2015).

These distinctions are conceptually crucial for the analysis of human practice and power relations in two ways. First, different traditions produce different research outputs (Clever & Franks, 2008; Hove et al., 2019) because their disciplinary positions produce corresponding outcomes for society-nature analyses (Budds, 2009; Hyden, 2008; Yagboyaju & Akinola, 2019). Second, disciplinary reverence to structural analysis or agential or object determinism interprets power relations as a false dichotomy that it is not (Chattopadhyay, 2015; Sikor, 2008; Sikor & Lund, 2009; Towett et al., 2020). Analysing power this way contradicts a conception of power and the relations it generates and infuses in state-society relations. In this thesis, the approach I take is to see power in its function, topology, and form as relational, constitutive, symbolic, and causal.

A central issue with political ecology power analysis is the strong bias for Foucaultian governmentality analysis (Ahlborg & Nightingale, 2018; Mayhew, 2009; Nustad & Swanson, 2021; Soyland & Kendall, 1997). Specifically, governmentality owes its emergence to the analysis of governmental relations of power in Europe (Scott, 1999; Sharma & Gupta, 2006). When extrapolated to West African countries like Nigeria where multiple 'sovereignties' exists at different levels and the legacies of colonialism persists, it is rendered inapplicable to most development contexts (Magrath, 2010), especially for its use in community water governance analyses (Rolfe, 2018; Rose & Miller, 2010). Further, the application of Foucault's key methodological tools (*from episteme to apparatus*) is yet to be adequately captured by most governmentality/disciplinary power analyses (moreso in water

infrastructure scholarship) that are underpinned by political ecology (Collier, 2009). The shift to the *apparatus* is critical because it signifies a transition from a purely material analysis to the immaterial aspects of power relations in the formation of the subject (Elden, 2016). A third problem lies with the lack or misapplication of Foucault's methodological approach. Despite Foucault's critical emphasis on historical analysis as a methodology, some scholars ignore this approach when examining the conditions of formation of a specific discursive device, which makes an accurate critique impossible (Collier, 2009; D'Arcy, 2004; Soyland & Kendall, 1997).

## **Power and the state in the thesis: conceptualisation, analyses, and use**

Due to the different scale of analysis, this thesis broadly conceptualises power and the logic of its relations in three different but complementary ways. Drawing on Foucaultian thought, power *operates* as “the antagonism of strategies” (Foucault, 1982, p. 780), where an actor deploys different strategies to produce, resist, dominate, or negotiate specific observed outcomes. This thinking centres *resistance* as a conceptual logic in the thesis when analysing social and political relations. Resistance is the principal lens through which Foucault and Bourdieu see cultural production (Fowler, 1997). To bring together the study of power as both a relation of force and a relation of communication, I also conceptualise power as “the power to make groups” (Bourdieu, 1989b, p. 23) through the imposition of a world view in peoples' minds, the “power of constitution and consecration” (Bourdieu, 1989b, p. 23). This idea signals Pierre Bourdieu's concept of symbolic power that generates, reveals, transforms social situations and grant legitimacy of “words and commands to give orders” (Bourdieu, 1979, p. 83). Thus, power is seen as being held (knowingly or unknowingly) as a ‘capacity’ (Allen, 2016a), capable of producing specific observable ‘effects’ (Foucault, 1982; Mitchell, 1991). Power is also viewed as an ideological resource or an instrument of domination that materialises in observed practices (Abrams, 1988; Bourdieu, 2020). This relational view of power is similar to the philosophical perspective of the *Yorùbá* speaking people of southwest Nigeria on the nature of reality as one of “binary complementarity”, which sees objective binaries as “inseparable and complementary in nature and function” (Olúwolé, 2015, p. 144).

Using these concepts, I analyse power and state-society relations in three different ways. I refrain from the analysis of the state through works that draw primarily on Gramscian approach to power such as Bayart, Jean-Francois's (Bayart, 2009). The first two – ideational (Carstensen & Schmidt, 2016; Jessop, 2014) and ideological power (Hay, 2014; Jessop, 2014) – view the state broadly as an “emergent effect of multiple projects, practices, and attempts to institutionalise power relations” (Jessop, 2017a, p. 351). The state is also a field of power marked by the use and threat of violence and shaped by “the image of a coherent, controlling organisation in a territory, which is a representation of the people bounded by that territory, and the actual practices of its multiple parts” (Midgal, 2004, p. 16). Midgal



adopted Bourdieu's concept of the "field" in an attempt to define the state (2004, p. 22). In contrast, for the third type of power analysis, I draw on Hoy's (2004) hypothesis of complementarity to integrate Foucault's disciplinary power (Foucault, 1982) and Bourdieu's symbolic power (Bourdieu, 1989). Hoy argued that integrating Bourdieu and Foucault as an analytical framework is possible if, for example, the aim is to deploy Bourdieu's work to strengthen Foucault's work. Hoy's proposition agrees with Pierre Bourdieu's admission of the philosophical similarity between his work and Foucault's work<sup>2</sup> (Bourdieu, 2008). This complementary approach helps to transcend the theory-praxis dichotomy and other dichotomies, enabling me to use whatever method and theories are suitable for the object and subject of research. This thinking influenced how I designed and composed my positionality statement. It also informed how I co-produced, collected, analysed the data, and disseminated my findings. [Appendix K](#) contains a detailed literature on the conceptual integration of Michel Foucault and Pierre Bourdieu's work.

## ***Research questions and approach***

Given the relationship between sustainable water access and infrastructure failure in Nigeria and the centrality of power in this relationship, the main objective of this thesis is to trace and analyse the processes of water infrastructure development. This analysis involves identifying the actors, and the different rationales and strategies of power used at different stages of water infrastructure development. The central research question of this thesis is: What are the changing effects of power on the development and governance of water supply infrastructure in Nigeria, and to what extent is it responsible for infrastructure failure? The sub-questions that contribute to this broad research question are:

1. What is the state of power and politics research in Nigeria's water (infrastructure) governance, and how is it conceptualised? (Chapters 1, 2 and 3);
2. How have changes to political governance and power relations in Nigeria produced current water infrastructure governance in Nigeria (Chapters 4 and 5);
3. How does the state affect relations of power at the community level, and what effect do they have on water users and their access to water? (Chapter 6);
4. As a strategy of power, how has infrastructure failure as a water policy and governance concept operate within Nigeria's water governance and with what effects? (Chapters 7 and 8).

In this thesis, I take a critical interdisciplinary approach because my initial research questions prompted further questions that required different methodological and theoretical considerations. For

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<sup>2</sup> Bourdieu notes in his book *Sketch of a Self Analysis* that they both draw extensively from Georges Canguilhem, the French philosopher of science.

example, having examined how ideas and ideologies are used at the federal level (Chapters 4 and 5), the benefits and limitations of ideational power to adequately explain the production of those ideas and rationales were evident. Similarly, the engaged research approach (Kirsch, 2018; Mukhtarov & Daniell, 2017) described below in *research methodology* was not robust enough to capture enough information in this regard. These challenges prompted a further exploration of how those ideas and ideologies were created in the first place, through a community-level analysis using new theories and methods (Chapter 6). I also consider governance, infrastructural scale, and history in its design and analysis, following an environmental historical (historical materialist tradition) and genealogical approach. These approaches guided how I selected the interpretive analytics.

## ***Research methodology***

### **The cases**

A case study approach was selected to provide rich data and an in-depth understanding of the processes of human interactions (Hartley, 2014; Yin, 2014). The cases examined in this thesis capture the governance, water infrastructure, scales and time. I selected a complex transnational inter-basin water transfer project (Chapter 4) to uncover pre-construction issues of a water infrastructure project that contribute to infrastructure failure. Existing scholarly arguments support the idea that pre-construction decisions have a flow-on effect on and contribute to infrastructure failure (Hofstetter et al., 2020; Felix et al., 2017; Van Den Berg & Danilenko, 2017; Nweze, 2016).

Pre-construction activities of the Transaqua inter-basin water transfer shed light on the limits and extents of Nigerian state power beyond its territorial borders. Chapter 5 examines the construction and post-construction phase of dams and standpipes in Nigeria, looking at the historical processes and conditions under which they were planned, constructed, and managed. At the pre-construction phase, the underlying ideological worldviews of dams and standpipe construction are rationalised through expressions of benevolence and good intentions for end users. This represents a form of state paternalism (Koot, 2020). Likewise, the material modification of space, place, and time to improve end users' livelihoods requires transforming their attitudes, cultures, and, practically, everyday living. In these two cases, results from an analysis of inter- and intra-state relations of power prompted me to explore state-society relations at the local or smaller community level. I observed that active participation and involvement of large sections of the water users was not promoted during the infrastructure development stage.

Chapters 6 and 8 move down the governance, infrastructure, and temporal levels to understand how this scaffold called the state unravels, manipulates its constituencies, or simply relates with the symbols that contain, sustain, and transport its powers. In Chapter 6, I select the *Ìgànná* water supply scheme in *Ìgànná* community, *Òyó* state, a rural *Yòrùbá* town in southwest Nigeria. The water scheme

consists of a dam and network of standpipes constructed at 70m–100m intervals along the road. I do this by zooming in on the standpipe as a potable water supply infrastructure, the endpoint (delivery) of the water supply scheme. In Chapter 7, I investigate the concept of infrastructure renovation as a policy concept used in water infrastructure governance. I explore its use in the Federal Ministry of Water Resources budget and its history from the colonial period in Chapter 8.

## Sources

Data sources for this study include field-based methods, archival searching, field observations, and audio-visual information. Data that I collected from 32 unstructured interviews and ethnographic observations were cross-checked against, and augmented by, historical material sourced from archives and libraries. Most of the interviews were with lower-level government and non-government staff and everyday people and water users. This was to present a broader social understanding of water governance, not always captured in the Nigerian literature, and due to the difficulty of accessing ‘elite’ actors for interviews.<sup>3</sup> Where possible, I initiated direct contact with interviewees and authors for phone and email interviews. One of the conferences I attended was a data collection site where I used “engaged research approaches and methods” (Mukhtarov & Daniell, 2017, p. 437), such as ‘follow-the-actor’ techniques to access “behind-the-scenes political processes, actors and decisions” (Chapter 4). This *in-situ* technique helped connect with the participants for data co-construction and co-generation (Schwartz-Shea & Yanow, 2012). My journal, field notes, and memorandums from multiple personal conversations with critical speakers and actors at the conference, and recorded speeches made by high-level delegates and country leaders, became valuable data sources.

Policy documents, officials’ speeches and statements, and individual commentaries of political actors from various institutional websites supported the desk-based approaches. Such data include Nigeria's Federal Ministry of Water Resources and the International Commission on Dams (ICOLD). Dams and reservoir information in the Nigerian compendium of dams and the 2014 national water resources masterplan were accessed. Fieldwork occurred for a total of five months (March–June 2017, and January–March 2018) in Nigeria with multiple visits to *Ìgànná* community, different states (*Òsun* and *Èkìtì*), and federal government offices in Abuja and Abeokuta.

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<sup>3</sup> It was difficult to gain access to senior government officials within the available timeframe. In addition, increasing security concerns affected my travel between my station in *Ìbàdàn*, *Òyó* state, and Abuja (500 km apart).

## Analysis

The analysis in this thesis views collected data through its ability to transform a given situation or interaction. By unpacking specific assumptions upon which water infrastructure governance is built in Nigeria, for example infrastructure renovation (Chapter 8), I connect discourses and narratives to specific governance structures and practices. I privilege human agency and see things (objects) that are enrolled as strategies or effects. Using individual stories that intersect multiple spaces of power, I identify and establish a timeframe of events, and processes between events. Thus, I can link these different temporal scales to the governance scales to determine how a phenomenon changes or becomes forgotten in the series of events. Triangulation of theories and methods is embedded in my research design as an analytical strategy and, broadly, my methodological approach (Williamson, 2018). My theoretical and methodological positioning foregrounds conceptual flexibility as a necessary tool to fruitfully study power relations. Seeking to understand the role of power relations in infrastructure failure requires me to generalise and reduce heterogeneities – the myriad of subjective interpretations of truth claims. Using this approach, I attempt to develop generalizable theories that are responsive to water infrastructure governance in Nigeria and other African countries, as one theoretical objective of this thesis.

Recognising the importance of developing paradigms and theories in water governance (Meissner, 2016), I ensure that analytical movements between theories, methods and data, from the specific to general details, and inter- and intra-subjective perspectives (individual or representatives of groups), inform the research design and data analysis; for example, state-defined entities or representations, such as the standpipe or dam, and societally sanctioned entities such as traditional or cultural artefacts and institutions. The analyses of ideational elements and ideologies identified in Chapters 4 and 5 (Part B) are conceptualised as practices and strategies (Foucault, 1984), as an apparatus in Chapter 8 (Part C), and as ideological instruments (Bourdieu, 1989) in Chapter 6 (Part C). Parts B and C thus complement each other because results from Chapters 6 and 8 demonstrate how those instruments and strategies of power work complementarily at the micro level in social and political struggles for domination.

I have been careful not to impose claims of inequity or injustice, consistent with the relativist position of Foucaultian analysis. I ensure that my interpretive analysis exhausts all complementing and triangulated evidence when deciding what constitutes injustice or inequity. However, I distance myself from Foucault's moral relativism in this regard because of the overwhelming evidence of injustice in the historical relationship between European and African countries. In instances where it is difficult to establish domination, subordination, acquiescence, or detachment in a relation of power, or where interaction does not convincingly demonstrate such, I refrain from forcing theory on the data. I am mindful of the theoretical and analytical implications of this relativistic position in Chapter 6 when interpreting what I observed, what I was told, and what was already written. Through this approach, I conceptually engage the analytical movements between the techniques, rationales, and practices that

unquestionably produce and perpetuate inequity and injustice. At the same time, I identify and embrace the productive components of relations of power necessary for positive transformative change in my analysis.

I synthesise the research results by demonstrating how each article contributes to an enriched understanding of facets of infrastructure failure and problems of water infrastructure governance in Nigeria. While in the research design (my attempt at constructing a frame to understand infrastructure failure) I had envisaged this synthesis work, its final shape was determined by the co-constructed data from the field. For example, despite utilising engaged research approaches in Chapter 4 (Transaqua) to access vital information from key actors, the approach was insufficient to clearly explain the underlying relations of power that produced those rationales. Coming to terms with this methodological concern prompted a search for methodological and theoretical approaches suitable for micro-level power analysis. In my opinion, such approaches must uncover the process through which ideas and ideologies develop and are accepted. Hence, in Part C, I firmly position the development of this process (of ideological formation) as both a symbolic and material relationship that interlocks, in recurring permanence, the individual with the rationales, techniques, and artefacts of political struggles, authority and governance structures.

## ***Thesis structure***

### **Chapter overview and content**

This thesis contains a total of eight papers (Figure 0-3) at different stages of the publication process. Appendices I – K contain detailed theoretical literature reviews of power and development, and a proposed power analysis framework, while Appendices L provide extended analysis for Chapter 4. Altogether, in the main part of the thesis there are ten sections with the introduction and conclusion chapters included. I provide linking text between each chapter and, in this case, between each of the three parts in accordance with *ANU Procedure: Higher degree by research - thesis by compilation and thesis by creative works*.

### **Thesis organisation**

This thesis is set in three composite parts (A–C) in response to the research questions and sub-questions. As research set in the critical intellectual tradition (Garland, 2014), Part A (Chapters 1–3) diagnoses and problematises water infrastructure governance in Nigeria to develop a conceptual framework. It begins by exploring this problem in the literature, policy, and development plans. Indeed, whatever is assumed to be ordinary or commonsense with water infrastructure governance in Nigeria is

a problem. The thesis assumes that a *common-sense* problem exists within this sociopolitical space regarding the system's political and governance processes and its social and political struggles.

Before interrogating how different forms and understanding of power and/or knowledge, rationale, strategies, and techniques have shaped Nigeria's water infrastructure landscape, I establish how power relations in Nigeria's water infrastructure governance have been analysed. Chapter 1 reviews research on water infrastructure governance in Nigeria to understand the empirical and conceptual issues, and

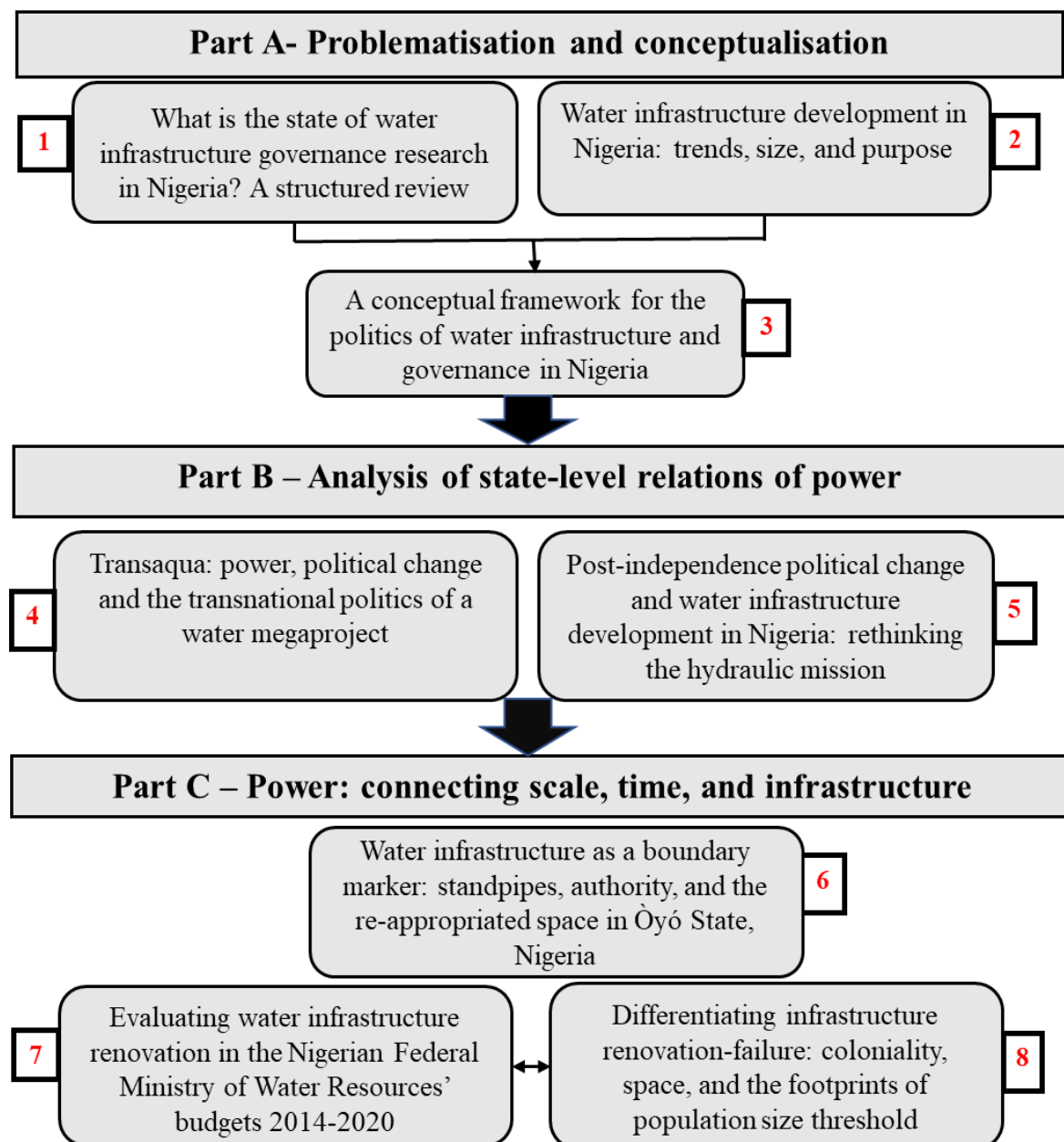


Figure 0-3: Thesis structure

how power and politics are understood and analysed. The structured review synthesises 30 years (1990–2019) of peer-reviewed literature, reports and conference papers that specifically investigate water infrastructure and governance. This review concludes that water infrastructure governance literature in Nigeria needs new conceptual tools; specifically, a conceptual model that foregrounds power and politics and embraces historical approaches to address the broader issues of infrastructure governance and failure. Chapter 2 examines pre-colonial, colonial, and post-independence water infrastructure development in Nigeria by analysing dam trends, sizes, and purposes. I find that Nigeria's water infrastructure is a product of the major colonial and post-independence national development plans (1946–1990), the agricultural development programs (ADPs) (1974–1995), and the two comprehensive national water resources development masterplans (1995 and 2014). Owned mainly by federal and state governments, these water infrastructures were not optimally used or managed, which led to repeated failure and renovation cycles. Based on the findings in Chapters 1 and 2, Chapter 3 develops a conceptual and analytical framework that prioritises power and politics to study water infrastructure and governance in Nigeria and West/Central Africa more broadly.

The conceptual and theoretical insights from Part A form the foundations for the empirical analysis in Part B. Consisting of Chapters 4 and 5, Part B responds to question 2. Here, both chapters examine water infrastructure development through political changes to the Nigerian State. Chapter 4 uses ideational power (Carstensen & Schmidt, 2016; Schmidt, 2017) to investigate how short-term political change in Nigeria and water infrastructure development intersect at the regional level, including the resistance from other regional actors such as the Congo DRC (see [Appendix L](#) for an extended analysis). This hydropolitical analysis shows how Nigeria's state power, through its newly elected leadership, mobilised different spaces, actors, and ideas regionally in West and Central Africa and globally between Europe and China. At its pre-construction stage, development of the Transaqua inter-basin water transfer project suggests that the contradictory rationales advocated by its proponents contribute to infrastructure failure. The series of quick pre-construction decisions achieved through the *political platforming* of specific discourses and peoples, mainly by the Lake Chad Basin Commission and the Nigerian leadership in crucial global and regional geopolitical spaces, is used as a new rationale to supplant historical arguments for its construction. Ideational elements used by the Nigerian state to achieve these objectives provide valuable insights into who is excluded or included at the development stage of a mega water infrastructure. Here, the logic of *planning for* the region and its people is a norm.

Chapter 5 zooms in to the national level to examine how water infrastructures have transformed Nigeria's society, nature, and geographical space over time, through dams and standpipes. Due to the rapidly changing political system and contradicting ideologies within the Nigerian state, the hydraulic mission as a theoretical concept is considered inadequate in explaining water infrastructure development in Nigeria, by examining its teleological purpose (the end it should achieve) and the required time. The theoretical argument presented here is that transformations to Nigeria's social and natural order through

its hydraulic mission was moderately consistent. The inability to reach a full hydraulic mission was because of frequent changes to the political system, and internal ideological contradictions between the nation-state and the constituent states and local governments. The federal government was unable to create a total hegemonic order substantial enough for prolonged domination of its constituent units through a hydraulic mission. I explore jurisdictional, policy, and other discursive strategies and ideas deployed by state governments and civil society when resisting the federal government's efforts to mobilise a hydropolitical order. Relatedly, I show how the financial, legal, and policy relationships between federal and state governments are organized to partly explain why infrastructure failure and decay persists in Nigeria. In Nigeria, development ideologies (often economic) and the post-war political-ideology (national unity) have longer-enduring effects on water infrastructure development than autocratic or nation-building arguments that have dominated the academic literature (Menga, 2015; Swyngedouw, 2007, 2014).

In Part C, I answer sub-questions 3 and 4 by examining micropolitical relations of power, and how spatial, financial, institutional, and jurisdictional powers and authorities affect everyday lives. I do this by analysing the rationales and strategies deployed. Here, the state is not always physically active because the effects of its rationales or strategies are almost invincible. They are carried in people and objects. State agents and users of the specific water infrastructure embody and manifest state ideas and prerogatives. Specifically, I identify and disentangle the process of group formation and authority accumulation; that is, the process of "legitimisation of legitimacy" (Haugaard & Clegg, 2009, p. 31).

In Chapter 6, an attempt to answer a policy and theoretical question in rural water governance and access in *Ìgànná*, southwest Nigeria, integrates Pierre Bourdieu's symbolic power with Michel Foucault's disciplinary power. I explore how specific techniques and strategies work to unite groups, exclude others, and normalise subordinating behaviours to sustain domination in spaces without institutionalised authority. I term this 'uninstitutionalised space'. Here, the central argument is that spatial proximity to a water infrastructure determines who holds authority for the day-to-day management. Using the standpipe as a *boundary marker* between state and society, I analyse the characteristics of violence, authority, and political order through the instruments and strategies used by water consumers. From this analysis of everyday politics, I conclude that physical spaces can be re-appropriated by using a standpipe and other things as instruments or strategies for gaining and sustaining authority to govern the standpipe. Therefore, decisions relating to leadership selection should account for proximity to the particular infrastructure.

Chapter 7 assesses the Federal Ministry of Water Resources' budget between 2014–2020 to understand the financial implication of infrastructure renovation and the types of water infrastructure investment it attracts. From the analysis, I propose a simple conceptual model that captures the cyclical *infrastructure failure and renovation* processes in the budget. Infrastructure renovation as an institutional practice masks financial misappropriation issues and promotes infrastructure decay and



deterioration more broadly. This problem happens because budgeting practices such as budget crossovers enable projects marked for repairs to be repeated over several years. As a vital contribution, the model will help navigate the infrastructure *construction-renovation-failure* cycle in water infrastructure finance research and practice. Having observed how infrastructure renovation and failure is studied in the literature (Chapter 1), its effect on policies and development plans (Chapter 2), and how structural and systemic changes produce and perpetuate it (Chapter 5), I find a critical need to understand its historical dimension as a discursive strategy of power in Chapter 8.

Finally, Chapter 8 takes this water infrastructure governance concept, infrastructure renovation, and unpacks it as a mechanism of power shaped in coloniality from a racial paternalism perspective. Using a Foucaultian genealogical approach and a dialectical logic, I explain how infrastructure renovation is a dialectical outcome of infrastructure failure because the former cannot exist without the latter. I propose a definition of infrastructure failure as *an insidious and unchallenged administrative and/or policy decision exercised within the public space and assumed as grounded in evidence*. Hence, I coin the term *infrastructure failure* to appropriately denote this concept and show how it is used as a strategy of power to divide rural from urban water governance, and entrench the standpipe as a main water supply infrastructure for rural Nigeria. Through this power mechanism, the colonial state transformed politics, spaces, and bodies, and entrenched systemic inequities in water infrastructure development and governance. This finding raises critical questions around issues such as sustainability of the community management model (Harvey & Reed, 2007; Whaley & Cleaver, 2017) as the primary theoretical and practice model for standpipe and waterpoint management, both in rural and peri-urban areas of Nigeria and other African countries. It demonstrates that regardless of the distinct features across infrastructure and governance levels, practices and strategies of power connect these scales, to erect and sustain inequities, unjust practices, and structures over time.

The conclusion section contains a summary of the overall contributions of this thesis. However, each chapter provides a detailed outline of the findings and recommendations. Precisely, the recommendations are addressed at researchers, policy practitioners and political actors to enable their understanding of policy, governance, and political topics that require attention if the current direction of water access, water infrastructure development and failure is to change. These suggestions include bridging the knowledge gap between different spatial and territorial contexts, in particular, the global North and South, politicising policy and governance choices through their social and political implications on peoples' minds and bodies, and revisiting particular constitutional and institutional subjects in the Nigerian State. As intersecting topics, they must be approached at structural, systemic, and individual levels. On a final note, the suggestions should lead to a robust understanding and an informed plan of action for steering Nigeria and other African countries towards developing sustainable water infrastructure in the future.

# **PART A**

## **PROBLEMATISATION**

### **AND**

## **CONCEPTUALISATION**

This part consists of three chapters that outline the development of the problem and propose a conceptual framework for its analysis. It begins by critically examining the existing literature on water infrastructure governance in Nigeria. Chapter 2 investigates the historical development and spatial distribution of water infrastructure (dams and standpipes), focusing on the trend, sizes, and purpose. Chapter 3 proposes a conceptual framework suitable for the study of politics in Nigeria's water governance.

# Chapter 1: What is the state of water infrastructure governance research in Nigeria? A structured review

Adeniran, A. B. (2021) What is the state of water infrastructure governance research in Nigeria? A structured review, *Water International*, <https://doi.org/10.1080/02508060.2022.2054548>

**Sub-question 1:** What is the state of power and politics research in Nigeria's water (infrastructure) governance, and how is it conceptualised?

## Chapter introduction

This Chapter responds to sub-question 1 by reviewing the literature on water infrastructure governance in Nigeria between 1990–2019. The aim was to understand whether, and how, power and politics are studied in water infrastructure governance research in Nigeria and highlight empirical and conceptual gaps in the literature. The publications were analysed for article quality, water infrastructure governance and management issues, and power and political relations issues.

A major outcome of the research is that governments and large non-state actors play a central role in the success or failure of a water infrastructure because of the power relations between government officials and stakeholders. None of the publications engaged explicitly with power and politics research, although most acknowledged the influential role of structural-level water actors in decision-making. Similarly, the central role of the government is reinforced by a standard narrative that structural actors should give or relinquish some power to communities to enable their increased agency. This finding points to the structure-agency debate in the literature around issues of water, power, and authority.

Linked to the above, the water management approaches used in the studies showed different types and purposes of water infrastructures. Unsurprisingly, the excessive focus on community management approaches is due to the orthodoxy of the approach and its embeddedness within state and federal water policies. Decentralised water systems such as wells, standpipes, and boreholes were more studied than centralised systems like dams and water supply schemes. In addition, regional imbalances in the research were also evident as most of the studies were conducted in the southern parts of the country. Because of these patterns, there are few studies that tease out micro-level relations where water infrastructure development and water policy intersect. These findings point to the conceptual gap between governance practice in Nigeria and the theoretical advancements in the water governance literature. Finally, the inadequate attention to conceptual, theoretical, and methodological application across the publications helps perpetuate top-down approaches to water infrastructure management, and maintain historical

injustices and inequities in taken-for-granted water governance concepts; for example, infrastructure renovation.

The proposed research agenda from the study includes: the development of a new conceptual toolbox and framework that are conceptually applicable to Nigeria (developed in Chapter 3); engaging infrastructure politics; rethinking state and society boundaries, roles, and responsibilities; and ensuring that future water governance research and practice engage gender and climate issues.

### **Abstract**

Water infrastructure occupies a central role in achieving the Sustainable Development Goals, especially in water supply, sanitation and health, agricultural development, and energy production. However, Nigeria, and many African countries face specific challenges around infrastructure financing, systemic and repeated malfunctioning, and decentralised infrastructure types. This structured review provides insights into the current state of water infrastructure governance research in Nigeria and presents a research agenda.

## **1.1 Introduction**

Water infrastructure occupies a central role in achieving the Sustainable Development Goals (SDGs) (Arimah, 2017; Mugagga & Nabaasa, 2016), especially in water supply, sanitation and health, agricultural development, and energy production (Grafton et al., 2014; World Water Council, 2016). However, Nigeria, and many African countries face specific challenges around infrastructure financing (Collier & Cust, 2015; UN-Water, 2018; WHO, 2020), systemic and repeated malfunctioning (Furlong, 2014), and decentralised infrastructure types (Eberhard, 2019). Nigeria has consistently lagged in meeting her global water security commitments on health, agriculture, potable water supply and environmental sustainability, while demographic increase and infrastructure breakdown continue to strain the sustainability of current progress (FMWR et al., 2020; NPC & ICF, 2018; WHO, 2020). Addressing these issues requires a review of this kind to shine light on these contradictions and identify research gaps to support context-specific infrastructure governance responses.

Increasing use of systematic literature reviews in water governance and policy research in the last decade has helped to identify current state of knowledge, characterize research challenges, shape future practice and research needs, and target evidence to improve water governance outcomes (Araral & Wang, 2013; Boeuf & Fritsch, 2016; Lilyea et al., 2016; Majuru et al., 2016; Moore et al., 2014; Olagunju et al., 2019; Özerol et al., 2018). However, knowledge gaps exist across the political and social contexts of these studies, leading to a call for a new research direction for water governance (Araral & Wang, 2013; Marques et al., 2016; Özerol et al., 2018; Whaley & Cleaver, 2017). Olagunju et al.'s (2019) pioneering work across Africa is notable here. In their systematic review of water governance

literature on Africa from 2000–2016, they found that contextually relevant studies are lacking, studies are theoretically weak and the application of models almost non-existent, and study designs are methodologically deficient thereby compromising analytical rigor and integrity (Olagunju et al., 2019).

Definitions for infrastructure have been drawn primarily from the work of anthropologists and water ethnographers and based on an analysis of non-water-related materialities; for example, roads and media (Larkin, 2013; Star, 1999). As this is a conceptual issue, I will not elaborate due to a lack of space. However, for the purpose of this review, I will make two distinctions. First, academic classification of water infrastructure overwhelmingly attends to dams, pipes, and boreholes (Grigg, 2019). Such classifications typically focus on the use of water infrastructure, and the source of water it transports (groundwater or surface water). Second, *water-related thematic research* largely focuses on agriculture, potable water supply, and energy due to the development-focused paradigm, which emphasises the water-food-energy-poverty nexus dynamics as a global template for national development and poverty reduction (Allan et al., 2015; Hussey & Pittock, 2012; Lele et al., 2013). Going by this classificatory logic of water infrastructure types, water source, and purpose, water infrastructure refers to that constructed for agriculture, hydroelectric, and potable water supply. Taken broadly, “water infrastructure consists of dams, levees, canals, pipes, pumps and water treatment plants (machines)” (Crow-Miller et al., 2017, p. 195). I adopt Zwarteveen et al.'s (2017) definition of water governance which is “about political choices as to where water should flow, about the norms, rules, and laws on which such should be based, about who is best able or qualified to decide about this, and about the kind of societal future such choices support” (2017, p. 1).

This review aims to provide insights into the current state of water infrastructure governance in Nigeria and highlight gaps in the literature for a research agenda. To my knowledge, this is the first review to synthesize the literature on water infrastructure governance in Nigeria. The specific questions are:

- What are the empirical issues addressed in water infrastructure governance in Nigeria?
- What conceptual challenges exist in water infrastructure governance in Nigeria?
- How is power and politics understood in water infrastructure governance research in Nigeria?

Following this introduction, the second section presents the review methodology, followed by the results in the third section. The fourth section summarizes and discusses the results while in fifth section presents six specific themes as a research agenda. The sixth section concludes.

## **1.2 Review methodology**

### **1.2.1 Search strategy**

Before beginning the review, an initial Google search for ‘electronic databases for social science research’ was carried out to get a feel for the water infrastructure governance literature in Nigeria published from 1990 to 2019. I selected 1990 as a starting date for three reasons. First, thematically, to focus on water infrastructure as a distinct but inseparable aspect of water governance. Second, to maintain a geographical focus on Nigeria because it marked the end of two decades (between the 1970s and 1980s) of intensive water infrastructure development in Nigeria at state and federal levels (JICA & FMWRRD, 1995b). Focusing on Nigeria resonates with the emphasis on context-specific research (national level in this case) that account for events peculiar to the country. Third, to focus on policies that encourage water infrastructure development, e.g., several thousands of waterpoints were constructed in Nigeria during the International Water Decade (1980 – 1990). After that, a two-part strategy was used to search the literature, which involved a hand search as a manual strategy to complement the electronic search (Richards, 2008). For the electronic search, I selected Scopus due to the volume of publications from the scoping search, its extensive peer-review library (Burnham, 2006), and its ability to capture publications from several developing countries (Zhu & Liu, 2020). Hand searching for grey literature was from Google, World Bank, and United Nations (UN) databases. Repeated searches confirmed Haddaway's (2015) suggestion to focus on the first 200 to 300 results from Google and Google Scholar. I used this rationale to assess the first 100 results from Google, the UN and World Bank databases. By attempting to capture publications through a range of sources that includes grey literature (conference proceedings and working papers), the tendency for publication bias in systematic reviews is averted (Lilyea et al., 2016; Petticrew & Roberts, 2006).

### **1.2.2 Study selection – Screening and evaluation**

The review used terms like ‘water resources management’ or ‘water management’ instead of ‘governance’ to filter the literature (see [Appendix A](#)). Following McGinnis et al. (2017), a three-stage multistep screening was used as a procedural guide against selection bias, once all titles had been exported into Mendeley citation manager as the preferred document manager (Venkataramanan et al., 2018). Mendeley is considered the most effective de-duplicating evaluation tool, due to its return time and the amount of false negatives returned when compared with other citation management systems (Kwon et al., 2015).

### 1.2.3 Eligibility criteria

The conceptual marker (Hausner et al., 2015) for what constitutes water infrastructure (since I could not find a satisfactory definition) had to be determined. Following Haddaway's (2015) suggestion to focus on a more focused group of studies when choosing the inclusion criteria, I attempted to limit the scope to specific statutory responsibility of the Federal Ministry of Water Resources (Federal Ministry of Water Resources, 2016a) as far as water infrastructure is concerned: dams, standpipes, boreholes, and wells. Figure 1-1 shows the flow diagram for the search process using a modified PRISMA template (Moher et al., 2009). A Scopus initial database search recorded 2,002 while Google Scholar recorded 1,430; and 2,951 duplicates were removed that focused mostly on oil wells in the petroleum sector or health-related sectors, leaving a total of 543.

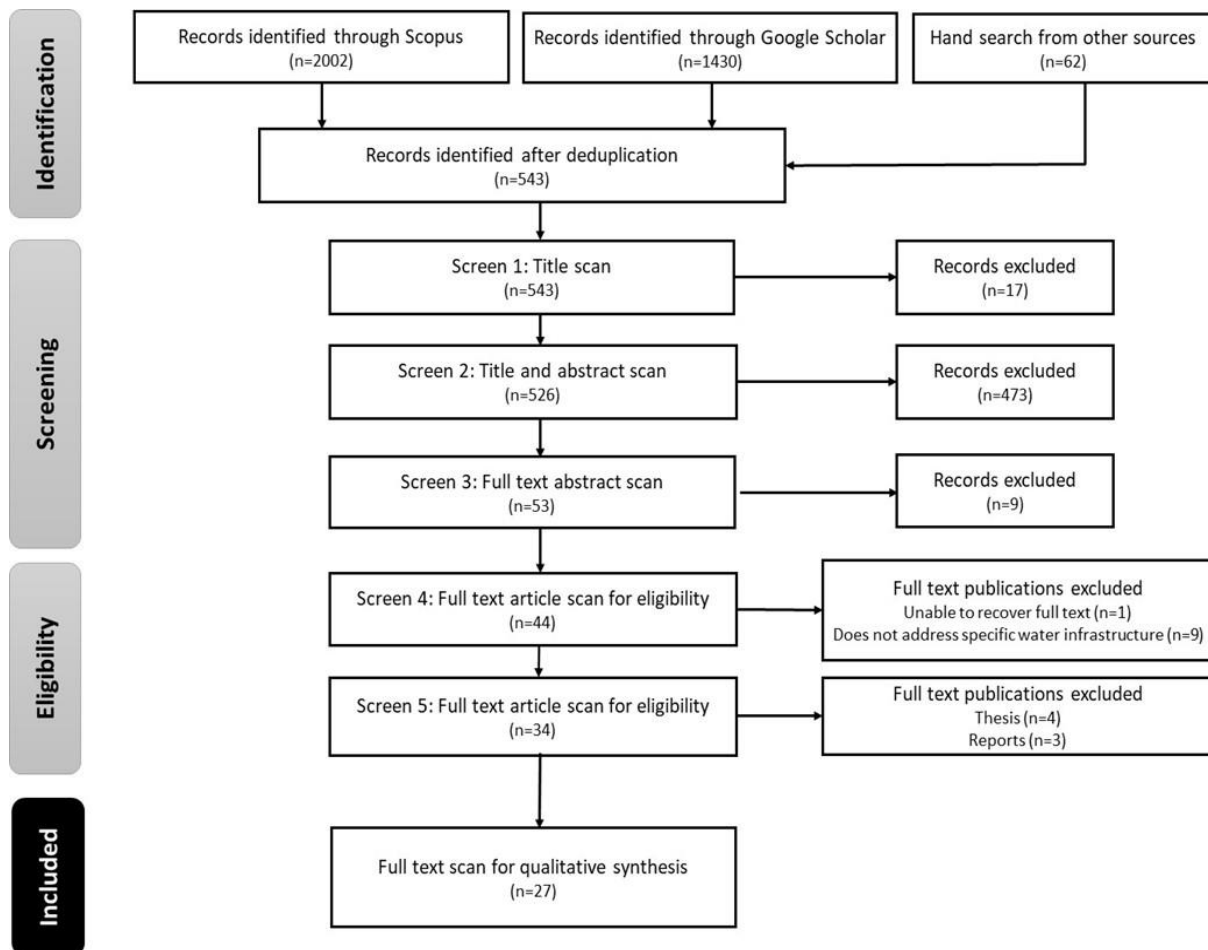


Figure 1-1: Systematic review flow diagram for publications selection process (McGinnis et al., 2017; Moher et al., 2009)

Five screens were carried out before arriving at the final figure of 27 publications used in this review. During screen 3, the specific inclusion criteria were applied following a full text abstract scan

based on the four inclusion criteria. The inclusion criteria were framed around topical and infrastructural issues and guided by the research questions. Publications must specifically address a type of water infrastructure or water facility. Studies were included if they met the following criteria:

- Is the article conducted within or on Nigeria?
- Does the article have a specific focus on water supply, agriculture, hydroelectric power infrastructure?
- Does the publication examine management or governance issues around water infrastructure?

The final full text screening for eligibility (screen 4 and 5) focused on identifying publications that do not address a specific water infrastructure or did not link the infrastructure problem to any management or governance theme. A final decision was taken to remove theses, reports, and documents with missing full texts. One such example is Oginni & Fadipe (2016), which met only two out of the three inclusion criteria. The final articles (n=27) were processed for data extraction using an excel spreadsheet and the analytical framework of issues and questions (Table 1-1).

**Table 1-1: Analytical framework for the articles used in the review**

<b>Category</b>	<b>Descriptors</b>
Publications	Author, article year, geographical location, geographical setting, publication type, study funder, study type, and study approach
Conceptual insights – governance, power and infrastructure	Does the article mention or analyse power or political relations? What water governance concepts are identified? Is water infrastructure defined? Is there a typology of water infrastructure? e.g., Standpipes Did the article describe a theory or method?
Empirical insights	What infrastructure issues are examined in the publications? What governance issues are examined in the publications?

For data analysis, a combination of descriptive and interpretive synthesis approaches, which “includes narrative summary and tabulation”, and content and thematic analysis, was used (Evans, 2002, p. 23). The narrative synthesis approach, according to Popay et al. (2006, p. 5), “relies primarily on the use of words and texts to summarise and explain the findings of the synthesis”. Combining descriptive and interpretive synthesis safeguards the validity of systematic review results (Evans, 2002). Descriptive synthesis was undertaken using the Pivot Table in Microsoft Excel database, based on specific identifiers. Article characteristics tabulated include: author, year, publication, publication type, study aim, geographical setting, geographical location, water source, study approach, water governance focus,



and study funder. With the descriptor, *water governance focus*, ‘institutional’ denotes publications that investigate water infrastructure fully owned and managed by government institutions. ‘Non-institutional’ refers to publications that investigate water infrastructure with a full or shared management arrangement by nongovernment organisations e.g., WaterAid and community groups. Qualitative content analysis was used to identify and organize the documents for relevant themes, narratives and insights (Taylor-Powell & Renner, 2003) through a content search of these articles. I excluded all years where no publication was identified in the results. Specifically, 1990 – 1992, and 1994 – 2006.

### **1.3 Results**

Table 1-2 provides an overview of the publications on water infrastructure governance in Nigeria. The publications consist of journal articles (n=20; 74.9%), book or book chapter (n=2; 7.4%), working papers (n=3; 11.1%), and conference papers (n=2; 7.4%). This diversity is also shown in the publication outlet. Aside from the World Bank (n=3; 11.1%) and the WEDC (n=2; 7.4%), which are working papers, books, and conference publications, all others are published in journal outlets ranging from prized international journals like *World Development* (Adams, 1993) and *Water Policy* (Akpabio, 2007) to local journals such as the *Lagos Journal of Geo-Information Sciences* (Ayeni et al., 2013). Both focus on institutional dimensions of water governance (and qualitative research).

Differences in the geographical distribution of these studies show that over half of the studies (n= 15; 55%) were conducted in the southern states, with the northern states having 18.5% (n=5). The remaining seven were conducted nation-wide. The geographical setting of each study is more even. Urban (n=8; 29.6%) and metropolitan areas (n=9; 33.3%) have the highest attention compared to studies in peri-urban (n=4; 14.8%) and rural areas (n=6; 22.2%). With funding or support for publications, studies that reported no support or funding are classified as independent (n=18; 66.7%), while those with funding support (n=9; 33.3%) had their funding largely from the World Bank and the United Kingdom government.

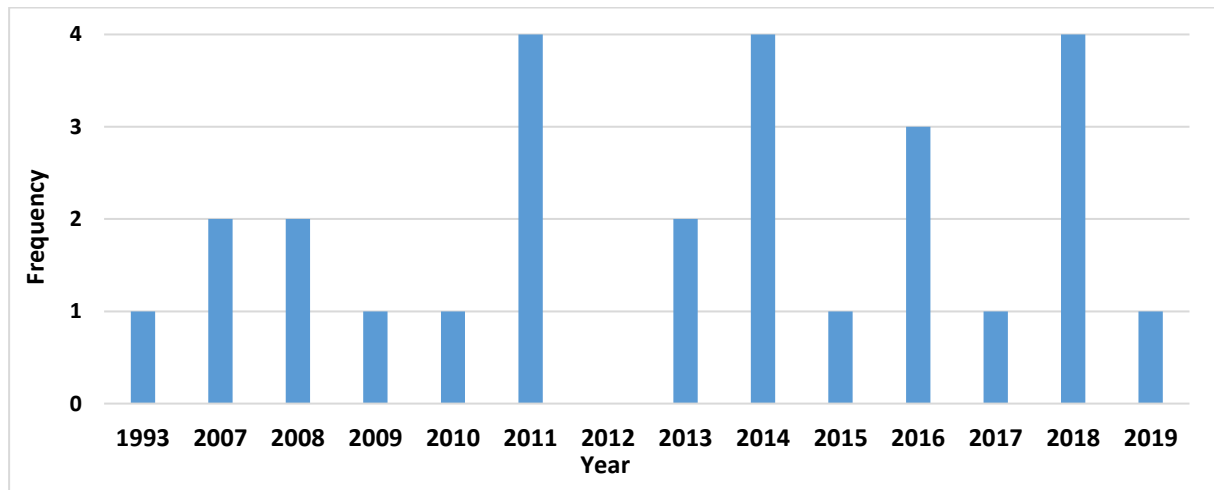
**Table 1-2: Publications included in this review**

<b>Publication</b>	<b>Author, Year</b>	<b>Publication type</b>	<b>Study aim</b>	<b>Geographical setting</b>	<b>Geographical location</b>	<b>Water source</b>	<b>Study approach</b>	<b>Water governance focus</b>	<b>Study funder</b>
World Development	Adams (1993)	Article	Provide insights into the technical difficulty of defining downstream needs and the constraints on effective communications between dam managers and downstream water users.	Not described	Sokoto	Surface water	Qualitative	Institutional	Independent
Water Policy	Akpabio (2007)	Article	Assess the implementation of irrigation project under the framework of IWRM	Rural	Cross River	Multiple	Qualitative	Institutional	The Commonwealth Scholarship Commission (CSC), United Kingdom
African Technology Policy Studies	Gbadegesin & Olorunfemi (2007)	Working paper	Assess the extent to which stakeholders are willing and able to adopt and implement sustainable, cost-effective and environmentally friendly management options for water resources	Periurban	Òyó	Multiple	Mixed	Non-institutional	ATPS, supported by multiple donors
Journal of Rural Economics and Development	Adeoti (2008)	Article	Evaluate participation in collective maintenance of boreholes and factors that influence it	Rural	Òyó	Groundwater	Quantitative	Non-institutional	Independent
Journal of Social Sciences	Olukotun (2008)	Article	Not described	Rural	Kogi	Groundwater	Qualitative	Non-institutional	Independent
Journal of Sustainable Development in Africa	Longe et al. (2009)	Article	Investigate the state and conditions of the water supply facilities in the rural communities vis-à-vis their sustainability.	Urban	Lagos	Groundwater	Quantitative	Non-institutional	Independent
Journal of Environmental Sciences	Adekitan et al. (2010)	Article	Investigate community participation in urban water supply.	Urban	Ogun	Groundwater	Mixed	Non-institutional	Independent
WEDC	Eduvie et al. (2011)	Conference	Report the monitoring activities of community and water supply and sanitation facilities	Rural	Jigawa	Groundwater	Not described	Non-institutional	Jigawa State Government and DFID
Management of Environmental Quality: An International Journal	Gbadegesin & Olorunfemi (2011)	Article	Examine the extent to which stakeholders are willing and able to adopt and implement sustainable, cost-effective and environment friendly management options for water resources	Periurban	Òyó	Multiple	Mixed	Non-institutional	Independent
Water Supply	Oluwasanya et al. (2011)	Article	Assess urban hand dug wells	Urban	Ogun	Groundwater	Quantitative	Non-institutional	The Commonwealth Scholarship Commission, United Kingdom
WEDC	Otun et al. (2011)	Conference	Highlight and discuss the issues and challenges of decaying water assets in PWUs in Nigeria.	Urban	Nigeria	Multiple	Qualitative	Institutional	Independent
Lagos Journal of Geo-Information Sciences	Ayeni et al. (2013)	Article	Evaluate various stakeholders' contribution in community water supply	Multiple	Ondo	Multiple	Quantitative	Non-institutional	Independent
Journal of Innovative Systems Design and Engineering	Emmanuel & Bamidele (2013)	Article	Evaluate the contributions of community efforts to borehole water supply schemes	Urban	Osun	Groundwater	Quantitative	Non-institutional	Independent
Journal of Environmental and Earth Science	Dominic et al. (2014)	Article	Explain factors weighing down the success of a sustainable water provision	Multiple	Anambra	Multiple	Qualitative	Institutional	Independent

Wiley Blackwell	Oloke & Olugboye (2014)	Book chapter	Not described	Multiple	Nigeria	Multiple	Qualitative	Non-institutional	Independent
Ethiopian Journal of Environmental Studies and Management	Oloruntade et al. (2014)	Article	Assess the sustainability of borehole for potable water supply	Periurban	Ondo	Groundwater	Qualitative	Non-institutional	Independent
Global Journal of Research in Engineering	Otti et al. (2014)	Article	Focus on the concept of community participation on water scheme without being wholly controlled by the State Water Corporation	Urban	Anambra	Surface water	Quantitative	Non-institutional	Independent
World Bank Group	Macheve et al. (2015)	Book	Identify issues related to SWA performance, tariff levels and structures, and financing mechanisms and any concerns about their governance.	Multiple	Nigeria	Multiple	Mixed	Institutional	World Bank
Utilities Policy	Abubakar (2016)	Article	Investigate the quality dimensions of piped water supply, and suggests some means for improvement.	Urban	Abuja (FCT)	Surface water	Qualitative	Non-institutional	Independent
American Journal of Water Resources	Chukwuma (2016)	Article	Examine the level of community participation in the development and management of rural water supply schemes	Rural	Enugu	Groundwater	Qualitative	Non-institutional	Independent
Open Journal of Social Sciences	Olajuyigbe (2016)	Article	Examine the extent to which community participation influences community ownership of water project and its sustainability	Rural	Ondo	Groundwater	Qualitative	Non-institutional	Independent
Environmental Science & Technology	Cronk & Bartram (2017)	Article	Explore factors influencing water system functionality.	Multiple	Nigeria	Groundwater	Quantitative	Non-institutional	The Wallace Genetic Foundation. Training grant from the NIH National Institute of Environmental Health Sciences
World Bank	Andres et al. (2018a)	Working paper	Analyse the extent, the timing, and the reasons for the failure of water points	Multiple	Nigeria	Groundwater	Quantitative	Non-institutional	World Bank
World Bank	Andres et al. (2018b)	Working paper	Analyse the reasons for the failure of water schemes	Multiple	Nigeria	Multiple	Quantitative	Non-institutional	World Bank
Science of The Total Environment	Klug et al. (2018)	Article	Analyse water system breakdowns	Multiple	Nigeria	Groundwater	Quantitative	Non-institutional	The Wallace Genetic Foundation and the American Water Works Association (AWWA). Training grant from the National Institute of Environmental Health Sciences
FUDMA Journal of Sciences	Tasi'u (2018)	Article	Examine the status of water resources and infrastructure for community development	Periurban	Jigawa	Multiple	Quantitative	Non-institutional	Independent
International Journal of Integrative Humanism	Akpan & Eteng (2019)	Article	Identify the administrative challenges faced by the Cross-River State Water Board Limited	Urban	Cross River	Multiple	Quantitative	Institutional	Independent

### 1.3.1 Water infrastructure governance research in Nigeria 1990–2019

Figure 1-2 shows a generally consistent increase in water infrastructure governance research since 2007.

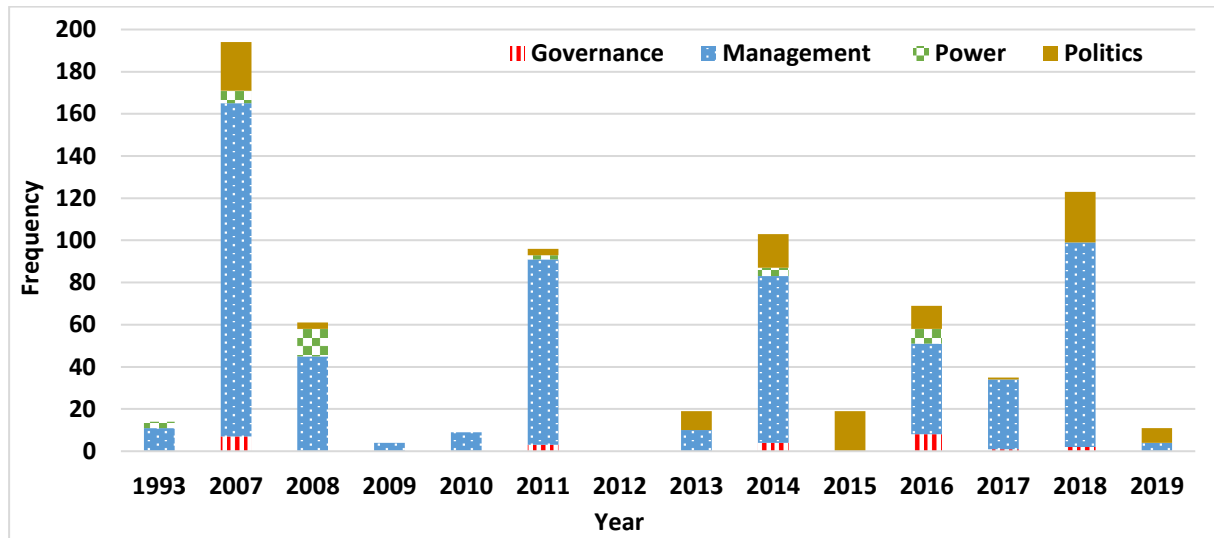


**Figure 1-2: Trend in water infrastructure governance research in Nigeria: 1990–2019**

This growth indicates that water infrastructure governance research is receiving sustained scholarly attention. The evident lack of research between 1993 and 2007 may have been due to the tumultuous political period between 1993 and 1999, when foreign support for development in Nigeria was withdrawn and several academic and research institutions embarked on industrial strikes (Enweremadu, 2013; Kraxberger, 2004). Since the return of a democratic government in 1999, it took another eight years (2007) before recording the first sets of publications, which remained consistent until 2018. Between 2011 and 2014 the total number of publications ( $n=10$ ; 37%) surpassed the previous twenty years ( $n=7$ ; 25.9%) and nearly equaled the following five years between 2015 and 2019 ( $n=10$ ; 37.1%), even if there was nothing published in 2012. This does not imply that no publication was made in 2012 because some publications may have been in local journals.

The publication content count of governance, management, power, and politics (Figure 1-3) highlights that ‘management’ as a concept is used more frequently in the publications than ‘governance,’; it is notably used in 2007 ( $n=163$ ), 2011 ( $n=88$ ), 2014 (82), and 2018 ( $n=97$ ). Altogether, a huge disparity exists between the total number of times governance ( $n=25$ ) and management (581) is used in all 27 publications, excluding Macheve et al. (2015). Governance use has been consistent since 2011. About half ( $n=13$ ; 48.1%) of the 27 publications (excluding their references) mentioned governance while 14 (51.9%) mentioned management. Of this 13 that mentioned governance, nine

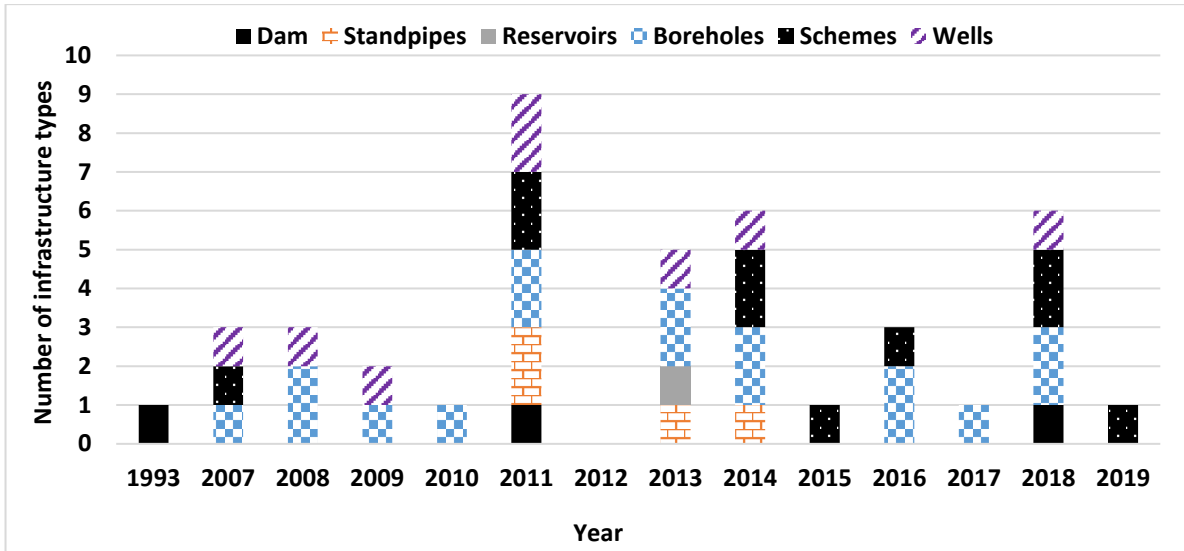
(69.2%) mentioned it once. Unsurprisingly, all the articles mentioned management with eight (29.6%) publications mentioning it 10 times or less. The mention of politics in the publications had similar levels in 2011 (n=23), 2014 (n=16), and 2018 (n=24) when compared to power.



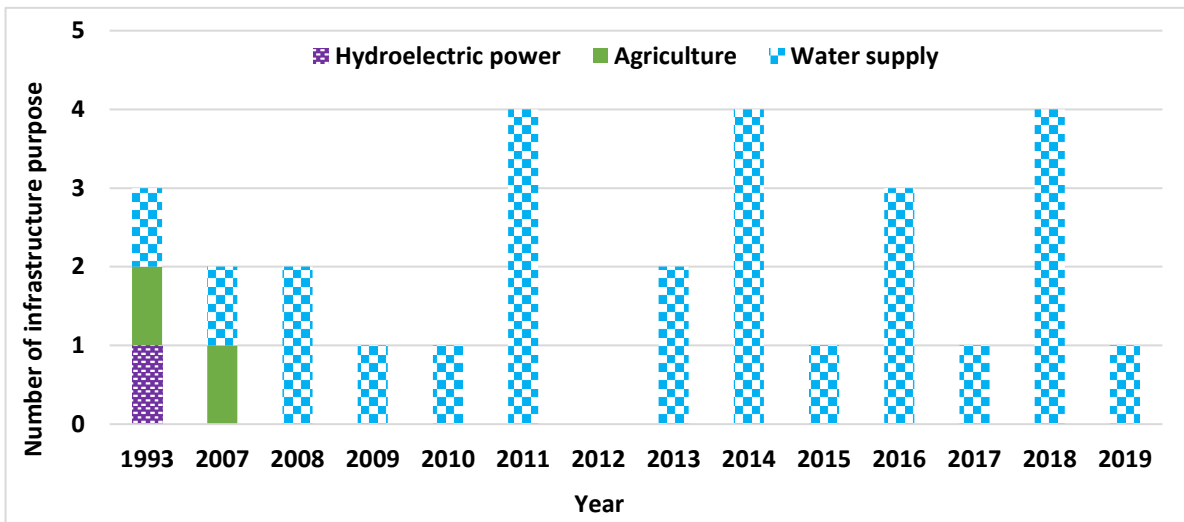
**Figure 1-3: Count of governance, management, power, and politics in the publications: 1990–2019**

Except in 2008 (n=13; 81.2%), power was mentioned six times during years when politics was mentioned in the publications. However, there was no mention of power since 2016, suggesting a decline in the engagement with the subject of power. About a third (n=9; 33.3%) of the publications did not mention politics, and of those that mentioned it (n=18; 66.7%), only 3 (16.7%) mentioned it more than ten times. Comparatively, the publications that mentioned power (n=11; 40.7%) were slightly higher. Similarly, the disparity between the total mentions of power (n=35; 23.2%) and politics (n=116; 76.8%) reflects the limited research engagement with these concepts. Only one (Akpabio, 2007) of the 11 articles mentioned power more than 10 times. Mentioning politics or power does not indicate that their findings suggest political manipulations.

The trend in Figure 1-4 (a) suggests that studies related to boreholes, wells, and water schemes are the dominant infrastructure types studied, however, between 2014 and 2018, there were no studies on wells. In terms of the purpose for which the water infrastructure is used over this period, Figure 1-4 (b) shows that research over the period is dedicated to water supply (n=26; 96.3%).



a



b

**Figure 1-4: (a) Publication count over time based on infrastructure type; (b) Publication count over time based on infrastructure purpose: 1990-2019**

Two of the water infrastructures studied were multipurpose, which points to the keen interest in water supply research. Only one study reported funding support from a local level, from the Jigawa state government (Eduvie et al., 2011).

### 1.3.2 Short reflection on article quality

The scholarly approach and quality of the publications were analysed based on the three broad research approaches (Table 1-3): (a) qualitative approach; (b) quantitative approach, and (c) mixed methods (Williams, 2011). The majority of the studies reviewed used a quantitative approach (n=12;

44.4%) and all those studies described their methods. The quantitative studies largely focused on sustainability (n=4) (Ayeni et al., 2013; Emmanuel & Bamidele, 2013; Longe et al., 2009) and functionality (n=6) (Adeoti, 2008; Klug et al., 2018; Tasi'u, 2018) of water infrastructure. A qualitative approach was used in 10 publications with a substantial focus on water infrastructure sustainability (n=5) and failure (n=4) issues. Mixed methods studies (n=5; 18.5%) using both quantitative and qualitative methods, (e.g., Adekitan et al., 2010) combine random sampling surveys with statistical techniques. These approaches highlight the numerical differences in water infrastructure research, but they fail to offer sufficient details and disaggregated information on the social and cultural behaviours involved in water infrastructure governance. Considering the recurring nature of water infrastructure failure and decay for example, approaches that address the “why” questions are vital.

**Table 1-3: Article quality and characteristics**

	<b>Research approach (%)</b>	<b>Number (n=) and percentage</b>
<b>Mixed</b>		5 (18.5%)
Qualitative		10 (37.0%)
Quantitative		12 (44.4%)
<b>Objectives described</b>		
N		15 (55.6%)
Y		12 (44.4%)
<b>Theory described</b>		
N		22 (81.5%)
Y		5 (18.5%)
<b>Methods described</b>		
N		5 (18.5%)
Y		22 (81.5%)

Studies that did not describe or use any theory or theoretical framework (n=22; 81.5%) outnumbered those that did (n=5; 18.5%). Of the five publications that used a theoretical lens, four of them used normative theories in social research. For example, Adeoti (2008) used the collective action theory (Meinzen-Dick & Bakker, 2001) to evaluate participation in collective maintenance of boreholes, while Gbadegesin & Olorunfemi (2007) used a theory of ‘social solidarities’ to assess stakeholder willingness to adopt cost-effective and environmentally friendly water supply options. For methods, most publications described their methods (n=22; (81.5%). However, this review did not assess the quality of the methods. Of the 27 publications, 14 (51.9%) used primary data and six (22.2%) presented

no data or did not show how information was systematically collected and analysed. All the primary data used qualitative methods such as interviews and questionnaires. Studies that used secondary data came primarily from government statistics (Andres et al., 2018; Klug et al., 2018; Otti et al., 2014).

### 1.3.3 State and status of water infrastructures

For the reviewed publications, I examined if and how water infrastructure was defined (Table 1-4), considering the necessity and associated challenges of defining water governance concepts (Meissner, 2016).

**Table 1-4: Infrastructure-related issues**

<b>Is water infrastructure defined?</b>	<b>Number (n=) and percentage (%)</b>
N	26 (96.3%)
Y	1 (3.7%)
<b>Infrastructure-related elements addressed</b>	
Sustainability	9 (33.3%)
Functionality	7 (25.9%)
Failure	4 (14.8%)
Development and implementation	3 (11.1%)
Services	2 (7.4%)
Data	2 (7.4%)
Quality	1 (3.7%)
Decay	1 (3.7%)
Financing	1 (3.7%)
Ownership	1 (3.7%)
Classification	1 (3.7%)

Of the 27 publications, 26 (96.3%) did not define water infrastructure or specify the boundaries and details of the water infrastructure studied. Only Akpan & Eteng (2019) defined water infrastructure – using Water Aid Nigeria’s definition – as: “equipment used in distributing potable water such as piped network (densification) or stand-pipes or water kiosks, hard technology (intake pumping equipment, storage tanks and distribution channels, quality assurance laboratory, etc)” (Akpan & Eteng, 2019, p. 8). This lack of definitions puts into question the scope of water infrastructure investigated, and limits the opportunities for further conceptual development of what constitute a water infrastructure in Nigeria, and Africa broadly.



The classification in Table 1-4 shows that water infrastructure sustainability (n=9; 33.3%), functionality (n=7; 25.9%) and failure (n=4; 14.8%) are the top three issues most studied. This is due to the overwhelming focus of most of the publications on water supply. These studies preferred community management or participation concepts (Adekitan et al., 2010; Adeoti, 2008; Olajuyigbe, 2016; Oloke & Olugboye, 2014), over Indigenous management (Tasi'u, 2018) and stakeholder management concepts (Ayeni et al., 2013). Studies that examined classification issues of water supply systems (n=1; 3.7%) noted that privately owned water supply systems (hand-dug wells) in Abeokuta, for example, account for approximately 45% of the urban population use (Oluwasanya et al., 2011). Thus, it suggests a need to integrate these water supply modes into mainstream research focus and policy options.

### 1.3.4 Engagement with governance and management

Water infrastructure governance research focused on a diverse range of governance issues (Table 1-5). The top three issues highlighted in the publications were technical (n=12; 54.5%), financial (n=10; 45.5%), and socioeconomic (n=8; 36.4%) aspects of water infrastructure governance and management.

**Table 1-5: Categorisation of governance-related issues from the publications**

<b>Governance issues</b>	<b>Number (n=) and percentage (%)</b>
Coordination	7 (31.8%)
Environmental	5 (22.7%)
Human resources	1 (4.5%)
Policy	4 (18.2%)
Knowledge	4 (18.2%)
Socioeconomic	8 (36.4%)
Others	2 (9.1%)
Participation and engagement	5 (22.7%)
Culture	2 (9.1%)
Legal	3 (13.6%)
Technological	7 (31.8%)
Financial	10 (45.5%)
Planning	1 (4.5%)
Technical	12 (54.5%)
Political	5 (22.7%)

Coordination (n=7; 31.8%), technological (n=7; 31.8%), participation and engagement (n=5; 22.7%), political (n=5; 22.7%), and policy (n=4; 18.2%) were also frequently studied. Most of these elements targeted water infrastructures used for water supply (26 of 27). Human resources (n=1), planning (n=1), and culture (n=2) related issues were the least studied issues. There were two publications that investigated issues such as vandalism, which is categorized under others.

Approximately 51.9% (n=14) of the issues were examined under state-managed water infrastructure. Non-state managed (n=4) and both state and non-state governance systems (n=9) account for the rest. In addition, 77.8% (n=21) investigated water infrastructure through an institutional analysis while others used non-institutional perspectives (n=6).

### 1.3.5 Engagement with power and politics

Engagement with the concept of power (e.g., empowerment) and politics (e.g., political, politically, and other derivations) in the reviewed publications points to how scholars perceive the political aspect of water infrastructure governance. The political languages used in the publications are categorised into four main themes (Table 1-6).

**Table 1-6: Categorisation of political language**

Actors	Decision-making	Structural	Instruments
elites, politicians,	dimensions, commitment,	change, regions, zones,	media,
interest groups,	power play, interference,	village-level, integration,	programmes,
appointees,	response, support, influence,	wards, unstable, party,	projects,
representatives,	pressures, dominance,	restructuring, organisations,	development
office holder, leaders	manoeuvring, activities,	institutions	
	will, implications		

The *actors*, including politicians (Gbadegesin & Olorunfemi, 2007; Macheve et al., 2015; Oloke & Olugboye, 2014; Oloruntade et al., 2014; Olukotun, 2008), political appointees (Abubakar, 2016; Macheve et al., 2015), and political office holders (Oloke & Olugboye, 2014), operate within specific *structural* (Andres et al., 2018; Emmanuel & Bamidele, 2013; Macheve et al., 2015) political arrangements, using specific *instruments* (Akpabio, 2007; Ayeni et al., 2013; Olukotun, 2008).

*Decision-making* often involves political interference or manipulation of infrastructure projects by these actors (Oloruntade et al., 2014; Otun et al., 2011), or they are required to mobilise political support for water projects (Chukwuma, 2016). Others claim that these actors need (or lack) the political will to back policies (Macheve et al., 2015; Oloke & Olugboye, 2014).

## **1.4 Summary and discussions**

This critical structured review reveals that water infrastructure governance in Nigeria faces wide-ranging conceptual and practical challenges, and explicitly directs our attention to future research needs. There is evidently a need to rethink the conceptual and empirical state of water infrastructure research in Nigeria as two broad cross-cutting themes.

### **1.4.1 Conceptual specifications**

Conceptually, the analysis of the publications strongly suggests that research practice and output in Nigeria's water infrastructure governance is yet to catch up with more recent advances in academic research, as shown in the disparity between the use of the terms, management and governance. The growth of governance in water infrastructure scholarship in Nigeria can be said to have started around 2007, perhaps due to the emergence of water governance as a field of academic research in the last two decades (Woodhouse & Muller, 2017). This gap represents a significant delay between theoretical advances and empirical research in Nigeria. Relatedly, dedicated research on power and politics in the reviewed publications is non-existent, as no single paper used a theoretical power lens or specifically studied political relations of water infrastructure management within the period examined. Additional conceptual issues arise from the definition of water infrastructure and the nature of infrastructure-related problems. The difficulty in defining water infrastructure is evident in the reviewed publications and the broader water infrastructure literature. However, this conceptual challenge is critical for African countries with a diverse range of water sources and delivery infrastructures (Eberhard, 2019; Hope et al., 2020). Similarly, the lack of a definition of water infrastructure suggests that researchers assume no distinction between water infrastructure governance and water governance. The only study that defined water infrastructure (Akpan & Eteng, 2019) focused mainly on its technical elements. Such a definition may conceal the social systems and practices under which those technical and technological objects are created.

Further conceptual work regarding sustainability and functionality, as the two main infrastructure problems, may nudge the praxis towards contextually-relevant expectations of water infrastructure lifecycles. Studies that investigated water schemes and borehole functionality did not provide a measure of time against which functionality is measured (Andres et al., 2018; Cronk & Bartram, 2017). Andres et al. (2018b, p. 6) admits that: "Most such surveys simplistically label the status of a water point's functionality using a binary definition: either the water scheme was 'working' or 'not working' at the time of its assessment. A few list failure rates over the entire survey period, but they are the exception." This is similar to studies that examined the sustainability of water infrastructure systems (Dominic et al., 2014; Olajuyigbe, 2016; Oloke & Olugboye, 2014). However, Olajuyigbe defined sustainability as "something that works for a long time," (Olajuyigbe, 2016, p. 92) pointing to the normative nature of

sustainability and functionality research. A few of the studies identified poor and ineffective communication as a conceptual problem. For example, Adams (1993) noted how technical language used by engineers can mask technical data, leaving farmers and downstream water users helpless and unable to access or translate the information. Other conceptual and theoretical themes to be clarified include the distinction between water source and water infrastructure. Studies that investigated water infrastructure through multiple water sources include rainwater collection and storage using Indigenous methods (Akpan & Eteng, 2019; Dominic et al., 2014; Tasi'u, 2018). Additionally, an attempt to classify self-supply systems (Oluwasanya et al., 2011) as a vital water source is important because such systems are not accounted for in most global water infrastructure classification systems (Grigg, 2019).

### **1.4.2 Theoretical engagement and elaboration**

Political issues have empirical validity, especially at the construction phase of water infrastructure development. Adams (1993) described how the Bakolori dam contractor's suggestion to the water authority to release flood water was truncated due to the narrow focus of the contractor and the bureaucratic systems. Dam and reservoir management issues like this can be linked to a lack of engagement with theory in most of the publications. It is equally a general water governance challenge partly because of the sectoral approach to water governance or the framing of issues as poor coordination or participation (Chukwu, 2015). For example, some of these issues are interpreted as coordination issues, especially if analysed using an institutional analysis framework (Olagunju et al., 2019). However, the evidence from the review on how actors use power and relate politically suggests that coordination issues could arise from attempts to dominate, manoeuvre, influence, or interfere with project outcomes (Chukwuma, 2016; Gbadegesin & Olorunfemi, 2007; Oloruntade et al., 2014).

Issues around the language of power in the publications revolves broadly around the need for government, management or coordinators of infrastructure projects to empower communities and social groups. Some authors believe that communities need government or management support to gain control of water infrastructure, develop their Indigenous water management systems (Adeoti, 2008; Eduvie et al., 2011b; Gbadegesin & Olorunfemi, 2011), or assist them to mobilise their creative potentials (Chukwuma, 2016). Such thinking suggests the persistence of the top-down approach to water resources management and the 'true' location of power. Others like Akpabio (2007) who approach power relations through water institutions (RBDA) contend that the power play between these actors leads to political division and inhibits effective irrigation management. Hence, regional reallocation of "power to make regulations" (Akpabio, 2007, p. 154) for the RBDA's must be balanced between the North and South. These two points demonstrate that demands for water rights and water justice in water infrastructure governance are gaps to be addressed. None of the papers indicated politics or power research as a crucial research need.

### 1.4.3 Empirical themes

The empirical themes unite around two main areas: structural and systemic; and infrastructural. Structural and systemic issues span political, social, and environmental governance, specifically focused on the institutions responsible for systems to function. Politically, Akpabio's (2007, p. 164) observation of official corruption at the decision-making level where “ethnic politics takes precedence over qualification in appointment to the office of the federal ministry of water resources” reflects on central issues of water rights between state and federal governments. Similarly, Olajuyigbe's (2016, p. 98) evaluation of a donor-driven water supply project concluded that “irrespective of the participatory approach adopted by the implementer of the project in the preparation of the work plans and budgets including prioritized activities, UNDP still reviewed, amended and finally approved such plan”. Evidently, sociopolitical power play in service provision can be observed in the non-state sectors where community ownership of water infrastructure projects is encouraged but limited by financial sustainability. Such relationships produce new policy and social actors, prompting key questions on how local non-state actors emerge, reorganise, grow, or become dissolved. Moreover, how do their interests and perspectives affect governance outcomes and policy objectives, say, in harmonising water supply sources or water policies? Participation of communities is limited because they are excluded from projects’ planning and development stages (Dominic et al., 2014).

Some publications demonstrate that contextual issues manifest in three primary ways: political regions; proximity of access; and hydrogeological. Regional differences in water infrastructure failure rates are due to hydrogeological problems, hence “location matters” (Andres et al., 2018, p. 20). Failure of water utilities also impacts water access geographically and reinforces historical rural–urban differences (Andres et al., 2018) at the household level (Tasi’u, 2018). Others feel contextual particulars like remoteness of community leaves them “backwards in terms of community management” (Tasi’u, 2018, p. 13). These affect the patterns of supply, management, and access across rural and urban settings (Ayeni et al., 2013) or across political regions (Akpabio, 2007).

### 1.4.4 Infrastructure relations

Inequities linked to absent, intermittent and unsustainable water infrastructure threatens the SDGs in crucial ways. Andres et al. (2018b) estimated that 46 percent of water schemes in Nigeria are non-functional. Others look at the ageing and decay of infrastructure that reduces functionality (Otun et al., 2011). When high infrastructural deterioration and low infrastructural investment merge, it is likely that existing water infrastructure cannot sustain current population growth (Macheve et al., 2015), driven largely by conflicts and socio-economic issues (Fox et al., 2018). Water infrastructures owned by federal (Akpabio, 2007) or state governments (Akpan & Eteng, 2019; Gbadegesin & Olorunfemi, 2011; Tasi’u,

2018) are clearly not immune from functionality and sustainability issues, but rarely at the local level (Olukotun, 2008).

The review also pointed to the issues of water infrastructure scale or size due to the different infrastructure types examined. Some studies focused on one type or group of water infrastructure; for example, dams (Adams, 1993) and borehole clusters (Adekitan et al., 2010; Adeoti, 2008; Oloruntade et al., 2014). Others that studied water schemes often include different sources and types of water infrastructure and management systems (Gbadegesin & Olorunfemi, 2007; Tasi'u, 2018). Management types also affect water systems' functionality. For example, systems managed by private operators performed better than community-managed systems (Cronk & Bartram, 2017). Furthermore, the excessive focus on community management approaches, 'large scale' water infrastructure development and management, and infrastructure sustainability and functionality has undermined studies at micro-level infrastructure governance, particularly those that engage the socioeconomic dimensions of water management around cultural and economic issues. One such study observed that community participation, especially labour and financial participation, can be encouraged by educating the household head, providing a reliable water supply, and improving perception on transparency of management, but is limited by "distance from the water source, presence of male household head, household monthly income and reduced enforcement of rules" (Adeoti, 2008, p. 10).

## ***1.5 What needs to be understood: Agenda for future research***

These knowledge and empirical issues must be addressed for future water infrastructure development to meet Nigeria's development needs.

### **1.5.1 Conceptual and empirical topics**

*Developing a new conceptual toolbox or framework that is contextually applicable*

A new conceptual toolbox with a suite of tools to address the highlighted conceptual issues is needed. In addition, water infrastructure governance itself needs a conceptual framework that foregrounds politics, power, context, time, and scale, since none of the studies examined any of these concepts explicitly. Engaging historical research on water infrastructure development is a critical component of this conceptual redevelopment. A conceptual shift from state and institution-based analyses to more hybrid thinking will assist to monitor and assess sociopolitical relations around water infrastructure management closely. To begin with, infrastructure governance analyses should shift from a management to governance perspective, to address the conceptual distinction between both frameworks (Franks & Cleaver, 2007). In addition, expanding the use of other governance concepts,

such as collaboration and co-production (Daniell, 2012; White et al., 2019) or comparative governance analyses (Özerol et al., 2018), can help in streamlining and finding synergies across governance practices within the country. These research and practice themes will also require new methodologies since the practices of the reviewed publications did not reflect much methodological diversity.

#### *Scale relations*

The political dimension of cross-scale and multi-scale relationships needs further exploration. Clearly, scalar relations and embedded political struggles and contestations define the connections across administrative or institutional scales, sectors, issues, nations, and regions. The need to strengthen national control over water access rights, allocation, and achieving the WASH SDG goals by 2030 is notable.

#### *Infrastructure politics or politics of water infrastructure*

Investigating how power relations shape failed or poorly performing water infrastructure projects must probe how the decisions to construct, locate, and design contribute to their (un)sustainability. It also calls for the economics of these infrastructure interventions to be interrogated; specifically, the politics of water infrastructure financing and the effects on budgeting, contractual obligations, and local political processes.

#### *Rethinking state and citizen boundaries, roles, and responsibilities*

As the central organising structure, the state plays a practical and integral role during processes of political formation, evolution, and governance as they affect infrastructure development. It is the central political domain where its critical elements, dispositions, processes, and actors constitute the objects and subjects of analysis. For instance, no discussion of major water infrastructure development like dams and standpipes, land and water allocation rights can happen without the state (Lavers & Dye, 2019). Intra-elite analysis to understand social and political struggles around water allocation and distribution rights, access, and non-water related connections such as ethnicity and religious affiliations, needs research. What role do key traditional/religious governance actors play in water-related decisions? How do they intervene or participate in the decision-making process concerning state financial, institutional, and political resources and processes? Such research must investigate the changing status and role of religious and traditional leaders in these arrangements, and explore the intersecting relations of state and economy (political economy), state and ecology (political ecology), and state-society (political sociology), where normative governance issues can be contextually situated to produce corresponding policy solutions.

## 1.5.2 Topics missing in the literature

### *Gender relations*

Much research is required on the gendered dimension of water infrastructure, primarily on women's absence in water-related decision-making across the country and at all levels. Analysis of intra-gender relations and the differentiated access to water and authority should pivot towards how researchers, policymakers and everyday water users interact, to understand infrastructure inequities.

### *Climate change relations*

How do future water infrastructure designs and management reflect climate change threats? New policies, financial mechanisms, and institutional arrangements for climate change adaptation across the country need new interpretation and understanding of its political, environmental and socioeconomic effects on future water infrastructure development. A first start will be to explore the underlying principles and assumptions of Nigeria's water policy and climate change plan to see how they reflect political, sociocultural, and economic realities at local, state, national, and regional levels. Furthermore, the compounding effect of climate change as a 'threat multiplier' on water availability and ecological destruction across the country, and the likely political outcomes of such impact, require research. Notably, this includes the impact of climate change on changing agricultural processes, adoption of large-scale mechanized farming, land-water-agriculture nexus, evolution of farmer-herder crisis, water demand and access across different regions, and risks (political and infrastructural) on rural-urban dynamics from rapid urbanisation.

## 1.5.3 Limitations

In light of the strengths of this systematic review, three limitations are highlighted. First, to reduce bias in article selection, the initial search included reports and theses. However, this decision was rescinded due to the volume of reports and theses, and their unpublished status. Secondly, since this is a single-author review, I have relied extensively on different disciplinary systematic review literature, primarily in public health, water governance and the social sciences, to ensure analytical rigor. In addition, analyses and content counts, for example, were carried out three times on different days to ensure rigorous and reliable outcomes. Nonetheless, it is possible that whatever benefits expected from having multiple authors involved may still be missed. Finally, the search method was restricted to the English language, which may have omitted studies close to the boundaries of Nigeria as it shares its geographical boundaries with four other *French-speaking* countries.



## **1.6 Conclusions**

This structured review examines the state of water infrastructure governance research in Nigeria. I explore article quality, water infrastructure governance and management issues, as well as the power and political relations they engender. Most of the suggested solutions point to the powerful role of government and non-state actors who should give or relinquish power to communities. Excessive focus on technical and technological issues and their solutions reflect this approach. Government still plays a central role in water infrastructure development and management, thereby holding the power to make policy and political changes necessary to confront and resolve the various infrastructure problems of access, breakdown, and service quality. Community participation and management as governance concepts are extensively used to understand management issues, to the detriment of more integrative approaches like collaboration and co-production. Finally, research needs to focus on conceptual, theoretical, and empirical developments to explain and formulate water infrastructure governance concepts and issues. Such developments should embrace new methodologies that enable a fine-grain analysis of decision-making processes at the planning, development, construction, and management phases of a water infrastructure project.

## Chapter 2: Water infrastructure development in Nigeria: Trend, size, and purpose

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**Sub-question 1:** What is the state of power and politics research in Nigeria's water (infrastructure) governance, and how is it conceptualised?

### Chapter introduction

Having examined the current state of knowledge and practice in Nigeria's water infrastructure governance, this chapter explores the historical development of water infrastructure in Nigeria. The trend, size, and purpose of dams and standpipes were analysed to understand the pattern of development over time and space within the country. This evaluation was necessary to show why Nigeria cannot meet its water supply commitments despite years of material investments in water infrastructure development.

Two findings from the research are noteworthy. First, different governments used water infrastructure development to divide spaces because policy choices from the colonial period shaped spatial development patterns in the post-independent period. Particularly notable is the rural–urban divide where standpipes and wells are common in rural areas and water supply networks in the urban areas (decentralised vs centralised systems). The political decisions over where to direct state investments for expanding water storage facilities explain these differences. In the same vein, political instability arising from Nigeria's complex and rapidly changing political system contributed to these issues.

Secondly, the study finds that water infrastructure renovation regularly features in the policies and development plans, mainly designed to improve water access. The impacts of failed projects vary across regions, between rural–urban and household levels, similar to the established pattern of constructed water infrastructures. A major problem is that the repetitive action of state interventions to repair or rehabilitate water infrastructure became a norm over the years. Similarly, this construct-renovate pattern is built into the plans to meet the Sustainable Development Goals.

The chapter concludes that through its power, the state contributes to the repeated failure at different stages of infrastructure development. The chapter also complements the findings in the literature review in Chapter 1 in demonstrating that water infrastructure failure is primarily a problem of relations of power and politics. To explore this problem, I developed a conceptual framework (Chapter 3) that draws on results in chapters 1 and 2.

## **Abstract**

Water infrastructure development is key to attaining sustainable development, especially for water supply, sanitation and health, agricultural development, and energy production. However, African countries face specific challenges around infrastructure financing, systemic and repeated malfunctioning, and decentralised infrastructure types. Using Nigeria as a case, this article aims to analyse historical water infrastructure development in Nigeria with a specific focus on dams and standpipes. Seven themes are discussed: infrastructure divisions; deprioritising water supply; political infrastructures; infrastructure failure and sustainability; infrastructure classification and typologies; optimal use of water resources and infrastructure; and a commentary on the future of water infrastructure development. The article concludes with policy and research suggestions for policymakers and other relevant stakeholders.

## **2.1 Introduction**

There is a global consensus that water infrastructure development is key to attaining the Sustainable Development Goals (SDGs) (Ait-Kadi, 2016; Sachs et al., 2020; The Economist Intelligence Unit, 2019; UN-Water, 2014, 2018). Specific targets in the SDGs related to water infrastructure include: achieving universal access to electricity and increasing renewable energy; improving the number of population with safely managed water, sanitation and hygiene; providing efficient agricultural and flood control systems; and protecting water-related ecosystems (UNDP, 2015). Valuation of water infrastructure is an important step in ensuring that today's hydraulic development is informed by past lessons to shape the future (UNESCO, 2021). Nigeria, and Africa more broadly, have specific needs in water supply, sanitation and health, agricultural development, and energy production (Arimah, 2017; Grigg, 2019; Mugagga & Nabaasa, 2016; World Water Council, 2016). However, most African countries face critical challenges around infrastructure financing (UN-Water, 2018), systemic and repeated malfunctioning (Furlong, 2014), and decentralised infrastructure types (Eberhard, 2019). The historical dimension to these issues in Nigeria (Okeke & Oyebande, 2009; Oyebande, 2001), and the contributions made by international and multilateral organisations in Nigeria's water infrastructure development, through financing, policy and technology, further complicate these issues (The World Bank, 1995; Wagner & Lanoix, 1959). Combining this history with Nigeria's external relations places water infrastructure development within broader water governance and political governance frames.

Nigeria has consistently lagged in meeting her global water security commitments on health, agriculture, potable water supply, and environmental sustainability (African Union, 2013; WHO & UNICEF, 2017). Although access to water has increased from 51 percent in 1990 to 68 percent in 2016, approximately 54 percent of rural and 78 percent of urban inhabitants currently have access. Demographic increases (rural–urban) continue to strain the sustainability of current progress, and

service coverage may decline by the end of the SDGs (NPC & ICF, 2019; WHO, 2020). At the local level, Nigeria's population and high fertility rates mean it will be the third-most populous country in the world by 2050, after China and India (United Nations, 2019c). Nigeria's population increase will also mean more challenges related to water resources development. Only 15 percent of the 3.14 million hectares of potentially irrigable land is irrigated (Federal Ministry of Water Resources, 2017; Federal Ministry of Water Resources & JICA, 2014b), yet Nigeria spent approximately US\$22.5 billion on food imports in 2017 (Ojewale, 2017).

Accounting for these scenarios requires an evaluation of the current state of water infrastructure development in Nigeria. Thus, this article analyses historical water infrastructure development in Nigeria with a specific focus on dams and standpipes. This study contributes to the historical literature on water infrastructure development and provides practical policy and research ideas for government and non-government stakeholders engaged in water resources and infrastructure development; specifically, the historical direction of water infrastructure development and the impact of policy and governance choices on spatial and infrastructural equities. Following this introduction, we present the materials and methods in Section 2.2, then in Section 2.3 briefly discuss Nigeria's water governance and its position within Africa. Section 2.4 presents historical and spatial trends in dam ownership and development, dam size, and dam purpose for water resources development. These trends are discussed in Section 2.5 through seven themes: infrastructure divisions; deprioritising water supply; political infrastructures; infrastructure failure and sustainability; infrastructure classification and typologies; optimal use of water resources and infrastructure; and a commentary on the future of water infrastructure development. The article concludes in section 2.6 with suggestions for policy and research for policymakers and other relevant stakeholders.

## ***2.2 Materials and methods***

Data on dam development in Nigeria is synthesised and published for the first time in this article. Secondary data used in this paper comes from Nigeria's Federal Ministry of Water Resources and the International Commission on Large Dams (ICOLD). Dams and reservoir information are contained in the Nigerian compendium of dams, and the 1995 and 2014 national water resources masterplans were accessed, with 192 dams identified, containing available data from 1923 to 2007 for analysis. Constructed dams in Nigeria are classified according to size: small, medium, and large (ICOLD, 2011), each having one or more purposes. In this article, water infrastructure refers to that constructed for agriculture, hydroelectric power, and potable water supply (Federal Ministry of Water Resources, 2016a). Data analysis was done using quantitative descriptive analysis on the completed dams' dates, geolocation, and categories.

Regarding study limitations, estimates of water resources availability may be inaccurate if based on published information about the existing and completed dams (reservoir capacity). The World Bank's historical water-related metadata on Nigeria only accounts for five out of the over 1,400 categories (The World Bank, 2019). A few incomplete data for dam sizes, completion dates, owners, and purposes were noted where necessary.

## **2.3 Nigeria and Africa – A short description**

### *Institutions, legislations, and policies in Nigeria's water governance*

Nigeria's water infrastructure management is designed to address broad developmental problems expressed in the 2016 national water resources policy (Federal Ministry of Water Resources, 2016a) (see [Appendix B](#)). Nigeria operates a sectoral approach to water resources management, where different government ministries or parastatals coordinate water resource use and management issues. Administratively, Nigeria divides the country into eight hydrological areas. The Federal Ministry of Water Resources (FMWR) is responsible for the water sector as the institutional body mandated for water resources development (surface and groundwater), water supply and sanitation, irrigation, drainage, and flood and erosion control. The FMWR discharges its duties through a few institutions such as the River Basin Development Authorities (henceforth, RBDAs), the Nigerian Integrated Water Resources Management Commission, the Nigerian Hydrological Services Agency, and the National Water Research Institute. The Federal Ministry of Environment manages environmental issues around water resources (Adedeji & Ako, 2009). Several intersectoral and interagency issues arise due to functional misfits at various policy implementation levels. The development of Nigeria's water governance-related legislation started as early as 1915, during the colonial era.

Water infrastructure development in Nigeria is classified into three periods. First, the pre-colonial era before the official annexation of Indigenous authorities and communities of all parts of present-day Nigeria, in 1861. This date marks the beginning of the first colony to be administered by the British, the colony of Lagos. Second, the colonial era. Michael Crowder, in his book, *West Africa under Colonial Rule* (Micheal Crowder, 1968), proposes a timeline starting in 1885 and ending in 1945. However, this article extends the date to 1954, when self-government began for the regional governments. Officially, Nigeria became a country after the amalgamation of the northern and southern protectorates in 1914, by then Governor-General Lord Lugard. Hence, the colonial government referred to in this paper lasted 46 years from 1914 to 1960, when Nigeria gained political independence from Britain. Following Nigeria's independence from Britain in 1960, the creation of the RBDAs in the 1970s marked the earliest post-independence attempt at developing a comprehensive and practical water policy framework in Nigeria (Adams, 1985; Adeoti, 2011; Akpabio & Ansa, 2013). The 1999 constitution of the Federal Republic of Nigeria (Federal Republic of Nigeria, 1999, p. 131) confers national-level water resources policy design

and formulation on the federal government. It draws on the Water Resources Decree 101 of 1993, which vested the “rights and control of water in the federal government” (International Environmental Law Research Centre, 1993).

Historically, Nigeria’s water policies have often targeted land, water quality, and environmental protection. The initial attempt to create a comprehensive nationwide water management strategy had begun in the early 1970s, but dwindling finances towards the end of the decade made it redundant (Ojiako, 1985). Building on the 1992 national water resources masterplan, the 2014 national water resources masterplan (Federal Ministry of Water Resources & JICA, 2014b) was the first completed broad and long-term national water governance framework incorporating Integrated Water Resources Management (henceforth, IWRM) as a distinctive feature. IWRM equally underpinned the policy framework for the national water policy in 2000, the draft 2004 water policy (Federal Ministry of Water Resources, 2004), and the 2016 national water resources policy (Federal Ministry of Water Resources, 2016a). The water resources sub-sector development plan (Federal Ministry of Water Resources & JICA, 2014c), designed to tackle cross-sectoral concerns, failed to address other equally critical intrabasin challenges such as water/environmental pollution and forestry.

Transboundary surface water flows into Nigeria account for 24 percent of Nigeria’s annual water resources potential (88 out of 324 BCM/year). River Niger, River Benue, and Lake Chad are the three major transnational surface water basins in Nigeria (Federal Ministry of Water Resources & JICA, 2014c), with other small to medium-sized rivers along the 1,975 km Nigeria–Cameroon border from the Cameroon-Adamawa mountains, such as the Katsina-Ala River (Familugba & Ojo, 2013), and the Ogun River in the southwest littoral zone. Nigeria’s representation in four international basin organisations (see [Appendix C](#)) equally raises conceptual issues on the importance of transboundary hydropolitical relationships concerning water infrastructure development.

Beyond these challenges, West, Central and parts of Southern Africa hosts 33 out of 47 of the United Nations’ classification of least developing countries (LDCs) (United Nations, 2019b), each with specific political-economic conditions, political histories and infrastructure development. Three such countries surround Nigeria. Table 2-1 illustrates Nigeria’s position by comparing water-related sectors with some countries in Central Africa. Considering the scale of Nigeria’s human and natural resources and capabilities, improved water resources management in Nigeria can improve regional water infrastructure development in West and Central Africa. With the largest economy in Africa regarding nominal gross domestic product (GDP) (International Monetary Fund, 2019), Nigeria is an influential leader in the West African sub-region. As one of the regional economic communities of the African Union (African Union, 2019), it has several advantages over many of its neighbours.

**Table 2-1: Nigeria’s comparative position in water-related sectors with countries in West and Central Africa**

Country	Population <sup>5</sup> (2019 Estimates) thousands	Life Expectan cy <sup>4</sup> (Years)	Fertilit y Rate	Human Development Index (HDI) <sup>3</sup> (2018)		Water <sup>2</sup> (2019 Estimates)		Energy <sup>1</sup>		Irrigation <sup>1</sup> (2017 Estimates)	
				Rank (out of 189)	Value (out of 1)	Drinking Water Access (%)	Water-Related Diseases (deaths/year)	Productio n (MW)	Electricity Access (%)	Agricultural Land (thousand Ha)	Irrigated Area (% of Agricultural Land)
Nigeria	200,964	48	5.5	157	0.532	69	177,800	12,522	59.3	70,800	0.41
Cameroon	25,876	51	4.6	151	0.556	53	18,300	1600	60.1	9750	0.30
Chad	15,947	46	5.8	186	0.404	52	14,300	215	8.8	50,238	0.06
Niger	23,311	42	7.0	189	0.354	58	40,300	284	16.2	46,660	n/a
Central African Republic	4745	48	4.8	188	0.367	68	4300	28	8	5080	0.02
Democratic Republic of Congo	86,791	47	6.0	176	0.457	52	107,300	2472	9	31,500	0.03

**Source:** Compiled from the following sources: (FAO, 2019; van der Wijngaart et al., 2019)<sup>1</sup>, (WHO, 2020)<sup>2</sup>, (United Nations, 2019b)<sup>3</sup>, (WHO, 2019)<sup>4</sup>, and (UNDESA, 2019)<sup>5</sup>.

## 2.4 Historical development of water infrastructure

### 2.4.1 Precolonial water infrastructure development

Water scarcity problems in pre-colonial Nigeria influenced the development of water infrastructure for agriculture or domestic purposes. Samuel Johnson described water scarcity in *Íketu*, an *Òyó* town, as “a place badly watered, their drinking water being miles away from the town”. The scarcity of water in *Íketu* has passed into a proverb. “*Omi d’oyin ni Íketu*” (‘water becomes honey in *Íketu*’) (Johnson, 1921, p. 455). In addition to water scarcity, flooding, droughts, and poor water quality determined bulk water production and storage (Barth, 1853). Large water storage systems consisted of deep underground tanks for storing rain water, “which seemed to be made by the hand of man” (Barth, 1857a, p. 205). Sources of water include open wells and streams, and creeks (Barth, 1857a; Johnson, 1921). Wells of four fathoms (24 feet) were recorded in northeast Nigeria, while dykes were constructed to ward off flooding waters in communities (Barth, 1857a).

The purpose and use of water infrastructures varied across the country relative to the geographical characteristic of each region. The southern region, a predominantly rainforest area, did not need for developing extensive irrigation infrastructures for agricultural purposes due to the abundance of rainwater and perennial or ephemeral streams.

Land cultivation in the Niger-Delta region and other parts along the Niger-Benue trough was watered by flood waters. However, as one progresses towards the semi-arid North, the technology changes to ox-powered wheels and shadoofs (Figure 2-1) for irrigation and groundwater extraction.

Henry Barth, the famous German explorer, described its use as “drawing up the water in a large leather bag containing a supply sufficient for two horses” (Barth, 1858, p. 88), a system that suggested that other than human labour, pre-colonial Nigerians used different technologies for water supply.



**Figure 2-1: A shadoof. (McBow & Ukeje, 1959, p. 10)**

Domestic water storage and consumption used mortars, calabashes (a type of gourd used for collecting or storing water), rock carvings (indentations of about 2 cm deep are made into rocks for collecting water and feeding pastures or drinking water), draughts, water skins, water ponds or *tebki* in *Yorùbá* and Kanuri societies of northern Nigeria (Barth, 1857b; Bascom, 1955). The production of this water carrying and storage equipment is mostly gendered and created by women. Pottery, for example, is a primarily female industry where high-quality clay, native to large areas of the *Yorùbá* country, is turned into large water-storage pots for domestic and sometimes commercial uses (Hinderer, 1877; Johnson, 1921).

### **2.4.2 Colonial and post-independence water infrastructure development**

In the Sokoto-Rima basin, the Kware irrigation scheme was Nigeria’s first major European style irrigation scheme (IBRD-IDA, 1965). The first machine-drilled borehole was bored in 1933 (Hazell, 2004), following the construction of the first European-style dam with the Lagos water supply scheme in the late 1800s (Olukoju, 2003). After six years of self-government from 1954–1960, Nigeria attained independence from the British in 1960. Colonial and post-independence water infrastructure development relied on the national development plans (hereafter, the plans) (see [Appendix D](#)) and the agricultural development programs (ADPs) as the two main national planning and policy mechanisms.



The plans were a set of documents outlining Nigeria’s approach to national economic development, starting with the 1946 10-year plan for development to the fifth national development plan 1985–1990 (Okigbo, 1989). The ADPs (1974–1997) were agricultural intervention programs created to enhance national development through primary agricultural production and food sustainability (The World Bank, 1974, 1995). As the world’s largest World Bank development investment program in developing countries at the time, the Nigerian ADPs cost approximately US\$1.2 billion (IEG, 2012) and contributed tremendously, sometimes beyond planned targets, to rural water infrastructural development. A total of 190 dams and 12,651 boreholes and wells were constructed within the 22-year period (see [Appendix E](#)).

The 1995 national water resources development masterplan (NWRDMP) was the first comprehensive water resources assessment and planning for the entire country (JICA & FMWRRD, 1995b), followed by the 2013 national water resources masterplan (NWRMP) (Federal Ministry of Water Resources & JICA, 2014b). Table 2-2 shows the distribution of proposed large and medium dams in the 1995 NWRDMP based on the hydrological areas. Financed by a Japanese Government’s technical assistance grant through Japan International Cooperation Agency (JICA) (The World Bank, 1990), the water supply and irrigation component of the 1995 NWRDMP planned to construct a total of 208 large and medium dams as a long-term strategy (JICA & FMWRRD, 1995a).

**Table 2-2: Proposed large and medium dams for irrigation and water supply towards 2020 in 1995 NWRDMP**

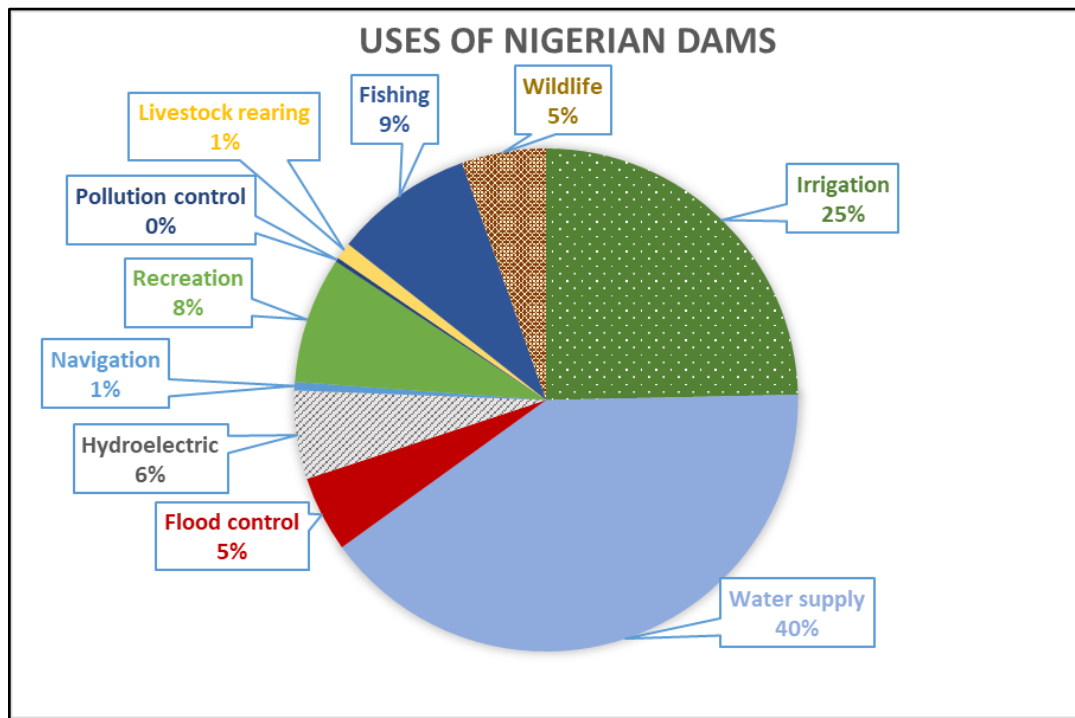
Hydrological Area (HA)	HA1	HA2	HA3	HA4	HA5	HA6	HA7	HA8	Total
JICA	11	49	23	49	14	37	25	0	233
RBDA, MANR, SWA	3	25	16	4	0	4	4	0	56

**Source:** (JICA & FMWRRD, 1995a). MANR: Ministry of Agriculture and Natural Resources; SWA: State Water Agencies.

These proposed dams (and boreholes) were to increase water supply and irrigation targets to  $1.5 \times 10^6$  ha and for 80 percent of the population by 2020 (JICA & FMWRRD, 1995a). There was also a marked difference between dam development proposals between JICA and RBDA, MANR, and the SWA as the responsible state institutions for water infrastructure development. With this historical overview of water infrastructure development in Nigeria, we can analyse dam purposes, sizes, management and development, and the future of water infrastructure development in Nigeria.

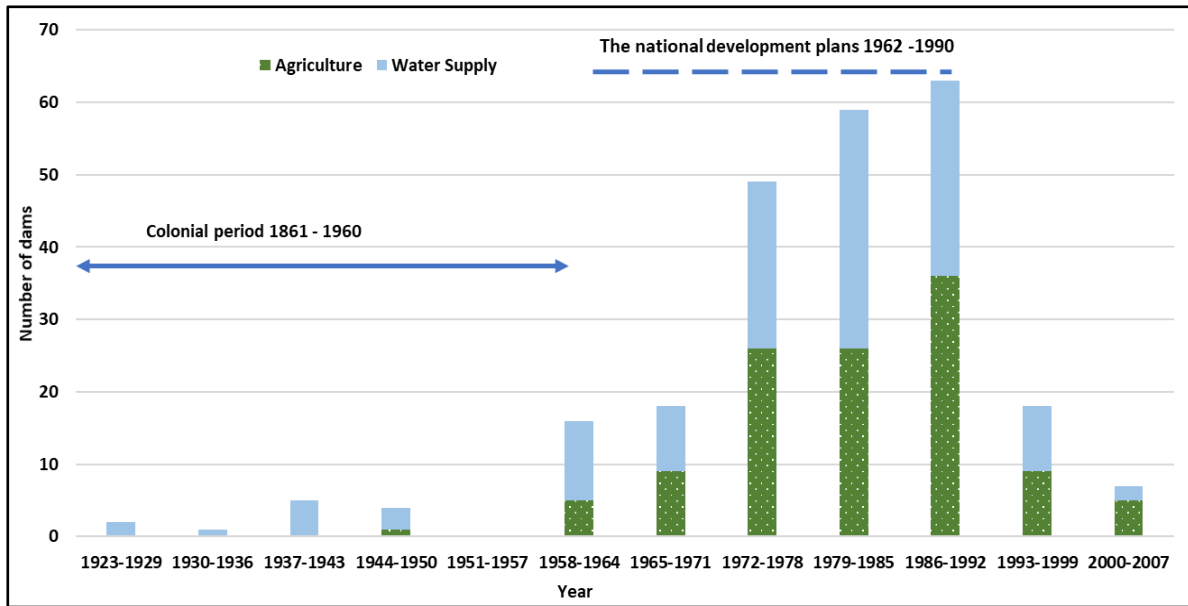
### 2.4.3 Dam uses and purposes

Constructed dams in Nigeria are classified according to size – small (<5 m), medium (<10 m), and large (>15 m) (Federal Ministry of Water Resources & JICA, 2014c; ICOLD, 2011) – with each having one or more purposes. Nigeria’s dams provide approximately 40 percent of their water for agriculture-related uses (fishing, livestock rearing, and irrigation) and 40 percent for urban and rural potable water supply (Figure 2-2). Irrigation and water supply account for approximately 67 percent of all dams constructed, aligning with the intention of the development plans.



**Figure 2-2: Uses of dams in Nigeria (Federal Ministry of Water Resources, 2007)**

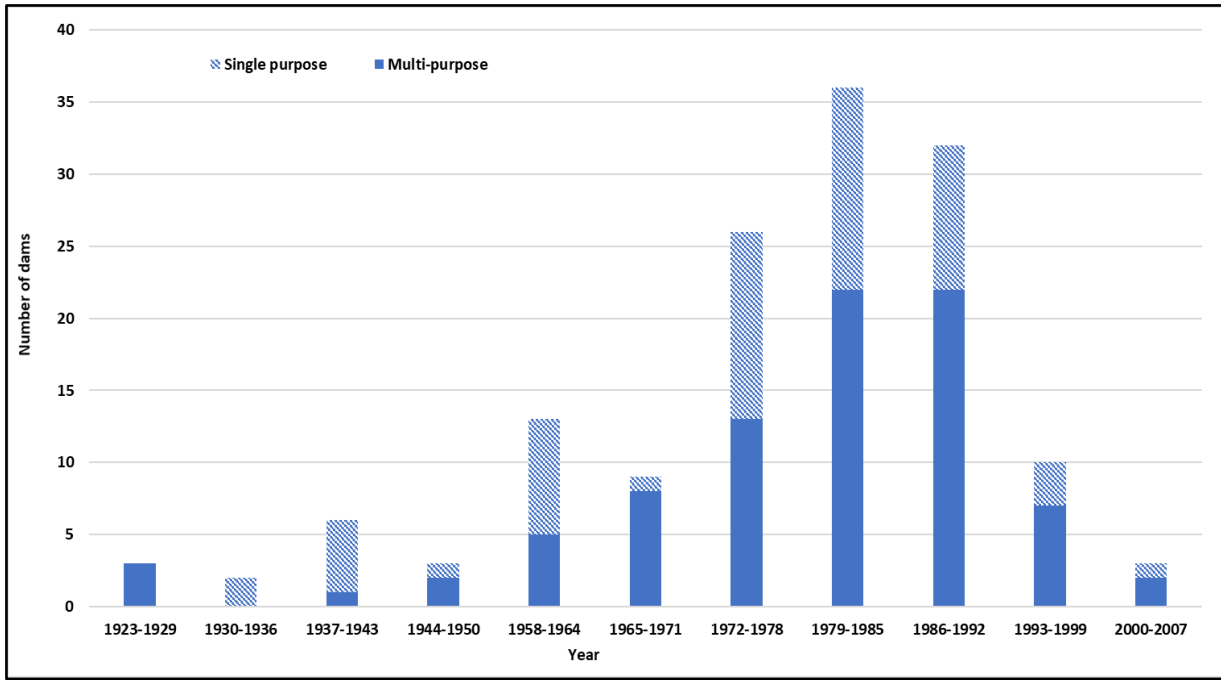
In Figure 2-3, constructed dams for water supply is consistently higher than for agriculture purposes since 1960, except in the early 1970s and mid-1980s when the cumulative agriculture number exceeded it. Agriculture purposes consist of irrigation, livestock rearing, and fishing. Agriculture growth is primarily due to the intensification of agriculture development during the oil boom between 1970 and 1998 and the end of the ADPs in the mid-1980s.



**Figure 2-3: Distribution and trend of dams constructed for water supply and agriculture from 1923–2007 in Nigeria (Federal Ministry of Water Resources, 2007)**

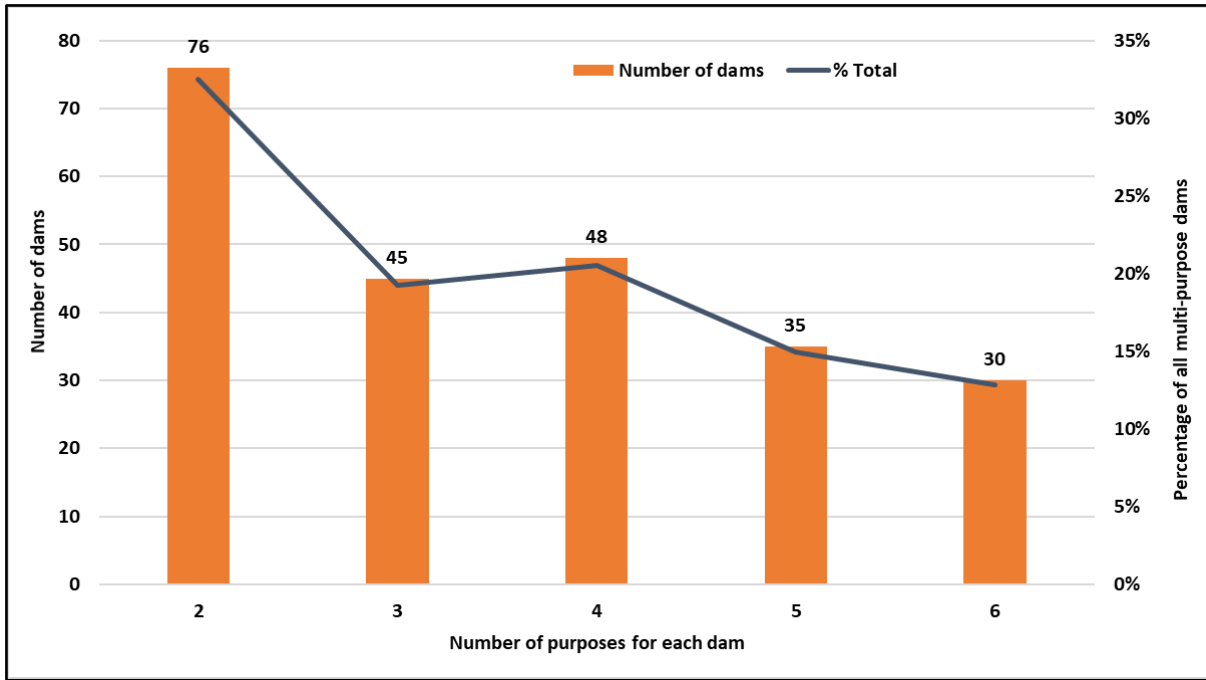
In 1980, the declaration of an international drinking water supply and sanitation decade between 1980 and 1990 (UNGA, 1980), and some of the supply-side drought management strategies of the Nigerian Government (Abubakar & Yamusa, 2013) contributed to these changes. The majority of the constructed dams during this period were multi-purpose, which almost always had a water supply component.

Multi-purpose dams (Figure 2-4) have more than one purpose for their construction and use. Colonial-era dam development focused mainly on welfare and social services such as public water supply and flood control in small towns and other urban centres (Mabogunje, 1968). The historical pattern of dam purposes indicates the government's direction and intent in developing multi-purpose dams. Between 1972 and 1992, 39 percent of dams were multi-purpose compared to 30 percent between 1993 and 2007. These figures show that post-independence multi-purpose dam development was high, aside from the period of the civil war (1967–1970); contrary to the common idea that the 1970s and 1980s Sahelian droughts did not cause a rise in dam development in Nigeria during that period. Rather, the intensity of dam development, especially for agriculture, was due to a planned developmentalist intervention expressed in the national development plans. These plans' ideological basis originated in the colonial period. During that period, the intensity of dam development, especially for agriculture, is principally a planned developmentalist intervention of the national development plans whose ideological basis is dated to the colonial period.



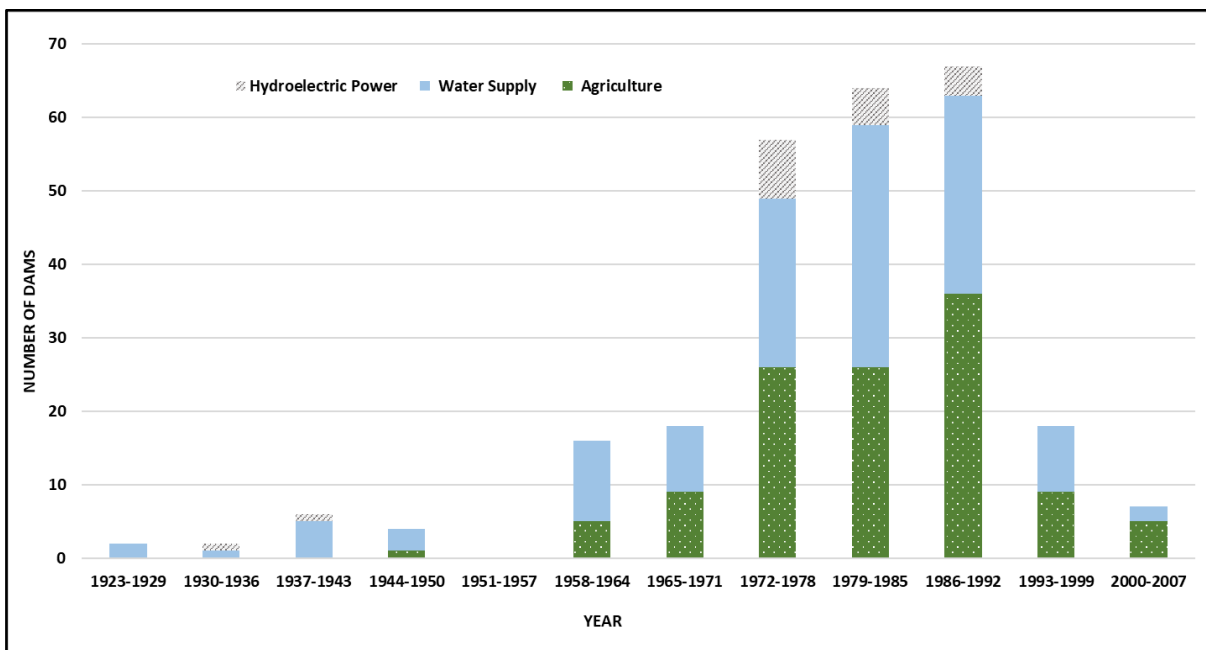
**Figure 2-4: Distribution and trend of multi-purpose and single-purpose dams 1923–2007 (Federal Ministry of Water Resources, 2007)**

In Figure 2-5, dam purpose is further disaggregated to show the corresponding number of dams and number of purposes of construction. Noted earlier, the sharp increase in multi-purpose dams coincided with the intensification of agricultural and rural development, completion of many of the ADPs, and the pursuit of Nigeria’s socio-economic objectives regarding public health and water supply. Approximately one-third of multi-purpose dams have two purposes (water supply and irrigation), representing 33 percent of the total number of all multi-purpose dams. Together, dams with five and six purposes account for approximately 30 percent of all multi-purpose dams. However, 94 percent of these dams are large, while the remaining 6 percent are medium-sized dams.



**Figure 2-5: Number of purposes for each dam and percentage of total number of dams that are multi-purpose**

Figure 2-6 shows the three main categories of dam construction. The agriculture category sums up all agriculture-related activities (noted in Figure 2-3), while hydroelectric and water supply are standalone purposes. The dominant occurrence of water supply indicates that substantial financial

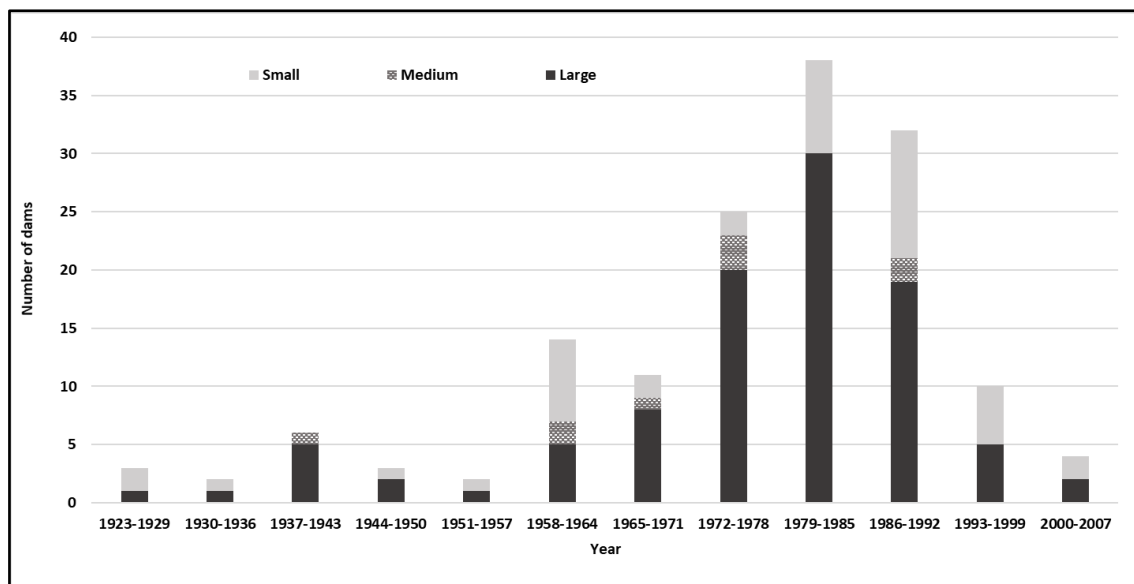


**Figure 2-6: Distribution of completed hydroelectric power, agriculture, and water supply dams 1923–2007 (Federal Ministry of Water Resources, 2007)**

investments have been made towards water supply development, despite the general narrative of underinvestment in water supply infrastructure (Collier & Cust, 2015) and the subordination of water supply in government policies. However, these investments are yet to translate to sustainable water access for the public. Essentially, the dynamics of dam purposes indicate the direction and interests of the Nigerian state and its broader developmental ambitions.

#### 2.4.4 Dam sizes

In Figure 2-7, the historical distribution of dam sizes shows how dams built during the colonial period were mostly small and large until the late 1930s. The passing of the second and third Colonial Development and Welfare Acts facilitated the construction of more dams, by enabling a transition from extractive development for the empire to welfare for Nigerians (Utietiang, 2015). After the second world war, dwindling financial resources and a lack of technical expertise in the water sector led to reduced dam construction (Ertsen, 2008; Papaioannou & Dalrymple-Smith, 2015).



**Figure 2-7: Dam sizes and year in Nigeria 1923–2007 (Federal Ministry of Water Resources, 2007)**

Dam sizes also indicate the direction of the government's post-independence development intention. For example, the prevalence of large and medium dams suggests an excessive focus on energy generation and agriculture development as in other countries (e.g., Spain, Sudan) (Erik Swyngedouw, 2007; Verhoeven, 2015) or increased water supply development for urban centers. Figure 2-8 shows the spatial distribution of completed dams and the hydrological zones in post-independent Nigeria during different political systems. In the southwestern parts, the majority of dams were completed between

1984 and 1998, where democratic governments were active and civil society was more engaged in public administration.



**Figure 2-8: Distribution of completed dams in post-independence Nigeria (Federal Ministry of Water Resources/JICA, 2014b; Federal Ministry of Water Resources, 2007)**

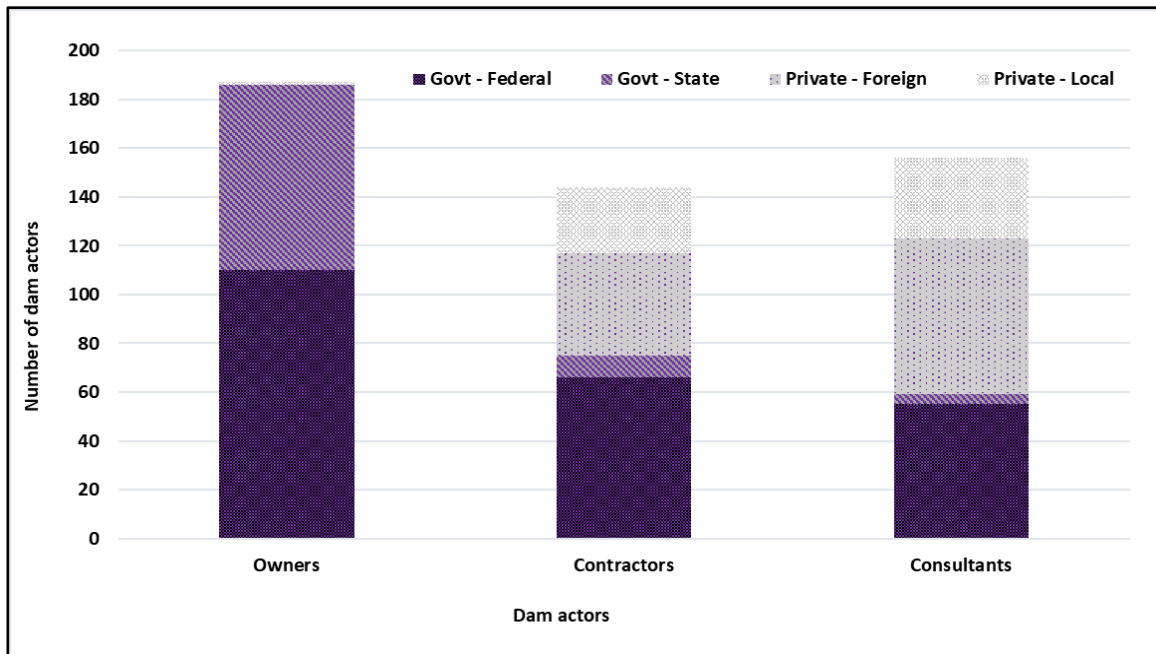
In addition, the low density of dams in the northeastern parts of the country is tied to the region's endemic infrastructure and urban poverty levels (Hoffmann, 2014) due to the low utilisation of land and other ecological assets (UNDP, 2018). Furthermore, the Sahelian climate with dry arid lands caused by meteorological droughts and variable rainfall means many seasonal rivers and streams dry out. Drought is exacerbated by climate change (Amanambu et al., 2019; Anyadike, 1993; Shiru et al., 2020), which diminishes dam development as a viable supply-side strategy.

Despite the impact of the oil glut in the late 1970s and rising debt levels, mainly due to inflationary trends and food imports, the five years of democratic government in the second republic achieved the highest levels of completed large dams. It is also evident that most dams in the country's north were

completed during the military regime between 1967 and 1979. As shown in Figure 2-8, under a democratic government (1979–1984), many of these dams were large dams that followed the development of the ADPs and the water supply decade.

### 2.4.5 Dam ownership and development

Dam owners, contractors and consultants (Figure 2-9) in Nigeria form a kind of water elite, whose decisions determine the success or failure of dam construction and management (Adams, 1993). Dam owners have the authority to manage the dam. In some cases, dam owners also act as consultants and contractors to build dams, thereby are responsible for the dam engineering design and construction. Dam contractors build the dams while dam consultants provide technical advice. These dam actors are categorised into two main groups: government and private. Government actors own and manage state-owned construction (e.g., the RBDAs) and consulting agencies (OYSADEP – Òyó state agriculture development program), often run like private corporations. Dam contractors can either be state or federal government entities. Private actors are local or foreign businesses that were classified based on the location of their official headquarters.



**Figure 2-9: Dam actors - Distribution of dam ownership, contractors, and consultants in Nigeria 1923–2007**

Dam actors perform a variety of independent or overlapping roles. For example, state or federal government parastatal often owns a dam they construct using state-owned companies as was common in the 1960s and 1970s (e.g., OYSADEP). Figure 2-9 further shows that the federal and state



governments own most dams, whereas contracting and consultancy services are provided mainly by federal agencies and private companies. Arguably, this disproportionate pattern in dam development has implications for the sustainability of water infrastructures.

## **2.5 Discussions**

### **2.5.1 Infrastructural and spatial divisions**

Water infrastructure development in Nigeria has deepened the rural–urban divide due to the differences in water sources and water infrastructure. In policy language and planning, the third plan favoured an integrated rural–urban development approach and aspired to “ensure that no community of 20,000 people or more shall be without essential services” (Federal Republic of Nigeria, 1974, p. 35). However, the guideline for the implementation of the plan differentiated between rural and urban water infrastructure development. This distinction is traceable to the colonial government’s 10-year development plan in 1946 (Nigeria Legislative Council, 1946). Valid at the time, using this distinction as a conceptual pillar was questionable in the 1960s and subsequent years due to the social and infrastructural transformation of rural areas, particularly in transportation (Filani, 1993).

Post-civil war plans for providing rural water supply were driven by ‘rural productivity’, while urban water supply infrastructure – viewed as social and economic infrastructure – was designed to improve ‘urban productivity’ (Mabogunje, 1992; Onokerhoraye, 1978). Here, water supply infrastructure is perceived as having two distinct roles for the federal government. Rural productivity imagines rural areas and their populations as spatially, temporally, and demographically static entities. This view suggests that their specific sociocultural histories limit their aspirations and needs, while their economic desires are restricted by predetermined cultural and traditional conditions and identities. In other words, rural cultural and traditional belief systems stop rural people from developing their economic potentials. Urban productivity builds on idealised ‘growth centres’ that seek to boost the industrial and commercial capacities of new state capitals emerging from newly created states. These conceptual issues have further entrenched the rural–urban divide.

The functionality of water schemes has a regional dimension, with projects in the southern region more likely to fail than in the North over 15 years; 51 percent of these failures are due to fixed variables such as political region and hydrogeology (Andres et al., 2018). Water schemes’ sustainability is comparatively better in the North in terms of greater water access. However, due to increasing levels of internal migration to the southwest, especially Lagos, water utilities are under considerable stress (Abubakar, 2017). Fifty-five percent of the total population and over 75 percent of agricultural households in the North live below the poverty line, and the northern part of the country performs below the national average on most development indicators (Macheve et al., 2015). Despite the presence of most large dams in the North, the functionality of water points and water schemes is higher in the North

than in the South (Andres et al., 2018). Economic poverty is also a delineating factor in the national North–South divide, and the link between water access and material poverty in this regard is established in the literature (Franks & Cleaver, 2007). The North–South divide has also triggered several debates about federal government infrastructural developmental priorities in agriculture, resources allocation and revenue allocation, based on the principle of equitable development used for revenue allocation.

## 2.5.2 Deprioritising water supply

Inherent in its design, Nigeria’s first ‘national’ development plan categorically excluded water resources development and subsumed agriculture development and water resources development under a broad economic development framework. The third and fourth development plans captured water supply in a category of ‘social amenities’, including medical facilities, schools, and electricity (Nwosu, 1990). Pius Okigbo noted the “exclusion of activities like water resources development (for agriculture and industry)” from what the government saw as the productive economic sector (Okigbo, 1989, p. 45). The third plan did not commit adequate funds for effective implementation of socioeconomic inequalities or address critical issues related to water supply, despite having a surplus of US\$5.2 billion (Lewis, 1977; Waziri, 1989). Unlike the agricultural sector, the first federally initiated and managed urban water supply project occurred in 1992 (The World Bank, 1992a), a 19-year difference between direct federal involvement in water supply. Before this project, the World Bank supported a range of state urban water supply initiatives and large dam constructions (e.g., the Anambra state water supply project in 1980). The water supply decade focused chiefly on rural water supply infrastructure development with boreholes as the primary water infrastructure type (e.g., The National Borehole Program).

## 2.5.3 Political infrastructures

Agriculture development through irrigation was historically a central pillar of development planning and intervention in Nigeria (Okigbo, 1989; Watts, 1983). Sahelian droughts are a historical reality for Northern Nigeria, who sees water resources and irrigation development as a “basic natural resource” for economic development (Federation of Nigeria, 1962, p. 113). Colonial-era irrigation systems were constructed to control farmers’ productivity (Ertsen, 2008) while simultaneously ignoring existing local wetland irrigation practices (Bjornlund et al., 2020; Edwardes, 1919; Lugard, 1922). The Northern Region Development Programme 1962–1968 dedicated 838,000 Pounds for irrigation development in the Sokoto-Rima valley as part of this agenda (Federation of Nigeria, 1962). Similarly, the federal government’s anti-drought management strategy in 1973 hinged upon a short- and long-term approach. The short-term approach provided a US\$13.3 million welfare grant to four northern states affected by the drought, while the long-term strategy aimed to construct grain stores, increase grain

production, and establish the 250,000 tons National Strategic Grains Reserve stipulated in the third plan (Federal Republic of Nigeria, 1975; Gowon, 1973).

Two crucial factors determine the further decline in dam numbers during the 1990s. First, the political instability arising from the complex military/democratic structure had begun to show the fractures inherent in such a system, due to the increasing pressure on General Babangida to hand over power to a democratic president. This initial pressure spiralled into the 1993 annulment that led to a transitional government and eventual takeover by General Sani Abacha. The second point relates to the end of the World Bank ADPs in 1993. These political changes meant that the multistate ADPs had to adjust to the flow-on effect of the corresponding policy and institutional changes, like the new states' commodity boards, which were often technically, financially and administratively ill-equipped to manage the ADPs (The World Bank, 1998). Even though the ADPs did not prioritise water supply, there were "unintended positive consequences" for rural water supply, going by the success of the water supply component of the programme (OYSADEP, 1989, p. 6). The water supply components consisted of small dams, wells, and public standpipes.

The political problems are also linked to the corresponding management challenges, which the GWP-N (Global Water Partnership-Nigeria) considers a critical governance problem in Nigeria. By asking to identify the "main actors in water service provision, their interests and those of the stakeholders involved" (GWP-N, 2014, p. 5), the GWP-N seeks to understand the allocation of power in the relations between various stakeholders invested in water infrastructure. Governance responses also prioritise the technical, financial, and technological manipulation and modification of governance systems, ecologies, and infrastructure (Danert et al., 2020; Lane, 2012; Moe & Rheingans, 2006; Tetra Tech & USAID, 2015) at the expense of narratives, policies, and governance practices that consider the local context (Akpabio & Ansa, 2013). Such responses include expanding water storage and access capacities by building more dams and boreholes (Adetola, 2016; Federal Ministry of Water Resources, 2017; Federal Republic of Nigeria, 1999) and constructing the additional 370 dams noted earlier (Adetola, 2016).

#### **2.5.4 Infrastructure failures and sustainability**

Water project failures are a crucial challenge in Nigeria. For example, in the rural water supply sector, functionality and sustainability as concepts are scrutinised due to the preponderance of failed water projects (Andres et al., 2018; Andres et al., 2018). The FMWR observed that 116 projects were still uncompleted or ongoing after an average of 15 years since commencement: 38 irrigation and drainage projects, 37 dam projects, and 41 water supply projects (Adamu, 2016). An estimated 46 percent of water schemes (water supply projects with drinking water as the main water component) are non-functional in Nigeria (Andres et al., 2018). The failure of these utilities impacts water access geographically, manifestly in the rural–urban dichotomies and differences (Oyeniyi & Oloyede, 2016)

and at the household level (Nduduba, 2014). In addition, existing water infrastructure cannot sustain current population growth due to the rate of infrastructural deterioration and low infrastructural investment (Macheve et al., 2015).

Nevertheless, the federal government plans to construct an additional 370 dams (10 dams in each state and the federal capital territory) in the country over the next four years (Adetola, 2016). This ambition demonstrates a lack of reflection on what the GWP-N described as the “underlying causal factors of infrastructure deterioration and decay to militate against a repeat of similar problems in the future” (GWP-N, 2014, p. 4). Ultimately, project failures cannot be divorced from the question of power and equitable distribution, or the politicisation of these infrastructure projects’ stakeholders, mechanisms, and governing processes.

### **2.5.5 Infrastructure classification and typologies**

In Nigeria and globally, dams and reservoirs are usually classified by size and capacity (Grigg, 2019). Standpipes and dams in Nigeria are still classified as technological entities (Akanmu, Remi-John, & Ekpo, 2011) despite evidence for the socio-technical nature of their development, use, and management (Abdullaev & Mollinga, 2010; Furlong, 2011; Moss, 2014; Nilsson & Nyanchaga, 2008). Taps, dug wells, and standpipes classified for potable water supply (WHO & UNICEF, 2019) raises questions about the source-infrastructure conundrum. Lack of a clear theoretical definition of what constitutes a water infrastructure (a Google search of ‘what is a water infrastructure?’ showed 257 results) becomes a specific problem for developing countries due to the different water governance systems, repeated malfunctioning of water infrastructure (Furlong, 2014), and multiplicities of technologies (Komakech et al., 2020).

### **2.5.6 Optimal use of water resources and infrastructure**

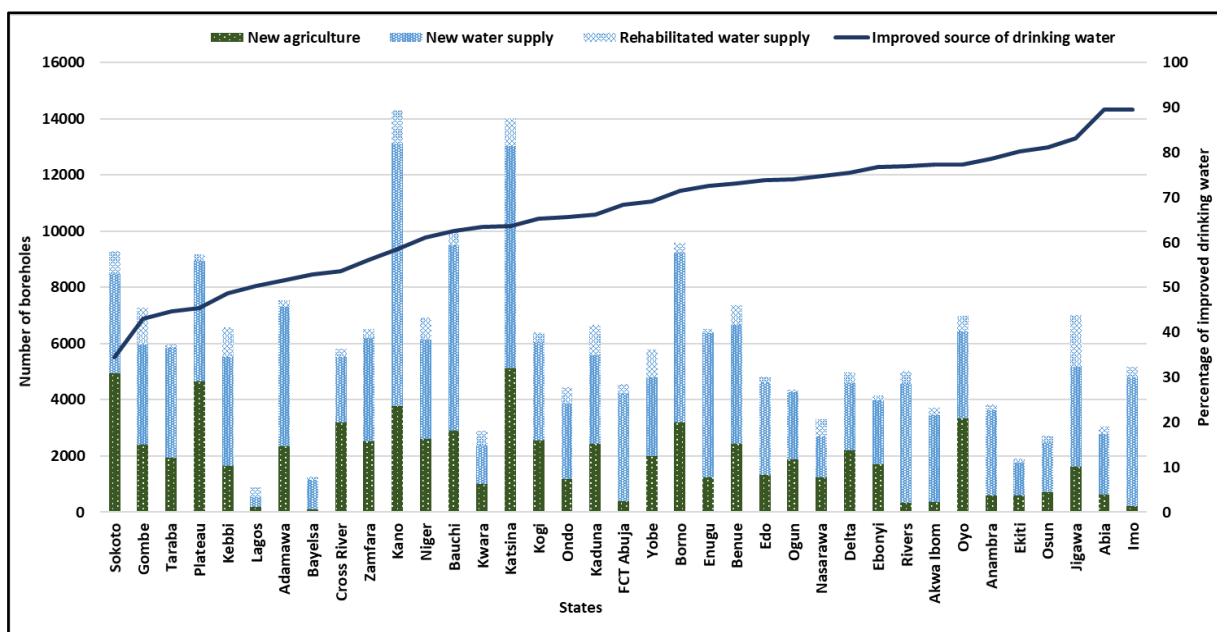
Nigeria’s 8,600 inland waterways (CIA, 2011) offer several social and economic development opportunities that can be channelled to increase economic opportunities. However, agriculture and water supply account for 75 percent of dam construction in Nigeria, while energy, the bedrock of any nation’s economic development, sits at six percent (Figure 2-3). In contrast to 70 percent for rich countries, Africa’s current hydroelectric potential development remains at approximately three percent (Cosgrove & Loucks, 2015). With navigation, colonial historical records show that the Benue River was navigable all year round in the 19th century (MacDonald, 1891). Nevertheless, efforts to dredge the lower Niger river has met with fierce resistance from downstream water users.

Water-related tourism is another potential area for economic development. The World Travel & Tourism Council’s report predicts that the Nigerian tourism industry will grow to approximately two percent of GDP by 2028 (WTTC, 2019, p. 2). Tourism’s potential socioeconomic and political impact

could be harnessed to mitigate conflicts and aid post-conflict environments (Bankole, 2002; Christie et al., 2014; World Bank, 2017). Dams and other water bodies possess potential as tourism infrastructures (James & Essien, 2019). Increased optimisation of these resources could raise additional pressures (and opportunities) for different regions and states in Nigeria. However, the opportunities this presents could be effectively harnessed with a conceptual perspective that situates people and power at the forefront of resource use and management.

## 2.5.7 The future of water infrastructure development

Figure 2-10 shows a state-by-state outline of new and rehabilitated boreholes for water supply and agriculture, planned to achieve SDG 6 and the regional disparities across the states (see [Appendix F](#)). Standpipes are a component of a water supply scheme where people gather around a pipe to access water for domestic and commercial uses, but also for irrigation purposes.



**Figure 2-10: New and rehabilitated boreholes to meet SDG 6 in 2030: Improved drinking water sources and agriculture needs in Nigerian states (Federal Ministry of Water Resources, 2014b)**

Water from standpipes is primarily sourced from groundwater but also reticulated systems from dams. Standpipes in this paper include tubewells, boreholes, protected wells, public taps, and protected springs (WHO & UNICEF, 2018). These reflect the range of ‘hardware’ components used to meet Nigeria’s SDG 6 long-term strategy of achieving full access to water by 2030 (Ajisegiri, 2016). It is also conceptualised differently to water governance, use, and construction of dams because the community

management model is the standard management framework for most water points in Nigeria. States like Imo, Abia, and Jigawa, with approximately 90 percent improved drinking water rates, will build new water supply boreholes in equal numbers as Taraba, Gombe, and Sokoto in the North, with over 50 percent margin in improved water access. Eight northern states (Borno, Adamawa, Bauchi, Kaduna, Kano, Katsina, Zamfara, and Sokoto) account for 38 percent of the new boreholes to be constructed for agriculture, while Lagos, the most populous state in Nigeria (22 million) and ranking 31 out of 36 states on water access, has the lowest number of new boreholes to be constructed for water supply. The variations on newly constructed boreholes across states and Abuja demonstrate how investments by states with lower water access rates can entrench the spatial inequities in water infrastructure and water access.

With dams, the 2013 NWRMP proposes 81 new and ongoing dams to be constructed and plans to rehabilitate 87 existing dams (Federal Ministry of Water Resources & JICA, 2014c). However, the NWRMP contained no description of the technological choices. Therefore, it misses the opportunity to embrace less ecologically disruptive technologies such as ‘zero head’ used predominantly in China and India (Moran et al., 2018). Recent studies on the role of dams (especially small dams) in developing countries suggest that small scale dam development for small towns’ water supply development could facilitate achievement of the SDGs (Muller et al., 2015). Although opinions are divided on whether Africa should pursue a dam-driven ‘green’ infrastructure trajectory, most of these studies disproportionately focus on large dams while reports of social and ecological damages caused by small dams remain to be assessed (Moran et al., 2018). Despite the historical problems, effective development of small and medium scale dams is promising for a sustainable future for water supply, agriculture, and hydropower development (Alhassan et al., 2019). Moreover, increases from such development fit conceptually into the broader African infrastructure agenda proposed in the Programme for Infrastructure Development in Africa (PIDA) framework (PIDA, 2019b).

Effective development here means focusing on what is variously called ‘nature-based solutions; and ‘ecosystem-based adaptation’; for example, restoring water catchments as suggested by the United Nations in *Valuing Water* (UNESCO, 2021). Rehabilitating existing, failed, and deteriorating dams, and their catchments, will support current climate mitigation efforts, especially in the northwest of Nigeria. Better management of groundwater as a different water source is needed as there are indications that the Sahelian and Niger basin groundwater stock is increasing (Mgbolu et al., 2019; Werth et al., 2017); and supporting Indigenous knowledge systems to improve local rainwater harvest and conservation agriculture. Lastly, encouragement of a more efficient use of existing water and return environmental flows is required. These options will set Nigeria on a different path from its past, for a more sustainable future where social, economic, ecological resources form the basis of future water infrastructure development.

## 2.6 Conclusions

This article presents a historical outline of water infrastructure development in Nigeria with a specific focus on dam management and development, dam sizes, and dam use and purpose, using data from the Nigerian compendium of dams 2007, and the 1995 and 2014 national water resources masterplans. In addition to the national development plans, the national water resources development masterplan (1995 and 2013) and the agriculture development programs (ADPs), are the two post-independence policy documents and frameworks that distinctly underpin water infrastructure development in Nigeria. The subordination of water supply infrastructural development to agricultural development at the national level until the early 1990s was evident in the four national development plans and investment in ADPs. The inadequate attention to, and unequal treatment of, rural water supply in the development discourse is apparent and affects livelihoods. A lack of intentional design and poor conceptualisation forces rural populations to bear the brunt of delayed, deteriorated, and failed water infrastructure.

Based on this assessment, priorities for more sustainable water resources development include:

- Reimagining how water infrastructure is optimally used in both the productive and non-productive sectors. Tourism and small-scale hydroelectric production capacities of the small and medium dams should be explored.
- Contemporary rural–urban development approaches that are coherent and integrative to reflect the blurred geographical and infrastructural boundaries, which previously separated peoples. These spatial differences are evident in the differentiated access to water between the southern and northern parts of the country and rural and urban areas.
- Infrastructure development options must remain flexible enough to cater for an uncertain future in terms of population growth, economic needs, and climate change (Daniell, 2013).
- Actors involved in policy planning, formulation and implementation should invest more to understand the power relations and political dimensions of water infrastructure development, specifically, in its spatial allocation, financing, and budgetary investments.

A synergy between researchers, the private sector, and government at all levels can facilitate more sustainable water resources development by drawing on existing financial, technical, and regulatory knowledge and opportunities at local, regional, and international levels (International Hydropower Association, 2018).

Three areas of future research emerge from this study. First, there is a need to better document and monitor dams, reservoirs, and other water infrastructure in Nigeria. Such systematic data collection would ensure more accurate estimates of Nigeria's water storage capacity and establish exact stages of infrastructural failure, deterioration, or accretion. Second, the validity and sustainability of current rural water supply strategies, overwhelmingly provided through wells and boreholes, require further

investigation as unsustainability appears to be an intrinsic attribute of this model of development. Finally, further research is needed to examine how power asymmetries between federal, state, and local governments can improve effectiveness and the increased roles of non-state actors in water infrastructure development and management. Such structural adaptations are necessary for large scale transformation; however, more research on this sociopolitical aspect is urgently needed.



# Chapter 3: A conceptual framework for the politics of water and infrastructure governance in Nigeria

Adeniran, A. B. (2022) A conceptual framework for the politics of water governance in Nigeria [READY FOR SUBMISSION - *Unpublished at the time of thesis submission*]

*Potential outlet: Water SA*

**Sub-question 1:** What is the state of power and politics research in Nigeria's water (infrastructure) governance, and how is it conceptualised?

## Chapter introduction

This chapter proposes a conceptual framework drawing on current water governance and politics literature. The framework is beneficial for water governance researchers with a focus on Africa because of its emphasis on context, scale (global to local) and history. The outcomes of this chapter address the conceptual problems highlighted in Chapter 1, using the literature gaps and empirical issues identified in Chapters 1 and 2, respectively. In developing this framework, the work of Jabareen (2009) on conceptual framework development and Maxwell (2005) guided the procedures selected.

The power-governance framework takes power as inseparable from water governance and highlights four domains of practical water governance in Nigeria: (1) ecological; (2) economic; (3) social; and (4) state (political). The state mediates the other three within the intersecting relations of time, context and scale. Further literature review and theoretical elaboration of power, the state and development in Nigeria are provided in Appendices I, J and K.

The framework offers two crucial pointers for water researchers and policy practitioners: first, to maintain procedural flexibility when interpreting water governance concepts in different contexts. Second, this flexibility requires that they consider the embeddedness of the state within society when they decide on nature and society interventions.

## **Abstract**

This paper proposes a multidisciplinary conceptual framework to study the politics of water governance in Nigeria, using personal experiences and knowledge of Nigeria's water, and extensive multidisciplinary literature on water governance. I developed a concept map to organize thoughts and issues into four interrelated domains – economic, social, ecological, and political – and to situate these issues around time, context, and scale.

## **3.1 Introduction**

Water governance in Nigeria is oriented, theoretically, on the idea of ‘managing for’ (management) rather than ‘managing with’ (governance) its stakeholders, despite the global shift in theory and practice of both terminologies (Franks, 2006). The OECD (2015a) and Pahl-Wostl (2009, 2015b) provided definitions that Woodhouse & Muller (2017) argue explains the distinction between water resources management and water governance. Both descriptions reflect the diversity of actors beyond the state and acknowledge the social relationships of water (Pahl-Wostl, 2015b). Akpabio & Ansa (2013, p. 305) noted that Nigeria’s water governance “has not yet matured from theory to practice” due to governmental apathy towards the citizens’ needs and weak institutional capabilities. Conceptual incongruity arising from the numerous definitions of water governance and empirically driven global changes in theory and practice, are two critical conceptual gaps for Nigeria. In other words, Nigeria lags in adopting and utilising theoretical advances in water governance and manages water resources in a way that is inconsistent with recent definitions of governance and water governance broadly. Thus, to develop contextually relevant interventions and solutions to its water governance problems is a primary conceptual issue.

The conceptual foundations of water governance have continued to evolve globally; from one which emphasises the sociotechnicality of water and its inherently political nature (Molle, 2009b; Molle et al., 2008; Mollinga et al., 2007), to an in-depth examination of the interactions and interrelationships that define its multiple distributions of voice, knowledge and expertise, and authority (Zwarteveen et al., 2017). Framing Nigeria’s water governance in this manner acknowledges the ‘politicised’ attributes of these connections and interrelationships, and the ‘political’ positioning of its actors. This is one that pays closer attention to and allows a fine-grained analysis of the processes and mechanisms through which the interactions occur. Hence, Nigeria’s water governance system is not just represented by these dichotomies (formal/informal, multilevel/polycentric), but is a repeatedly re-constructed system of authorities (individual and collective) defined by diffuse power relationships over time.

By centring power and politics, this paper aims to broaden the remit of water governance analyses in Nigeria beyond what is empirically and theoretically available. I have only provided the basic concepts needed for Nigeria’s water governance analyses in this paper. I argue that existing theories and

research directions are incapable of addressing the empirical and conceptual challenges, and that any future adoption and implementation of water policies must foreground a political approach. This diagnostic and exploratory framework is anti-reductionist and indeterministic, therefore it does not seek to predict water governance outcomes. Following this introduction, Section 2 discusses the methodology of the conceptual development. Section 3 presents a literature review of water governance research in the past decade. In Section 4, I provide a theorisation of power and politics in water governance. Section 5 presents the conceptual and analytical frameworks, and Section 6 concludes.

### **3.2 Methodology**

*Purpose* – Conceptual framework development is an attempt, according to Becker (2007) and quoted in Maxwell (2005, p. 52) “to inspect competing ways of talking about the same subject matter” and to provide understanding (Jabareen, 2009) and a knowledge of “soft interpretation of intentions” (Levering, 2002, p. 38). With this in mind, I define a conceptual framework as a system that “explains, either graphically or in narrative form, the main things to be studied – the key factors, concepts, or variables – and the presumed relationships among them” (Miles & Huberman, 1994, p. 440). Conceptual frameworks must be modifiable, flexible, and provide an understanding of events or phenomenon (Jabareen, 2009). “Methodology is in part descriptive, in part prescriptive” (p. 1), two actions that speak to the fluid nature of systems where human agency, knowledge, and power are ever-interfering currencies.

*Philosophy* – In developing this framework, I follow a constructivist-interpretive tradition (Yanow & Schwartz-Shea, 2014) as a philosophical strategy, bridging *a priori* and *a posteriori* knowledge in the process. The power dimension of my positionality as a researcher is acknowledged in this development. As Mary Hawkesworth noted, “strategies that are accredited as legitimate means to acquire truth gain their force from decisions of particular humans working within particular academic communities; thus, there is a power element in the accreditation of knowledge” (Hawkesworth, 2014, p. 28).

*Logic* – The logic of inquiry is abductive reasoning based on Charles Pierce’s notion of the abduction processes as a template on which “all the operations by which theories and conceptions are engendered” (Douven, 2017, p. 4). Abduction captures the realization of everyday contexts and reasoning, possesses an extensive capability for multidisciplinary thinking, and analyses (Douven, 2017). I have selected this approach for its increasing power to unlock essence and meaning in political research. Gary Shank argues that inferences drawn from abduction “lead to hunches, omens, clues, metaphors, patterns, and explanations” which are useful in the search for truth (Given, 2008, p. 1).

*Data* – Data influences on the design of this conceptual framework hinge on three of the four origins of conceptual development proposed by Maxwell (2005): (1) the use of personal knowledge and experience; (2) existing theories; and (3) research (p. 44). Experiential knowledge allows an integration

of the subjective and reflexive elements into the research process. At the same time, it encourages the researcher's power (positionality) to be acknowledged, concerning the constitutive research relationships across space, time, and with the subjects and data (Schwartz-Shea & Yanow, 2012, p. 60). Using existing theoretical concepts and research ideas in a model development strengthens and justifies it in many ways. Theories in this context go beyond the set of concrete ideas and concepts, but postulations help us creatively imagine and understand the meaning of a phenomenon, and why it exists in such ways (Strauss, 1995). Maxwell (2005) suggests that using prior research in conceptual development can provide support for research justification, form the basis for the selection of methods by highlighting methodological issues, can be a valid data source, and can help generate a new theory.

*Analysis* – Procedurally, I adapted a 'procedure of conceptual framework' development using the first five steps (out of eight) iteratively (Jabareen, 2009). The last three phases of Jabareen's procedure focus on theoretical development, an exercise beyond the scope of this article. The model is constructed as a thought experiment working as a foundation to develop future theories, enhance understanding of a phenomenon and illustrate processes of conceptual evolution. I present in section 3.3 a review of research agendas in water governance in the last decade. Following from this extensive reading and analyses of academic and context-specific literature, I identified and named a broad categorisation of data and concepts before describing each concept to identify the main attributes, characteristics, assumptions, and roles. I developed a concept map as a tool to capture broad categorizations of concepts and their relationships under which empirical issues exist.

All three sources of data for conceptual framework development are complementary. Using existing theories and literature complements the limitations of thought experiments (Cooper, 2005). This way, the researcher's presence and agency (bias) in answering the 'what-if' questions during conceptual development becomes a critical factor in the evolution of theory and the identification of its limitations (Maxwell, 2005). By integrating positionality with theoretical development and the logic of situational/contextual meaning making, I reject the idea of a 'phantom' researcher in the research process (Schwartz-Shea & Yanow, 2012). This thinking suggests that context is not only restricted to the geographical space but is also inclusive of the agency of actors that (re)configure it, their embodied spaces, and power relations (Foucault 1980; Bourdieu, 2000).

### **3.3 The need for a conceptual framework – A review**

In the last decade, increased use of literature reviews (systematic, traditional, and meta-analysis) in water governance research has highlighted the current state of knowledge, characterized research challenges, shaped future practice and research needs, and targeted evidence to improve water governance outcomes (Araral & Wang, 2013; Boeuf & Fritsch, 2016; Lilyea et al., 2016; Majuru et al., 2016; Moore et al., 2014; Olagunju et al., 2019; Özerol et al., 2018). However, significant knowledge

gaps exist across these political and social contexts with diverse descriptions of water governance (fragmented, nested, multilevel, polycentric, hybridized) in most African countries. Table 3-1 shows a synthesis of the water governance literature reviews that informs this review section.

**Table 3-1: Reviews of water governance research agendas in the past decade**

Study	Review Approach	Governance field	Region	Key findings from literature	Recommendations for future research
Olagunju et al. (2019)	Systematic	General	Africa	<ul style="list-style-type: none"> <li>• Theoretically and methodological weak</li> <li>• Most studies conducted through institutional analysis and discursive perspectives</li> <li>• Policy relevance of studies are questionable due to poor analytical rigor</li> <li>• Limited scope of contextual analysis</li> <li>• Intersection between indigenous knowledge and water governance are underresearched</li> </ul>	<ul style="list-style-type: none"> <li>• Examine the effects and mitigation of colonial legacies across contexts to create learning opportunities</li> <li>• Explore the socio-technical interface of water governance</li> </ul>
Araral & Wang (2013)	Traditional	General	Global	<ul style="list-style-type: none"> <li>• Water governance definition is still limited by scope and definition</li> <li>• Lack of multidisciplinary approaches to water governance studies</li> <li>• Theoretically inconsistent</li> <li>• No uniform approach to water governance research</li> </ul>	<ul style="list-style-type: none"> <li>• Multidisciplinary approach that considers public administration, political economy, and institutional economic analyses.</li> </ul>
Özerol et al. (2018)	Systematic	Comparative	Global	<ul style="list-style-type: none"> <li>• Contestations still surround water governance definition</li> <li>• Studies emphasize elemental aspects of water governance focused on policies</li> <li>• Over-reliance on Ostrom's IAD theoretical framework</li> <li>• Limited mixed methods approach</li> <li>• High reliance on primary data</li> </ul>	<ul style="list-style-type: none"> <li>• Limit geographical bias by increasing analyses into the global south</li> <li>• Balance small, medium and large N studies</li> <li>• Increase research into justice, equity and power issues in the global south</li> <li>• Evaluate temporal trends and patterns in governance</li> </ul>
Whaley & Cleaver (2017)	Traditional	Community	Africa / Global	<ul style="list-style-type: none"> <li>• Lack of approaches that connect the socio-technical interface</li> <li>• Excessive focus on community analyses</li> <li>• Inadequate understanding of power relations in the intersection of multiple institutions and broader community governance</li> <li>• Practice-focused and critical-academic researcher positionality critically bias research outcomes</li> <li>• Practice-focused analysis are undertheorized and superficial</li> </ul>	<ul style="list-style-type: none"> <li>• Focus on the socio-political situatedness of community-based committees to investigate equitable access</li> <li>• Subject water management arrangements to context-specific evaluations</li> <li>• Investigate power relations across scales within and beyond the community level</li> <li>• Explore the socio-technical interface with interdisciplinary approaches</li> <li>• Utilize theoretical and methodological approaches that provide a detailed understanding of governance systems</li> </ul>

For many West, Central and parts of Southern African countries, Nigeria included, current water governance research lacks contextually relevant studies, is theoretically weak, and analytical models are poorly applied, which compromise analytical rigor and integrity (Olagunju et al., 2019). Some of these are path-dependent and speak to the historical conditions and legacies of most African countries (Harris

et al., 2011; Inguscio, 2018; Jedwab et al., 2014). These contextual and complex governance challenges are not amenable to one-size-fits-all conceptualisations (Miranda et al., 2011; OECD, 2011). Such conceptualisations do not readily accommodate socially and politically constructed contextual nuances, are inherently uncertain about actor agency, and they simplify the complex human interactions (Chambers, 1986a, 1986b; Long & Ploeg, 1989; Rondinelli, 1994). Neither are they fixable by relying on a single paradigm or model, which may produce the panacea problem (Ostrom & Cox, 2007, 2010). Water governance models need to be specifically selected for every context and territory (De Stefano et al., 2014), and individual nations must examine prevailing governance practices and processes against desired national outcomes (Conca, 2006).

In a recent systematic review of comparative water governance, Özerol et al. (2018) found out that water governance models showed an evident lack of equity, power, and justice in comparative water governance research and geographical bias, in the volume of research from the developing world. Comparative water governance research compares themes or contexts to identify best practices across different governance settings. It pays attention to specific governance elements like regulations, mechanisms and policies, cooperation and coordination, and participation and stakeholder engagement, amongst others (Benson et al., 2015; Knieper & Pahl-Wostl, 2016). Acknowledging a preponderance of water governance challenges in developing countries, Araral & Wang's (2013) review showed that there is little evidence of interdisciplinary or multidisciplinary analyses, and a weak theoretical coherence across most of the papers analysed, and called for a "second-generation multidisciplinary research agenda" (Araral & Wang, 2013, p. 3945).

Three critical lessons emerge from these mostly functionalist perspective research agendas. Firstly, both in data composition and description there is an apparent disproportionate representation and geographical bias against African countries, leading to poor regional characterization (Araral & Wang, 2013; Özerol et al., 2018). Secondly, though most of the papers agree on the dearth of theoretical rigour in water governance research, there is a tendency to advocate for theoretical uniformity by anticipating a single conceptual framework for studying water governance. Such intention, if achieved, may provide little benefit or effectiveness in practice (Woodhouse & Muller, 2017). Theoretical uniformity may create panaceas due to researchers' overreliance on specific theories (Knieper & Pahl-Wostl, 2016) or the theory-practice implementation issues experienced in various sectors, such as project management and policy implementation (Bredillet et al., 2015; O'Toole, 2004). Theoretical pluralism is not a threat if used to examine stark contextual differences. For diagnostic purposes, researchers should be able to shop for theories in the 'marketplace of theories' or design theories fit for the diagnostic and analytical objectives. Such theories must be underlain by the intellectual rigor that is characteristic of academic research.

Thirdly, the reviews do not situate power accordingly despite the UNDP's pronouncement that "the scarcity at the heart of the global water crisis is rooted in power, poverty, and inequality, not in physical

inequality” (UNDP, 2006, p. 2). These contextual limitations present conceptual, empirical, and theoretical challenges. For example, evidence from such studies does not reflect the “allocation and access” issues in developing countries, (e.g., in transboundary water politics; see Mirumachi 2015, p. 10) or the values in SSA countries (Woodhouse & Muller, 2017). A truly interdisciplinary conceptual framework for critical, analytical, and diagnostic water governance research that meets the research needs of most developing countries (emphasis on SSA) must acknowledge the politics of water governance (Molle, 2009b; Mollinga, 2008b; Mollinga et al., 2007; Squires et al., 2015; Swyngedouw, 1999, 2009). Such approaches must be guided by a conceptual lens versatile enough to accommodate the complex social, political and ecological interrelationships in these countries. Equally, they must be responsive to flexible methodological approaches that place empirical understanding of issues above prescriptive rulemaking, and able to trace processes, practices, and governance types and regimes (Daniell & Mercer, 2017; Daniell & Kay, 2017; Whaley & Cleaver, 2017).

### **3.4 Political economy in Africa and Nigeria as a developmental state**

Marxists and, more contemporarily, neo-Marxist analysts have dominated much of the literature on development and the developmental state. Chris Allen highlighted this point succinctly in 1981 when describing the bibliographic study of the political economy in Africa: "Most of the most important material on the political economy literature of Africa has been, and will continue to be, produced by Marxists" (Allen, 1981, p. 291). For example, William Graf's analyses of traditional grassroots politics and the 1983 *coup d'état* in Nigeria were based on a Marxist class analysis (Graf, 1986; Graf, 1985). Allen went on to suggest that the central role of Coleman's modernisation theory is at the core of this theoretical direction, and whose methodological and analytical commitments and subject matter consist of the following:

*A concern with the temporal dimensions, with how change may occur and be induced; a concern with the ways in which systems and phenomena are reproduced, or reproduce themselves, rather than an assumption that this does not require explanation; a concern with the economic bases of ostensibly noneconomic phenomena; a concern with holistic theories as much as, or more than, with middle range analysis; and sensitivity to disciplines other than one's own.* In terms of subject matter, the approach "is marked by a stress on the themes of underdevelopment, imperialism, and class formation and action; and, more generally, with questions not merely of the distribution of power and wealth, but with the origins and morality of this distribution, and with the means to change it. (Allen, 1981, p. 291)

Temporality, change, multidisciplinary and the (re)production of a particular phenomenon are the central features of this political economy that seeks to understand the "historiography of modern Africa" through Afrocentric or Eurocentric perspectives, and capitalist and socialist interpretations (Wallerstein,

1981, p. 30). Allen's prophecy has remained true. The theoretical influence of these analyses can be seen in contemporary works in the *Palgrave Handbook of Political Economy in Africa* (Oloruntopa & Falola, 2020a), while the continued conceptual, analytical and theoretical limitations persisted. Not much of these have changed, as attested to by Oloruntopa and Falola:

African Political Economy has not been developed conceptually, theoretically, or analytically as a field of study. It suffers from the same fate as some other disciplines and fields of study in Africa in which knowledge production has been essentially anchored in theories and concepts from elsewhere. (Oloruntopa & Falola, 2020b, p. 1)

Regarding the subject matter, the social, political and economic conditions of African economies and states have changed since the early postcolonial/postindependence era, all maintained by a pursuit of developmentalism as an idea and an ideology. However, the subject matter has remained fixed to the traditional analytical themes of predentialism (Casey, 2013; Lewis, 1996), patronage and corruption (Omobowale, 2018), colonial rule (Falola & Heaton, 2018), and ethnicity and nationalism (Doron, 2011; Olasupo et al., 2017b). This new historiography has shifted the understanding of ideological instruments such as religion, colonialism, and nationalism in state formation and societal reconstruction. In a democratic Nigeria, for example, the link between religion, radicalism and neoliberalism (Hackett, 2011) and the effect of missionary legacies (Shankar, 2018) are some of the subjects that attempt to piece together the ideological and material aspects of Nigerian economy, politics and society.

Besides being a committed Marxist in theory and practice, Claude Ake's leading contribution to understanding the intersection of political economy and ideologies in Africa remains one of the under-analysed texts. Bringing the actions of African leaders and the ideological relations of development together, Ake centres the logic of colonial ideologies as a vital starting point, because of its role in structuring African colonial economies differently from western colonial economies, even though both systems emerge and are shaped by capitalist forces of development (Ake, 1981). Another crucial point that Ake makes about the nationalism and development debates relates to the adoption of the doctrine of neoliberal democracy by postcolonial African leaders. Ake argues that two crucial reasons underpin the adoption of this ideology as follows:

First, it was useful for mobilising liberal opinion in the metropolitan countries. It was most effective to make their appeal to western liberals in terms of values and doctrines they understood and valued. Second, it was the ideological correlate of the capitalist relations of production that the nationalist leaders intended to retain and which they have retained. Finally, and most importantly, liberal ideology was the classic tool for coping with the fundamental contradictions of all bourgeois revolutions. (Ake, 1981, p. 203)

In his book, *Social Science as Imperialism: The theory of Political Development*, Ake stringently pushes the idea that the theory of political development is a “bourgeois ideology” that “fosters and legitimises



the consolidation of the dictatorship of the Third World bourgeoisie who are the allies of international capitalism” (Ake, 1979, p. 60 and 61).

Regarding the relations of power and operational processes of Nigeria as a developmental state, Ezema & Ogujiuba's (2012) thesis recognises the social, political, economic, and financial dependence as limiting political subjectivities of the Nigerian state. This view enables a distinction between postindependence state-driven developmental ideas and today's neoliberal-driven agenda that uses the Nigerian state as a mediatory tool/strategy (Neocosmos, 2010). Developmental state arguments perpetuate the classical economic development thinking that prioritises agricultural development-led industrial development for countries like Nigeria (Ikpe, 2021). Ikpe (2018) believes that the developmental state paradigm, in its classical, pre-neoliberal conceptualisation, has an enduring relevance to mono-economy states like Nigeria. Kayizzi-Mugerwa & Lufumpa (2020) have argued that African states follow experiences from Asia, particularly South Korea. Nevertheless, these debates and propositions for the democratic developmental state paradigm often fatally ignore the fundamental differences in the political subjectivities of individual states because they continue to impose the classical structural conceptualisation of the state, its role, and its reach into civil society. Likewise, these interpretations advance the teleological expectations of the state (Smith, 2013; Wallerstein, 1992). Essentially, the frontiers or limits of state power organise society for sustained transformation, regardless of the differences in the historical systems of liberalism between the global North and South.

Omotoye Olorode, in his book *Neoliberal Siege Against Nigeria*, describes the role of the neoliberal reforms (privatisation and commercialisation) of the World Bank in Nigeria as a "neoliberal siege" orchestrated by "overseers and evangelists" who privatise and deregulate corruption, subvert the public purse, and contribute to the continued decline of the Nigerian masses (Olorode, 2016, p. 46). Arguments about the state's role in promoting development are often silent on the state's *agency* to operate in this historically complex and multi-scalar system. For example, the geopolitical relations of power of formerly colonised states imposed upon the Nigerian state a role of *mediator* of developmental ideas in the pre-neoliberalisation era and now in the neoliberal stage where the state acts as a *broker*, not an enforcer (Neocosmos, 2010).

Five crucial observations emerge from the trajectory of political economy analyses in Nigeria and Africa more broadly. First, the tendency to see the nation-state as a coherent unit and a national-level power centre. Second, the dominance of class analysis of the state with an excessive emphasis on the economic dimension of political power relations. The third point captures the issue of subject matter. There is an absence of political economic analyses of water and water infrastructure comparable to how oil and forests resources are reified, considering that water is a primary resource in the developmental agenda. Fourth, the overt materialist analyses miss the epistemic dimensions of colonial and post-colonial leaders, societies and their practices. Lastly, the lack of attention to paternalism (Young, 2009), especially racial paternalism (Elkins, 1987; Fanon, 1968), as the fundamental element of the liberal-

colonial state production and practice, liberalism *a la* John Stuart Mill (Mill, 1859), is under-analysed. Some of these conceptual points have been raised about the effectiveness of political economic analysis as an analytical tool in development research (Hudson & Marquette, 2015).

### 3.4.1 The Nigerian state and resource governance

The starting point to understand resource politics in Nigeria is through the corpus of work of the leading scholar on resource politics in Nigeria, Michael Watts. His scholarship on Nigeria's political geography and, more specifically, Nigeria's political ecology is foundational in this regard. Watts' analysis of power through a political ecology (early development) lens focuses on two main subjects: agricultural development and crude oil. Through these investigations, he has exposed the impact of neoliberalism through market integration on farmers' self-sufficiency and productivity (Watts, 1983). In *Silent Violence*, Watts argued that the commodification of agricultural outputs among the peasant population of Northern Nigeria enhanced the speedy process of soil and land degradation. Watts' economic historiography explains how the social structures of Hausa farmers and their complexities intersected with the changing political economy of oil in contemporary Nigeria in the 1970s, to leave an enduring pattern of food shortages and food crises. According to Porter (1985, p. 106), Watts' main argument is that "drought does not cause famine", which suggests the social production of famine. One of Watts' legacies is the ability to string together the ethnographic, archival and ecological data to explain the social production of famine. These methodological and theoretical contributions laid the foundation for political ecology as a discipline and an approach in *Liberation Ecologies* (Peet & Watts, 2004).

Watts' subsequent work shifted to the analysis of oil in Nigeria, describing Nigeria as an "oil complex" (Watts, 2010, p. 57) and a "Petrostate" (Watts, 2012, p. 448). Through these conceptual systems, Watts was able to explore the different spaces of indigeneity, the economies of violence, and the pernicious effect of corruption in its "decentralised" form.....as more oil revenues flowed to the major oil producing states" (Watts, 2012, p. 452), and how these elements challenge the coherence of the nation-state. What then does Watts' work say or miss about the Nigerian state and its relations to society and environmental resources? Moreover, how does his work influence this thesis? The most important insight from Watts' work is to look at his criticism of the *resource curse* concept and the analysis of conflicts in the development literature, based on Michael Ross and Paul Collier's (Collier, 2007; Ross, 2008) conceptualisation. Moseley (2009) aptly summarises Michael Watts' three core arguments as follows:

1. The problems of analytical categories used to describe political actors: these categories do not capture the complexity of these actors and their allegiance to opposing centres of authority in Nigeria. This inability of these categories to explain the contradictions links to the second point.

2. The problem of the unique characteristics of a resource, oil as a global commodity fixed in place. Here Watts' critique is about the determinism attached to the behaviour of oil. For example, that oil cannot be looted.
3. The problem of the inappropriateness of theoretical concepts is such that the underlying assumptions of theoretical concepts can derail empirical analysis and policy interventions.

Three critical issues are amiss here. First, Watt's arguments focused very little attention on the enduring impact of colonialism on the Nigerian developmental state and the agricultural production of Hausa society, despite paying considerable attention to the role of international banks. More importantly, his interpretation of colonisation as "not so much as the destruction of the natural economy, as by the intensification of commodity production" (Watts, 1983, p. 265) is problematic. This interpretation under-represents the effect of colonial violence on state formation and reproduction, considering the extensive arguments in the post- and neo-colonial literature (Bhambra, 2014; Ekeh, 1975; Fanon, 1968; Rodney, 1973), and in the hydraulic development in Africa (Mehta et al., 2014; Swatuk, 2008; Tempelhoff, 2018; Verhoeven, 2015). The second point concerns the silence on water infrastructure development as a central feature of the agro-developmental project. The ecological resources through which resource politics in Nigeria have been analysed have a global commodity dimension that is incomparable to water, which is arguably the most important resource for development. This omission of the central role of water and infrastructure was a consistent feature of political ecology analyses until the last decade, and attempts to centre infrastructure at the heart of theoretical and empirical analyses have grown (Star, 1999). Third, the ethnographic or place-based nature of his research, largely in the Niger Delta and the North West/North Central part of Nigeria, means that some abstractions may not be replicable in other parts of Nigeria; specifically, those that draw on the ethnocultural articulation of power, space and territories.

William Adams, in his book, *Wasting the Rains: Rivers, People and Planning in Africa*, provides a more comprehensive analysis of water and water infrastructure development in Nigeria (Adams, 2014). The book's title may suggest a focus on Africa and African wetlands. However, most of the primary data that the author used came from Nigeria; for example, the Bakolori dam and irrigation project (Adams, 1993). Adams' concerns were with the use and transformation of rivers and, most importantly, wetlands and deserts. By connecting the dreams of engineers and planners, and the water policy and management vision inspired by the Tennessee Valley Authority, to the finances provided by international banks and a state's development ambition through agriculture, Adams developed his concept of "irrigationism" (Adams, 2014, p. 156). He argued that irrigationism had benefited every entity invested in the political economy of nation states except the Indigenous population. In his words:

It has been good for the international consultancies and engineering contractors, and for the experts who jet out from Northern universities to hold forth on the future of Africa. It has suited young states eager to establish control over remoter regions, and

to harness and direct energies within the country to predictable and controlled ends. (Adams, 2014, p. 156)

A deep reading of Adams' works highlights the processes and mechanisms through which this ideology is reproduced. Although Adams did not explicitly name these as reproduction mechanisms, in another paragraph he describes how the ideology has cascaded from these international platforms to nation-states. His thought here is insightful because it sets aside the role of corruption, the problematic political economy of modern African states, and the selfishness and profiteering of development actors to attend to this point. It is essential to quote the paragraph here:

Over the last three decades, a firm belief in the potential of irrigation has been almost universally held by opinion leaders in all positions in international development world, and by those experts at research institutions in the North whose job and vocation it has been to dream and plan for the improvement of the lot of the Third World poor. Decision makers in Nigerian government bureaucracies in the 1970s, like their counterparts in other African governments and in the aid agencies which advised them, were all school to see the potential of irrigation. The landscape of Africa seen through their educated eyes, was transformed from the landscape outside the Nigerian conference rooms window into the new and promising world of the irrigation film. Africa was viewed through rose-tinted spectacles, and projects were devised to make reality match the image. Unfortunately, as so often, African reality has refused to be moulded to fit the wishful thinking of outsiders. (Adams, 2014, p. 157)

Despite these tremendous insights into the nature of global North and South water resources development issues, Adams goes on to propose a neoliberal remedy to the problem by advocating for a large-scale agribusiness to replace existing government irrigation schemes, to produce vegetables in global markets:

One option to consider being canvassed is to continue with large scale irrigation, but to move from government schemes with large numbers of smallholder farmers to large capitalist farming operations – private farms and estates, including those owned or managed by transnational agribusiness companies. Such irrigation can have a very direct link into world markets and First World consumers. (Adams, 2014, p. 185)

William Adams, no doubt, provided crucial insights into the internal arrangements and workings of what would today be called the hydraulic mission (Baghel, 2014; Molle et al., 2009). However, his work is short on the enduring legacies of colonialism in development, the specific limitations of the Nigerian state and the divisions along ethnicity, religion and political ideologies as political subjectivities within the nation-state. More importantly, it fails to show the different effects of racial codifications of infrastructural relations within a nonsettler state like Nigeria, either in bodies or institutions.

### 3.4.2 The state, political rule and water infrastructure development

The relational turn to the state has its history in analysing the Marxist understanding of power that maintains the structuralist interpretations of power relations (Jessop, 2007, 2013; Kelly, 1999). This strategic-relational view of state power has been coupled with water infrastructure and power analysis, to see the state (Ioris, 2012, 2014) as a hydrological entity. In a historical-materialist tradition, state and nation-building occur through the mobilisation of water infrastructure and political and bureaucratic institutions (Boelens et al., 2016; Ioris, 2012; Swyngedouw, 1999; Scott, 1998). More recent theorisations by political ecologists draw their ideas from Timothy Mitchell, who sees states as relational entities to be analysed "not as an actual structure, but as the powerful, metaphysical effect of practices that make such structures appear to exist" (Mitchell, 1991, p. 94). This historical-materialist analysis, which engenders state production and decline, recognises the different temporalities of that history and all embodied relations.

Approaches to systematically link power to water supply infrastructure development have been dominated by social scientists (geographers, historians, sociologists, and anthropologists) who continue to tease out state-environment governance relationships and the linkage with water supply infrastructures (Guerrero, 2018). For the least developed countries, much fewer benefit from such studies. Two of the most cited works are Karl Wittfogel's *Oriental Despotism* (Wittfogel, 1957) and Donald Worster's *Rivers of Empire* (Worster, 1985). Swyngedouw (2014) differed somewhat slightly from the work of dominant environmental historians like Karl Wittfogel on theories of political governance and societal behaviour as environmentally deterministic. Such criticisms of Wittfogel's work are not particularly new and have continued to date (Bichsel, 2016; Obertreis, Moss, Mollinga, & Bichsel, 2016). Swyngedouw (2009) highlighted five critical connections – to struggles for power, water scarcities or surpluses, whose water, governing hydrosocial configurations and imagining different hydrosocial metabolism – central to the political economy and ecology of the hydrosocial cycle.

Loftus's (2020a) concern with theorisations in political ecology research within political geography is "to challenge fetishisations of the state" that emphasise the institutional relationships that constitute the state. New scholarship that makes this distinction explicit includes Harris (2012), who sees state-water infrastructure power relations as a materially and discursively produced socio-natural construct. Angel & Loftus (2019) argue that social and political struggles are the essence of state form and production. Meehan (2014) and Meehan & Molden (2015) draw on the effects of embodied practices to analyse state effects, where objects and water infrastructure serve as tools of state production that delimit the extent of state power and powerlessness. These materialist readings often de-emphasise the symbolic interactions that underline the state's effect, specifically the critical dialogue between political geography and critical geopolitics. More so, how to unpack the intraclass issues amongst social groups bounded by race, gender, sex, and economic class (Loftus, 2020) remains a critical challenge.

Following a special issue on water, infrastructure and political rule, organised by the journal *Water Alternatives* in 2016, Obertreis et al. (2016) highlighted three different notions of power and political rule in the recent literature. First, water research areas that focus on the discursive strategies of power, influenced primarily by Michel Foucault's (Foucault, 1991) power-knowledge relations that produce regimes of truth (Boelens et al., 2016b; Hussein, 2018; Kooy & Bakker, 2008b; Mukhtarov, 2009; Roman, 2017). Second, politics of water privileges contestations and social and political struggles as the focal point of water governance, access and use (Ahlers, 2010; Otero et al., 2011; Paerregaard, 2018). Some of these strands have helped develop the scholarship on water justice (Boelens et al., 2018; Sultana & Loftus, 2015) and the right to water and sanitation, especially in the global South (Bond, 2019; Jepson et al., 2019; Sultana & Loftus, 2019). Third, critical water studies that use governance (institutional and legal) as a conceptual lens to analyse global and multilevel water governance (Gupta & Pahl-Wostl, 2013; Moss & Newig, 2010; Pahl-Wostl, 2015d).

Bichsel (2016) synthesises existing literature on water, infrastructure and political rule as one pathway to understand the state of current literature, and mapped five different approaches (Table 3-2). Bichsel (2016) acknowledges how much the literature has shifted from Wittfogel and, given the state of the literature, proposed six themes as an agenda for future research.

1. Obduracy and change relate to how the processes of infrastructure decay, deterioration and repairs are buried in the memory of the place and of the infrastructure itself. Theoretical explorations of this idea in the global South have been explored in books such as *The Promise of Infrastructure* (Anand et al., 2018).
2. Temporal and spatial configurations explore the different effects of time and space, the temporality of infrastructure, its extent, and how it can explain social and political changes across regimes and vice versa. I would add that understanding this temporal fragility may help better define what sustainable water infrastructure connotes (Ramakrishnan et al., 2020).
3. Discourses and materiality – seek to bridge the theoretical "gap between constructivist and materialist philosophies" (Bichsel, 2016, p. 367). This distinction only serves an analytical purpose that is not deterministic. In addition, the *hard* materialist interpretation of Foucaultian discourse analysis does not consider the transition Foucault made to reimagining the *dispositif* (Foucault, 1980).

**Table 3-2: Approaches to water, infrastructure and political rule**

	<b>Water as...</b>	<b>Infrastructu re as...</b>	<b>Political rule as...</b>	<b>W-I-P connection</b>	<b>Key concepts</b>
Political Economy	Resource	Economic and symbolic structure	State and elite supremacy	Political and economic power	Hegemony, economic production, state- and nation-building, ideology
Political Ecology	Relationship produced / co-constituted by society	Material mediator between water and politics	State-society relations, governance	Hydro-social relations	Inequality, justice, scale, governance, subjectivity
Socio-technical approaches	Multi-purpose / multi-functional substance	Technology	National and transnational regimes	System (-building)	Design, regime, builders, agency
Socio-material approaches	Matter	Physical artefact	Relationship between 'things' which exert agency	Assemblage / configuration	Relationality, contingency, objects, non-humans, agency
Discourse analysis	Text	Discursive and non-discursive construction	Power-knowledge relationship	Discourse	Statements, power, social construction, ideology

**Source:** (Bichsel, 2016, p. 364).

4. Intentionality and contingency – different conceptual approach privileges either intentional or contingent outcomes. This dichotomy moves the dialogue to the realm of immateriality and instigates an explanation of the ontological relations of power and decision making through material representations.
5. Property relations
6. Subjectivities – how the interaction between water, political rule and (re)producing subjectivities within the nation-state; in this case, subjectivities inspired by Foucaultian interpretation of power-knowledge practices. I would add to these subjectivities inspired and produced by symbolic interactions in a Bordieuan sense.

Bichsel (2016) suggests that integrating infrastructure history, domination, and power will further help develop the conceptual basis of water infrastructure and power research.

### **3.5 Theorizing politics and power in water governance**

Globally, the focus on actors and their power relationships in the last two decades has shifted the conceptual foundations of water governance, due to improved understanding of the sociotechnicality of water governance systems and its inherently political nature (Molle, 2009b; Molle et al., 2008; Mollinga et al., 2007). Questions about apolitical (Budds, Linton, & McDonnell, 2014; Robbins, 2019), depoliticised (Rodríguez-de-Francisco & Boelens, 2016), or post-political traps in water governance have been echoed (Beveridge & Koch, 2017). Through this conceptual shift, actors, structures, and agents responsible for (in)equity and (in)justice in water governance are identifiable and better understood (Balyaminu, 2017; Perreault, 2014; Sultana, 2018; Tortajada, 2006, 2010). Some scholars also argue that through the analysis of power differentials, an in-depth examination of the interactions and interrelationships that define the distributions of voice, knowledge, expertise, and authority in water governance could correctly diagnose and resolve water equity and justice issues (Joy et al., 2014; Roth et al., 2018; Zwarteveen et al., 2017).

The repeated failing of water infrastructure (Furlong, 2014; Grigg, 2019), the preponderance of decentralised water distribution systems and point source access (Collignon & Vézina, 2000; Gerlach & Franceys, 2009; Keener et al., 2010), and the variegated modes of water access (e.g., bottled water; Pacheco-Vega, 2019) are vital conceptual, analytical, and empirical differences between developed and developing countries. The concept of ‘ungoverned spaces’ represents one of the spatial distinctions usually riddled with conflict, where the reach of the nation-state is severely constrained or a lack of ‘effective state sovereignty’ is evident, and informal (traditional) governance structures, practices, processes and mechanisms have no remit (Akpabio & Udom, 2018; Taylor, 2016). Actors in these spaces evolve authority and develop rules and processes through power relationships that differ to what exists in well-structured and organised governance systems. These conceptual differences force any theorisation of water governance to emphasise context, in order to understand the historical function and character of power in spatial and temporal changes in culture, knowledge, and governance processes and practices (Ingram, 2011, 2013; Pahl-Wostl, 2015e). It also helps to “embed analysis of current decisions and outcomes in broader histories and contexts” (Wilson et al., 2019, p. 3). The effective combination of the past and present opens new, critical, and investigative research opportunities towards diagnosing the changing policy, knowledge, and institutional landscape.

Water governance scholarship is broad and transdisciplinary. It draws on polycentric governance (Ostrom, 1999; Ostrom, 2009; McGinnis, 2016), multi-level governance (Piattoni, 2010), and institutional bricolage (Cleaver, 2017) as the most common analytical approaches to the governance of natural resource commons. These theoretical approaches acknowledge the complexity of governance systems, and the role of culture, politics, and accountability in policy planning and implementation. Critical institutionalism goes a step further to incorporate as a central feature, the social embeddedness of these systems and the critical role of power and meaning in governance processes and interactions



(Cleaver & Whaley, 2018; Whaley, 2018). Building on the works of Carmel (2019) and Pahl-Wostl (2015), the conceptual agenda presented here describes how governance happens in practical terms, since the aim is to present a diagnostic and analytical framework that will sharpen empirical understanding. Carmel's (2019) post-structuralist account of governance emphasises space, time, and meaning-making as key features of political action. Thus, any theorization of politics in water governance must accommodate time and temporality as additional analytical elements (Anand et al., 2018; Star, 1999).

Governance systems encompass the spaces, processes, and mechanisms through which competing actors' interests, values, and norms interact to produce observable outcomes in society. Three key points are critical to this thinking: first, governance as a social and political interaction space where analysis of power relations is not binary (e.g., powerful vs powerless; domination/hegemony vs subservience); second, governance as a decision-making space where power and authority is exercised (or not) across imaginary and real boundary (conflict between mental imagery of territory, values, rules, and physical geographical boundaries) relations define the creation, use, preservation, and meanings of those boundaries; third, governance as a space of 'political' contestations dominated by conflict and social and political struggles. These are the new horizons for theorizing on water governance in developing countries (Anand, 2012; Goodwin, 2018). Against this background, this article follows Zwartveen et al. (2017) to define water governance as being "about political choices as to where water should flow, about the norms, rules, and laws on which such should be based, about who is best able or qualified to decide about this, and about the kind of societal future such choices support" (2017, p. 1). Identifying 'who' makes the choices allows us to re-engage with and refocus attention on the structure vs agency debate in the analysis of power relations, and to incorporate the ideational and symbolic components of the 'who'. Thinking of governance in this manner helps to acknowledge the political and politicized nature of these connections, the positioning of its actors, and emphasizes the contextual particulars of the country.

What constitutes the political is central to the debate on the 'politics' or the 'political' in water governance. Strange (1996) noted that politics as a common activity transcends politicians and government officials, extending beyond any institutional arrangement and structures. In this regard, Warren's (1999) definition of politics is beneficial:

The subset of social relations characterized by conflict over goods in the face of pressure to associate for collective action, where at least one party to the conflict seeks collectively binding decisions and seeks to sanction decisions by means of power' (Warren, 1999, p. 218).

Any scholarship seeking to engage the 'political' in water governance must ground itself in the empirics of 'water distributions' and the ideological and ideational positioning of water actors. This

pragmatic study indicates a shift from the dominant technocratic paradigm, to include water, its distributions of voice, authority, knowledge and expertise (Zwarteveen et al., 2017). Such scholarship offers the much needed interdisciplinarity, where knowledge is carefully investigated and contested, contextual particulars inform theories, and a diligent investigation of power dynamics underpins analyses of governance systems. New technologies and new forms of water distributions (and governance systems), and the incorporation of multiple ontologies into governance frameworks, are essential elements that necessitate new theorisations of politics in water governance (Wilson et al., 2019; Pacheco-Vega, 2019).

Governance as an inherently political concept (Peters, 2012) loses its value without the currency of power. In terms of transformative change and sustainable transitions, power mediates governance processes, influences its mechanisms (Cleaver & Whaley, 2018; Harris et al., 2011; Molle, 2009a; Mollinga, 2008; Scoones, 2016) and depends on its use and mobilization by various actors. Daniell et al. (2014) succinctly capture this:

Even though most water managers, and people and places with a stake in its management, tend not to acknowledge power and the role that power plays in shaping water management systems and societal structure, developing such an understanding, and of its mechanisms and enactments, and then changing current water management institutional processes based on this understanding, is necessary to develop more sustainable water and river basin management practice around the world. (Daniell et al., 2014, p. 469)

Whereas Luke's (2005) explanation of power (structural, instrumental and discursive) has offered tremendous opportunities into the analysis of power in collaborative environments (Brisbois & de Loë, 2016; Dare & Daniell, 2017), recent scholarship has recentred the role of ideas and ideational power (Berman, 2013; Carstensen, 2015; Carstensen & Schmidt, 2016; Schmidt, 2017) in power relationships. Against its topologies, power also exercises individuals in non-intentional ways, which forces the individual to 'self-govern' (in Foucaultian terms). The ways in which power structures us and the decision-making capabilities of individuals occupying legitimate power still remain elusive and is an essential research element (Allen, 2004); more so, the difficult work of dissimulation and transfiguration advocated by Pierre Bourdieu (Bourdieu, 1989b).

Power and knowledge are mutually constitutive because they inform each other in various ways, and manifest at different axes of governance relationships (Foucault, 1982). The ubiquity of power and the integral role of knowledge (Foucault, 1972a) suggest that what is political or politicized in an attempt to gain authority or control is unrestrained in character, contact, agency, time and process. Framing power relations in this way can broaden the scope of the empirical study of power in governance and sociopolitical relationships. The notion of power as *influence* can be replaced with the "mobilization processes" of power (Heiskala, 2001, p. 6). For individuals, the representation of contexts they exist in,

webs of meaning they process internally and communicate, the epistemic assumptions that structure these meanings and their interpretations of social relationships, influence their decision-making (Alasuutari & Qadir, 2014). Here, the central role of language as a social practice “functions in constituting and transmitting knowledge, in organizing social institutions or in exercising power” (Weiss & Wodak, 2003, p. 14). Through this theorizing, we can empirically investigate intentionality and the internal processes that generate ‘power over’, which has dominated our understanding of power in political interactions, and with more clarity understand different ways that power structures socio-ecological relationships. A truly interdisciplinary and conceptual approach to study water governance that meets Nigeria’s (and broadly Africa) empirical and theoretical needs must be critical, analytical, and diagnostic, and acknowledge the politics of water governance.

### 3.6 A conceptual framework for Nigeria’s water governance

The conceptual framework (Figure 3-1) presented in this section is to study power and politics in

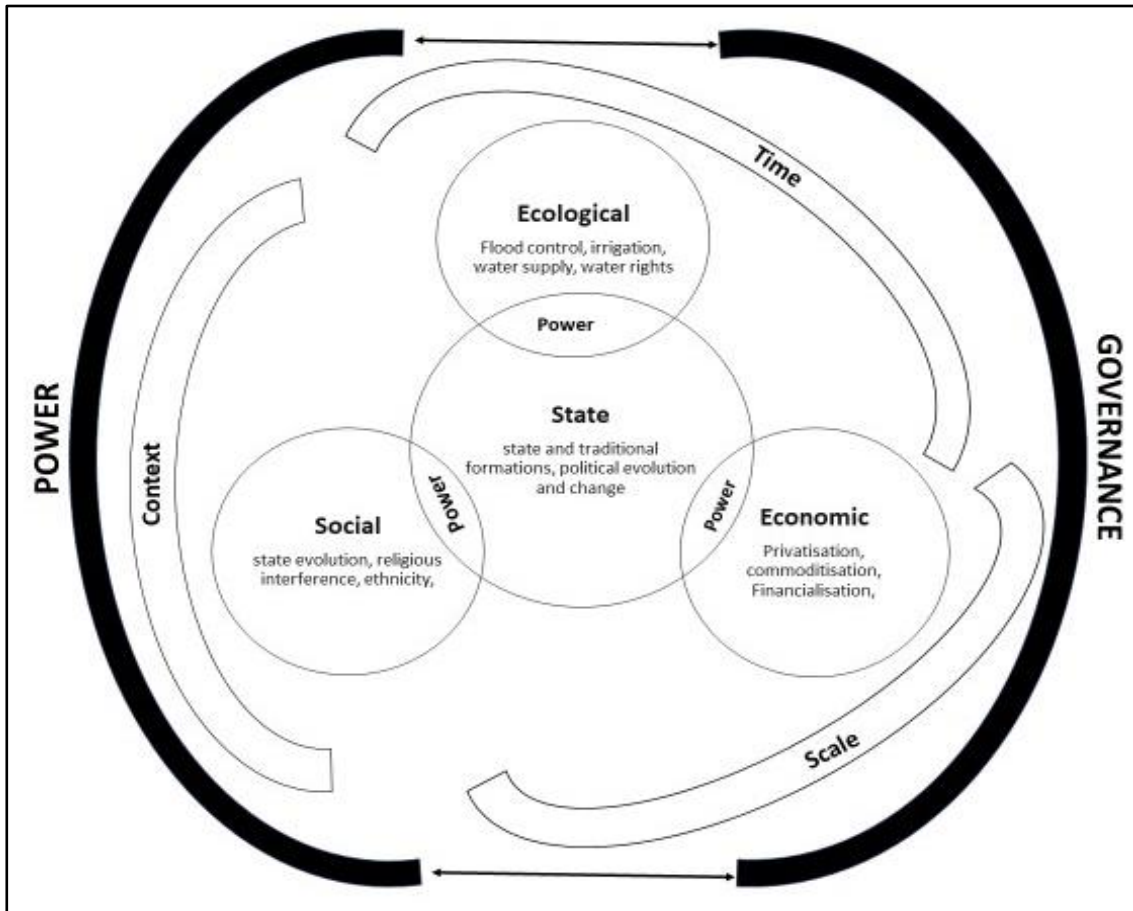
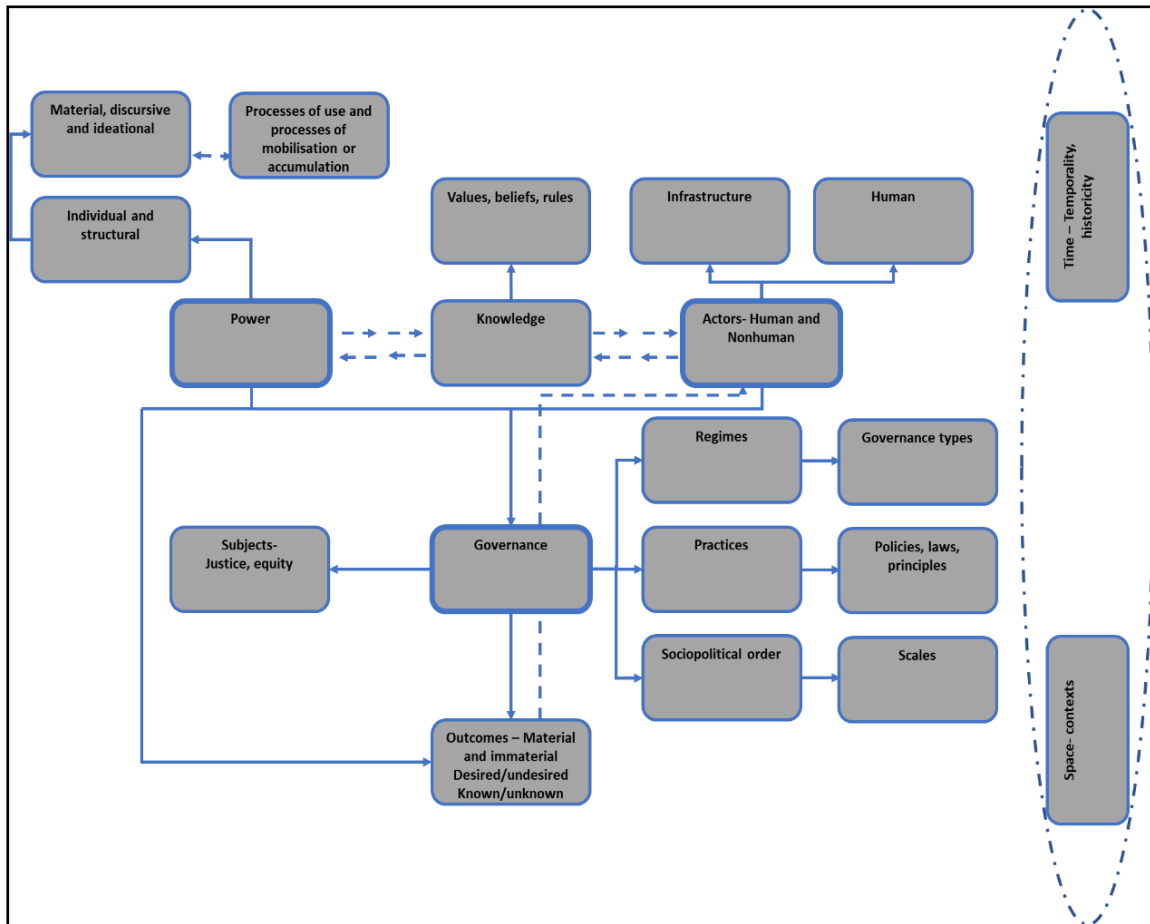


Figure 3-1: The four domains of practical water governance challenges in Nigeria: A conceptual framework

Nigeria’s water governance, taking a relational account of power and agency in the nature–society relationship. This framework centres the symbolic, substantive and multidimensional nature of the spaces and relationships (Bourdieu, 1989b, 1995; Foucault, 2001). Four interdependent and mutually complementary domains that represent collective and insufficiently researched aspects of water resources management in Nigeria are presented. The four domains are grounded in firmly established and theoretically developed research areas of political sociology, political ecology, and political economy (Adams, 2014; Mollinga, 2008; Rathore, 1986; Robbins, 2019; Swyngedouw, 2009; Watts, 2000) that have found utility in water resources analyses. These knowledge domains form a multidisciplinary aggregate of scholarship, made more analytically effective when the respective processes and mechanisms are viewed historically. The interlinkages and overlaps are crucial to understanding water problems in Nigeria. The analytical framework derived from this broad conceptual model is presented in Figure 3-2.



**Figure 3-2: A proposed analytical framework for studying Nigeria’s water governance**

### 3.6.1 State

As the central organising structure, the state plays a practical and integral role in water governance. The processes of political formation, political evolution, and political governance have an impact on social, economic, and ecological systems, with the state as the mediating entity. Analysis begins with the state as the political domain where its elements, dispositions, processes, strategies, and actors constitute the objects and subjects of analysis. No discussion of water infrastructure development like dams and standpipes, land and water allocation rights can happen without the state (Lavers & Dye, 2019). The state also mirrors the interactions of these constituent parts with its boundaries and territories (actors, agencies, geographies, and the ruled). State practices are the performative features of these component parts that are everyday in nature (Midgal, 2004; Sharma & Gupta, 2006). However, these practices and processes expose the tensions, discordances and contestations that arise when institutions and actors representing the state (image) frequently contradict its practices and image. Given the above, the theoretical limitations of the linear conception of state, its evolutions and political change or the assumptions of its form, structure, and power relations as pyramidal poses a central analytical problem for most developing countries.

Indeed, the question of what constitutes a weak state and the ideals against which they are measured is critical (Kumpel et al., 2016); specifically, concepts (e.g., developing markets, ungoverned spaces, financialization etc.) that are applied to developing countries. A critical examination of the defining characteristics of the relationship between political rule and water infrastructure governance suggests that political power transcends the nation-state, its institutions, and its networked architecture (Castells, 2011; Daniell & Mercer, 2017; Pedregal et al., 2015). The state is embedded within society and the various groups that constitute it (Midgal, 2004). This view looks not just at the discursive dimensions of political power, but on specific issues of state and nation building (Menga, 2017; Swyngedouw, 2014). The state's ideational and ideological origins and characteristics (Menga, 2015; Williams et al., 2018), which are dated in colonial and post-independence regimes (Acey, 2012; Kooy & Bakker, 2008a), manifest in contemporary neoliberal incursions into developing countries (Loftus, 2020; Loftus & Nash, 2016), and the micro-level politics involved in the multiple distributions and representations of water (Turner, 2017).

### 3.6.2 State and society

The relationship between the state, non-state, and traditional governance systems is equally vital at the structural and systemic level; specifically, institutional interplay between the political and sociological. In practice, traditional governance institutions operate within the confines of Nigerian state power as a competing governance regime (Adekola, 2012; Smit & Warren, 2018; Sokoh, 2018). However, the boundaries of these relationships are undertheorized considering how ethnic identities

have shaped topical matters like state creation and the political territorialization of Nigeria (Adetoye, 2016). Changes to the political order, the people that constitute the order and the ideas – material or immaterial – that they introduce into governance form a corpus of empirical research. (Cleaver & De Koning, 2015; Cleaver & Whaley, 2018; Jones, 2015).

### 3.6.3 State and economy

Conceptual issues arising from Nigeria's federal political arrangement include jurisdictional boundaries, intergovernmental and intra-national financial and economic relations, regional and sub-national governance, and policymaking and implementation (Bouckaert et al., 2020; Nwankwoala, 2014). Claims regarding the rentier nature of the Nigerian economy have been advanced as a major cause of these issues – specifically, issues of accountability and sources of income and expenditure patterns that are linked to effective water governance. The United States Aid (USAID) agency described this problem succinctly:

In a rentier political economy, there is very little accountability in the implementation of programs. Funds are not always spent in a manner that will fulfil stated policies, laws, and regulations, and a system of political patronage means that there is scant regard for, and little interest in, a systematic program of improvement for impoverished people: politicians at national, state, and local level use available funds to foster agendas that strengthens their own political and economic ambitions, irrespective of annual allocation of funds by sector or individual project' (Tetra Tech & USAID, 2015, p. 3).

Revenue sharing arrangements between the states and federal government, and debates around natural resource control have major impacts on sub-national political and economic relations. Despite numerous accountability mechanisms and processes put in place at different institutional levels, financial corruption, and abuse of statutory power of public holders hinders the achievement of the Sustainable Development Goals (SDGs), especially in project delivery (Federal Government of Nigeria, 2015; UNDP & UNICEF, 2015). Tracka Nigeria, a citizen monitoring and advocacy company in Nigeria set up to encourage citizen inclusion and participation in developmental projects (Tracka, 2017), estimated that in 2016, out of the 852 constituency development projects tracked, 42% were not completed at all, 17% were ongoing, and 41% were completed (Tracka, 2017).

### 3.6.4 State and ecology

In the ecological domain, irrigation, water supply, consumption, and quality are some of the urgent issues. Water supply infrastructure built to support and control these water development agendas connects the water governance components. A reason to investigate the intersection of politics and ecology is to seek how the technical, social, ideological, and political connect in governing water

resources and water infrastructure (Guerrero, 2018). These ecological issues date back to the 1970s (Areola, 1991). However, the linkages are crucial to understand water problems in Nigeria, and the domains capture the conceptual framework's explanatory and exploratory functions (Babbie, 2008). Additionally, the concept map enables the organization of research ideas and perspectives, which allows an investigation of the descriptive components of broader conceptual issues in Nigeria's water governance. Conceptualising this interconnectedness and historicity of these concepts can support the development of a nuanced, contextually defined theoretical framework. Situating the concepts within different spatial and temporal scales as well as social and institutional contexts will improve the process of theoretical and analytical development.

### 3.6.5 Context

Nigeria's ecology, economy, sociology, and politics are complex. Because they are often politicised, this influences trends in water management outcomes. The European Union (EU) succinctly captures this complexity and the political implications for Nigeria in the European development fund (EDF) evaluation report on Nigeria:

The Nigerian context differs in several ways from that of most other cooperation countries. The Federal Republic of Nigeria is a large and complex country in 36 states and the capital, Abuja. It is one of the world's major oil exporters, yet a large part of the population lives in poverty and the non-oil economy is poorly developed. Hence, Nigeria is a classical 'rentier-state' in which oil revenues are conducive to corruption and tend to reduce the dependency of the rulers on the ruled. Although Nigeria returned from military dictatorship to democracy in 1999, the political system's articulation of the non-elite population is weak as expressed in a certain 'democracy fatigue' encountered by the Evaluation Team. There is a lively civil society, which tends to see itself as the real opposition, and free quality media, yet governance problems prevail: corruption is widespread, and the human rights situation is problematic. The rentier nature of the State also reduces the Government's dependency on foreign aid and sets the scene for a cooperation program filled with challenges (European Commission, 2010, p. 1).

People and place are essential in defining governance outcomes and transformational changes. Their history, ecology, culture, knowledge systems, worldviews, meaning-making, are (re)negotiated to produce the observed governance outcomes and are therefore essential when diagnosing, prescribing, or evaluating water governance systems (Ingram, 2011, 2013).

### 3.6.6 Scale - Political administrative levels

Multi-level issues connect global with local and national-level policy issues. Global water policies are translated and adopted with minimal consideration of their history and the underlying agendas and

framings (Mukhtarov, 2014; Mukhtarov & Daniell, 2016). Nigeria continues to apply “blind and uncritical global policy tools without thoughtful attention to local policies” (Akpabio, 2012b, p. 13). For example, Integrated Water Resources Management (IWRM) as a global policy objective is vulnerable because it disregards contextual conditions, especially in relation to policy implementation issues (Biswas, 2004; Leong & Mukhtarov, 2018; Mukhtarov, 2009; Pahl-Wostl et al., 2012). As a global hegemonic paradigm, it also ignores sociopolitical realities because its normative prescriptions do not address the underlying political dynamics in its creation and implementation (Mukhtarov & Cherp, 2014).

At the national level, the decentralisation policy is yet to achieve its desired objectives because of power struggles (Gupta, 2007) and the political contestations of water management processes (Saravanan et al., 2009). The top-down management approach in Nigeria’s water governance has led to a one-size-fits-all approach, where the FMWR imposes a uniform water management plan on the RBDAAs (Akpabio, 2007). Many of these organisations have “flat or tall” (Akhionbare et al., 2012, p. 24) management structures with respect to commercial, finance, and engineering departments, and an over-concentration of power in one individual contrary to the objective of the organisation. Due to these conceptual issues and its failure to meet its expected agricultural and rural development mandate, Gana et al. (2019) have challenged the continued use of the RBDA as a water management institution or unit within the FMWR.

Cross-level challenges are politicised when a new policy is introduced to existing management structures such as the governance of water and sanitation governance (Franks, 2006). This may also lead to the creation of multiple agencies, which most times duplicate each other’s functions. This process of institutional bricolaging poses a critical challenge to the governance of community-managed water and sanitation policies and processes across Nigeria and Africa (Cleaver & De Koning, 2015; Cronk & Bartram, 2017; Gbahabo, 2017; Jones, 2015; Ordinioha, 2011). The need to strengthen national control over water access rights, allocation, and achieving the WASH SDG goals by 2030 is noticeable, where the water resources and health sectors clash over roles and responsibilities.

### **3.6.7 Time**

New conceptualisations of water governance must be historicised (Pahl-Wostl, 2015a) to acknowledge how social and political conditions reconfigure the spatial and temporal attributes of policies, political regimes, institutional developments, infrastructure accretion, and other micro-level changes to water governance (Adams et al., 2019; Anand, 2015b; Bichsel, 2016; Ley, 2018). In particular, this includes the various discursive and material tools used by actors to create and perpetuate historical injustices (Anand et al., 2018). The historical dependence on boreholes and wells in rural areas is a remarkable example of rural water infrastructure delivery in Nigeria (Gbadegesin and Olorunfemi,



2007). Questions regarding waterpoint sustainability is inextricably linked to the differentiated histories of policy intervention in water infrastructure over the years. To investigate the conceptual basis of such intervention, the technical and ideological knowledge underlying its design and conception, and the power relations that facilitated its choice should be set in history. This will highlight how the changing geographies (increased urbanisation), infrastructure (technological development), and populations (demographic changes) since the introduction of the policy have shaped the functionality and sustainability of these water infrastructures.

### 3.6.8 Future

Developing a conceptual framework must account for the different imaginaries of the future. Existing work on such imaginaries attempt to bring together the social and the technological as shown in the works of Sheila Jasanoff and Ehsan Nabavi (Jasanoff & Kim, 2015; Tavakoli-Nabavi, 2017). Nabavi's work is a bold attempt to make a case for ontological integration of 'more than human' (things) with the science and technological aspects of water and socioecological governance (Tavakoli-Nabavi, 2017). However, both works are silent on two key aspects of power relations in the ordering of the global social order: colonialism/coloniality in the relation between the global North and global South; and the effects of coloniality on the Being, an ontological and epistemological problem in the formation of individual subjects (Foucault, 1982) or agents (Bourdieu, 1996).

In my estimation, two vital components of such future imaginaries are necessary for a just water infrastructure governance in the global South and for socioecological governance, more broadly. First, the pursuit of a pluriversal view of science, technology and society, as espoused by Arturo Escobar (Escobar, 2018) is necessary. Pluriversal ideas of society are rooted in the understanding of historical power relations in society; primarily, the impact of colonialism on the global South. Pluriversal visions of the future envision different ways and relations of knowing (epistemology), reimagine relationality at international, regional, and local levels, and most importantly, unpack the effects of coloniality of power and social knowledge, all in a bid to reconstitute a different, more deliberative, and just future (Mignolo & Escobar, 2013; Tucker, 2018).

Philosophically, this transition would involve looking at other philosophical traditions of reality, knowledge, and wisdom. In particular, Indigenous thinking and understanding of society-nature relations. For example, the philosophical perspective of the *Yorùbá* speaking people of southwest Nigeria on the nature of reality is one of "binary complementarity", which sees ideas and matters (or other binaries) as "inseparable and complementary in nature and function" (Olúwolé, 2015, p. 144), and not in opposition to one another. This line of thought is similar to the relational mode of thinking about society - nature interactions.

The second point relates to the historical constitution of Being with respect to the colonial legacies (Fanon, 1967; Mignolo, 2013). The main point here is to understand the role that socially-constituted knowledge plays in the development of hegemonic structures in society, and consequently, in the formation of an individual. Here again, openness to other forms of knowledge is vital if minds, values, beliefs, and hearts are to change in order to accommodate these new perspectives. Conceptually, I return to the *Yorùbá* conceptualisation of the nature of knowledge, wisdom, and truth, and its limits across place, space, and time. The rejection of absolute knowledge (truth) or certainty within human sensory experience, the interpretive nature of knowledge and the inability to quantify these ideas (Olúwolé, 2015), are some examples of *Yorùbá* indigenous philosophy and conceptual frameworks that will contribute to a re-imagination of the future.

History and time are central to the understanding of futures and can draw from the *Yorùbá* conception of time. Time in *Yorùbá* is complex and multidimensional, however, three main conceptual attributes of circularity, fluidity, and relativity are invaluable to its understanding (Ayoade, 1984; Olúwolé, 1997). Circularity suggests a repetition of past and present events (e.g., natural phenomenon – sunrise and sunset), while the fluidity thesis restates the concept of uncertainty or unpredictability of future events (Olúwolé, 1997). Relativity of time as a major distinction in *Yorùbá* conceptual thought strings together the past, present, and future in a non-linear manner (Ayoade, 1984).

### **3.7 Conclusions**

In this paper, I have proposed a new conceptual and analytical framework for Nigeria's water governance, linking different disciplinary literature and bodies of knowledge. First, I argued the need for a new conceptual framework due to the lack of contextually relevant theoretical frameworks, the apolitical characteristic of existing frameworks, and the rudimentary attention to power in water governance research in Nigeria and Africa broadly. Methodologically, I follow a social constructivist-interpretivist tradition and an abductive logic of inquiry to develop the concept map using experiential knowledge, relevant theories, and empirical literature. I then theorise on power and politics of water governance, drawing on multiple strands of theoretical literature to help situate the broad range of power and basic elements of a political relationship.

The proposed conceptual approach foregrounds the interconnectedness of the social (sociology), state (political), economic (economy), and ecological (ecology) relations of water with the state, all grounded in an understanding of Nigeria's context, time, and scale relations. Governance decisions happen in this complex environment. Conceptual framework development is sometimes limited by the underpinning assumptions or different interpretations and understanding of concepts or events. However, it is modifiable, flexible, and provides robust knowledge, analysis, and understanding of

events or phenomena. The limitations open up new areas of research in Nigeria's water governance and broadly for other African countries with similar water governance challenges and outcomes.

# **PART B**

## **Analysis of State-level Relations of Power**

This part answers sub-question 2 (How have changes to Nigeria's political governance and power relations produced current water infrastructure governance?) through an empirical analysis of the state relations of power. Both Chapters 4 and 5 take a historical approach at two levels of temporalities.

## Chapter 4: Transaqua: Power, political change and the transnational politics of a water megaproject

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**Sub-question 2:** How have changes to Nigeria's political governance and power relations produced current water infrastructure governance?

### Chapter introduction

To answer sub-question 2, this chapter looks at the political and power relations at the pre-construction stages of the Transaqua inter-basin water transfer project; specifically, on short-term political change to the Nigerian state and its effects on political decision-making. I have provided an extended analysis to this chapter in [Appendix L](#). Building on Schmidt's (2017) and Carstensen & Schmidt's (2016) work on ideational power, the empirical analysis identified the discourses, techniques, and strategies of power.

Nigerian State, through its president, used its ideational power to:

- mobilise national and regional stakeholders and other multilateral organisations in support of the Transaqua project
- activate multiple financial opportunities
- suppress narratives that contradict its positions or alternative development options.

More importantly, the chapter identifies the discourses of *legitimation* and *urgency* as two political-discursive strategies and ideational elements used to fast track the project. Using these discursive techniques, the Nigerian State established new platforms and allies through what I refer to in the Chapter as 'political platforming'.

The speedy decision-making on the construction of the Transaqua project did not allow enough time for a detailed examination of old ideas and conditions that shaped its development. In short, the ideational response did not address the project's history when crafting new political rhetoric for its uptake. The decision to change from economic development to humanitarian and sustainability narratives is a good illustration.

Another significant contribution is the reliance of the Nigerian State as a ‘developing country’ on geopolitical power systems, despite being a political hegemon in the West African region. Connecting this dependence to the transregional scale of the water infrastructure is an important marker of the limits of political power. This point suggests that social and political resistance, as an essential feature of socio-natural order, should be taken seriously when analysing domination and authority. In Chapter 5, I further probe this question of hegemony and social and natural order at a national level.

### **Abstract**

Least developed countries with their unique governance and political-economic conditions face uncommon and under-researched transboundary hydropolitical issues. We analyse the impact of power and political change on the adoption of the Transaqua water transfer megaproject in Central Africa, using process tracing and analysis of documents, interviews, and fieldwork. We present the key actors and their interests and argue for the central role of the Nigerian leadership in driving Nigeria’s state power and the Lake Chad Basin Commission. The discourses of ‘legitimation’ and ‘urgency’ are two framings used to justify the Transaqua project and expedite its construction, shaping our understanding of the political strategies underlying its speedy adoption.

## **4.1 Introduction**

Large water infrastructure projects are back on the water development agenda for most African countries (Blomkvist & Nilsson, 2017), triggering the revival of long-conceived or abandoned projects and the emergence of new ones. One of the reasons for this shift is increased access to new sources of funds, for example from China (Foster et al., 2010; McKinsey & Company, 2017) and other multilateral banks, including the African Development Bank (AfDB, 2019). One such project is the Transaqua water transfer megaproject (WTMP henceforth), designed to transfer water from the Congo River in Central Africa to replenish Lake Chad (See LCBC 2017, p. 25, for comprehensive information on the climatic, demographic, political and hydrological statistics on the Lake Chad basin). Lake Chad is a shallow endorheic lake in Central Africa with its drainage basin covering an estimated 2,500,000 km<sup>2</sup> (Kindler et al., 1989).

With the construction of the Transaqua yet to begin, there are serious governance challenges for the political leaders promoting its execution. In effect, a level of internal political-economic stability among the riparian states is necessary simply for the fact that megaprojects like the Transaqua carry inherent political and economic risks, as a result of the long-term planning and construction involved (Flyvbjerg, 2006, 2014). This is particularly true for Nigeria, Cameroon and Chad, whose financial contributions to the Lake Chad basin commission’s budget account for nearly 90 percent of member contributions (Galeazzi et al., 2017). Thus, a practical challenge with large infrastructure projects is

political discontinuity in political governance (Fischhendler et al., 2015) due to the length of time it takes between project conception and implementation (Priemus, 2010).

For conceptual clarity, this paper builds on Shumilova et al.'s (2018) definition of WTMPs as projects that cost US\$1 billion or more, exceed 190 km<sup>2</sup> and convey over 0.23 km<sup>3</sup> a<sup>-1</sup> of water. Supply-driven water management interventions like the Transaqua are often promoted by politicians, business actors, policymakers and academics as the 'only' viable option (Islar & Boda, 2014) against demand-driven options that focus on population dynamics and local water resource requirements in agriculture, and water supply (Cui et al., 2018; Nechifor et al., 2018; Whittington et al., 1998), but state power remains crucial in steering these WTMPs from development to execution. Campbell (2018) and Vichi (2014) highlighted the political will of principal actors as responsible for the delay in commencement of the Transaqua. Taken together, the role, power and agency of principal actors are crucial to the governance and execution of the project, which necessitates an analysis of individual/state power asymmetries and the mediating processes of power in governing (Warner et al., 2017) the Transaqua.

Much of the literature on the politics of mega hydraulic infrastructure is state-centric, western focused and urban development-centered (Ghassemi & White, 2007; Liu & Zheng, 2002; Moore, 2018; Rinaudo & Barraqué, 2015; Wong, 2007; Zhang et al., 2015). Too often, the case studies involve shared river bodies and basins that do not reflect the "allocation and access" issues associated with transboundary water politics in developing countries (Mirumachi, 2015, p. 10), and ignore the ideational power and agency of individual political actors. Instead, they focus on issues such as the territorialization of government power, state power legitimization, nationalization and other forms of political authority (Bakker, 2010; Menga, 2018; Obertreis et al., 2016). With the inter-basin transfer to Lake Chad, examples of peer-reviewed articles that have engaged a hydropolitical analysis include Magrin's (2016) political ecology analysis of Lake Chad. The argument that the 'mythical' disappearance of the lake is to be replenished by an inter-basin water transfer is advanced by diverse political interests seeking some form of high modernism (Scott, 1999), and that the project is delayed by a "fragmentation of political management" (Magrin, 2016, p. 205). In contrast, from a hydrosecurity and regional integration perspective, Ifabiyi (2013) has contended that an inter-basin water transfer to Lake Chad offers potential benefits for solving the increased terrorism menace in the region, by enhancing regional cooperation and development of the landlocked Central African countries. Both peer-reviewed studies mentioned the two major WTMP schemes proposed for replenishing Lake Chad (the Oubangui scheme and the Transaqua project), but neither has offered a comprehensive hydropolitical examination of either project.

A hydropolitical analysis of large water projects offers useful insights into the political-economic conditions of least developed countries (LDCs) (Asah, 2015). This emerging research field, which focuses on the intersection of intranational political analyses and transboundary water governance, can adequately address the contextual features of LDCs (see United Nations, 2018 for more descriptive

information on LDCs), often with distinctive political-economic conditions in West and Central Africa, such as the differences in political histories and infrastructure development. Such hydropolitical analyses are salient for the conceptual foundation of water conflict and water coordination analysis (Moore, 2018; Yildiz, 2015), and are important to future transboundary water governance research, particularly those that combine governance scale and individual actions.

To this end, this paper contributes to the scant research on the impact of political change on large water infrastructure in West and Central African countries with weak institutional, political-governance structures. The aim is to examine how individual agency and state power are leveraged to advance the hydro-infrastructure project through discursive practices. Specific questions this paper seeks to answer with regards to power, political change and the Transaqua project include:

- a. Who are the major actors and stakeholders involved in the Transaqua project and how have their actions shaped its emergence?
- b. What role has the Nigerian leadership played in the approval of the Transaqua project?
- c. How has Nigeria's state power shaped the progress and development of the Transaqua project?

Following the introduction, Section 4.2 describes the Transaqua project. Section 4.3 discusses the analytical framework. Section 4.4 outlines the methodology. Section 4.5 examines the key actors and stakeholders in the Transaqua project. Section 4.6 explores the role of the Nigerian leadership and Nigerian State in the Transaqua project. Section 4.7 discusses the discourses of legitimation and urgency and the counter discourses. Section 4.8 concludes.

## ***4.2 The Transaqua project***

The Transaqua (Figure 4-1) project is a multipurpose inter-basin water transfer project designed to replenish Lake Chad and provide developmental benefits in agriculture, reforestation, energy, navigation, and forestry, for the Central African region. At an estimated cost of US\$70 billion and 30 years of construction, the Transaqua project will divert approximately 30 billion m<sup>3</sup> of water per annum through a 2,500 km canal, from right bank tributaries of the River Congo to Chari River before emptying into Lake Chad (Bonifica Group, 2018). Several dams will be constructed along the canal, to potentially generate 25 thousand million kWh of hydroelectricity, irrigate 70,000 km<sup>2</sup> of land in the Sahel zone, and provide new infrastructure platform for development in agriculture, industries, transportation, and electricity production (Bonifica Group, 2018; LCBC, 2016). Most WTMPs in the future will be constructed in politically and economically fragile countries with volatile democracies and less robust water management organizations (Tockner et al., 2016).





**Figure 4-1: The Transaqua watercourse**

In scope, governance and financing, the Transaqua differs from the largest inter-basin transfer in West and Central Africa, the 200 km Lesotho Highlands water project (Turton & Henwood, 2002), and Africa's largest – Libya's 2,820 km Great Man-made River project (Siala & Stoner, 2006) – for three reasons. First, its transnational scope: the project requires a minimum of two independent countries for right of way and 12 countries for decision-making and benefit sharing. Second, it is transregional, linking two regional economic communities and political blocs: The Economic Community of West African States and Economic Communities of Central African States. Third, the region comprises least developing countries; three out of four Lake Chad riparian countries have a low human development index rating and are unstable (United Nations, 2019b). These attributes of the Transaqua project present political governance and coordination problems uncommon in most inter-basin water transfer projects. The Lesotho highlands water project was between two state parties and only needed a bilateral agreement between South Africa and Lesotho (Mirumachi, 2007), and the China South-North transfer (Liu & Zheng, 2002) did not require transnational treaties with other nation states. The Great Man-made River, for example, was started by the Gaddafi government in 1983 with Libyan state funds and no recourse to foreign financial assistance (Wheida & Verhoeven, 2007).

### **4.3 Analytical framework: Power, governance and strategic–relational theory**

This article subscribes to Heiskala's (2001) synthetic power conception to enlarge the scope of the empirical study of power in governance and sociopolitical relationships. According to Heiskala, four conditions are necessary for the exercise of power: “(1) access to resources; (2) strategies to mobilize them; (3) skills to apply these strategies; and (4) the willingness to do so” (Heiskala, 2001, p. 6). The willingness to act underlies the connection between political will and ideational power, whereas ideational power is “the capacity of actors (whether individual or collective) to influence other actors’ normative and cognitive beliefs through the use of ideational elements” (Schmidt, 2017, p. 258). An actor can synthesize ideational power and engage power processes through the three conduits of ideational power: persuasive power – power through the manipulation of ideational elements; compulsory power – power over differing ideas; and structural and institutional power (Carstensen & Schmidt, 2016). Thus, the negotiating and bargaining power processes account for an individual’s existence within a structure, accepts their norms and ideals, and believes their ontological position of self and truth (Alasuutari & Qadir, 2014).

Strategic-relational theory recognizes the existence of a strategically positioned actor mobilizing power within a strategically selective context, and acknowledges the complexity of the actor-context relationship, its spatio-temporal dimensions and the social embeddedness of this relationship within the state structure (Jessop, 2005). Thus, strategies of mobilizing and exerting power is intentional and conduct is oriented towards a particular context (Hay, 2002). This understanding of strategic-relational theory (Jessop, 2005, 2014) enables us to focus on the mutually constitutive and interactional nature of structure and agency (Hay, 2002). Strategic action can be intuitive or explicit; however, most actions combine instinct and established forms and practices to produce a direct impact on the context or provide strategic learning opportunities for the actor (Hay, 2002).

The dynamic relationship between context and conduct reproduces or transforms existing social, political and ecological systems through the instruments of state power to produce certain political outcomes (Hay, 2014; Jessop, 2014). Hay (2014), in an ontological assessment of the state, posited that state power is a useful analytical tool for three reasons: state power is a theoretical entity with a debatable value; it is without agency, unless mobilized by some political agent; and it constitutes an aggregation of institutions made vulnerable by competing tendencies through time. Foucault pointed out that “the state's power (and that is one of the reasons for its strength) is both an individualizing and a totalizing form of power” (Foucault, 1982, p. 782). Given this position, theoretical analysis can proceed from state power (with its apparatuses), not from the state itself. State apparatuses are platforms (spatial and historical) that allow political representation of state “identities, interests and aspirations” and enable a state’s parallel power networks (Jessop, 2013, p. 99). Political actor(s) strategically manipulate state power to connect these political and institutional platforms. The theoretical currency of Hay’s work,

according to Jessop (2014), opens up new opportunities for investigation into: 1) how individual or collective actions shape state power apparatuses and enhance their capacities; 2) how state power is (re)configured by *ideas* and used to align multiple powers and assets; and 3) how state power is used to mobilize, organize or coordinate competing actors. Thus, strategic-relational analysis is consistent with investigations into discursive power analysis and the contextualization of the connection between political change and structural, agential and ideational elements (Hay, 2002; Jessop, 2007).

Governance theory is also used as a diagnostic tool for understanding the direction of power, one that brings together individual level behaviour with structures and institutions (Peters, 2012). Such a theoretical frame departs from the functionalist perspectives, as well as the normative and prescriptive roles of governance, shifting the focus away from strict individual or structural determinism, to tease out the tenuous relationship between individual actions and structure when examining governance outcomes. By allowing a theoretical exploration of the role and power of multiple actors in the politicized decision-making processes that precede and determine the progress, regress or discontinuation of large water projects (Islar & Boda, 2014) like the Transaqua, cross-scale and cross-level governance connections could be better explained to improve governance theory.

#### **4.4 Methodology**

The case of the Transaqua project is considered unique because of the distinctive characteristics outlined in Section 4.2. Regardless of its potentially transformative nature, the Transaqua project has received little attention from social and political science researchers. Peer-reviewed journal articles that have attempted a political-economic analysis of the project are rare and technical information is scanty.

Over 150 documents from the World Bank, United Nations, consultants, intergovernmental, including several reputable Nigerian and foreign newspapers, video and audio recordings of speeches made by key actors, UN Security Council meeting minutes, European parliament journals, related to the Transaqua project, the Lake Chad basin, and the Lake Chad Basin Commission were used. Many of these documents are published by state, regional and global multilateral agencies in English, and some in French and Chinese languages. Documents in French and Chinese were translated to English using Google translate. Online data sources from social media systems like Facebook and Twitter also contributed.

Primary data sources consisted of personal communications, semi-structured and unstructured interviews with an environmental NGO, academics, government officials, several high-level participants at the three-day International Conference on Lake Chad (henceforth, the conference), consultants, journalists and academics, and a local farmer group from northeast Nigeria. The conference also served as a data collection site, enabling the researcher to be immersed in-situ and connect with the participants for data co-construction and co-generation (Schwartz-Shea & Yanow, 2012). This way, personal

journal, field notes, memos from multiple personal conversations with key speakers and actors at the conference, and recorded speeches made by high-level delegates and leaders of state parties, became useful data sources. During the conference, techniques such as follow-the-decision/actor, referred to as engaged research approaches (Mukhtarov & Daniell, 2017), were used to gain access to ‘behind-the-scene’ political processes, actors and decisions. Informal discussions over coffee or dining during the conference are examples of such interactions. In total, 16 interviews were conducted: three semi-structured and 13 unstructured. The interviews ranged between 10 and 30 minutes and five of the interviews were audio recorded and later partly transcribed.

A total of five months of fieldwork (March – June 2017, and January – March 2018) was undertaken in Nigeria. In May 2017, visits to some government offices in Abuja, Nigeria, to speak with senior government officials at different government ministries resulted in the presentation of an initial draft of this paper at the conference in Abuja, in February 2018. The rich information provided by the respondents deepened an understanding of the discourses that historically shaped the project, enabled effective triangulation of data, and improved the integrity of the data analysis.

The article uses a process tracing method (Beach, 2017; George & Bennett, 2005) that allows researchers to establish causal relationships between conjectured causes and outcomes, and enables the extensive investigation and exploration of causal mechanisms and processes embedded in particular contexts. The *explaining-outcome process tracing* method is useful for explaining a particular interesting and puzzling outcome (Beach & Pedersen, 2013). Discourse and content analysis were used to uncover the legitimizing discourses and practices around the project by interpreting and analyzing political speeches, meeting minutes, interviews and field notes. In this case, the performative component of discourse and ideational power (Mirumachi, 2015; Schmidt, 2017) helped locate the individual’s language, positionality and actions within the state apparatus and society more broadly. Notably, the ideas being propagated in official statements and positions, the intensity or repetitiveness of such positions, and the strategic positionality and location of specific actors, give deeper insights into how the Nigerian State and its actors use and mobilize power. Content analysis was used to identify and organize the documents for relevant themes, narratives and insights (Taylor-Powell & Renner, 2003). A thorough content search of these documents was complemented by newspaper articles, political speeches, communiqués and websites related to the project. Emphasizing the inextricable link between individual agency and state power, this article builds on Williams’ (2018) study that integrates discourse, governance and institutional approaches to power and political analysis in transboundary water management.

Data quality, ethical issues and the status of the Transaqua as a conceptual design makes the replicability of this methodology challenging. Such challenges are common with a qualitative-interpretive research design that emphasizes contextual peculiarities (Schwartz-Shea & Yanow, 2012, p. 125). Moreover, demands for replicability do not usually consider the ubiquitous nature and impact

of power in sociopolitical relationships, neither do they acknowledge or value the potential contributions from methodologically antireductionist approaches to transboundary water governance analyses (Blatter & Ingram, 2001). While this methodology may be inadequate in determining certain ‘truths’, it nevertheless provides key elements of interpretive research and sense-making through reflexivity and attention to contextuality, when interpreting and analyzing power relations between structural, and individual agency, particularly through constitutive causality (Schwartz-Shea & Yanow, 2012). Formal access to some key political actors and a lack of access to potentially important documents (e.g., the Transaqua engineering design) also posed some difficulties. Since the Transaqua is still an idea, it is difficult to conduct a detailed analysis of its direct impact on the economy, society, environment, institutions, and intergovernmental relations. Nevertheless, this project idea has already mobilized a considerable number of actors, as will be outlined in the following section.

#### 4.5 Key actors and stakeholders in the Transaqua project

Decision-making at the initial planning stage of a water transfer megaproject often involves only a few actors, such as political actors, technical experts and policymakers. Figure 4-2 shows the relationship between the LCBC, and the key political and institutional actors actively or tacitly involved in the project.

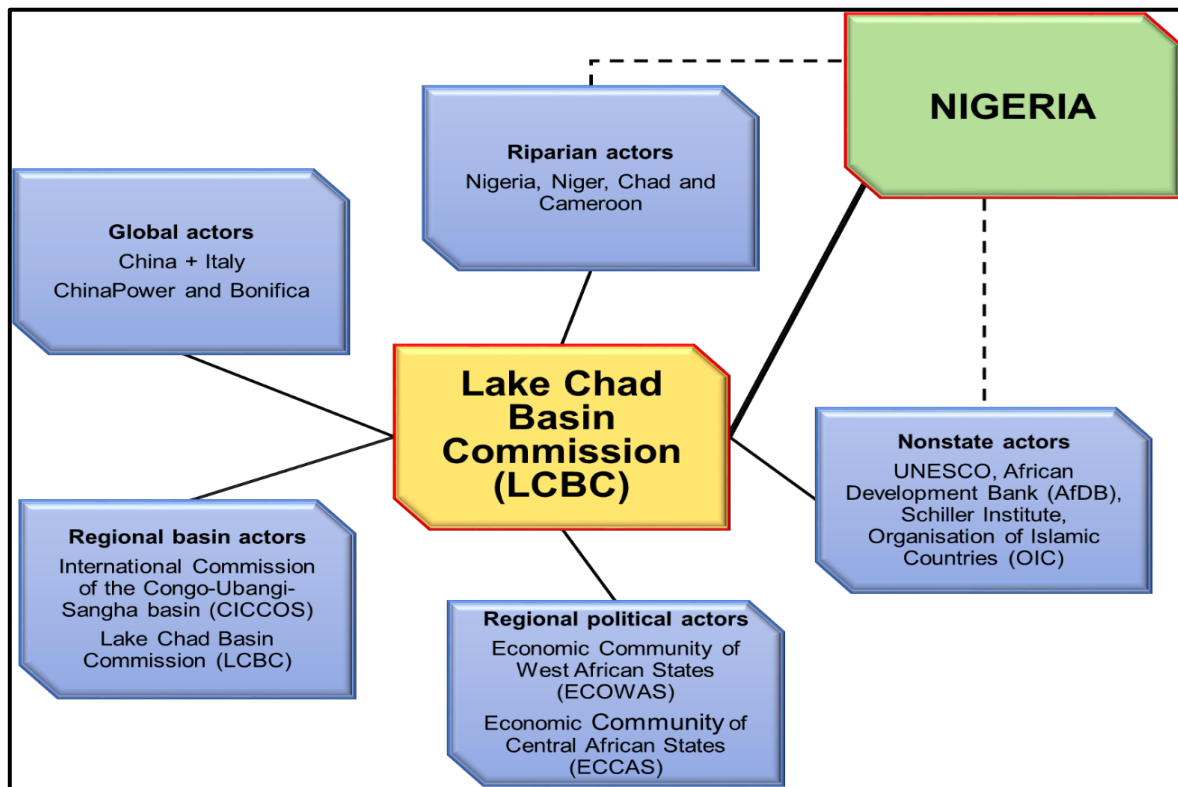


Figure 4-2: Major political and institutional actors in the Transaqua project

### 4.5.1 Global actors: China, European Union, and African Union

Global actors are the principal players that ultimately determine the execution of a project. They combine political power, access to financial resources with technical knowledge, and expertise to become the most powerful actors shaping the project. For such huge projects to be accomplished, most West and Central African countries rely heavily on the political and financial decisions made by this cohort of actors. With the Transaqua project, China and the European Union (EU) – two major regional political-economic blocks – need a level of strategic geopolitical commitment and alliances to manage potential impediments. The initial disapproval of the project by the EU in 2013 due to environmental concerns is a useful illustration. On July 17, 2013, an Italian Member of the European Parliament and a member of the European Conservatives and Reformists party asked in a written Question P-008774/13 why the European Commission (EC) did not consider the Transaqua project as a water infrastructure project that will alleviate the “suffering of the African peoples endeavouring to survive in the Sahel” (European Parliament, 2013). This question was answered on October 14, 2013, (European Parliament, 2014). The EC acknowledged the environmental risks associated with the Oubangui water transfer as a key concern for their disapproval, “environmental impact of funded projects is of paramount importance to the commission,” but added that the Transaqua project is not included in PIDA or in Chad’s national development plan, therefore, it cannot contradict national or regional objectives of countries in the region (2014, p. 174). We argue that this position has arguably abated as a result of an improved Chinese–Europe relationship and the launch of the Chinese Belt and Road Initiative (BRI) in 2013. Otherwise known as the One Belt One Road, the BRI according to Cai (2017, p. 1) “aims to strengthen Beijing’s economic leadership through a vast program of infrastructure building throughout China’s neighbouring regions.” Cai argued that another defining aspect of the BRI policy is China’s desire to export their excess capacities in engineering and technology beyond their geopolitical region. Thus, African countries have adopted mechanisms to attract these surplus Chinese capacities. Conceptually, the BRI incorporated the Transaqua into an African infrastructural development framework.

The African Union with its Agenda 2063 (African Union, 2015b) also forms a less powerful part of this alliance using its financial arm, the African Development Bank, to fund water, energy and power projects in the Lake Chad region (AfDB, 2019). Despite the exclusion of the Transaqua project in the 51 projects highlighted for Chad and the Central African region in PIDA (programme for infrastructure development in Africa – supported by the EU, AU, the World Bank and NEPAD – the New Partnership for Africa’s Development) (PIDA, 2019b), the China–EU regional realignment presents a renewed political-economic lifeline for the project.

### **4.5.2 Regional basin actors**

The LCBC manages the Lake Chad basin while the International Commission of the Congo-Oubangui-Sangha basin (CICCOS) manages the Congo-Oubangui-Sangha basin. Within Nigeria for example, the LCBC collaborates with the six federal states (Kano, Borno, Adamawa, Bauchi, Yobe and Gombe) in northeastern Nigeria, adjoining Lake Chad, to manage the Hadejia-Jama'are-Komadugu-Yobe transboundary river basin (Africa Water Facility, 2014).

### **4.5.3 Regional political-economic actors**

Collective political decisions around transboundary water governance involve decisions made by regional political-economic actors. The African Union recognizes eight regional economic communities or building blocks (African Union, 2019). Within these groups, power asymmetries suggest the existence of powerful actors that influence, control or define the groups' political decisions. The Economic Community of Central African States (ECCAS) and the Economic Community of West African States (ECOWAS) are the two important political-economic actors at the regional level. Nigeria and the Democratic Republic of Congo are regional leaders within these two regional economic communities, and both exert some hegemonic control of the Transaqua project. On one hand, Nigeria as a major beneficiary country dominates the ECOWAS region in terms of political and economic resources while also 'steering' the LCBC. On the other hand, the Democratic Republic of Congo, as the source country for the water transfer, wields enormous bargaining power on the benefit-sharing arrangements and is a leading country in the ECCAS region.

### **4.5.4 Riparian actors**

The four riparian actors are Nigeria, Chad Republic, Cameroon, and Niger Republic. Within the Lake Chad riparian basin, Nigeria is the regional hydrohegemon (Warner et al., 2017; Zeitoun & Warner, 2006) amongst all four due to its financial and political grip on the LCBC. In addition, 8.5 million of the 10.7 million people affected by the drying of Lake Chad are hosted in Nigeria (OCHA, 2018), with 7.1 million of these requiring humanitarian assistance (UNOCHA, 2019). This situation positions Nigeria at an advantage to draw on its material capacity and discursive power for the construction of the project.

### **4.5.5 Non-state actors**

Multilateral institutions and organizations such as the United Nations Education, Scientific and Cultural Organization (UNESCO) have been active in the Lake Chad Basin since the 1990s, actively protecting the two world heritage sites around Lake Chad (Engida, 2018; UNESCO, 2012). UNESCO

co-sponsored the 2018 ICLC, increased its bilateral relationship with China for world heritage capacity building and cooperation (UNESCO, 2019), and committed to saving Lake Chad through the transboundary BIOPALT (Biosphere et Patrimoine du Lac Tchad) project funded by the AfDB (UNESCO, 2018b, 2018a). BIOPALT is a US\$ 6,456,000 multistakeholder ecological project planned from 2018–2020 (UNESCO, 2017). The AfDB also led the April 5, 2014 roundtable donors' conference in Bologna, Italy, to fund the LCBC five-year investment plan 2013–2017 and which produced the Bologna declaration. Through these UNESCO environmental programmes, criticisms and oppositions to the Transaqua project from environmental nongovernmental organizations are not silenced but neutralized, making the argument for hegemonic control of narratives difficult to establish. Another non-state actor, the Schiller Institute, is the main technical advocate for the construction of the Transaqua project, working collaboratively with the LaRouche political foundation since the 1990s.

#### **4.5.6 Lake Chad Basin Commission**

The LCBC consists of Cameroon, Central African Republic, Chad, Libya, Niger, and Nigeria. Since the approval of the Lake Chad basin masterplan in 1992, which contained an inter-basin water transfer at the 8th Summit of Heads of State and Government (LCBC, 2010), the LCBC has been a constant advocate for an inter-basin water transfer into Lake Chad; for example, the 2008 Sirte roundtable (Musa et al., & Mahaman, 2008). The LCBC is primarily responsible for actualizing the Transaqua project by coordinating the activities of its member countries, riparian and non-riparian alike. The supranational organization was established in 1964 by the Fort Lamy declaration in Chad, Ndjamená, by the four riparian states – Nigeria, Chad, Niger and Cameroon – to pursue the economic development of the Lake Chad basin (Agoro, 1966). The executive secretary of the LCBC coordinates the affairs of the LCBC executive secretariat with the duties and executive powers outlined in article 12 of the Statutes of the Fort Lamy convention (FAO, 1997). Political decisions made by the heads of states at summits meetings are passed onto the council of ministers, who then engages with the consultative committees, such as the politically inclined inter-ministerial committee, and other more 'apolitical' committees like the technical or stakeholder committees. These relationships have been strategically applied by the Nigerian State and the Nigerian leadership to advance the Transaqua, as discussed in the following section.

### ***4.6 Nigerian state power and the Transaqua project***

The development of the Transaqua project has seen Nigeria exploit its state power and apparatuses through political-discursive practices performed by its institutions, people and connections. The effect of the political change in May 2015 on the development of hydraulic infrastructure is largely less understood. For the Transaqua, the materially interdependent nature of state agents and institutions



combines with the ideational power of a principal agent to effect change and stimulate its progress. Recognizing the historicity of the Transaqua idea expressed in the political, financial, and power differentials among state parties, a comprehensive examination of the history of the Transaqua project is beyond the scope of this paper. However, major events in its evolution will inform the analysis; for example, the central and consistent role of the LCBC.

The Nigerian government's power, its relationship with the riparian states, and the historicized context of how Nigeria uses this power within the LCBC is central to the analysis and understanding of the progress of the Transaqua project. Nigeria contributes over 52 percent of LCBC membership contributions and nominates the executive secretary and financial controller (Galeazzi et al., 2017; LCBC, 2010); yet, Magrin (2016) suggests that Nigeria demonstrates a lacklustre attitude to the region. Two key actors on the project, a journalist and co-editor with the Executive Intelligence Review (EIR), a publication supported by the LaRouche foundation (LaRouchePAC, 2020), and a vice-chairman of the LCBC international scientific committee, have highlighted Nigeria's leadership role and relevance to the actualization of the project (Celani, 2017; Freeman, 2014a). Despite this acknowledgement, Nigeria cannot theoretically be described as a 'supremely powerful' actor on the project. Nigeria's power is countervailed by its lack of political, geographical, financial and material resources, and capacities, for the hydraulic control of the Congo River. Hence, Nigeria leverages its discursive power to legitimize the Transaqua agenda. Before 2015, nonstate actors such as the Schiller Institute and the LaRouche foundation were the main advocates for the Transaqua project. Notwithstanding the uncertainty around the project, scholars such as Adams (2014, p. 113) have emphasized the possibility for implementation and the "considerable momentum, politically and commercially" behind the project. Indeed, the narratives projected by the Nigerian state and associate actors have propelled the Transaqua project in the past four years.

#### **4.6.1 The Nigerian leadership: the pivot**

The Nigerian leadership has played a substantive role in the adoption of the Transaqua as the preferred project to replenish Lake Chad, since assuming power in May 2015 (Adeniran & Daniell, 2017). At the national level, *The Buhari Plan*, authored by the Presidential Committee on the North East Initiative, is a foundational document detailing the strategic approach to recharging Lake Chad. In the Buhari Plan, the Lake Chad Recharge Programme is one of the three initiatives under the North East Environmental Protection Initiatives (Presidential Committee on the North East Initiative, 2016). The UN Security Council (UNSC), in its Resolution 2349 (2017) adopted these programmes where it:

recognises the complex challenges faced by the region and welcomes the development of programmes by respective governments to help build and sustain peace by addressing the root causes of the crisis.....and calls upon respective governments to strengthen their coordination and prioritisation within

these programmes.....and calls upon international partners to extend their support in this regard. (General Assembly Resolution 2349 2017, p. 6)

Acknowledging and accepting a water replenishment scheme at important international platforms like the UNSC is crucial because it elevates the legitimizing discourses to key global actors, and provides an impetus for further action; a point acknowledged by the UN Deputy Secretary General in 2018: “The Security Council’s visit to the region over a year ago should not be underestimated, and the adoption of resolution 2349 (2017) really created a momentum that must be maintained” (UNSC, 2018, p. 3). The current president of the 74th UN General Assembly as a Nigerian (Nigeria’s former permanent representative to the UN from 2018–2019) advocated for the inter-basin transfer, even though it contradicted the submissions from technical experts working on the Lake Chad region (UNSC, 2018). Conjectured evidence suggests a ‘Nigerianisation’ of the UNSC, and an amplified ‘political platforming’ of the Nigerian State’s agenda under the Nigerian leadership.

The BRI and the African Union Agenda 2063 (African Union, 2015b) are two documents of strategic importance that the Nigerian State has leveraged for the speedy and continuous development of the Transaqua project at the regional level. In Agenda 2063, infrastructure development forms a critical component of the African Union vision of an integrated and prosperous Africa, as articulated in PIDA. The integrated high-speed train network, a pan-African high-speed rail connecting capital cities across Africa, is one of the flagship projects in Agenda 2063 comparable in scale with the Transaqua idea (African Union, 2015a; NEPAD, 2018). Essentially, nine key events have taken place since the Nigerian leadership took over in 2015, indicating Nigeria’s influence on the project (Table 4-1).

**Table 4-1: Progress since political power change in Nigeria in May 2015**

<b>Timeline</b>	<b>Event</b>
<b>November 2016</b>	The Water Charter was ratified by the Nigerian Federal Executive Council (Wakili, 2016)
<b>December 2016</b>	PowerChina and the LCBC signed an MoU (LCBC, 2016)
<b>June 2017</b>	PowerChina and the Italian engineering firm, Bonifica Spa, signed an MoU (Ndukong, 2017)
<b>August 2017</b>	Water Charter signed into law (Jones, 2017)
<b>February 2018</b>	The Abuja declaration was presented (LCBC, 2018a)
<b>October 2018</b>	The Italian government and LCBC signed the MoU for the €1.5M grant for the feasibility study (LCBC, 2018b)
<b>February 2019</b>	Nigeria officially joins the BRI (The Nation, 2019)
<b>May 2019</b>	Organization of Islamic Cooperation (OIC) adopted the water transfer

**Source:** Authors 2019

On November 9, 2016 the Nigerian federal executive council ratified the Water Charter, five years after it was signed by the state parties in 2011, and it was signed into law in August 2017. For the Water Charter to become effective, Nigeria's ratification was needed to satisfy the two-thirds required by the LCBC member states. Several high-level bilateral meetings across governance levels resulted in the signing of the 'Abuja declaration' (*the joint statement by the heads of state parties selecting the Transaqua project as the preferred scheme to replenish Lake Chad*) in February 2018 (LCBC, 2018a). Improvements to the Nigeria-China relationship during this period was noted in the 2017 McKinsey report, which classified Nigeria as a "solid partner" of the Chinese with very large potential for strategic collaboration; and that Chinese companies have 96 percent local employment in Nigeria (McKinsey & Company, 2017, p. 53). Nigeria's state power, its institutions and people are positioned and mobilised through a well-coordinated strategic-relational arrangement. Under the current AfDB leadership, the Lake Chad region has received increased infrastructural funding on roads, water infrastructure, and information and communications technology (AfDB, 2018). For example, the Palambo multipurpose dam (a navigation and hydropower dam constructed on the Oubangui River) whose lead national agency is the LCBC, and managed by PIDA under the African Development Bank (PIDA, 2019). The Palambo dam is a main component of the Oubangui mega water transfer project.

This strategic instrumentalization of Nigeria's hegemonic powers within the LCBC has opened up new opportunities to exploit the (re)alignment of geopolitical actors. The LCBC with support from the Nigerian State is able to highlight, discuss and consolidate its objectives on the multiple platforms created by the realignment of China and EU as two key geo-regional political-economic forces. Such platforms emerged from increased financial interests and transactions between major European governments and financial institutions and Chinese government and businesses. Secure geopolitical commitments and alliances between China and Europe as two major regional economic blocks is indispensable to the Transaqua project's execution.

Pan-African scholars such as Horace Campbell are contending for a shift away from a financial model that favours the 'development partners' and for Africa to oversee the project funding through the institution of a US\$50 billion Africa fund (Campbell & Nkrumah, 2018; LCBC, 2018a). The integration of the China-Africa infrastructure cooperation plan in the Beijing declaration at the 2018 Forum on China-Africa cooperation summit (Chinese Ministry of Foreign Affairs, 2018) supports the idea that the Transaqua is now "coming closer to realization as a result of the Belt and Road Initiative" (Schiller Institute, 2018, p. 334). The adoption of the water transfer at the 14th Islamic summit conference in May 2019 by the Organization of Islamic Cooperation (OIC) is another crucial step towards realising the required project financing (OIC, 2019). The OIC, headquartered in Saudi Arabia and with a US\$19.4 trillion GDP in 2017, has a long political-economic history with Nigeria and the African Development Bank (Faseke, 2019). The political continuity provided by the Nigerian leader's re-election in February

2019 for another four-year term poses critical questions about the inevitable construction of the Transaqua project and what discourses will dominate the multiple political-economic platforms the Nigerian State offers.

#### **4.6.2 Discourses of legitimation and urgency of an inter-basin water transfer**

Discursive practices are deployed to frame, justify, legitimize and deflect water management problems and reify WTMPs by different actors (Williams et al., 2018). The influence of non-state actors in promoting these water management discourses and specific WTMP solutions is increasingly highlighted in the literature on developing countries (Bradlow, 2015; Nghipangwa, 2017).

Proposals for an inter-basin water transfer to replenish Lake Chad waters were presented in the 1970s. However, one of the resolutions from the first international conference to save Lake Chad in April 1988, was the “launching an international campaign to save Lake Chad. .... And request assistance from the Italian government for an inter-basin water transfer from the Zaire River basins ” (International Lake Environment Committee Foundation, 1988, p. 5).

Three decisions made at the 10<sup>th</sup> Summit of Head of States and Governments on July 28, 2000 (supplementary material 3 for a breakdown of inter-basin water transfer-related decisions at the summits) prompted the Nigerian government to pay US\$5 million for a feasibility study into a water transfer from the Congo River through the Oubangui River. The feasibility report estimated the construction cost to be US\$14.5 billion, and concluded that the project was technically feasible, but not achievable based on a cost-benefit analysis (CIMA International, 2011).

At a transnational level, the Democratic Republic of Congo (DRC) as the water-donating country is the only regional power publicly objecting to the project of all the African Union’s six regional powers, by vetoing the decision to proceed with the Transaqua feasibility study in June, 2018 (Misser, 2018). The balkanisation agenda and Rwanda’s interest in the project, and internal politics and crises within the DRC, are potential arguments for the DRC’s objection (Bofala, 2017; Paddon & Lacaille, 2011; UNECA, 2015). The framing of the Lake Chad problem poses another objection to the construction of the project. For example, a local farmer, during an interview, argued that over-abstraction from the “illegal dams built by Chad and Nigeria especially the Chari, Hadeija- Jamare-yobe and Challawa dams ” is primarily responsible for the distorted environmental flow into Lake Chad and the shrinking of the lake<sup>4</sup>, and proposed the demolition of these dams to restore environmental flows into the lake. Furthermore, three decades of hydro-ecological policy interventions from multilateral and intergovernmental agencies, sometimes contradictory, have failed to deliver the lake to ecologically

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<sup>4</sup> Interview with President of local farmers’ association, February 2018

sustainable conditions. The inadequacies of these non-supply side interventions and smaller scale alternatives (Gupta & van der Zaag, 2008) in addressing the Lake Chad water crisis will continue to sustain the argument for the Transaqua project as a transformational solution for the region.

### 4.6.3 Legitimising discourses

According to Bonifica’s S.P.A. foreign director, the engineering firm that designed the Transaqua and has spent the past three decades advocating for the project execution, the initial design was to fulfill an African economic development agenda that “is not simply to replenish Lake Chad, but to give access to drinking water, revive agricultural activity, irrigation, fish farming, a navigable waterway, trade, transport, regulate flows, produce electric power, river ports, commerce, and road connections—thus creating *an economic development system* along the Transaqua waterway” (Bocchetto, 2017, p. 24). Bonifica and LaRouche foundation have a long history of collaboratively promoting the Transaqua project as an economic development narrative that has dominated and underpinned the legitimization strategies in specific ways.

Gao et al. (2011, p. 2) was the first scholarly publication to support the idea of an inter-basin water transfer to Lake Chad when they concluded in 2011 that due to anthropogenic impacts on the lake a “full recovery of the lake is unlikely without an inter-basin water transfer”. Politically, Romano Prodi’s speech at the 2014 Bologna conference of donors for the revitalization of Lake Chad perhaps strengthened the idea of an inter-basin transfer scheme as unavoidable. Prodi highlighted the “*indispensable* infrastructural works: dams and canals that will supply the basin of Lake Chad with an additional flow of water derived from the river Oubangui that will manage to restore the pre-existing water levels” (Prodi, 2014, p. 3). Earlier pronouncements like these provided a premise for the official decision of the state parties in 2018 that “there is no solution to the shrinking of Lake Chad that does not involve recharging the lake by transfer of water from outside the basin, and an inter-basin water transfer is not an option, but a necessity” (ICLC, 2018, p. 5). Concurrently, humanitarian and ecological narratives were exploited to effectively position the project’s political-economic and developmental priorities, as will be discussed in the following section.

### 4.6.4 Humanitarian and ecological sustainability narratives

Words like *livelihood* and *sustainability* often accompany the humanitarian narrative deployed and these rely on the increasing population dynamics of the region. Nigeria, Cameroon and the Chad Republic have some of the highest population growth rates in West and Central Africa (The World Bank, 2018). A speech at the COP24 also supports a narrative that links the Transaqua project to the riparian peoples’ sustenance: “I once again call on the international community to support this worthy project for the benefit of over 40m people that depend on their *livelihood* and security” (UNFCCC, 2018).

To legitimize the water transfer megaproject, the Transaqua is also framed as a broad sustainability issue. Although inter-basin water transfers provide ecological benefits such as restoration of environmental flows and reduced ecological decay (Merenlender & Matella, 2013; Zhuang, 2016), using these ecological narratives to justify a proposed water transfer megaproject is a recent phenomenon. The ecological benefit narrative was used to justify the middle route of the South-North water transfer project. With the Transaqua, the ecological risks would be colossal and some studies have argued that aquatic environmental disruptions resulting in species invasions across the basins (Tshibwabwa, 2017) and threats to peatland communities in the Republic of Congo (Dargie et al., 2018) are inescapable. Whether the ecological tradeoffs anticipated by the Transaqua can be sufficiently mitigated remains unknown. Neither the initial Transaqua plan nor the updated version contained any specific ecological benefit either to the donating or receiving countries.

Woven around the humanitarian and ecological narratives is the discourse of ‘urgency’, used to accelerate the execution of the Transaqua. It is not only politically expedient to draw on the sustainability and humanitarian narratives to achieve a strategic goal; creating a discursive-political framing to accelerate action becomes a strategic choice utilized by the project’s proponents. An illustrative quote from the outcome of the 2018 International Conference on Lake Chad explains this: “That failure to take appropriate and *timely action*, will result in Lake Chad completely drying up soon” (ICLC, 2018, p. 5). Words and storylines like these elevate public consciousness and attract the attention of hesitant actors, even if their positions on the project remain unchanged. Ultimately, the urgency discourse insists on and justifies a rapid execution of the Transaqua project as a legitimate transformational solution to the humanitarian and ecological disaster around Lake Chad basin against other valid options.

## **4.7 Conclusion**

This paper examined the effect of political change in Nigeria on the progress of the Transaqua project in the past four years. The unique characteristics of the Transaqua project present some intranational and interregional political challenges that key actors must consider in order to achieve the project’s aim. For least developed countries in West and Central Africa, paying attention to national and geo-regional politics offers useful theoretical and practical contributions to transboundary water governance. A clear understanding and an outline of the countries’ position is a starting point for planning strategic engagements with the different stakeholders required to accomplish the project objectives.

Bringing together governance, power theory and strategic relational analysis, this study has argued that Nigeria’s ideational power was strategically deployed to mobilize the Nigerian State, the LCBC and other multilateral organizations in support of the Transaqua project. This analytical perspective allowed the examination of non-state actors who sometimes possess more power than many state actors in LDCs.

Nigeria's stake in the Lake Chad basin is high. It is safe to argue that Nigeria's demonstration of political will and the leveraging of the BRI and Agenda 2063 as conceptual pillars have liberated a range of political-economic actors, particularly China. This has culminated in Nigeria officially joining the BRI in 2019. Multiple financial opportunities are unlocked for Nigeria and the LCBC to embrace; however, they are splintered and will require consolidation to be undertaken by Nigeria and the LCBC. Now that the Nigerian government has officially joined the Belt and Road Initiative, it may create a body specifically for this purpose; to deliberate, plan and project the possibilities for the construction of the project.

From a project initially driven by economic narratives, the development of the Transaqua project is now propelled by the discourses of legitimisation and urgency as two observable political-discursive practices. Both framings promote the Transaqua as a sustainable and indispensable solution to the humanitarian and ecological challenges in the Lake Chad basin, and simultaneously advocate for a speedy commencement of the project. The urgency discourse paints an apocalyptic view of the Lake Chad region if the Transaqua is not constructed. This is perhaps the first case of a water transfer megaproject where actors in the political process of legitimisation draw on political-discursive practices that concurrently sanction and expedite action, with consequential outcomes within a short period of time.

Given the progress towards the planning of the Transaqua project, additional research of a political ecology nature, focusing on the project's potential to impact – positively or negatively – on human livelihoods along the watercourse, and mindful of the region's developmental status and the achievement of the SDGs, is necessary. Furthermore, a localised political economy approach to understanding the non-state actors and non-LCBC countries (right of way) is essential. If accomplished, the Transaqua project may provide political and socioeconomic benefits for Africa, but like other regional or transnational projects in Africa, significant delays or complete abandonment could be its downfall if national politics and a range of underlying voices in concerned populations are ignored.

# Chapter 5: Post-independence political change and water infrastructure development in Nigeria: Rethinking the hydraulic mission

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**Sub-question 2:** How have changes to Nigeria's political governance and power relations produced current water infrastructure governance?

## Chapter introduction

This chapter investigates the impact of systemic political changes on water infrastructure development in post-independence Nigeria. The chapter uses *resistance* against the nation-state from its constituent units as the analytical focus to show the contradictions within the state and its effect on infrastructure development and hegemonic power. With this idea, I examine one of the fundamental assumptions of the hydraulic mission as a concept, the idea of a ‘synergetic relationship’ necessary at the national level to achieve a complete hydraulic mission.

The study finds that Nigeria's hydraulic mission occurred in two stages: after the Nigerian civil war between 1970 and 1991; and since 2015, when the current president was elected. From 1970, rapid changes in the post-civil war period encouraged federal attempts to consolidate power, which was resisted by the state governments. The ideological differences between the federal and state governments stopped the federal government from having complete hegemonic control over the Nigerian State. Materially, the federal government's attempt to centralise political power through policy, legislation, and finances was resisted with different tactics by other social groups within the state. This partial hegemony led to a modest hydraulic mission in Nigeria. Essentially, federal states with evenly distributed ethnic nationalities and political-ideological orientations should be examined in ways that do not assume a hegemonic power of the nation-state.

The policy implication here is that political instability caused by these systemic changes affected the states' capacity to develop sustainable infrastructure, leading to failed, incomplete, or decaying water infrastructure. Theoretically, I suggest that analysis should instead begin from the resisting position of the constituent units when using the hydraulic mission in federal states.



## Abstract

We investigate the effect of political changes on the development of water supply infrastructure in Nigeria, using discourse analysis and quantitative assessment. We find that Nigeria could not achieve the total political hegemony needed to attain the full potential of a hydraulic mission. The federal government's attempt to mobilise and consolidate political power for 'national unity' and development is constrained by internally contested issues, such as financial, legislative, institutional, and material allocation of state resources. We suggest that further research is needed to understand how these intermittent changes contribute to a broader spectrum of water infrastructure failure by rethinking the analytical usefulness of a state hydraulic mission in Nigeria. We proposed that the constitutional responsibility for developing water supply infrastructure should be made exclusive to one arm of government, the state government.

## 5.1 Introduction

By increasing water storage capacities to meet potable water supply needs, increase agriculture and energy production, and manage flood control structures, Nigeria has historically developed water infrastructure to improve the wellbeing of its citizens and expand economic development (Adeniran et al., 2021; Onolememen, 2020). However, the sustainability and functionality of these interventions have been called into question (Andres et al., 2018; The World Bank, 2017a; Whaley & Cleaver, 2017) despite repeated attempts by governments at all levels to repair, reconstruct, and rehabilitate such water infrastructure (Federal Ministry of Water Resources, 2016b; Obani, 2018; WHO, 2020; World Bank, 2017). Hydraulic infrastructures in Nigeria include dams, standpipes, wells, and boreholes because of the decentralised supply-side intervention promoted, a typical difference between the global North and global South (Eberhard, 2019; Hove et al., 2019).

Scholars have argued that some fundamental assumptions about the social and political relationships that determine infrastructure development, maintenance, and governance differ between the global South and global North, citing an example of the persistent repairs of infrastructure in the South (Furlong, 2014). This 'systemic malfunction' is crucial when theorising infrastructural time and power relations in the global South, in particular state and society relations of power (Guerrero, 2018). In this sense, nation-states as sociopolitical entities seeking some form of modernity link material and ideological effects of the state to water infrastructure development (Ferguson, 1999; Harvey & Knox, 2015).

As far as we know, studies on the political economy of state and water infrastructure development in Nigeria are rare. Those found focus on intersectoral coordination and rural development (Akindele & Adebo, 2004; Akpabio & Rowan, 2021), and none of these have engaged the topic through theoretical concepts such as the *hydraulic mission* (Molle et al., 2009). Michael Watts' influential work, *Silent*

*Violence* captured the intersection of state-society relations and water infrastructure development from a historical-development perspective (Watts, 1983). Subsequent studies by William Adams in *Wasting The Rains* (Adams, 2014) expounded on the politics of dam construction (Adams, 1993). Both studies focused primarily on state-driven agricultural development through dam construction. However, their analyses missed a critical element relevant to the construction of the contemporary Nigerian state: the rapid changes to the political system beginning with the role of the military.

Important book-length contributions on Nigeria's political economy, such as the Oxford Handbook of Nigerian Politics (Levan & Ukata, 2018), only dedicated a chapter to extractive resources development such as crude oil and forests (Watts, 2018). These resources have a global commodity dimension that is incomparable to water, which is arguably the most important resource to development. Using Nigeria as a case study, we contribute to the theoretical conversation on the political economy of water infrastructure development by unpacking the hydraulic mission through the hydrocracy, not on the basis of the 'reasons for...its strength and persistence' (Molle et al., 2009, p. 344), but on the basis of the reasons for its weakness and fragility. We argue that the inability of the federal government to expand its hegemonic powers over different groups and the constituent states explains why Nigeria has only achieved a *modest hydraulic achievement* (Wijeyewardene, 1973). A strong hydraulic bureaucracy capable of delivering a full hydraulic mission develops, when policy, legislations on land and water, and ideologies align over a prolonged period of time (Wijeyewardene, 1973).

To conceptually engage in the dialogue between political change and water infrastructure development throughout the paper, our analysis focuses on resistance (Foucault, 1980) and sociopolitical struggles within the state (Bénit-Gbaffou & Oldfield, 2011; Loftus, 2020; Swyngedouw, 2007) to explain the limits to despotic power (Wijeyewardene, 1973). Broadly, we cast the state (Nigerian State and its constituent states) as an 'idea', an ideological project (Abrams, 1988, p. 75), as well as a material practice (Midgal, 2004) by analysing its internal contradictions. We argue that the Nigerian nation-state's apparent developmental unity, visible in its hydraulic vision, masks the ideological and material disunity.

Similarly, we show how attempts by the federal government to consolidate political power over water resources and infrastructure development, and to transform Nigeria's social and natural order through material modifications, are resisted by federating states and civil society. Here, we build on Timothy Mitchell's (Mitchell, 1991, 2006) work on the state as an 'effect' (Harris, 2012) and Meehan & Molden (2015) to focus on the discourses, techniques, and rationalisations for water infrastructure development and governance. Contestations in this process manifest in hydrosocial territories where "forms of state organisation *and* spatial control over water" (Boelens et al., 2016a, p. 8) are negotiated within the nation. These negotiations result in the failure of the federal government to expand its hegemonic powers over different groups and the constituent states and are why the nation-state has only

achieved a *modest hydraulic achievement* (England & Haines, 2021; Molle et al., 2009; Wijeyewardene, 1973).

Data for this study was collected during fieldwork in Nigeria between March to June 2017 and January to March 2018. Document sources include several policy documents and official government publications, such as the Nigerian National Assembly Acts, military decrees, reports from federal and state governments, the World Bank institutions, the Central Bank of Nigeria, and the Nigeria Office of Budget. Six semi-structured interviews and four personal conversations with mid-level government officials at the federal and *Ọ̀yó* state government agencies also informed the analysis. We complemented it with transcribed interview videos and speeches from official websites. We adopted 1961 as the first year for the descriptive analysis because Nigeria gained political independence on October 1, 1960. Next, the paper presents the literature on the hydraulic mission and the state, and then proceeds to explain the theoretical framework of water infrastructure development and its interaction with the contradictions within the state. The following section briefly describes the role of the military in water infrastructure development, followed by an analysis of the modes of resistance to federal domination during a new democratic government, and the nature of these resistance today. The paper then concludes.

## ***5.2 Hydraulic mission, the state and political change – a brief critique***

Molle et al. (2009) has provided a most comprehensive summary of the connection between the hydrocracy and the hydraulic mission, specifically, on the link between hydraulic bureaucracies and state power. They write that: “hydraulic bureaucracies, are, first and foremost, the creation of the nation-states and reflect a number of their concerns and objectives” (Molle et al., 2009, p. 336). They go on to suggest that synergetic relationships (Molle et al., 2009) allow “Water bureaucrats, state-level and local politicians, water business companies, and development banks” (Molle et al., 2009, p. 336) to concentrate power in the hands of the nation-state to produce the hydraulic mission. This view of the hydraulic mission that sees a nation-state as a coherent unit and a national-level power centre, has influenced the scholarship on water infrastructure and political rule in a precise direction where most analyses of state building and production generally begins from the state’s intent to mark, dominate and consolidate spaces and territories. Bischel (2016) and Molle et al. (2009) traces this tendency to the enduring legacies of Wittfogel’s hydraulic hypothesis (Wittfogel, 1957) and its perspective on despotic states whose core concerns are the autocratic centralisation of political rule and power for state building<sup>5</sup>. Consequently, influential works on the hydraulic mission on bureaucracies, topology etc have been written about autocratic nation-states or dictatorships with long years in power (Conker & Hussein,

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<sup>5</sup> Please see Bischel 2016 for a detailed analysis of the evolution of the hydraulic hypothesis and its criticisms.

2019; Rusca et al., 2018; Menga & Swyngedouw, 2018; Nabavi, 2017; Swyngedouw, 2000; Wester et al., 2009; Tempelhoff, 2018; Verhoeven, 2015). Did the Nigerian nation-state succeed in the process of building a formidable hydraulic bureaucracy necessary to achieve a “full control” (Molle et al., 2009, p. 344) of land and water?

Analytically, one way this tendency pervade the political economy literature is through the notion of political fragmentation in developing<sup>6</sup> economies (Demart & Bodeux, 2013; Lockwood, 2014; Obikili, 2016; Walther et al., 2017), with consequences for related subjectivities like water infrastructure development in Africa (Mehta et al., 2014; Menga, 2015; Verhoeven, 2015). Related criticisms of political fragmentation, the state and state power are not new. Young (1968) explored the idea in relation to the discontinuities model of international political system, suggesting political integration as a direct opposition to the fragmentation model.

In his paper, *Political Fragmentation?*, Romesh Thapar makes two critical points. First, that India should not be analysed as a “typical nation-state... but a federal complex of many communities and highly developed cultures and aspirations” whose politics could not be understood if a mechanical view conditioned by *western theory and precepts* are applied (Thapar, 1970, p. 75). Second, that “economic considerations”, which political economists privilege in their analyses, “cannot be the sole yardstick in national development” (Thapar, 1970, p. 75). Recent arguments against *power centres* operating in a top-down or networked manner have evoked insights into the nature of state power. However, they all speak to the state’s capabilities, giving an impression of what Allen (2004, p. 22) calls an “overblown sense of what centralized institutions are capable of bringing about at a distance”.

Political fragmentation assumes the breakdown of a coherent and consistent centre of power, therefore a specific logic of analysis. Theoretically, this line of thought about state power and purpose is a kind of logic that determine how the hydraulic bureaucracy and hydraulic mission is analysed. Bourdieu (1996, p. 107) suggests that one has to break with linear thinking in order to prioritise the logic of the mode of explanation (domination and coherence) over the logic of what is to be explained (hydraulic mission) in order “to account for the infinite diversity of practices in a way that is both unitary and specific”. Using resistance as a contradictory logic of power to understand the hydraulic mission in Nigeria is one way we pursue this objective. Our concern in this paper is with the logic that resistance produces as an explanatory theory (in relation to the hydraulic mission).

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<sup>6</sup> Preferably low-income countries.

### **5.3 Contradicted states, political change, and water infrastructure development**

The state is a field of power marked by the use and threat of violence and shaped by “the image of a coherent, controlling organisation in a territory, which is a representation of the people bounded by that territory, and the actual practices of its multiple parts” (Midgal, 2004, p. 16).

Over time, the state’s image is reconstructed through ceaseless interactions with its practices between the ideological and symbolic (Abrams, 1988; Bourdieu, 1985; Loyal, 2017), and discursive and material (Midgal, 2004), giving an appearance of coherence. The material effects and practices of the state (Mitchell, 2006) occur through discursive practices that reify the ideological (Jessop, 2017b; Midgal, 2004), or what Hay refers to as the ontological state (Hay, 2014). This interaction renders indivisible and indissoluble the “ideological and material aspects of state constructing, and understand how the state comes into being, how it is differentiated from other institutional forms, and what effects this construction has on the operation and diffusion of power throughout society” (Sharma & Gupta, 2006, p. 8).

The state as a *contradictory* entity is not ideologically or materially fixed because of its contacts with internal and external social elements (Abrams, 1988; Jessop, 2017b). Through its practices, the state is “often promoting conflicting sets of rules with one another” (Midgal, 2004, p. 22), using legislations, discourses, infrastructures, finances, and policies as strategic devices and tactics of power (Foucault, 1991) or what Bourdieu calls ideological instruments (Bourdieu, 2013). These then serve as counter-hegemonic techniques of power to produce differentiated national development outcomes across territories and new socio-natures that emerge as effects (Harris, 2012; Mitchell, 1991). Thinking through political power and hegemonic domination to explain the *contradictions of a given system* (Abrams, 1988; Jessop, 2017b) “requires a resolute refusal to accept the legitimating account of it” (Abrams, 1988, p. 116). This disunity of the state can be explored in the context of developing nation-states like Nigeria (Edigheji, 2005; Ezema & Ogujiuba, 2012; Faluyi et al., 2019) to illuminate the prosaic nature of state relations of power (Painter, 2006).

Fundamental to this incoherence is the relations of power: the sociopolitical struggles to classify groups and spaces by presenting a legitimate view of the world; that is, the power to produce legitimate objective reality (Bourdieu, 1985). Practices of resistance from different individuals and social groups in these sociopolitical struggles (Loftus, 2020; Erik Swyngedouw, 2007) enrol particular social, cultural, economic, and political knowledge to change social and natural relations (Swyngedouw, 2014). Through this “antagonism of strategies” (Foucault, 1982, p. 82), the state’s “social and ideological underpinnings” can be transformed (Midgal, 2004, p. 112). This internal arrangement is noteworthy because the fragile coherence of the state “can breakdown, counteract one another, or overreach.... as

they offer spaces for manoeuvre and resistance, and indeed can be turned to counter-hegemonic purposes” (Mitchell, 1991, p. 93). Because of this resistance, the ‘synergetic relationships’ (Molle et al., 2009) observable at the federal level of nation-states for a total hydraulic mission did not materialise in Nigeria, despite the adoption of the hydraulic mission by state and federal governments. Peet & Watts (2004) proposed this line of argument in the political analysis of other extractive resources like crude oil in Nigeria, with a critique of analytical concepts like ‘resource curse’ (Watts, 2004).

These internal contradictions also define the rapid political changes observable in many ‘developing’<sup>7</sup> countries where differentiated influences of political change include divisions between ethnic affiliations, religion and secularisation, tradition, and the ultimate challenge of new/modern states as having a ‘unilinear development’ (Smith, 2013). Unilinear development models imposed on the analysis of developing countries fundamentally ignore a history of colonisation and the teleological purpose (end it should achieve) of unilinearity (Smith, 2013). Political systems (democratic or autocratic) and political structures (federal or unitary) do not obey these unilinear rules when pursuing their hydrodevelopment visions (Meehan, 2014). Relations of power in a developing developmental state recognise that the social, political, economic, and financial dependence are limiting political subjectivities operating in a historically complex and multilevel system (Ezema & Ogujiuba, 2012). Similarly, such scenarios where global actors impact water infrastructure development in former colonial states by producing new regions through technical expertise, economic development and the hydraulic mission have been studied in southeast Asia (Sneddon, 2012). This multidimensional reading is essential for analysing political change in Africa (Olukoshi, 2004).

Water infrastructures are material effects of what Edigheji (2005) calls the democratic development state, under which the new hydraulic paradigm emerges in most African countries (Dye, 2016; Kithia & Majambo, 2020; Menga, 2017). Beyond the use of large dams and water infrastructures to control water, space, and political power, the hydraulic mission includes controlling water by smaller non-dam infrastructures. Wells and standpipes, which rely solely on groundwater sources, are part of the hydraulic system because, historically, they constitute key attempts to harness the power and usefulness of water in developing countries (Adeniran et al., 2021; Gerlach & Franceys, 2009). Given the above, we seek to explore Nigeria’s hydraulic mission through a historical account to show the effects of political change on water infrastructure governance and control structures.

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<sup>7</sup> Preferably non-European countries or low-income countries..

## **5.4 The military, ideology and hydraulic development 1966–1978**

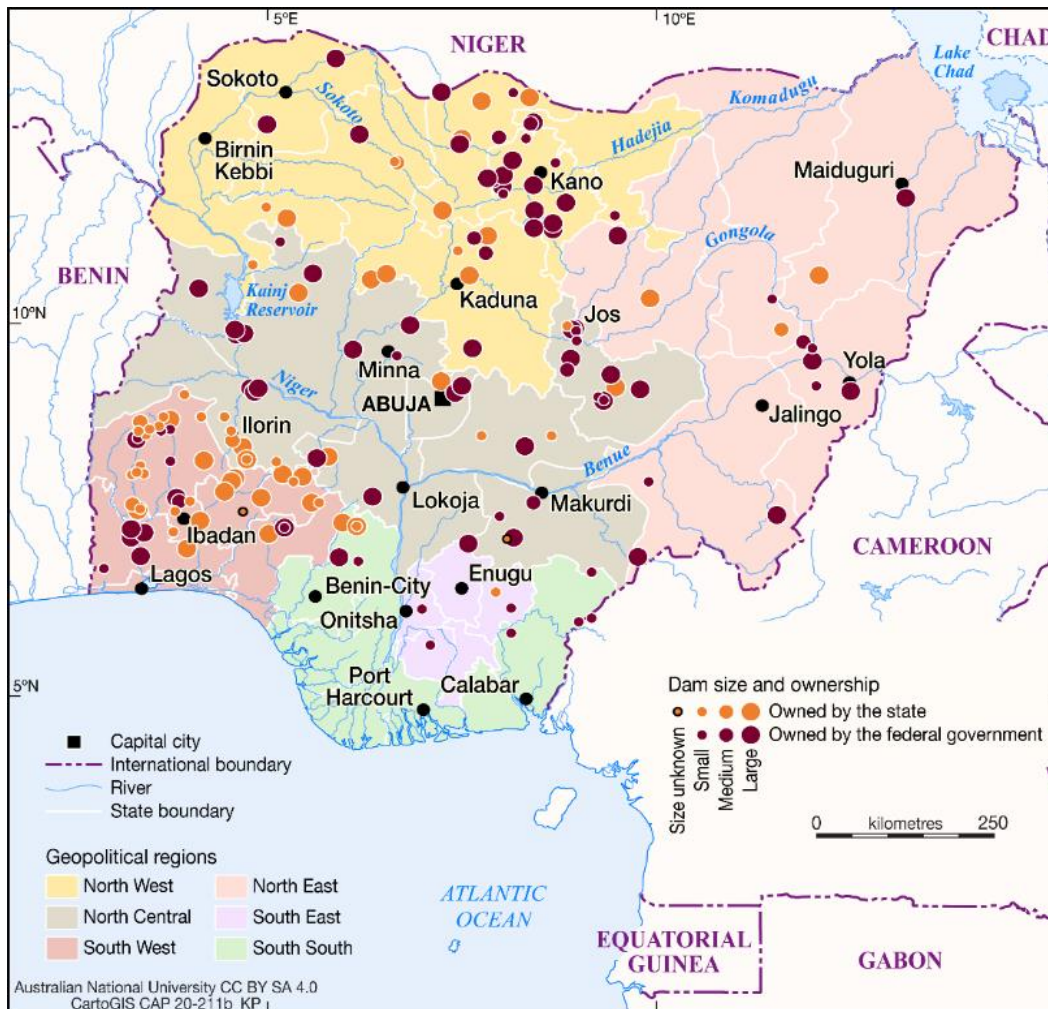
‘To keep Nigeria one is a task that must be done’

Amongst many others, this was perhaps the most famous statement co-opted from General Gowon's radio broadcast on July 7, 1967 as a decisive stance on Nigeria's unity (Ngoa, 2011). Between 1966 and 1978, Nigeria's sociopolitical and economic space was profoundly unstable, uncertain, and with multiple (dis)continuities ([Appendix G](#)). The violent military takeover of government in 1966 and subsequent attempts at democratisation are two political-ideological events that defined water infrastructure development in post-independence Nigeria. As a significant political-ideological narrative, wartime propaganda slogans created by the military, such as ‘national unity’, enabled federal level attempts to mobilise and consolidate political power in subsequent years (Doron, 2011).

Post-independence national development plans (henceforth, NDPs) and, subsequently, the agricultural development projects (henceforth, ADPs) united the Nigerian State along developmental-ideological lines, mainly through the agricultural development discourse. The five NDPs (1962–1990) consist of documents outlining Nigeria's approach to national economic development, while the ADPs are a set of agricultural intervention programs embedded in Nigeria's third NDP (1975–1980). Federal and state governments pursued a coherent economic development strategy that unravelled as the differentiated regional desires, capacities, social and religious sentiments unfolded. Initially pivoted broadly on agriculture development and primary production, the NDPs changed according to the direction of local, regional, and international political-economic logics and practices. Intended to build national unity, the federal government emphasised ‘national development’ as a consistent and systematic way to guarantee food and energy security, rural transformation and development, and improved livelihoods, dedicated to post-civil war reconstruction (Federal Government of Nigeria, 1970). The first plan aspired to increase export crops production and modern agriculture methods while targeting an increase in agricultural expenditure from 6–12 percent (Federal Ministry of Economic Development, 1962). Subsequent plans framed this agriculture-focused perspective as a matter of building a “united, strong, and self-reliant nation” (Federal Government of Nigeria, 1970, p. 13). To ensure national stability and reconstruction, President Yakubu Gowon, in his 1968–69 budget broadcast speech, declared that “Nigeria had to rely upon her traditional source of economic strength – agriculture” (Gowon, 1968, p. 6).

Through the developmental state and because of the national unity ideology, efforts to balance the spatially uneven infrastructural and material development fell on the federal government. In Figure 5-1, the appearance of a coherent nation-state in line with the hydraulic mission masks the internal contradictions within it. Regionally, the concentration of large federally owned dams in the north central

region compared to the south suggests the consolidation of federal government power in its pursuit of national unity and even development. On the contrary, state governments own most dams (large and small) in the southwest, a disproportional representation partly due to the ADPs and the effects of the ideological positions of the southwestern states during the second republic.



**Figure 5-1: Dam size and ownership throughout Nigeria 1960-2007. Source: (Federal Ministry of Water Resources, 2014a)**

Ideological distinctions manifested in the governance decisions made by state governments. These decisions became a constant source of resistance between the state governments and the federal government, and amongst the state governments, particularly during the democratic government. Ige (1994) noted that state governments enjoyed the most freedom in the post-civil period. This relative autonomy was due to the gradual transition from the civil war, an ethnic war for self-determination (Olasupo et al., 2017). Following the attempted secession, an ideological shift occurred from regionalism to provincialism to federalism. The pre-secession regional system was abolished by decree 34 of 1966, otherwise known as the unification decree (Federal Military Government of Nigeria, 1966).



Decree 59 suspended the unitary structure and reinstated a federal political system, but, in principle, only changed the name and authority of the head of state while retaining core powers at the federal level (Kirk-Greene, 1971).

Post-independence attempts at central coordination of water resources development began with the first national development plan (Federal Ministry of Economic Development, 1962). At that time, federal level powers to establish a nationwide administrative structure for water resources control and coordination were non-existent due to the regional political arrangement and despite the nationalisation efforts in 1953.<sup>8</sup> Under regionalism, the equal and independent status of the regional governments encouraged and forced active collaboration between the national government and the constituent regions in the design, formulation, and implementation of the national development plan and the individual regional development plans. Post-civil war reconstruction arguments emboldened the federal government to intensify harmonising and strengthening national control through national unity and development narratives. Increased attempts to consolidate federal powers over the political management of water provoked a series of political struggles over land, water, and money by the state governments.

#### **5.4.1 The national development plans and the deprioritisation of water**

The national development plans (hereafter, the plans) were a set of documents outlining Nigeria's approach to national economic development. The plans place a notable emphasis on agriculture development with a consequent deprioritization of water supply infrastructure development. Inherent in its design, Nigeria's first national development plan categorically excluded water resources development and placed agriculture development through water resources development under a broad economic development framework (Federal Ministry of Economic Development, 1962). Subsequent plans framed this agriculture-focused perspective as a matter of building "A united, strong and self-reliant nation through agriculture" as shown in the third plan (Federal Republic of Nigeria, 1974, p. 4). Nonetheless, the third and fourth plans captured water supply as a supplement of social amenities, including medical facilities, schools, and electricity (Nwosu, 1990). The argument that in practical policy terms, the third plan did not commit adequate funds for effective implementation or address critical issues of socio-economic inequalities such as water supply (Lewis, 1977; Waziri, 1989) is valid if the disparity between water and agriculture budgets in the plans are considered (Table 5-1).

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<sup>8</sup> Circular from the Secretary of state of Nigeria Government to all the regional governments, September 19, 1953, circular 901/53

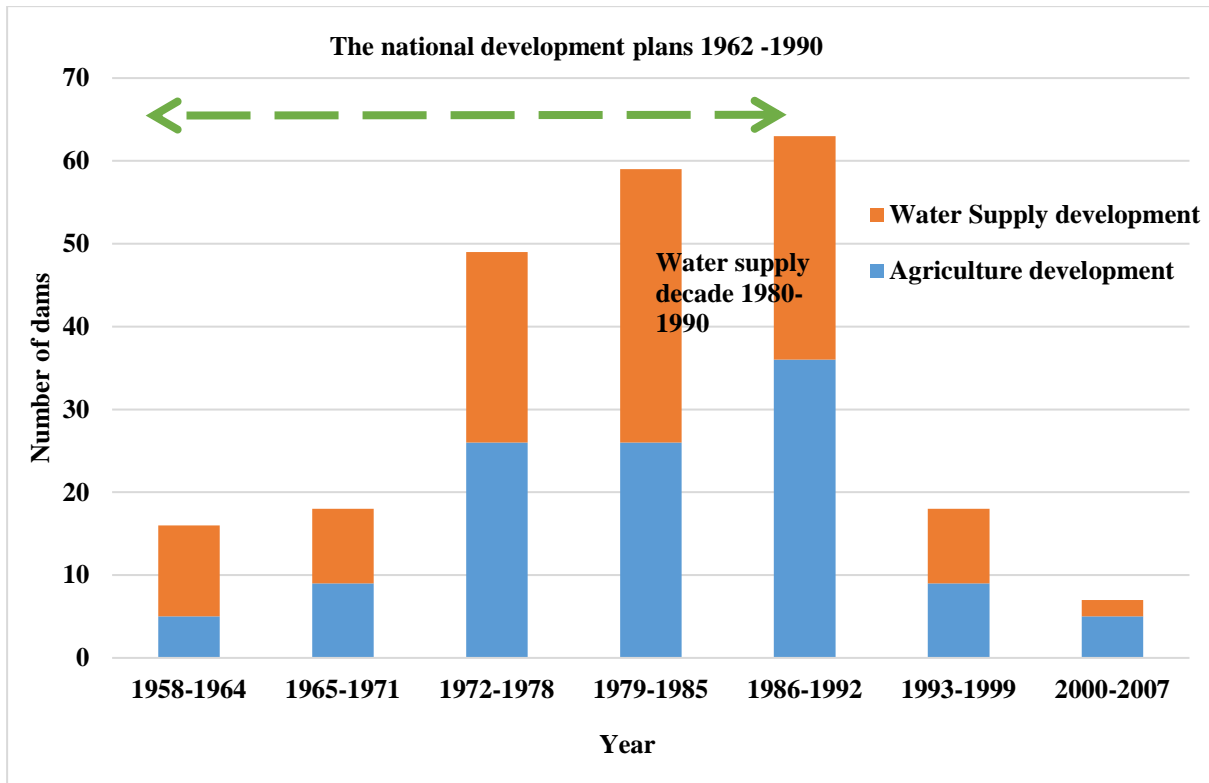
**Table 5-1: Federal government capital expenditure for water and agriculture in the national development plans**

Plan	Years	Projected Resources (N million)	Water (other than irrigation) (%)	Agriculture (%)
First	1962-1968	2,434	3.6	13.6
Second	1970-1974	9,051	5.8	na
Third	1975-1980	43,783	2.8	5.0
Fourth	1981-1985	96,968	0.4	11.1
Fifth	1988-1992	N/A	N/A	N/A

**Source:** (Okigbo, 1989). Federal and state governments. N = Naira (Nigeria's currency since 1971).

The first of four objectives of the first plan aspired to an “increase in the production of export crops and the use of modern methods of agriculture,” while targeting an increase in agricultural expenditure from six to twelve percent (Federal Ministry of Economic Development, 1962, p. 12). Writing about the underrepresentation of water resources development in the plans, Pius Okigbo noted in his book, *National Development Planning in Nigeria: 1900-92*, the exclusion of activities like water resources development (for agriculture and industry) from what the government saw as the “productive economic sector” (Okigbo, 1989, p. 45). The implication of the ideological or political-economic narratives that promote agriculture infrastructure development over water supply is mixed at best. Yet, such understanding offers essential insights if the purpose of dam development for agriculture and water supply purposes are explored as a vital starting point (Figure 5-2).

The spike in 1980s of water supply related dams at the collapse of the second republic is *accidental*, partly due to the multipurpose nature of the constructed dams, which almost always had a water supply component or the declaration of the international drinking water supply and sanitation decade between 1980-1990 (UNGA, 1980). However, water supply infrastructure development during the *water supply decade* focused mostly on rural water supply, where boreholes were the primary water infrastructure (e.g., the National borehole program). Unlike the agricultural sector, the first federally initiated and managed urban water supply project did not occur until 1992 (The World Bank, 1992a). Before this project, a range of state urban water supply initiatives and large dam constructions were supported by the World Bank (e.g., Anambra state water supply project in 1980). By 1990, agriculture-related dam development had spiraled upwards to reflect the effect of the national development plan, the completion of the enclave and state-wide ADPs, and the start of some third-generation ADPs.

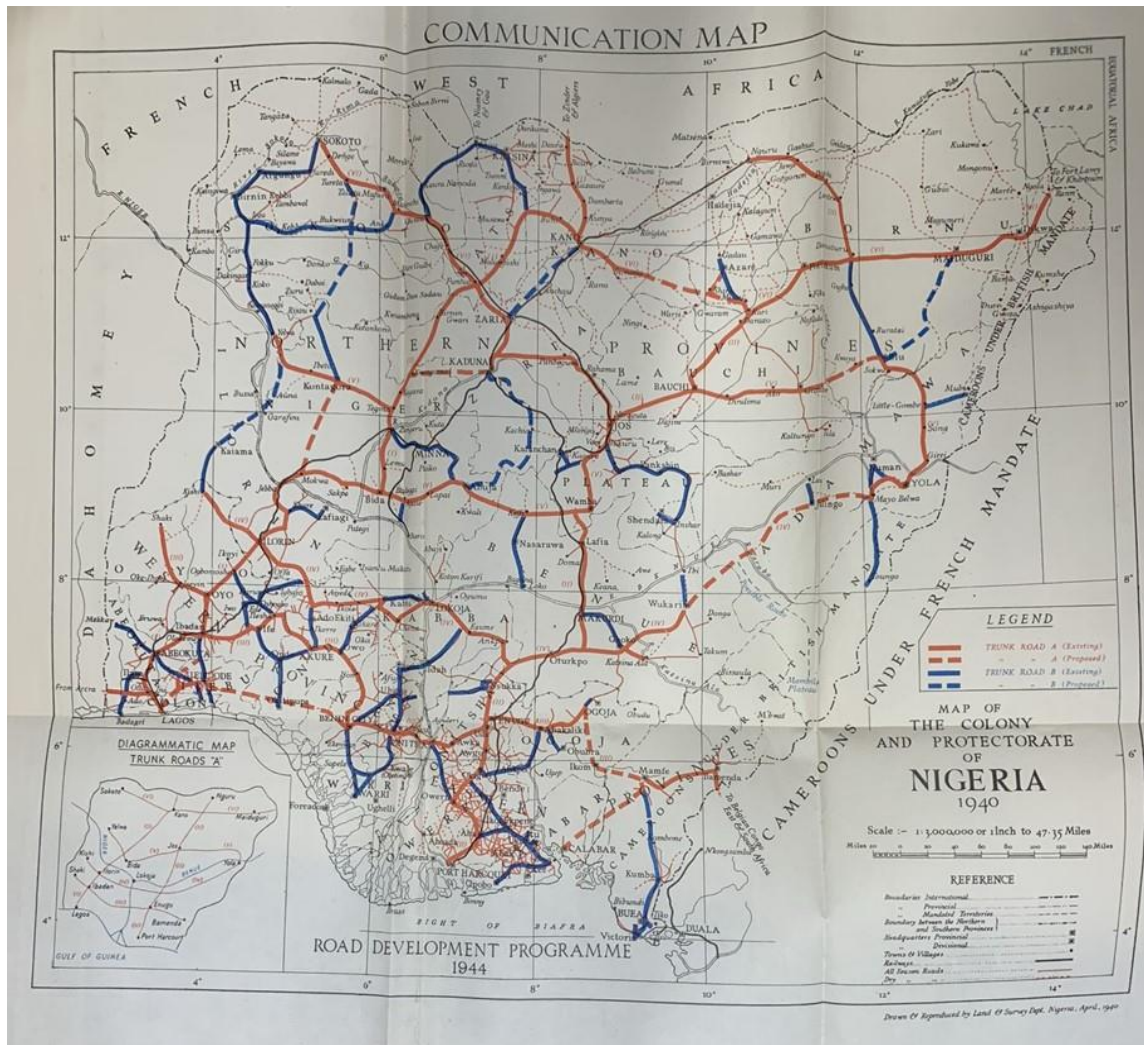


**Figure 5-2: Distribution of dams constructed for water supply and agriculture purposes from 1958-2007**

Public requests and advocacy played an essential role in the development of water supply infrastructure. Halfway through the implementation of the first plan, the comprehensive World Bank report on water and sewerage in Nigeria, *Economic Growth of Nigeria*, noted this lack of attention to Nigeria’s water supply needs. The report noted: “The increasing interest in water in Nigeria is evidenced both by growing popular request made to government for piped water supplies and by the growth in development spending for water in response to these needs” (IBRD-IDA, 1965, p. 5). Such cases where peoples’ aspirations influence policy and politics emboldened the Western Region Government to use potable water supply as an electoral weapon to curry favour for votes during the 1965 regional elections.

In policy language and planning, the third plan favoured an integrated rural-urban development approach to the development of water supply infrastructures and aspired to “ensure that no community of 20,000 people or more shall be without essential services” (Federal Republic of Nigeria, 1974, p. 35). However, the guideline to the implementation of the plan distinguished between rural and urban water infrastructure development. This distinction is traceable to the development of the colonial government’s ten-year development plan in 1946 (Nigeria Legislative Council, 1946). Perhaps this distinction may have been valid at the time; using the distinction as a conceptual pillar was questionable in the 1960s due to the social and infrastructural transformation of rural areas. Free education in western Nigeria through adult education in the 1950s and road infrastructure development had opened up many

rural areas in the west. The communications map for the Ten-Year development plan shows the concentration of road network planned for southern Nigeria (particularly the southwest) (Figure 5-3) compared to the rest of the country.



**Figure 5-3: Communication map and road development program for Nigeria, 1944. Source: (Nigeria Legislative Council, 1946)**

The ideology of development ensured that the subordination of water resources was more intense in rural areas. Post-independence plans for the provision of rural water supply was driven by rural agricultural productivity, and to service urban productivity. Water supply infrastructure plays two distinct roles for the federal government. Rural productivity imagines rural areas and their populations as spatially, temporally, and demographically static entities whose specific sociocultural histories delimit aspirations and needs, and its economic gaze circumscribed by predetermined cultural and traditional contexts and identities. Urban productivity builds on the idealized *growth centers* and seeks to boost the industrial and commercial capacities of new state capitals emerging from newly created

states. Urban water supply infrastructure, viewed as social and economic infrastructure, was designed to improve *urban productivity* in the areas of industry (Mabogunje, 1992; Onokerhoraye, 1978). This meant that “other economic and social services, e.g., water supply and feeder roads, were almost ignored” (IBRD-IDA, 1972, p. 6). The Nigerian developmental state and its constituting subjectivities create such an image and enforce it on the people. Such practices are evident in recent years.

#### 5.4.2 Technical knowledge and local expertise

Hydraulics politics often enrol technical knowledge and expertise when constructing the hydraulic mission, because as a unifying component of power formation it can be used to define the boundaries between state and society, or government and non-government activities. In Nigeria, the reverse is the case, as the Nigerian State did not actively participate in the technical and engineering aspects of water infrastructure development. This is partly a colonial legacy such that after independence, states and federal governments were faced with limited options locally due to the shortage of Indigenous technical and engineering expertise, irredeemably linked to the poor development of technical expertise during the colonial period (Utietiang, 2015). The Ashby report,<sup>9</sup> which Asiawaju (1972, p. 2) referred to as “Nigeria’s education bible,” has since defined post-independence education policy in Nigeria, especially manpower development. Speaking in support of the 1955 colonial development and welfare bill in the British parliament, the then Secretary of State for the colonies, Mr Allan Lenox-Boyd, described what he saw to be “a desperate anxiety on the part of the African ministers as to whether there would be technical officers able to help them to spend effectively the money voted to Nigeria”, and that this was the “most vivid” of all the recollections he had from his visit to Nigeria.<sup>10</sup>

Concerns about the continued domination of foreign consultants and contractors in the implementation of the second national development plan were identified in the guidelines of the third plan (Federal Republic of Nigeria, 1974). The human capital needs, especially water engineers, were insufficiently addressed in the 1960s and 1970s education policy and the NDPs (Lewis, 1977). Fundamentally, the goal of the statutory National Universities Commission in the second and third plans was to increase student enrolment to meet the workforce needs of the economy (Ajayi, 1975; Federal Republic of Nigeria, 1974; IBRD-IDA, 1972). This situation triggered federal investment in water-related disciplines, especially dam and borehole construction, forcing the federal government to create the only water resources and environmental engineering institute in 1976. Completed in 1979 in *Kaduna*, the National Water Resources Institute was the first post-secondary educational institution devoted to the study of water resources and the training of water resources experts through technical

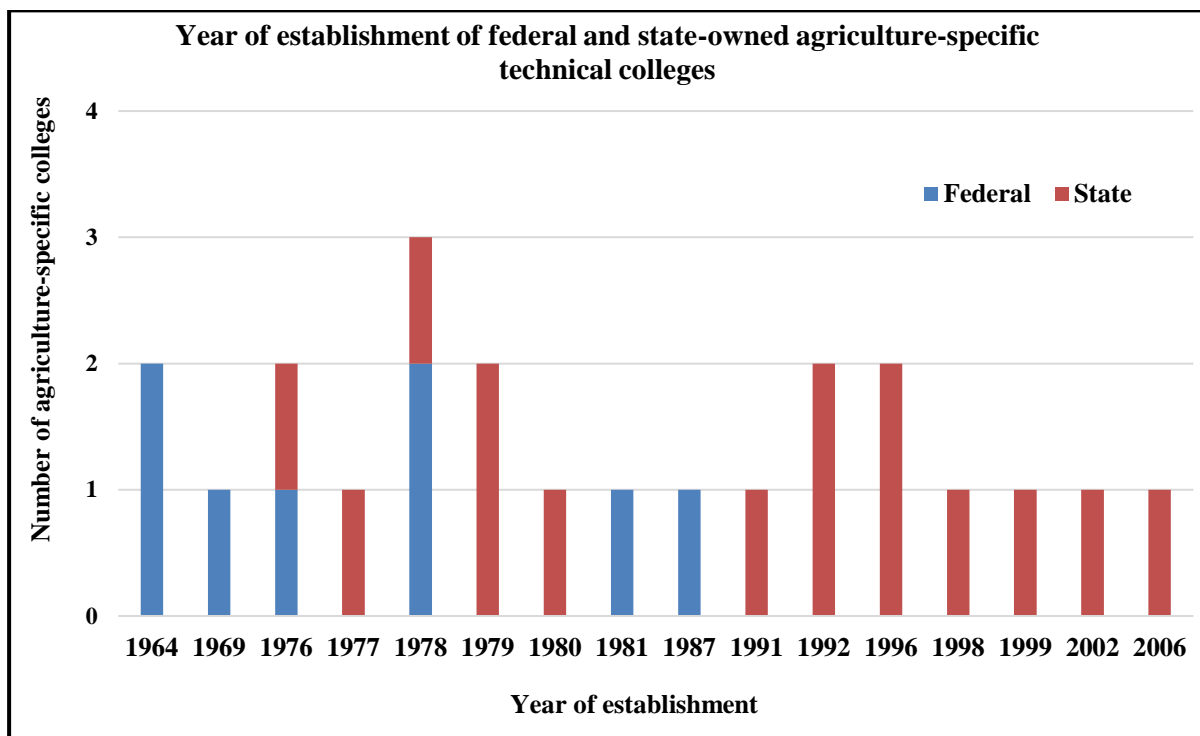
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<sup>9</sup> Rhodes (1973) wrote a dissertation on the genesis of the Ashby commission in Nigeria that sheds more light on this subject.

<sup>10</sup> HC Deb 02 February 1955, vol 536 cc1116-220, Colonial Development and Welfare bill.

diploma delivery. The National Water Resources Institute was also the only government institution dedicated specifically to water resources engineering technology. However, the Institute was under-resourced and its diploma certificate was not accredited by the National Water Board for Technical Education in Nigeria. A review project conducted in 1987 on the Institute concluded that: “The recognition of the diplomas by the National Water Board for Technical Education, which is attainable from this year on, remains one of the main objectives of the Institute” (UNESCO, 1987, p. 8).

Figure 5-4 shows the post-independence establishment of federal and state-owned agriculture-specific technical colleges. The first specialist university of agriculture was established in 1988 as the only government institution explicitly dedicated to water resources engineering technology (Odueze, 1990). Political instability from the civil war also accounts for the lack of sustained investment in the skills shortage carried over from the colonial era. The guidelines of the third plan noted the continued domination of foreign consultants in the implementation of the second national development plan (Federal Republic of Nigeria, 1974). This stage of water infrastructure development is just as crucial as the management stage and several questions remained unanswered on how relations at this stage set in



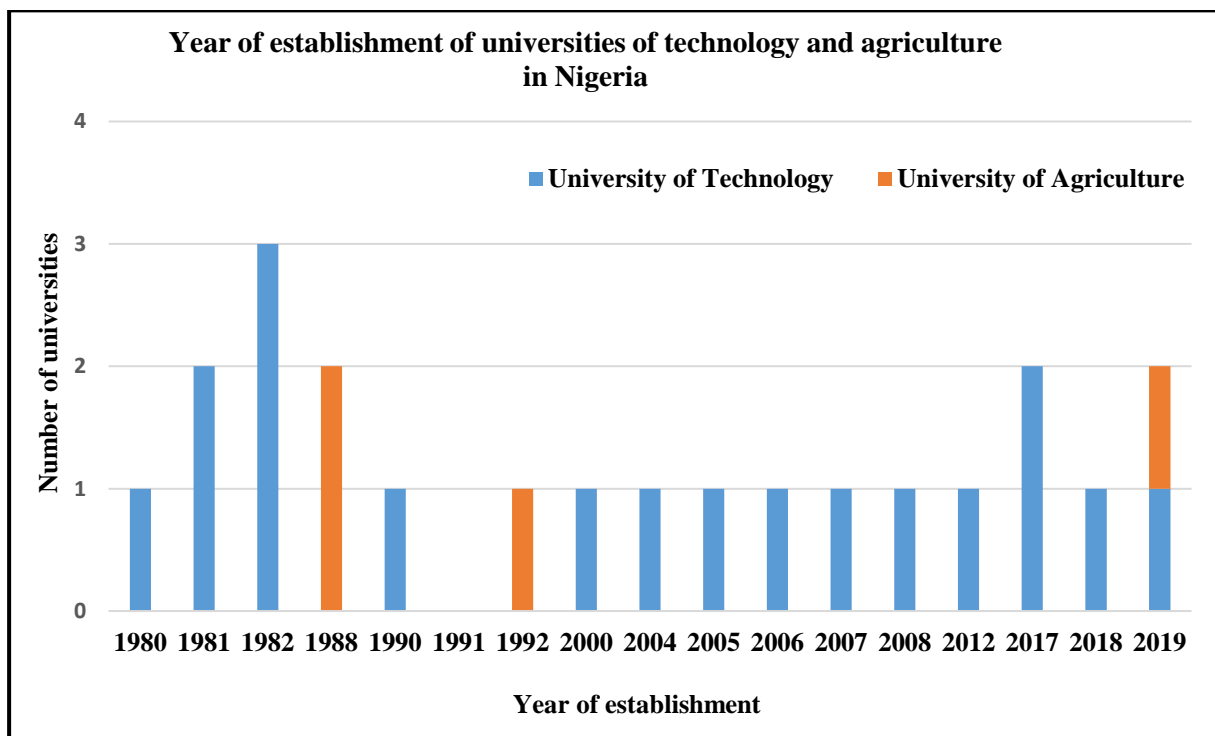
**Figure 5-4: Federal and state-owned agriculture colleges in post-independence Nigeria.**

**Source: (National Universities Commission, 2021)**

place elements of unsustainability or incompleteness. Earlier agriculture and technical colleges were wholly devoted to petroleum value chain development, trade and agriculture through iron, steel, and primary production. The 1979 democratic government showed no specific urgency either. The first bill

signed by the incoming democratic President, Shehu Shagari, despite being named the “science and technology bill,” was designed to “promote science and technology for national development” (Shagari, 1981, p. 1). The N354million investment in technical education and N1.250billion (US\$980million) in higher education that followed the bill aimed to stop or reduce the loss of foreign exchange (due to foreign scholarships for Nigerian students), by building seven new universities of technology and six new federal technical colleges (Federal Republic of Nigeria, 1981).

University education was not much different. The first specialist university of agriculture was established in 1988 (Figure 5-5), 28 years after Nigeria’s independence and nearly two decades after the civil war. The institutional and human development investments were distorted in favour of classrooms and teachers primed for technical and university education for industries around steel and petroleum development (Federal Republic of Nigeria, 1980a). Nonetheless, it marked a clear distinction between the military and democratic government in their economic planning priorities, with dwindling income forced by the oil glut. In other words, the democratic government did not localise the third leg of the trifecta of a hydraulic mission as both federal and state governments allowed external actors to dominate.



**Figure 5-5: Federal Universities of technology and agriculture in post-independence Nigeria.**

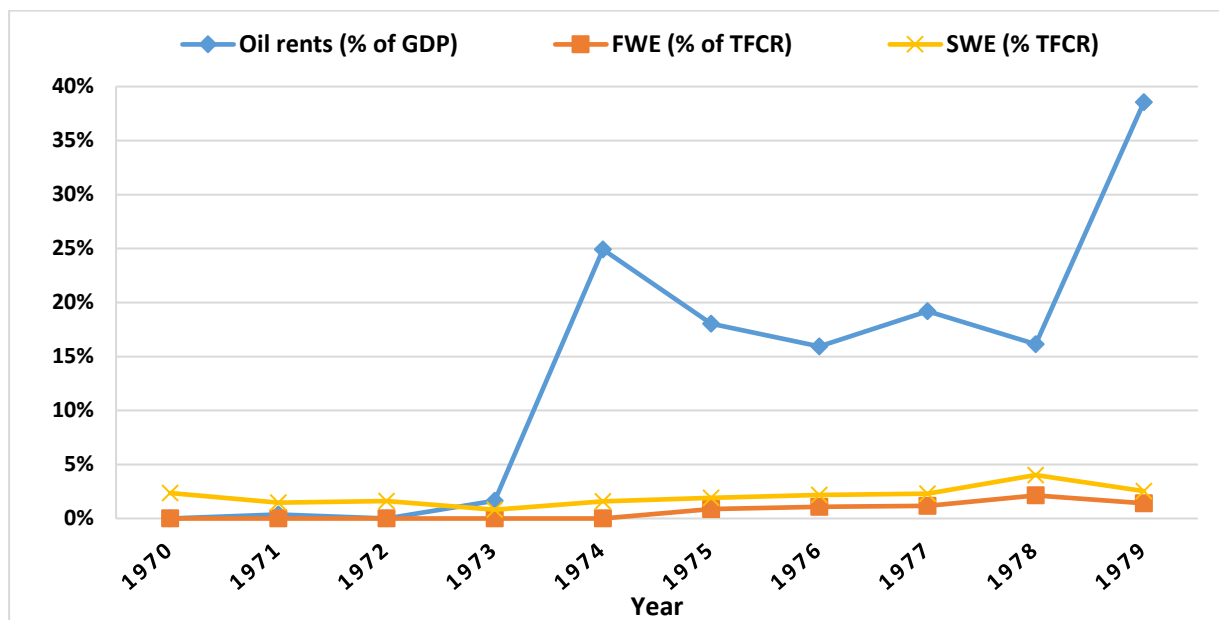
**Source: (National Universities Commission, 2021)**

Consultants and contractors’ countries of origin also determined the type of engineering design, methods, and quality and to what extent their roles overlapped, say, between a consultant and contractor. With boreholes and dug wells, for example, the geological society of Nigeria, formed in 1929, played a

prominent role in the development and evolution of dug wells and boreholes in Nigeria (Hazell, 2004). The first water geologist of Nigerian origin graduated in 1957, but the skills and knowledge shortages in this sector became evident after the completion of several borehole drilling and rehabilitation projects in rural areas across the country in the years following the water supply decade (Hazell, 2004).

### 5.4.3 Onset of financial encroachment

Central to these changing power relations were the financial relations between the federal, state, and local government councils. The basis of this encroachment in the governance of water infrastructure is an aspect of what Michael Watts refers to as ‘petro-coersion’, an instance where the federal government politically manipulate oil wealth to subordinate the state governments (Watts, 2004, p. 77). To ‘upscale’ its expenditure and ‘expedite’ the developmental process, the federal government commandeered capital projects and investments (e.g., the ADPs and dam development projects) undertaken by state governments, using this strategy to tweak, align, mobilise, and consolidate specific organs of the state for its political-ideological agenda. Increased rents from crude oil post-civil war did not translate to a marked increase in water infrastructure expenditure despite a GDP peak of approximately 40 percent of federally collected oil revenue in 1979 at the beginning of the second republic (Figure 5-6).



**Figure 5-6: Government income and water expenditure (capital) in Nigeria 1970-1979. TFCR - Total federally collected revenue. FWE-Federal water expenditure; SWE–State water expenditure**



Investments by state governments surpassed the federal government because up until 1973, state governments were statutorily responsible for water supply. The onset of the oil boom, the attempt to establish the local governments as the third arm of government and improve their effectiveness in state administration, and the unilateral authority over the reconstruction efforts, allowed the federal government to wrestle more federal income from the federation wallet (Watts, 1983). All these fit within the federal government's strategy of gaining control over what General Gowon called the “strategic sectors of the Nigerian economy”, (Gowon, 1973, p. 1) which he declared in his October 1, 1973, independence day address:

The federal government now holds 40% of the equity shares in the three central expatriate commercial banks and has its appointees serving on the board of directors. Further, negotiations that have been in progress and aimed at securing government participation in the existing oil companies and their concessions have been concluded successfully. As a result, the federal government now holds at least 35% of the equity shares in each of the oil companies operating in the country (Gowon, 1973, p. 1).

Legislative efforts to facilitate this fiscal upscaling occurred through the promulgation of a series of decrees, such as decree 15 of 1970, which allowed the federal government to collect petroleum and mining taxes. Nowhere in any federal fiscal, political system worldwide had state governments relied so acutely on federal revenue (Federal Republic of Nigeria, 1980b).

#### **5.4.4 Legal harmonisation**

Decree number 25 of 1976, which established the river basin development agencies (RBDAs), was transformational for Nigeria's water infrastructure landscape. A critical infrastructure-related function of the RBDAs, according to Section 4 (1b) of the RBDA act, 1987 is “to construct, operate and maintain dams, dikes, polders, wells, boreholes, irrigation and drainage systems, and other works necessary for the achievement of the Authority's functions” (Federal Government of Nigeria 1987; Federal Military Government of Nigeria 1979). The RBDAs became powerful developmental and bargaining tools for the federal government when relating with the federating states; specifically through the primary influence of political actors in defining the geographical boundaries of each basin from a political rather than a physiographic standpoint (Adams, 1985). Institutionally, the Federal Ministry of Agriculture and Natural Resources changed its name a few times. The Ministry of Water Resources was established in 1989 but merged in 1992 with the Ministry of Agriculture and Natural Resources<sup>11</sup> (Please see Ngene

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<sup>11</sup> Lack of timely access to the FMWR and the National Assembly library hindered the compilation of sufficient data from providing a rigorous account of the series of changes to the ministry and its parastatals. A helpful example is the expansion of the RBDAs from 12 to 18 in 1985 by then military head of state, General Buhari.

et al., 2021 for further reading on the development of the RBDAs). Federal and state institutions and agencies continue to fight to preserve power over their convoluted and rapidly changing territorial and administrative spaces because of the politicisation of the processes and responsibilities between them. One strategy of the federal government was to provide state governments, through the RBDAs, 'a helping hand', grants for capital projects: the value of such grants in the fourth NDP was N104million (US\$100 m) in 1980 (Federal Republic of Nigeria, 1981).

The Nigerian Land Use Decree 6 of 1978 empowered state governments (governors) to own and control land within their territories in trust for the people (Federal Republic of Nigeria, 1979). Allott (1978) described the 1978 Land-use decree as 'revolutionary' with far-reaching ramifications for individual water access rights and the federating states' scope of power. Arguably, the contest between state and federal government is an internal contradiction within the civilian political class. State governments' resistance to the federal government over the Land-use decree was to preserve its autonomy as a viable governing authority and check the federal government from usurping the powers of the states over local governments and the populace. For example, compulsory land acquisition for waterworks construction purposes was already inscribed in the *Òyó* State Water Corporation Edict no 24 of 1977 before the federal military government enacted the Land-use decree. Both the Waterworks Act and the Land-use decree had similar effects: expropriating resources from everyday citizens. Section 53 subsection 1 of the Water Corporation Act reads:

Wherever there is a hindrance to acquisition by the Corporation of any land required for the purposes of any waterworks, including any failure by the Corporation to reach agreement as to the amount to be paid in respect of the acquisition, the Executive council, upon the application of the Corporation and after such enquiry as the Executive Council may think fit, may declare that the land is required for the service of the Corporation. Upon such declaration being made, the land to which it relates shall be deemed to be land required for a public purpose of the state within the means of the Public Lands Acquisition Law, and the executive council may cause action to be taken by the appropriate authority for the purpose of acquiring the land for the government of the state (*Òyó* State of Nigeria, 1977, p. 12).

State governments continued to subordinate local governments in land and water infrastructure-related matters. The 1976 local government Edict no 5 of the *Òyó* state government restricted local governments' ability to borrow money, yet left them responsible for rural and semi-urban water supply (*Òyó* State of Nigeria, 1976). Still, concerted efforts by the state and federal government to revert this law were lacking. The federal government's attempt at the 1976 local government reforms was modelled on the *Òyó* state's 1972 local government reforms (Olowu, 1986). The lack of capacity from the local government councils caused by the frequent leadership changes prevented the effective maintenance of the constructed wells and boreholes during the ADPs (The World Bank, 1997).

Further attempts at federal-level consolidation followed the 1976 military coup that ousted General Murtala Mohammed, setting the stage for the military's defining role in democratic transitions and the

future character of Nigerian democratic institutions. Hence the influence of military-curated ideas of the state is profound. Agbese (1992) argued that the military plays a ‘custodial role’ in Nigeria's democracy by dictating the terms and timelines of transition and the scope of corresponding constitutional changes. This self-imposed role, rooted in the assumption of their moral and leadership superiority to the civilian class, manifested in the changes to water resources development during the democratic transitions.

### ***5.5 Democratising and liberalising resistance: the limits of the nation-state - 1979-1999***

The 1979 democratic transition enacted the previous political-ideological inclinations of the main ethnic blocks. The Yòrùbá-speaking southwest region with democratic socialism-welfarism was led by Obafemi Awolowo (Awolowo, 1947); the eastern region with capitalist orientations, and the northern region with feudal-welfarism. Between 1979–1999, the impact of these competing organisational logics of the (S)states, wedged with specific ethnic positionings, offers a practical way to analyse the state-water infrastructure juncture, which has been largely omitted in the analysis of political practice of the Nigerian State. Nigeria’s fate as a developmental state with a ‘unifying purpose’ was complete with the NDPs. However, these ideological differences played out in the policy mechanisms used to achieve the hydrodevelopmental vision.

The policy position of the Lagos state democratic socialist government on private capital and middlemen involved in agriculture reflects the utilitarian logic of “the greatest happiness of the greatest number” (Jakande, 1985, p. 44). Such policies include abolishing private primary schools and eradicating middlemen in the agriculture value-chain by establishing services boards and farming co-operatives. The Lagos state government established the state commercial bank, Ibile Bank, and Lagos state insurance company to support these policies (Jakande, 1985). From the first to the fourth plan, each region (and state) produced its development plans structured around similar developmental objectives, but with varying financial, social, and technical commitments or strategy pathways and methods. The Lagos state government under governor Lateef Jakande became the first state government to establish a college of engineering, with a school of environmental studies, when the first state-owned university (Lagos State University) was established in 1981 (Jakande, 1985). By the mid-1980s, clashes between the expectations of a civil society guided by Nigeria’s academic elite (often to the left of the political-ideological spectrum)<sup>12</sup> and the traditional and religious leaders truncated increased democratisation of Nigeria's political and social space, promised by the Babangida regime (Graf, 1986; Shettima, 1995).

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<sup>12</sup> The political left, many of whom are Marxist, held sway in Nigeria's academic, newspaper publishing and labour union institutions (e.g. S.G. Ikoku, Eskor Toyo, Edwin Madunagu, Omolara Ogundipe-Leslie) (Mayer, 2016).

State and federal governments regularly contested changes to the collection, allocation, and distribution of revenue. We illustrate this contestation by visiting the debates during the 1980 revenue allocation commission. All collected national revenue went into a distributed pool account (federation account, after Section 149 of the 1979 constitution) and were distributed into the federation account, joint state account, and local government joint account. Hoping to favour the local governments, the Senate aligned itself with the federal executive and local governments' interests against state governments' proposals during the debates. Nine state governors criticised the Senate's position, arguing that water supply financing could be seriously affected if Senate changes were approved. The Senate chairman on the revenue allocation committee, Senator Dafinone, responded that "apart from secondary education and teacher's training, there are no positive and concrete duties assigned to the state governments for which they require additional funds" (Dafinone, 1980, p. 2).

The Federal Minister of Finance held a similar view of state governments' efficiency with water development projects stating: "I do not think that the states are really serious when they create the impression that they are more efficient, there is no evidence at all" (Federal Republic of Nigeria, 1980c, p. 10). To ensure a fair and balanced debate, the commission chairperson questioned the Minister of Finance on the federal government's encroachment on the concurrent provision for agriculture and water resources development, especially the bloated contract figures that state governments criticised as too high. The minister responded that state governments are inept, noting that "it is true that the rate of agricultural development in the country for a number of years is very slow and dismal and if we were to leave this to the states alone, I do not think we will be in a position either to feed ourselves or to provide the necessary raw materials for the vast industries we intend to develop" (Federal Republic of Nigeria, 1980b, p. 12). Such strategies of condescension entail part of the suite of political-discursive practices that the federal government deployed.

The fourth NDP was the first time the local governments were actively involved in development planning (Koehn, 1989; Oyediran, 1988), despite their active involvement in other areas of national development. Subsequent local government reforms followed with the 1984 Dasuki Commission and the 1986 Political Bureau Commission (Cookey Commission).<sup>13</sup> The recommendations of the political bureau report (Federal Republic of Nigeria, 1987) were ignored by both democratic and military-political officeholders. Both Dasuki and Cookey commissions recommended additional responsibilities for local government councils to provide social services (including water supply, especially rural) but failed to recommend a substantial increase in revenue allocation or revenue-generating powers. The commissions' recommendations ignored the 50 percent increase in local government councils between

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<sup>13</sup> The 20-person political bureau commission's recommendation indicates their influence in burying any aspiration for a balanced integration of traditional rulers in Nigeria's political governance. Most of these elites supported the relegation of the role of traditional rulers in political governance, as was the case for the southwest region since independence.

1979 and 1989, from 301 to 449, respectively (The World Bank, 1992b). Recommendations from these local government reforms prompted constitutional amendments to local government-related matters in the 1979 and 1989 constitutions, in preparation for the second and third republic, respectively. Section 7, subsection 1 of the 1979 constitution, gave state governments the constitutional rights to create and conduct local government elections, subject to two-thirds of National Assembly members (Federal Republic of Nigeria, 1979). In that sense, the 1979 constitution was a democratic consolidation of the unification decree. Most of the implemented changes were imported from other federal nation-states like Thailand or were not supported by ideas based on sound scientific evidence in Nigeria (Read, 1979).

An underlying assumption of the political bureau recommendation on local government council reform was that “local government operations are usually not complex and generally do not require sophisticated and highly qualified personnel for effective performance” (Federal Republic of Nigeria, 1987, p. 116). The bureau did not describe what ‘complex’, ‘highly qualified’, or ‘sophisticated’ implied. This view influenced the Cooney Commission's decision to allocate 10 percent for local government councils, despite acknowledging that most written and oral submissions advocated for 20 percent (Federal Republic of Nigeria, 1987). In principle, it is also inconsistent with the expanded social, political, and infrastructural responsibilities delegated to the local government councils in its report. Nigeria's post-independence hydraulic mission – the development of dams and standpipes – was an auxiliary political project in the contradictory approaches to the national development agenda.

Three critical events explain the decrease in dam development between 1985 and 1990. First, the currency crash of the Naira disrupted the balance of trade, which stopped many contracts (The World Bank, 1994). Second, the continuing effects of political instability from the coup and counter-coup d'états did not allow a consistent policy and political formulation. Third, the Babangida regime introduced the structural adjustment program that heralded a series of liberalisation mechanisms (Okoroafo & Kotabe, 1993). These conditions led to an exodus of foreign-born education and technical experts domiciled in Nigeria (e.g. Indians, Ghanaians) (Okoroafo & Kotabe, 1993). A similar event happened when the Gusau and Gombe ADPs experienced a remarkable reduction in their skilled workforce after the 1975 military coup. The mass retrenchment of nearly 10,000 workers recommended by the federal government led to a 19-month delay to the start of the first ADP enclave projects (The World Bank, 1982).

Privatisation and commercialisation of physical public assets under the structural adjustment program in 1986 had minimal effect on dam ownership and development because the government's focus was on the monetary and fiscal elements (e.g. currency devaluation and market-determined trade policy) of SAP (Bangura, 1987). The federal government did not privatise the consultancy and contracting sections of their water institutions. Two explanations for this paradox are: (1) financial undervaluation of the supply side of water resources and infrastructure development by the federal government meant that the financial potential of water infrastructure as a state asset is ignored; (2)

ideologically, the federal government's position on what constitutes strategic infrastructural asset to Nigeria's sovereignty (Olukoshi & Aremu, 1988). The federal government retained ownership of fixed national assets such as energy (generation, distribution and transmission), petroleum storage and distribution, and agricultural-related assets like dams during SAP (The World Bank, 1992a).

### 5.5.1 State level political and program change

Political changes at the state level occurred concurrently with the development of the second phase of the agricultural development programmes. Figure 5-7 shows that between the start of the second republic in 1979 and the start of the fourth republic in 1999, *Òyó* state had eleven governors: three democratically elected and eight of military background. In total, four of these governors were under a democratic system with one elected governor under the transition period during the third republic. These changes greatly affected the direction of the projects. For example, Omololu Olunloyo, the opposition democratic governor that took over from Bola Ige, only ruled for 12 months during which several water projects were cancelled or renegotiated (Oginni & Fadipe, 2016). Revisiting projects from previous governments is not uncommon in Nigeria; what is different in this case is that both governors differed in political ideology.

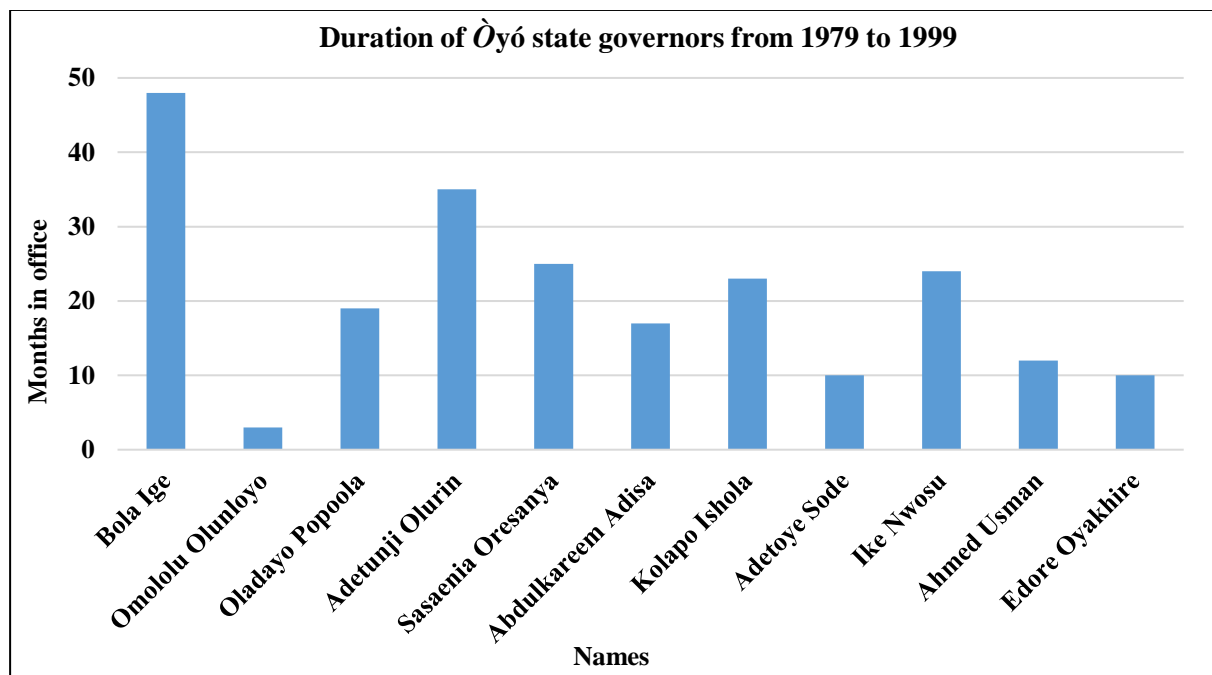


Figure 5-7: Duration of *Òyó* state military and democratically elected governors from October 1, 1979, to May 28, 1999

Bola Ige was one of the southwest governors of a democratic socialist hue, following in the footsteps of *Obafemi Awolowo* and *Lateef Jakande*<sup>14</sup>. The progressive increase in the capital budgets for agriculture, water supplies and education (shown in Table 5-2) indicates the priorities of the socialist democratic government that resumed in 1978 compared to the previous military government. These political changes also affected the bifurcation of OYSADEP when *Òsun* state was created out of *Òyó* state in 1989, as I will discuss in the next section.

**Table 5-2: Capital expenditures on water supplies, agriculture and education *Òyó* state**

	<b>Agriculture</b>	<b>Water supplies</b>	<b>Education</b>	<b>Total Budget</b>
1976	40,967,550	20,968,990	24,161,760	226,508,190
1977	N/A	N/A	N/A	N/A
1978	1,014,170	N/A	611,540	7,606,656
1979	8,431,670	14,500,000	19,446,420	106,207,281
1980	7,964,980	15,511,260	47,691,200	218,706,408
1981	6, 848, 650	113, 556, 000	86,153,280	378,704,860
1982	35,874,990	50,206,000	65,568,540	385,166,910

**Source:** (*Òyó* State of Nigeria, 1977) and (OYSADEP, 1990)

### 5.5.2 State, local governments and water infrastructure development

At the introduction of the 1974 local government system in the western state, the Western State government adopted a condescending view of local councils, describing them as a *failure*, and linked their poor performance and viability to the size of their jurisdiction (Western State of Nigeria, 1974). Before the 1974 local government reforms, the *Obas* (kings) occupied one-quarter of the councils' membership according to existing law. The new system excluded *Obas* and *Oloyes* (chiefs) from membership of the local government council, to rescue them from the “diminution of authority, loss of prestige and disgrace.....caused by having their salaries stopped or reduced to a penny per annum and from them being pampered and kicked around by the councilors” (Western State of Nigeria, 1974, p. 22). The western state government’s disingenuous stance discards the fact that elected councillors are appendages of the state government. Essentially, the councillors were a proxy for the state government in a war of authority and domination. *Failure* of the local government councils was a strategic creation of the western state government. Two decades of attempts by the western regional government to dismantle the colonial administrative structure that, by default, made *Obas* and local chiefs heads of local councils, were complete (Oyediran, 1988). Prior to this time, since the 1950s, the western regional

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<sup>14</sup> Jakande was the democratic governor during the second republic from 1979-1983 and an ardent follower of Obafemi Awolowo

government had pursued the demystification of *Obas'* spiritual and earthly powers over the people. The ideological (and ideational) root of this action can be traced to Obafemi Awolowo's<sup>15</sup> belief that "kings and paramount chiefs are not the divine creatures that uncivilized mankind thought them, and that in the long run, the machinery of government works much more smoothly without them than with them" (Awolowo, 1947, p. 66).

The rural agricultural development projects that began in the northern states in 1972, classified as first generation enclave projects (D'Silva & Raza, 1980; The World Bank, 1974), were expanded to *Òyó* state in the early 1980s. Table 5-3 shows the timeline of *Ìgànná* water supply scheme, highlighting the changes in ownership, management, local government, its status and the changes in national political

**Table 5-3: Timeline of *Ìgànná* mini water scheme: Ownership and management**

Year	Ownership	Management/ Coordinating agency	Local government	Political structure	Status
1982	Old <i>Òyó</i> state	ONADEP	Ifedapo	Democratic	Constructed
1986	Old <i>Òyó</i> state	ONADEP	Ifedapo	Military	Constructed
1989	Old <i>Òyó</i> state	ONADEP/OYSADEP	Ifedapo	Military	Reticulated/piped
1991	New <i>Òyó</i> state	OYSADEP	Ifedapo	Democratic/Military	Dysfunctional
1996	New <i>Òyó</i> state	OYSADEP	Iwajowa	Military	Reconstructed
2017	<i>Òyó</i> State	WCOS	<i>Ìgànná</i>	Democratic	Partly piped

**Source: Author**

governance. At the completion of *Ìgànná* dam, the infrastructure component of ONADEP was adjudged as more successful than the main agriculture component (The World Bank, 1992b). By 1991, a new state, *Osun* state, was carved out of *Òyó* state and all OYSADEP resources were divided on a 3:2 ratio between the *Òyó* and *Osun* states respectively (OYSADEP, 1994, p. 22). In 1996, *Ìgànná* community was reported to be enjoying "uninterrupted water supply throughout the year from the programme's constructed water schemes" (OYSADEP, 1996, p. 5). From the late 1980s to the 1990s, several multilateral and nongovernmental agencies, both internal and external, political office holders such as senators, house of representative members, aspiring politicians and a few benevolent and wealthy indigenes, were now involved in water supply to complement state efforts, each with its individual

<sup>15</sup> Obafemi Awolowo was a Nigerian politician, political theorist, and first premier of the western region from 1954-1960 and a democratic socialist.



implementation and user-engagement approaches and challenges. Most, if not all, of these water supply facilities have since broken down.

Dysfunctional or broken-down facilities occur as a result of conflicts over dam ownership and management, a problematic issue in Nigeria. Paragraph 2 of the *National Water Resources Bill 2016* empowers the Federal government with the ownership of, and jurisdiction over, all dams and reservoirs in the country. It states that: “There shall be no private ownership of water but the right to use water” (National Assembly of Nigeria, 2016, p. 5). Access to bodies of water in this case is a right, which only the Federal government could provide. OYSADEP owns 22 dams and all information regarding the dams had to be collected from their office at *Ìbàdàn*. Interviews with the project engineer provided some hydro-physical and technical statistics about the dam including the implication of silted dams, which can be detrimental to the state’s policy on guaranteed access, if left unaddressed. The drop in the *Ìgànná* dam’s water volume due to the siltation was acknowledged by the project engineer, and highlights the historical dimension of this problem as an evidence of long years of neglect: “The dam is silted because it has been abandoned for close to thirty years. I think it could be up to about 40% of the dam.”<sup>16</sup>

While the *Ìgànná* dam has been transferred to the WCOS from OYSADEP to reticulate the water supply scheme, there are no existing legislation or mechanisms to accommodate or empower the recipient state government corporation – WCOS – for repairs or modifications to the dam. This then becomes a political issue to be ultimately decided by the state governor. Such decisions to repair the dam are either outsourced to OYSADEP or other private contractors. The financial implications of desilting the dam becomes another ‘political’ issue, as the project engineer also confirmed: “We (WCOS) may have to pay for it. OYSADEP does not have resources to fix the dam.”<sup>17</sup> It is true that OYSADEP’s resources have greatly diminished for a range of reasons over the years, primarily due to political governance of *Òyó* state. The director of dams at OYSADEP commented on the organization’s inability to produce an annual report since 2011 because of dwindling allocation from the state government, pointing to the eventual winding up of the agency. Coincidentally, the current administration was elected and sworn in in May 2011 and served its second four-year term in office until 2019. This did not begin in 2017. The drop in the number of pages and details included in the annual reports from the late 1980s to 2011 when the last report was prepared is indicative of a trend that began long ago.

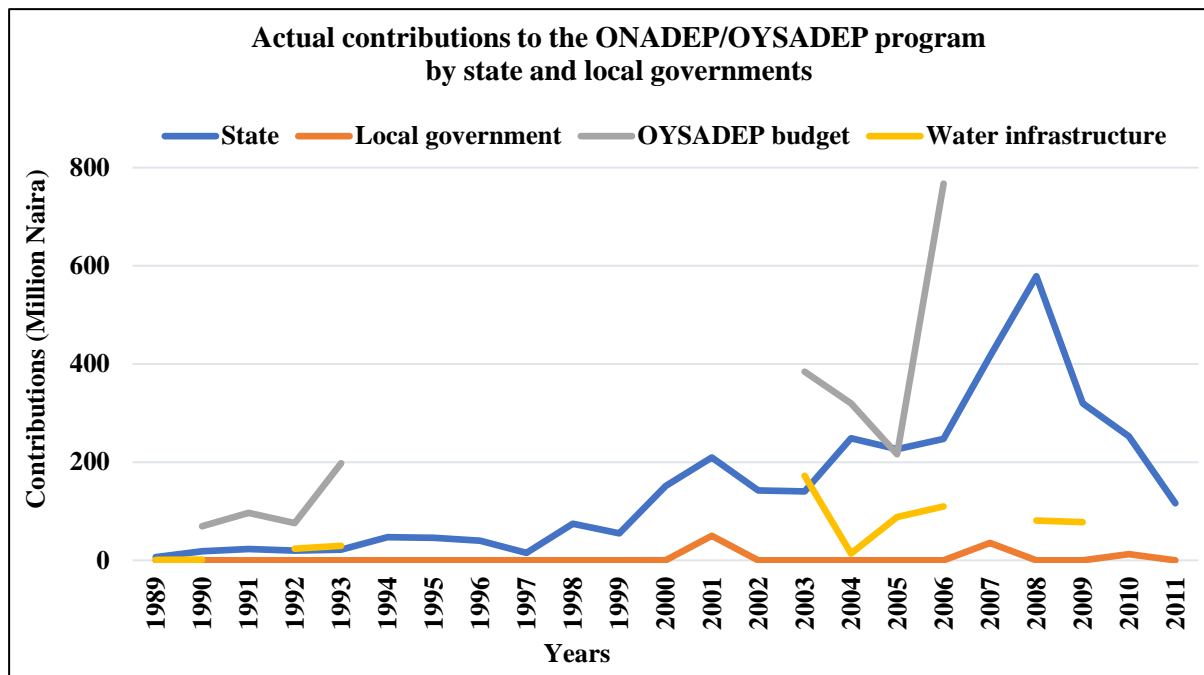
Water supply provision was tied to the conditions for loan extension, which the states and local governments had to share. Figure 5-8 highlights that the state government and OYSADEP contributed most of the funding expectations from the local government. Scenarios such as this inevitably subordinates the local governments financially to the states and affect the sustainability of water

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<sup>16</sup> Interview with project engineer, May 12, 2017

<sup>17</sup> Interview with project engineer, May 12, 2017

schemes. One such contractual condition was that the local government must maintain the constructed feeder roads, and the state water corporation must complete the purification and extension of the pipes



**Figure 5-8: Actual project contributions to the ONADEP by the state and local government between 1989 and 2011. Source: (OYSADEP, 2011)**

of all constructed dams before a loan extension is granted (The World Bank, 1980a, p. 5). Both the state water corporation and local governments reneged on this contractual responsibility because of financial problems (The World Bank, 1992a, p. 5). The maintenance plan showed that the yet to be created local government councils should assume management once the piped network was completed. However, this did not materialize due to the political problems during the implementation process; one such issue occurred between the state government and the project management team around staffing (ibid, p. 3):

It became apparent during project implementation that LGCs were neither financially capable, adequately staffed (e.g. no qualified road engineers), nor politically willing to take over the role envisioned for them. The attendance in the committees in the northern ADPs tended to be poor; the lack of receptiveness on the part of the LGCs led to a minimal training effort. (The World Bank, 1993, p. 35)

Just at the conclusion of the ONADEP project in 1989, the Òyó State military government changed ONADEP to Òyó State Agricultural Development Programme (OYSADEP) through edict number 8 that came into effect on April 1, 1989 (Òyó State of Nigeria, 1989) in readiness for the creation of *Osun* state. This change also coincided with the program's sustainability plan, aimed at transitioning to the second multistate ADP. Two years later in 1991, the federal military government carved *Osun* state out

of *Òyó* state, following the recommendation of the political bureau report. This move initiated the formal partitioning of OYSADEP's resources. Following the name change, OYSADEP's resources had to be divided on a 3:2 ratio between *Òyó* and *Osun* states respectively (OYSADEP, 1994, p. 22). Conceptually, the sharing ratio seemed fair; however, the majority of OYSADEP's fixed assets were located in the new *Òyó* state which left it in a stronger negotiating position as by the completion of the settlements about 70% of OYSADEP's infrastructure remained in *Òyó* state (OYSADEP, 1994, p. 22). In the *Ìgànná* case, these changes were also responsible for the four-year delay in closing the loan. ONADEP was to end in 1985 but this was not completed until 1989. Besides the political changes and the concomitant effect on local government finances and authority, the ADP program was also facing changes concurrently by transitioning from the second agricultural development project to the third. All of these contributed to the dysfunction that characterises water supply schemes across the country, where projects have to be rehabilitated periodically, as shown in Figure 5-9.



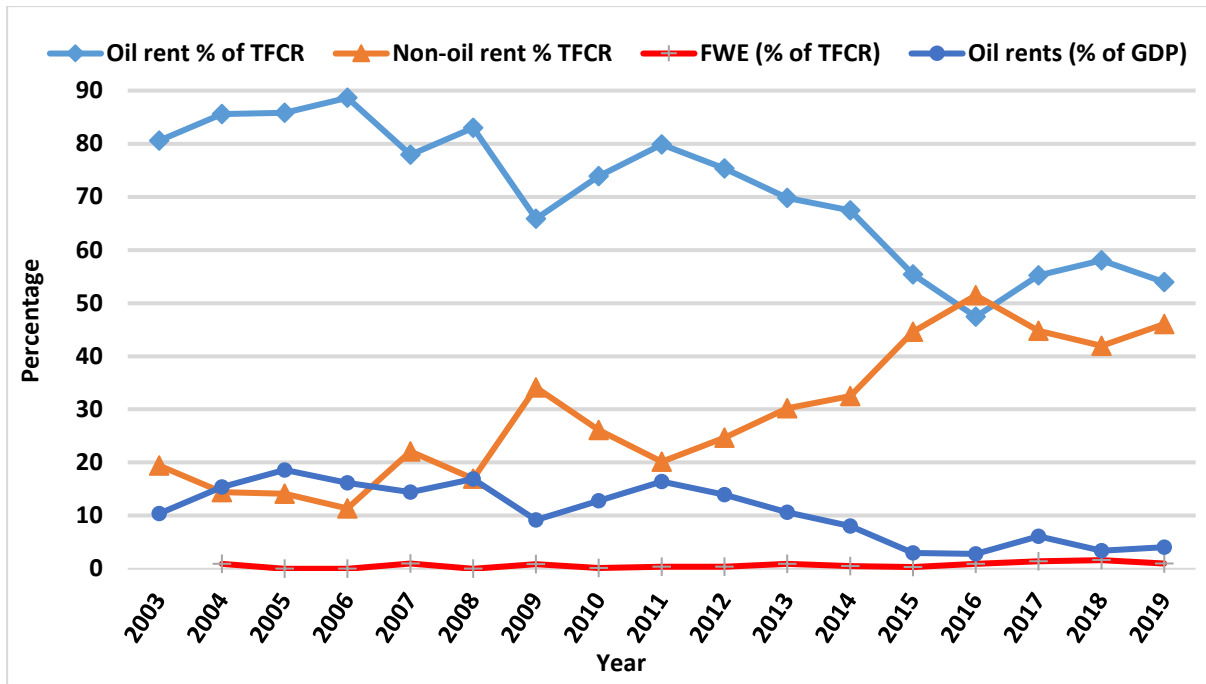
**Figure 5-9: Old (constructed 1985) and new (constructed 2017) pumps, storage tanks, and standpipes. Source: Author**

Political manipulation of the local governments by the state governments continued into the third republic and up until 2017. In 2011, the elected governor did not conduct a local government election for seven years between 2011 and 2017 and only appointed coordinators who were known to be appendages of the state government. The political intrigues behind the non-organisation of election is beyond the scope of this paper; however, one of the reasons proposed by some scholars is the governor's desire to maintain political and economic control over the local government and to punish local government electorates that voted against him during the governorship elections in 2011 and 2015 (Babalola, 2016). At the end of the project, 12 medium and large dams with a total capacity of 5,478,000 litres were completed as against the planned 40 dams (28 small and 12 medium-scale) with a capacity of 2,600,000. Over 40% of the wells were successfully completed (1391 instead of planned 300). Approximately 37% of these completed pumps were in *Kajola* local government under which *Ìgànná* was by this stage (OYSADEP, 1990, p. 6). *Kajola* was one of the three local governments in *Òyó* North at the time.

## **5.6 Escaping the military? The situation today– 1999 - till date**

As a former military head of state, President Buhari's May 29, 2015, inauguration indicated a return to large-scale hydraulic development by the federal government. The completion of the 40MW Kashimbilla hydroelectric power dam, the construction of the 3,050MW (US\$5.8 billion) Mambila hydroelectric power dam, and the near completion of the 700MW Zungeru hydroelectric power station, are a few of many stories of revitalising the hydraulic mission. Many of these projects were conceived in the 1970s and 1980s and left redundant or uncompleted. Today, a significant difference is that the technical and financial support comes from bilateral agreements with non-western countries, especially China and India (Chinese Ministry of Foreign Affairs, 2018; Ministry of External Affairs Government of India, 2019). Similar developments exist in the irrigation sector, with several abandoned irrigation projects rehabilitated in northern Nigeria. Produced in 2016, the product management strategy of the Agriculture Promotion Policy clarified its aims: "revitalising existing, and development of new, small (earth) dams, tube wells and wash bores" and optimise existing large dams for irrigation (Federal Ministry of Agriculture and Rural Development, 2016, p. 21).

Crude oil remains the primary economic engine of the Nigerian economy and the source of federal power over the different organs of the Nigerian State. The decline in oil rent as a percentage of GDP (Gross Domestic Product) and TFCR (totally federally collected revenue) from 2015 was balanced by the relative stability of non-oil rent contributions, allowing the federal government to maintain its political-economic power (Figure 5-10).



**Figure 5-10: Government income and water expenditure (capital) in Nigeria 2003–2019. Source: (Central Bank of Nigeria, 2020)**

Federal capital expenditure on water increased between 2016 to 2018 by three percent despite a reduction in oil rent. Specifically, between 2015 and 2020, the federal government's financial investments explain their direction, interest, and the pivotal role of the hydraulic mission in the broader developmental agenda. The consolidation of power at the federal level using the federal government's financial support for states is evident in the declaration of a 'state of emergency' in the water sector in 2018. A state of emergency uses the urgency narrative to mobilise all government resources to resolve a problem (Watts et al., 2019). Adoption of WASH has become a precondition for states to access federal grants and loans. During a speech at the launch of the national WASH plan, the president noted: "Henceforth, Federal Government support to State Governments will be based on their commitment to implement the National WASH Action Plan in their respective States and to end open defecation by 2025" (Buhari, 2018). Only two state governments, Enugu and Osun (Ogunnaike, 2020), have adopted the state of emergency idea. One reason for the states' reluctance to embrace this 'carrot' is the perceived subtle economic threat and an attempt by the federal government to consolidate federal power through water resources policy and legislation.

### **5.6.1 Resisting federal domination – the 2020 National Water Resources Bill**

Through the 2020 National Water Resources Bill, the federal government sought to accomplish two main objectives. First, to strengthen national control through institutional reharmonisation and

expansion of federal legal powers. Recentralisation through institutional re-organisation of water resources management started in 2011, following the creation of the Ministry of Water Resources as a standalone ministry. By 2014 the National Water Resources Masterplan was completed to develop new boreholes and rehabilitate others to meet the SDGs (Federal Ministry of Water Resources, 2014b). Building on this purpose, the 2016 National Water Resources policy sets ambitious targets to implement IWRM at every hydrological area and achieve 100 percent water access by 2030 (Federal Ministry of Water Resources, 2016b).

Concern over the consolidation of water rights by the federal government stymied the adoption of the 2016 water resources bill. The policy asserts that “*all water*”<sup>18</sup>, wherever it occurs in the water cycle, is a national asset and resource common to all, the use of which shall be subject to national control” (Federal Ministry of Water Resources, 2016a, p. 12). As a strategy, it seeks to achieve broader regulatory and administrative control for the federal water ministry. Honourable Femi Gbajabiamila<sup>19</sup> described the 2016 national water resources bill as “all-encompassing and contained solutions to water resource problems” (Gbajabiamila, 2017, p. 2). Since then, prominent religious leaders such as Pastor Adeboye and some politicians have also resisted the bill (Ososanya, 2019), leading to its suspension by the federal government in 2019 (Aileman, 2019). The bill was reintroduced and passed in July 2020 as HB 921 in the House of Assembly (National Assembly of Nigeria, 2020).

Requiring a concurrent Senate approval, the introduction of the bill in August 2020 (National Assembly of Nigeria, 2020) attracted criticisms and resistance from large sections of the Nigerian society, including politicians (state governors, senators, activists, and members of the House of Representatives), lawyers, labour unions, NGOs, and civil society organisations (CSOs). Section 2 deals with *the public trusteeship of water* “where the right to the use, management and control of all surface water and groundwater affecting more than one state is vested in the federal government” (National Assembly of Nigeria, 2020, p. 2). Although consistent with the 1978 Land-use decree, this right to water plays to the country's embedded insecurities in ethnic, religious, and political classes. Much around the intent of the bill to decentralise political power is at a time when calls for the political devolution of federal power for effective national development is rife.<sup>20</sup> Femi Falana, the famous Nigerian lawyer, constitutional expert, and human rights advocate, noted in an opinion piece that:

Given the current state of the law, the sponsors of the National Water Resources Bill should be told that it is dead on arrival. It is unconstitutional. In particular, they are advised to study the relevant judgments of the appellate courts above (Falana, 2020, p. 3).

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<sup>18</sup> Italics ours

<sup>19</sup> He is the current Speaker of the House of Representatives in the 9th Assembly but a Federal House of Representatives member when the bill was introduced.

<sup>20</sup> Nationalist agitations by two of the three dominant ethnic groups have heightened since President Buhari's election in 2015; first by the Ibos of southeast Nigeria and in 2019 by the *Yorùbás* of the southwest.

These struggles have forced the federal government on an education and familiarisation tour across the country, with the water minister appearing on a series of national radio and television ‘sensitisation’ programmes (Federal Ministry Of Water Resources, 2020). These constitutional and legislative struggles continue to threaten effective coordination and accountability between state and federal institutions. There is a problem of ‘superiority’ or a lack of ‘accountability’ when discussing a water supply rehabilitation project managed by an RBDA to rehabilitate 16 boreholes across two southwest states as noted by a state government official:

They (the RBDA) bring a project to implement in a community; now, this same community still wants you to bring another project, and the community that has nobody in the House of Assembly or the government is neglected. However, if the state government is carried along, everybody (state and RBDA) looks at the project and asks how we solve this problem? Why not site the project in this place? If we carry ourselves along, the infrastructure will be used to its optimum. So, there should be no conflict. But maybe for political reasons, I think it is purely for political reasons or because, can we say, superiority (Interview with state government official, 2017).

The official suggested that the RBDA used their proximity and access to more powerful actors within the federal executive, legislative, and jurisdictional establishment to undervalue the informal coordination ‘agreements’ between the states and the RBDA. Most rural and small-town water infrastructure projects initiated at the federal level, where federal (or state) legislators use their constituency budgets to work collaboratively with state institutions for development purposes, follow this pattern (Orimogunje, 2015; Udefuna et al., 2010).

A shift in water ownership, access, and distribution to private entities, and increased financial powers at the federal level, will further consolidate the neoliberal agenda (Bakker, 2010; Bayliss, 2013), and increase inequitable and unjust distribution and access between rural/urban and different socioeconomic classes (Ahlers & Merme, 2016). Among many others, the water bill's critique by CSOs centres on the World Bank's specific support for the bill to be legislated (World Bank, 2019). Indeed, the World Bank has historically promoted market-driven initiatives such as water commercialisation and privatisation to address water infrastructure issues in Nigeria (Ayeni, 2016; Gandy, 2006).

One of the priorities for commercialisation in the bill that sets it against societal interest is Section 75 in the criteria for issuing the driller's water well license for commercial operators. The bill notes that “no borehole driller, whether corporate or individual shall commence borehole drilling business in Nigeria unless such driller has been issued a Water Well Driller's Licence by the Commission” (National Assembly of Nigeria, 2020, p. 42). It thus vests the powers for license issuance in the new regulatory commission (WRRC<sup>21</sup>, a federal-level parastatal in Abuja, the federal capital). From an access,

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<sup>21</sup> Water Resources Regulation Commission

infrastructure governance, and development perspective, an individual, business, or government institution that chooses to sink a well must, for commercial purposes, procure a federal government license. Approaches like these ignore the fact that over 90 percent of Nigerians in rural and urban areas rely on groundwater sources for potable use, primarily relying on traditionally constructed artisanal wells and technology (diggers and shovels) for securing improved water access (Federal Ministry of Water Resources, 2020). Therefore, dealing with the commission hundreds of miles away for water access rights is incomprehensible, considering the bureaucratic issues the ministry has been accused of; for example, delays in pushing files through (Rasul & Rogger, 2018). Most water users from rural and urban settlements will resist such institutional and legislative overreach. Demanding compliance from such social groups will further the limits of federal power to total control of the country's peoples, spaces, and institutions.

## **5.7 Conclusion**

Using Nigeria as a case study, we attempt to re-evaluate the concept of the state hydraulic mission within a frequently changing political system. We draw on literature from political change, developmental states, and relational ideas of state-society relations of power. We use the logic of *resistance* to explain socio-natural reproduction within the Nigerian State through the historical processes, especially the material and ideological practices enrolled in the process. On the one hand, the post-independence Nigerian State unites in the economic development agenda driven by the national development plans and the agricultural development programmes. Nigeria's hydraulic mission was propelled by the logic of the developmental state defined by international organisations, foreign firms, academic institutions, and governments. Internally, the federally determined political ideology of 'national unity' held the country precariously together through its development plans. The federal government's attempt to mobilise and consolidate political power for 'national unity' and development is constrained by fundamental internal contradictions within the Nigerian State. In this developmental process, various political constituencies have contested financial, legislative, institutional, and material elements that make political hegemony for the hydraulic mission impossible.

We believe the Nigerian case and the approach we have taken contributes in three ways to the literature: gives insights into the different motivations for state-making and consolidation beyond the traditional arguments on spatial or autocratic control by the federal government; help explain some contributing determinations of other water-related issues beyond the traditional analytical tropes of corruption, fragmentation, ethnicization; and allows us question other analytical concepts in the political economy field that assumes a fundamental coherence of the nation-state. The Nigerian case adds a theoretical component to the analytical utility of the hydraulic mission by not seeing it as a coherent, persistent or strong concept. Rather to focus on the process of a nation-state's formation and evolution



by examining its political system and history when used in the global South countries. Focusing on the formation processes of hydraulic bureaucracies as a starting point can be further explored to understand the different stages of what constitute a modest or full hydraulic mission, and to define what a “full control of water” is.

Recent attempts by the federal government to pursue the hydraulic mission mimics the historical tendencies to centralise water resources management through the water resources policy and the water resources bill. Whereas the 2020 Water Resources Bill passed in the house, resistance from religious leaders, ethnic groups, influential individuals, labour union groups, and the media forced the federal government to abandon its push in the Nigerian Senate. Hence, the process of assembling a total hegemonic order to sustain the current hydraulic mission was stopped. While this resistance may limit the achievement of specific water-related goals, further research is needed to understand how these contested issues, roles, and responsibilities contribute to water infrastructure failure, a vital concern for sustainable water supply. To reduce these contestations, we propose constitutional changes to remove water infrastructure and services provision from the concurrent legislative list. This change will centralise water provision in one arm of government (preferably state governments), and allow the federal government to redirect its political and administrative powers towards regional and geopolitical water governance issues. Theoretically, the concept of the hydraulic mission and its analytical capacity in countries with rapidly changing political systems, where external factors primarily determine economic and development ideologies, needs revisiting. Because of these dynamics, the idea of a state hydraulic paradigm is rendered partially inapplicable and requires further theoretical work. The idea of the hydraulic mission needs additional work to integrate spatial reproduction and institutional changes.

# **PART C**

## **Connecting Scale and Infrastructure: People, Time, Place, and Space**

This part of the thesis answers questions 3 and 4 through an analysis of micro-level social and political relations.

## Chapter 6: Water infrastructure as a boundary marker: Standpipes, authority, and the re-appropriated space in Òyó State, Nigeria

Adeniran, A. B., Daniell, K. A. (2022). Water infrastructure as a boundary marker: standpipes, authority, and the re-appropriated space in Òyó State, Nigeria, *Environment and Planning E: Nature and Space* [UNDER REVIEW - *Unpublished at the time of thesis submission*]

**Sub-question 3:** How does the state affect relations of power at the community level, and what effect do they have on water users and their access to water?

### Chapter introduction

This chapter unpacks the ideological and ideational formation process in groups and the development of political hegemony in society. Analysing violence, authority, and order around the standpipe shows how individual practices and aggregated meanings become ideological. In this instance, the standpipe is viewed as a *boundary marker* between state and society to answer a policy and theoretical question in rural water governance. Using the *Ìgànná* water supply scheme, the analysis at the everyday level of power relations around the standpipe as a source of water access showed how Òyó state government's policy commitments translate on the ground.

With policy-related findings, the chapter illustrates how the state's policy recommendation on water access (*one standpipe/250 persons at 50 litres per person per day*) is not reflected at the standpipe because of the relations of power and struggle for water access. Essentially, the Òyó state government's intention cannot be achieved by the standpipe due to the struggle between different water user groups and the corresponding volumes of water consumption. The strategies of power exercised in these social and political struggles vary across individuals, groups, and spaces. Mundane objects such as *buckets* or ideas like *low water pressure* are used as strategies to consolidate or negotiate power. Similarly, the findings show that proximity to a standpipe determines who gains authority to manage it. Therefore, selecting members of the community management teams should consider individuals stationed close to the standpipe; hence, shifting away from the generic approach, where local chiefs and kings decide who sits on the team, will improve the selection process.

The chapter contributes to the theoretical literature on power by suggesting the 'hierarchy of stakes' as one way to analyse power. This lens is useful because the stake of social and political struggles determines what strategies and techniques of power are used and what networks are strengthened. The

hierarchy of stakes is a proposition that in a development project, there is a central stake around which lesser stakes are generated.

### **Abstract**

Analyses of governance challenges facing rural water schemes often ignore the role of power in decision-making spaces. This article addresses parts of this limitation by exploring how power shapes access to water using *the Ìgànná* water supply scheme as a case study. By integrating Pierre Bourdieu's concept of social space and symbolic power with Michel Foucault's disciplinary power, we interrogate the production and accumulation of authority around the standpipe as an 'unregulated' space and its impact on equitable access to water within the community. We argue that water infrastructure as a *boundary marker* for demarcating state-society relations, allows an examination of how spaces and authority are appropriated and validated. Our main contribution is that we examine political dynamics around the standpipe to show how practical authority to manage the standpipe and inequities in individual water access emerge, to influence policy interventions in water access ratio and selection of community management members.

## **6.1 Introduction**

Through its state water supply schemes<sup>22</sup>, Òyó state government intends to meet its rural<sup>23</sup> potable water access deficit of 71 percent (National Bureau of Statistics, 2017, 2018) at a ratio of 1:250 (one standpipe/250 persons) and 50 litres per person per day (Òyó state Government, 2011). These schemes consist of ponded streams and rivers and distributional networks of underground pipes and surface standpipes (Janus & Jaeger, 2011). Standpipes (Figure 6-1) are components of a water supply infrastructure where people gather around a pipe to access potable water. However, in Nigeria, most of these schemes are either dysfunctional or no longer used (Andres et al., 2018), raising critical concerns on how power and access play out in their management (Hope, 2015; Whaley & Cleaver, 2017). At an individual level, unequal water access can result from the effect of low water pressure in a distributive network and the behaviour of powerful individuals or groups at the standpipe.

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<sup>22</sup> Water supply schemes as a collection of water supply infrastructure are important ways that governments at all levels deliver potable water to their citizens.

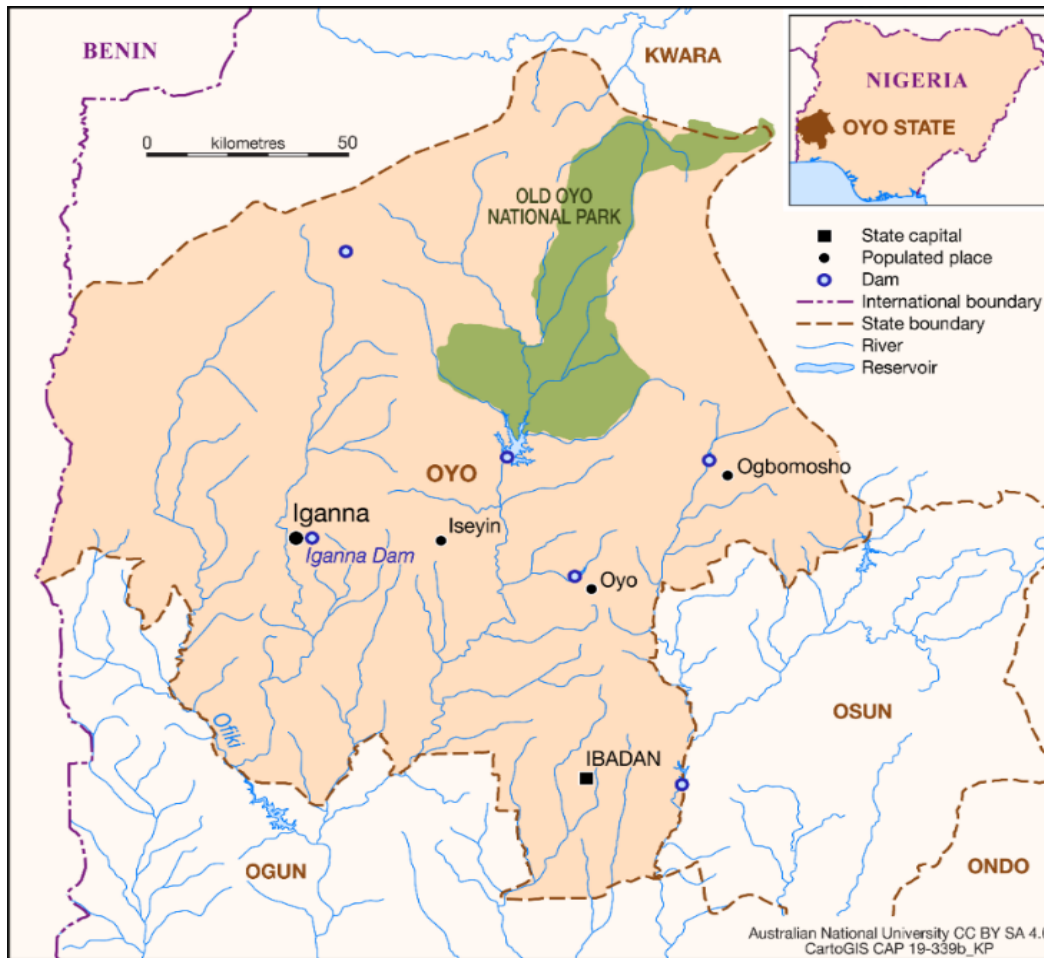
<sup>23</sup> The Nigerian National Population Commission defines a rural community as one with a population of 150 to 5,000 persons (NPC and ICF International, 2014).



**Figure 6-1: A public standpipe in *Igànná*. Source: Lead author**

One such scheme is the *Igànná* water supply scheme in *Igànná*, a rural town in the northern region of Òyó State (Figure 6-2) with a population of 17,000 (Òyó State Government, 2017).

Studies that seek to understand everyday relations of power in water infrastructure governance have disproportionately focused on urban water infrastructure (Akpabio & Rowan, 2021; Alba et al., 2020; Dakyaga et al., 2021; Lund, 2006; McFarlane & Rutherford, 2008; Truelove, 2020), raising concerns as to what extent the policy and theoretical insights are transferable to rural sites. Crucial insights from studies that acknowledge the plurality and complex embeddedness of institutions and privilege meaning and power in governance arrangements on the institutional dimensions of rural water governance have been provided by critical institutionalist scholars (Clever & De Koning, 2015; Cleaver & Whaley, 2018; Hall et al., 2014). However, due to their institutional focus on water governance and access, an analysis of individual–relational power when negotiating or making compromises in rural water governance (Clarke-Sather, 2017) is needed to further explore ‘practical authority’ (Abers & Keck, 2013) as a necessary type of authority for access and justice (Meehan, 2019). Hence we ask: *How does authority emerge from power relations around a water infrastructure within specific spaces?* We investigate the intersection of material and incorporeal registers of power within the community to broadly respond to what Whaley & Cleaver (2017) suggest: “A need at the community level to look beyond the form and functioning of formal organisations such as the water point committee” (WPC) (2017, p. 62).



**Figure 6-2: Map of Òyó State, Nigeria, showing Ìgànná dam and town**

Instead, attention must turn to the “sociopolitical milieu in which such organisations are embedded and in the ways wider community dynamics influence both the relative functioning of the WP and the degree to which equitable access is secured” (Whaley & Cleaver, 2017, p. 62). As a culturally homogenous community, Ìgànná is a useful case to study the differences between urban and rural areas.

Following Kelly-Richards and Banister (2017), we examine ‘spaces of informality’ as ‘unregulated’ or ‘uninstitutionalised’ spaces; sites without state regulatory control and where the banalities of state power are practically absent, but only represented by a water infrastructure – the standpipe. We argue for the connection between spatial proximity and accumulation of authority to be taken seriously when analysing legitimate authority and power in rural water governance. In this sense, through the conjuncture of social relations and water policy/infrastructure, we look beyond the “innocuous” state practices (Meehan & Molden, 2015, p. 447) and their observable effects on societal relations and water governance outcomes. Conceptually, we integrate Bourdieu’s symbolic power and

social space with Foucault's disciplinary power<sup>24</sup>, to explore the evolution of authority around the standpipes, specifically, how new actors emerge when 'uninstitutionalised' territories are contested. Our main contribution is the use of power research to influence water policy decisions on water access and community management, a common challenge in water governance (Loftus, 2020; Whaley, 2018).

*Ìgànná* water supply scheme was selected primarily for two reasons: resonance and generalising, following Lund (2014). The cultural and technical elements of the scheme resonate with similar schemes in rural southwest Nigeria. Although the internal dynamics of rural settings differ in Nigeria, the broader attributes may resonate with the *Ìgànná* case. Second, we can generalise the patterns of social practice and accumulation of authority to govern the standpipes despite the differences in material positions of the supervisors from the observations of the three standpipes. These two points led us to question the prevalent method of selecting members of water users associations and the *Òyó* state policy assumptions on water access in the conclusions. This article is based on data from ethnographic fieldwork between April and June 2017 and a follow-up visit in January–March 2018. In total, ten semi-structured interviews and three focus group discussions were conducted by the lead author: one hotel owner; the *Oba* and palace chiefs; three government ministries; two officials from *Òyó* state government agencies and corporations; three standpipe 'supervisors'. Historical information on *Ìgànná* and its water access issues was sourced primarily from World Bank documents and the Nigerian National Archives in *Ìbàdàn*. In addition, informal conversations with the local guide proved valuable and mirrored an in-situ approach (Sukraroeck, 2013) and with the 12 additional community members. Following this introduction, we provide a brief description of the *Ìgànná* water supply scheme. We then outline our theoretical position that couches water infrastructure within Bourdieu's social space but is enrolled in practice by applying symbolic power and Foucault's disciplinary power. The last two sections examine the re-appropriation of space and the legitimation processes of legitimate authority around the standpipe.

## 6.2 *Ìgànná* water supply scheme

*Ìgànná* dam is the primary water supply source in the community, accessible and used extensively by the inhabitants throughout the year, more intensely during the dry seasons from November to February. The region experiences limited rainfall during the dry season between November and March, with a notable negative impact on access to water supply. The *Òfíkí* River (the annual stream on which the *Ìgànná* earth dam was constructed in 1985) was the primary pre-colonial water supply source, aside from other open and shallow wells. Water levels at these sources suffer severe fluctuations, partly due

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<sup>24</sup> Building on Hoy's (2004) complementarity hypothesis and Risto Heiskala's synthetic power conception (Heiskala, 2001), the complementary and integrative possibilities of both theorist and the potential it delivers for power analysis is examined in an unpublished paper. Similar attempts have been made by Hannus & Simola (2010) for understanding power mechanisms in education and Schlosser (2012) for empirical sociology of prisons.

to the limited rainfall during the dry season and because *Ìgànná*'s geology consists of basement complex rocks and is known to have limited porosity; therefore, poor for groundwater development (Adagunodo et al., 2013). *Ìgànná* is a hilly town covering a land area of 2,529 square kilometres, with thick savannah forest and woodlands. The dam refers to a captured body of water and is used interchangeably with reservoir by the scheme's actors. A project engineer, mid-level management from Water Corporation of *Òyó* State (WCOS) (*Òyó* state government statutory body responsible for water supply management) coordinated the engineering aspects of the project during construction.

*Òyó* state government owns and manages the dam and project through the WCOS. The WCOS liaises with other state government agencies and parastatals such as the *Òyó* State Agricultural Development Program (OYSADEP), the Rural Water and Sanitation Agency (RUWASA) and the *Òyó* state Ministry of Agriculture. The local government authorities and WCOS have the institutional mandate to provide potable water supply in *Ìgànná* as contained in Paragraph 26 of the *Òyó* state water policy, which "empowers the state ministry of water resources to coordinate water schemes in *Òyó* state" (*Òyó* State Government, 2011). Paragraph 30 of the state water policy also mandates the local government to be:

responsible for the establishment, operation, and maintenance of rural water supply schemes, in conjunction with the benefiting communities be through the establishment of a unit that shall be technically equipped, adequately funded and staffed (ibid).

WCOS operates local water offices in towns with water schemes and is tasked with maintaining the project's standpipe and other technical and engineering components. These maintenance tasks may include replacing the tap head if damaged and responding to calls for leaks in the pipe network, amongst others. The scheme has a capacity of 180,000 cubic metres, large enough to meet the potable water needs (for drinking and other basic domestic needs) of *Ìgànná*'s population (*Òyó* State Government, 2017). The dam is approximately 1.1 km from the *Oba*'s palace, where three standpipes are erected<sup>25</sup> and connected to water storage tanks. Approximately 25 percent of the new distribution pipes have been constructed at an interval of 70–100 m apart. The interconnectivity between the standpipe and the dam allows an understanding of the spatial distribution of water infrastructure within the *Ìgànná* community. Potable water is pumped uphill from the station approximately 250 m away into the 250,000 m<sup>3</sup> steel water storage reservoir via a step-down pump before supplying the standpipe network through gravity. Gravity fed water supply systems are mostly common in rural areas and affect the balance of water pressure along distributional network as Nixdorff (2020) shows in Haiti. Through the effect of *low water pressure* on the standpipe, we explore the interplay of relations of power among water users and broader social and political dynamics in the community.

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<sup>25</sup> Personal observations recorded in field notes, April 2017.



### **6.3 Water infrastructure as a boundary marker – relating social space, symbolic and disciplinary power**

Following in the tradition of scholars in the non-state-centric analysis and infrastructure governance in the global South and West and Central African countries (Dakyaga et al., 2021; Lund, 2006; McFarlane, 2008; McFarlane & Silver, 2017; Alves, 2021; Stacey & Lund, 2016), we consider water infrastructure (standpipe in this case) as an objective *boundary marker* between state and society. This thinking draws on the work on boundary objects as maps, models, and scenarios, and connects knowledge production with decision-making (Lang et al., 2012; Star & Griesemer, 2016; White et al., 2019). We draw explicitly on the proposition that technological objects can function as boundary objects by analysing the social meanings they generate and transmit in their relation to knowledge production and transmission (Fox, 2011). Boundary objects in this sense can either facilitate or impede communication depending on what they mean to individuals or groups (Fox, 2011). This integration of social meaning to a technological object acknowledges “the social and power relations that a technological object mediates” (Fox, 2011, p. 82). The structuring effects, material and immaterial, on bodies and spaces can be explored along the peripheries of social and political power relations away from the centre (Sultana, 2020), and vice versa, by isolating and identifying (decentring) specific strategies, instruments and techniques, issues, and stakes of the constitutive struggles for authority.

Arguably, the effects of state power are activated around the standpipe (and the dam) through the re-appropriation process and the stake of social and political struggles it engenders. If violence, authority, and order are the prime markers of state power (Castells, 2011; Painter, 2016; Watts, 2017), then the fuzzy spatial (territorial and imaginary) boundaries within society and between state and society (Boelens et al., 2016; Mitchell, 1991) can be explored discretely. Around the standpipe, authority as the gradation against which asymmetrical relations of power is measured can be isolated to examine power relations that produce it. To undertake such analysis, we account for the processes of accumulation of authority, the actors and their spatiality within the community, and the stakes and ideological instruments used in the social and political struggles around the standpipe – essentially, how the effects of the standpipe structure and modulate societal relationships to create new modes of socio-technical relations. In this sense, infrastructure and its spaces are enrolled as cultural, social and technological objects to validate legitimate authority (Clegg & Haugaard, 2009; Haugaard, 2009).

What is generally referred to as ‘everyday politics’ (Kerkvliet, 1990, 2009) of infrastructure governance (Lund, 2006; McFarlane & Silver, 2017; Truelove, 2020) we suggest is, in fact, a type of governance comparable to (except in the scale of territory, authority, and violence) what can be called the ‘as-if ontological state’ (Hay, 2014; Jessop, 2014). Similar to the state in function and practices, the differentiating element between the state and practical governance is this: the authority produced from everyday politics is not durable and it is limited in space, whereas, the state’s territorial extent and its monopoly of violence used to extend territories and maintain order and longevity guarantees its authority

and durability. To a large extent, the exercise of power and authority ensures social and political order through violence. Therefore, the ontological state of everyday people is what matters and should be considered vital when analysing their relations to authority because authority structures their abstract and material realities which determines how they perceive legitimate authority.

To examine the objective relations of power and how it is inscribed in bodies, we view power relations to occur within a social space, a space that exists simultaneously as an “abstract space and a physical space”, inscribing itself in both spaces through the actions of agents (Bourdieu, 2018, p. 109). The *social space* is structured and characterised by “distributions” (Foucault, 1995, p. 143) or distinctions (Bourdieu, 1996) and the differentiation of agents and things. We draw on symbolic power as the power to make groups through the imposition of a worldview in peoples' minds (Bourdieu, 1989b) within the social space. Symbolic power generates, reveals, and transforms social situations, mobilised only through its recognition by those it seeks to dominate (or intend to). Thus, seeing beyond interpersonal relations and relations with things is necessary as “the truth of the interaction is never entirely contained in the interaction” (Bourdieu, 2013, p. 81). By applying symbolic violence, the physical space (Bourdieu, 1995) can be transformed into an appropriated space (Bourdieu, 2018) where different fields of power (capitals) operate (Bourdieu, 1989b). Over time and under a different set of conditions, an appropriated physical space can be re-appropriated to become a disciplinary space. a “functional site” to normalise individual practices (Foucault, 1995, p. 215). Hence, to observe and explain the process of change in authority and water access, we examine the re-appropriated space through an imposition of water infrastructure – a public standpipe.

Appropriating a physical space from the social space relies on the *classificatory, mediating, and generative* function of the habitus<sup>26</sup>. The effect of the interaction between the symbolic representations of capitals (generosity) and the habituses of the agents is the essence of the social space because it transforms the social space into a symbolic space. To produce common-sense, the habitus *mediates* the dialectical relationship between the individual habitus (supervisor) and an *objective event* (butcher movement in town or low water pressure). The habitus inscribes itself and being inscribed in the social space in two ways: It seeks the conjuncture of past and present positions within the social space, and the objective positions and distance (e.g., physical and mental) to produce transformational practices and collective action (Bourdieu, 2013, pp. 82–83). The habitus transforms dispositions to actions and ensures that the time-defined process of domination and naturalisation persist (Bourdieu, 2013).

The process of domination entails the communication of objective reality (common-sense) to institute differences and distinctions, highlights a specific discourse to create a myth or ideology that binds the group, creates an imaginary integration of the group (around the standpipe), disempowers the

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<sup>26</sup> “a system of lasting, transposable dispositions” and “a durably installed generative principle of regulated improvisations (Bourdieu, 2013, pp. 78–81)

dominated group(s), and legitimises the established differences and hierarchy (Bourdieu, 1979, 1985). The process of dominating an appropriated physical space also requires individuals or groups to acquire more locale-related *profits of space* in the political and symbolic struggle, orchestrated through the transmission and conversion of capital into symbolic power (Bourdieu, 2018). Profits of space occur when there are unequal chances of access in the spatial distribution of agents (localised bodies as holders of capital, e.g., supervisors) and the distribution of goods and services (standpipe and honour). In practical form, profits of space appears as *profit of localisation* (Bourdieu, 2018, p. 110). Social or political struggles that produce profits of space can either be individual or collective and exist in three different types. First, *rents of situation* in which proximity to things or people within the physical space grants some symbolic capital or can be mobilised in the symbolic production of such. Second, *profit of position or rank*, where an individual's (or group) social position confers prestige or increases the capacity to accumulate and consolidate their social or cultural capital to pursue symbolic profits. Third, *profits of occupation*, where possession of a physical space grants the power to exclude individuals, groups, or things (Bourdieu, 2018). At an individual level, the profit of occupation works through the occupation of a locale to increase the chance to 'aggregate opportunities of appropriation of different materials or cultural goods and services available at a given time' (Bourdieu, 2018, p. 111).

The creation of a physical space presupposes the formation of groups that unfold through the logic of classification. Using these classificatory principles, we differentiate the groups (theoretical classes) by their distinctive objective properties, as they objectify and inscribe both physical and abstract spaces. This act of classification is a "struggle for classification" (Bourdieu, 1998, p. 11). Given that it is a stake in the social and political struggle for differentiating spaces, it is a fundamental analytical problem. To analyse the genesis of groups yet to be constituted (around the standpipe), we begin by identifying the organising principles of differentiation of the groups around the standpipe, how they are constructed and operate within the broader social space (*Ìgànná* community); specifically, looking for the stakes and instruments of the struggles and the different types and structure of capitals accumulated and deployed in the struggles (Bourdieu, 2018).

The process of normalising domination requires normalising judgement as an instrument of disciplinary power that allows holders of power to compare, differentiate, hierarchise, homogenise, and exclude (Foucault, 1995) dominated groups or individuals through correct training. Normalising the judgement of a dominant group is necessary for order and achieved by the repetitive application of specific strategies and techniques. We identify the techniques or strategies applied and the different objective entities they assume when constituted as an ensemble of "instruments, techniques, procedures, targets or levels of application" to be exercised by individuals or groups (Foucault, 1995, p. 215). For example, the efficacy of a tub (water infrastructure) as a corrective instrument is bound in a double system of "gratification-punishment" (Foucault, 1995, p. 180). When carried out perpetually, it

normalises behaviours and consolidates authority through subordination. Thus, the social order inscribes itself in individual and collective bodies to make them embody the *norm*.

## 6.4 Spatial appropriation and accumulation of authority

### 6.4.1 The standpipe as a re-appropriated physical space

The standpipe occupies what we term a *re-appropriated physical space* for two reasons. First, the 2017 engineering redevelopment of the standpipes network along the old *Òkehò* road follows a similar route to the first reticulation (piped) in 1989 (OYSADEP, 1989) and subsequently in 1995 (OYSADEP, 1996). Figure 6-3 shows the new pipe network along the old *Òkehò* road, which follows a similar distributive pattern as the old scheme. On both occasions, the state government, through the Water Users Associations (WUA) had a designated management arrangement for the standpipes.

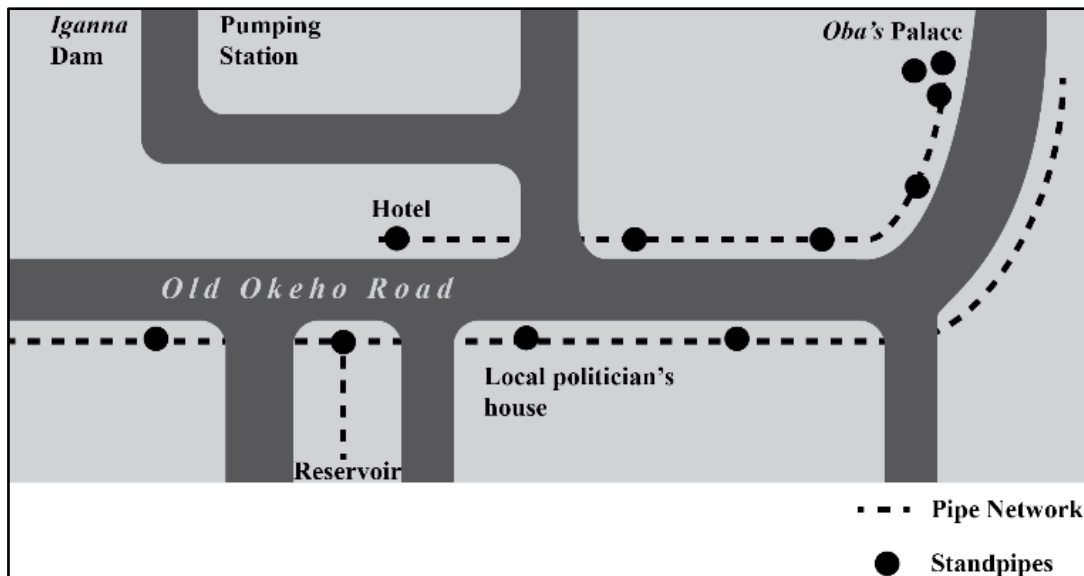


Figure 6-3: A spatial representation of the *Ìgànná* water supply scheme

However, the 2017 reconstruction had no formal governance arrangement at the standpipe. WCOS erected the standpipes on the offset of *Òkehò* road (government land), adjoined to private lands or houses without consultation with the people or property owners. While this action is guided by the state government's expectations of rural communities to "take full ownership" of water supply facilities provided by the government (*Òyó* State Government, 2011), the community may not be well-equipped or organised to manage the contestations arising from such *uninstitutionalised spaces*, sustainably. Without some direction or active involvement of WCOS or other institutional mechanisms at the structural level, for example, traditional governance mechanisms, water users undertake the management of the standpipe without specific direction or support from any government agency. Water

access is more personal and experiential at the standpipe, entailing daily face-to-face experience and different challenges arise because of the diversity of actors at the standpipe.

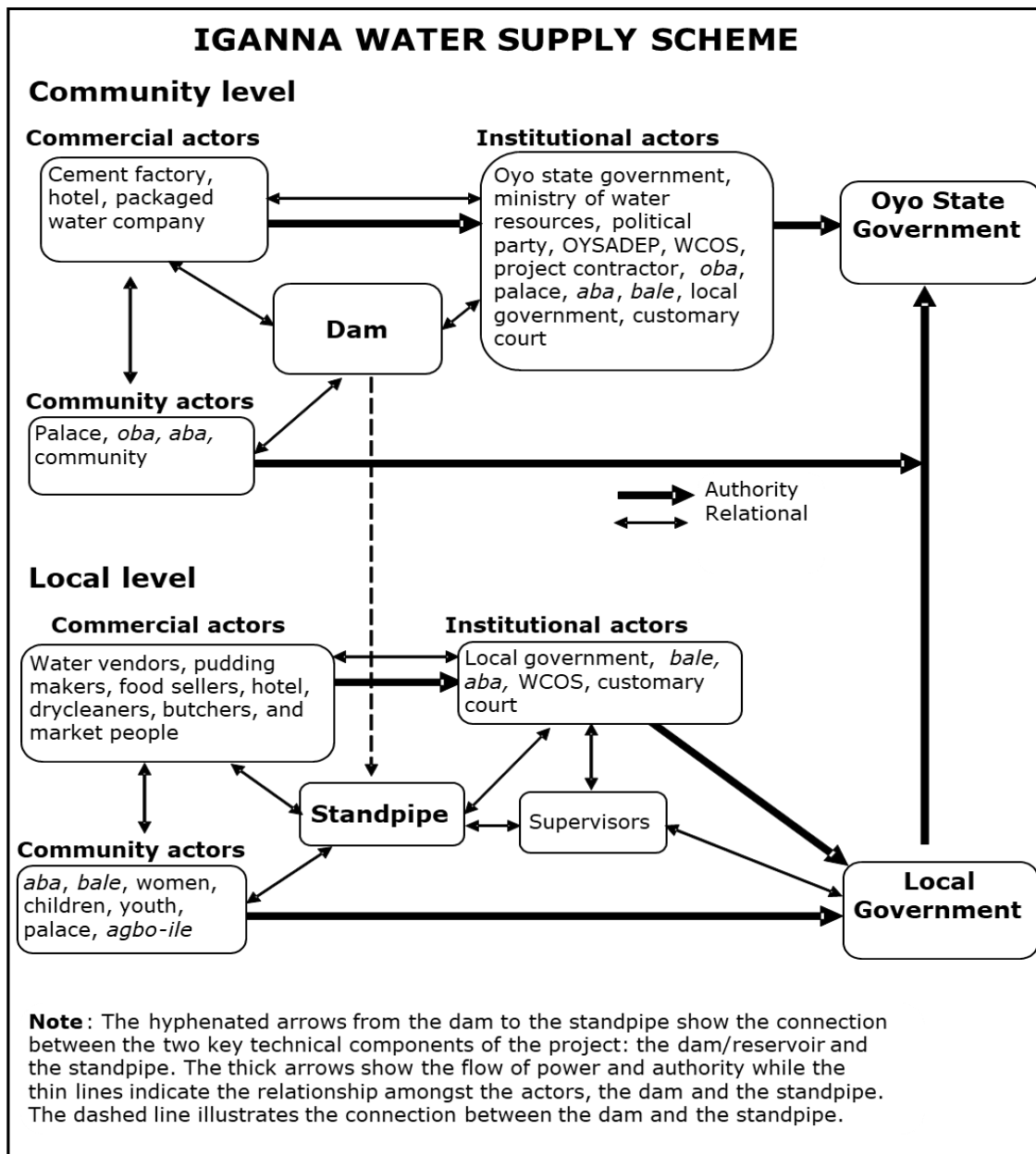
### 6.4.2 The basis for the formation of water user groups at the standpipe

Specific classes or groups of users around the standpipe reflect the divisions and positions they occupy within the social space. Figure 6-4 shows the different groups and their relationship to the dam and the standpipe. The groups emerge from and are produced by the relationship between their differentiated positions within the social space and the relations of power inherent in the different capitals they hold. Time is a critical element in the accumulation of symbolic capital (Atkinson, 2019; Bourdieu, 1986); for example, in the amount of time devoted by the agents to specific labours and tasks, or in its relation to the distances (physical) between the standpipe and other locations of power. We classify three broad manifestations of the differences in distances in social spaces to show the economy of their symbolic production: (1) the *distance between each standpipe* due to their location at 70 m–100 m apart; (2) *distance between each standpipe and the spaces of concentrated power*, for example, between the standpipe and government office. Each standpipe is managed by an individual who often must expend labour of time to maintain communication between the different institutional actors; for example, local government office, WCOS, market (for purchase of parts and other standpipe-related materials); (3) *distances between the standpipes and the multiple locales occupied by each agent*. Water users that converge at the standpipe to collect water are multi-situated, sometimes mobile, or temporarily situated in different locales within the community. These differentiating principles are fundamental to how the different groups (classes) operating around the standpipes are constructed.

### 6.4.1 The genesis of groups and classification of groups

As an appropriated physical space, the standpipe is an arena where the interfering reaches of symbolic and disciplinary power are observed; one that requires authority and breeds contestation for that authority. Symbolic order is necessary for fair and equitable access to water at the standpipe, which requires an authority to exist and be sustained. Building on the stakes and fields embedded around the standpipe and the social and political struggles they engender, four interrelated, objective, and distinctive differences in their social positions within *Ìgànná* were used to categorise the four key groups at the standpipe: commercial actors; institutional actors; community actors; and supervisors. The four differences are: water use/consumption; water extraction (at the standpipe); geographical location (situatedness); and mobility. Characteristically, each standpipe represents a multidimensional “enclosure” (Foucault, 1995, p. 141) because of their spatial distributions along *Òkehò* road and the governing structures and systems created around them. Short equidistance means that some symbolic

and material exchanges occur between them. Each standpipe has a ‘permanent’ group of people who often, by their propinquity to and sociability around the standpipe, access their water from the



**Figure 6-4: The actors and power relations in the *Iganna* water supply scheme**

standpipe.<sup>27</sup> Such groups are automatically excluded from decision-making around a different standpipe when attempting to access water from it as noted by a community actor: “some people from that *agbo-ile* often come here to fetch water when their standpipe is broken down, but the supervisor makes them

<sup>27</sup> Personal observations recorded in field notes, April 2017.

wait a little longer than most who fetch here”<sup>28</sup>. In this sense, each standpipe is also characterised by different rules that are differentially applied within that space.

Access to water from the standpipe remains the fundamental stake over which collective symbolic struggles occur at the standpipe. Thus, the deployment of individual habituses to achieve symbolic efficacy and order is geared towards this objective. Symbolic struggles inspired by these relations of power are seen in the actions of the different actors present at the standpipe. On this basis, the distinctive properties of each group are used to allocate water users into specific groups. Hence, commercial actors, institutional actors, and community actors are homogenised (united) around specific material (economic), ecologic (water) and symbolic properties that drive the stakes of everyday social struggle.

The *commercial actors* are classified based on their commercial interest and water-intensive business activities (consumption volume). They take large quantities of water from the dam or the standpipe and are guaranteed a distinct level of rootedness. Commercial actors generally operate from two main locations within *Ìgànná*. First, *large water* users operate from fixed/designated locations such as local market, hotel, cement factory, packaged water company, and *above-average* users such as dry cleaners and pap makers who work from home. Their water consumption thus profoundly affects the standpipes closest to their fixed locations. Second, they also operate at various locales. *Above-average* users such as food and water vendors are more physically mobile than other actors with fixed locations who hawk their goods around town.

Commercial actors consume more water than the average domestic household. For instance, the butcher uses more water on average than a fruit seller. The nature of the butcher’s work (its network of relations from the abattoir to the display stalls) makes it possible to aggregate them with other commercial actors similar in consumption pattern. The butcher is also highly mobile, occupying different locales at different times as he hawks his meat around town. This mobility incurs additional water use, such as wetting the meat at intervals as he traverses the town, often in 30-degree heat. The butcher’s stall in the market offers him stability and permanence where he must keep the meat wet and appealing to customers. The repetitive nature of these practices, daily, sometimes hourly, and their physical distance from the water sources (standpipes) ensures that the durability of these dispositions in the habitus is reinforced and inscribed. The interplay between the pressure of time, the urgent need to sustain their economic capital, and their water consumption define the political actions they display at the standpipe.

*Institutional actors* are key ‘decision-makers’. Holding legitimate authority, their rules and laws (mis)govern the socio-technical (material and immaterial) spaces. Different individuals, depending on their location across the town, embody institutional power, but the standpipe also embodies and objectifies institutional power as it mediates relations between state institutions and water users that are

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<sup>28</sup> Interview with a community agent, March, 10 2018

situated and culturally stable. Other actors recognise that power, agency, and institutional authority reside in these spaces and may determine equitable water access. Historically, colonial institutional agents contributed to inequal water access in *Ìgànná* through the decisions made by the water authority on the geographical location of new wells. Recognising the existing hierarchy of authority and relevance in the community, the 1952 rural water supply programme marked four new wells for construction, all to be located on old *Okeho* road as follows: ‘one in *Shabigànná*’s compound, one in the dispensary compound, one in Baptist school compound and one on the hill leading to *Ofiki* River’<sup>29</sup>. This allocation pattern has continued until today as earlier highlighted.

At the traditional governance level, the *Oba*’s<sup>30</sup> (king) palace and *abá* (camp or settlement) are the physical and symbolic space. As the supreme political authority for the community (*ilu*), the *Oba* governs with the support of his *olóyès* (palace chiefs), whose role is to advise and update him on events in their respective domains. The *abá*, the smallest geographical unit before the individual households (*agbo-ilé*), is governed by a *Bale* whose role “is to maintain the peace in his settlement” (Schlitz, 1980, p. 151). *Abá*, in most cases, is an agglomeration of consanguine family units. *Agbo-ilé* is the basic social and political unit of the *Yòrùbá* (Olajubu, 2012). As spaces for adjudicating and resolving conflicts, these descriptions and community structures are characteristic of the *Òyó Yòrùbá*<sup>31</sup> whose social and political organisational structures are sufficiently recorded and documented (Bascom, 1955; Forde, 1951).

The *Oba*’s institutional authority is limited to important decisions on commonly held resources such as land (or access to) and/or granting permission to government requests for appropriate location of the development project (e.g., water scheme). The *Oba*’s other roles include advocacy and consultation with politicians and government officials. For instance, the current pump station is located on land allocated by the previous *Oba* after consultation with his *olóyès*.<sup>32</sup> At the state level, the WCOS office and the *Ìgànná* local council development authority (LCDA) headquarters in *Ìgànná* town are a visible representation of the institutional actors’ material organisation and a symbol of authority. The local customary court provides conflict resolution services on issues that intersect traditional, state, and customary rules and boundaries. Institutional agents do not engage in everyday water-related conflict management, as attested to by the *Oba*: “I never had to settle any water related conflict; the *olóyès* resolve most of such issues before they escalate to the palace”<sup>33</sup>. This signals a lack of involvement (consultation, official nomination) of traditional institutional agents in the emergence of the supervisor.

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<sup>29</sup> National Archives, Ibadan correspondence between the *Òyó* resident Officer and the provincial office, 999/2/103, 28 February 1953

<sup>30</sup> The official title of the *Oba* in *Ìgànná* is ‘*Shabigànná*’.

<sup>31</sup> *Òyó Yòrùbá* is one of the sub-*Yòrùbá* groups. Historically, they occupy most parts of the northern region of *Òyó* State and dominate the *Yòrùbá*’s political, sociological, and cultural practices.

<sup>32</sup> Interview with *Oba* and his *olóyès*, March 9, 2018.

<sup>33</sup> Interview with *Oba* and his *olóyès*, March 9, 2018



*Community actors* are deeply rooted in the community. They constitute, shape, and maintain the community's local, institutional, and cultural governance arrangements. Community actors are everyday people who are versatile and undertake different socially constructed positions that intersect with other actor groups. They use water primarily for domestic purposes, observable in their frequency at the standpipe and the volume of water they fetch. The *Yòrùbá* are the dominant ethnic group in *Ìgànná*, with historical, spiritual, linguistic, and cultural connections to the region. However, there are sprinkles of other ethnic settlers in the town, such as the Fulani herders.

The *supervisors* are a set of actors with authority emerging under different sets of symbolic interactions that precede the installation of the standpipe and the relations around it. The absence of formal water management committees (WMCs) to manage the standpipes raises peculiar problems for who assumes the management responsibilities. In addition, institutional actors do not engage in everyday water-related conflict management, which points to a lack of involvement (consultation, official nomination) of traditional institutional actors in the emergence of the supervisor.<sup>34</sup>

Group classification and formation uses the habitus's classificatory function and capacity to segregate durable group-like dispositions, by considering the history of the social space and the relationship between the contingent forces or fields of power. To differentiate subgroups requires the legitimately named supervisor (*àsàkóso*)<sup>35</sup> who has acquired the power to consecrate and produce the common-sense view around the standpipe to classify and exclude. This process of institutionalising a taxonomy of the actors – producing and imposing a particular vision of the divisions within the re-appropriated physical space – happens when the supervisors deploy their symbolic power enabled by the habitus's classificatory capacities. Delimiting these categories is only possible when the supervisor's habitus mediates these positions and the manifestations at the standpipe.

Classifying the subgroups also requires the supervisor to have a firm and practical knowledge of the actual positions occupied by the water users within the broader *Ìgànná* community and the corresponding distances of those positions to the standpipes. With this knowledge, the supervisor understands the strengths and weaknesses of the classification strategies applied by individuals and groups in their attempt to win the stake of struggle at the standpipe; for example, knowing the closest standpipe to a butcher. The supervisor will then regulate this knowledge against their core interests at the standpipe: to maintain the order necessary to ensure and sustain equitable access and distribution of water, a consistent theme across the three standpipes investigated. Other secondary responsibilities of the supervisors include, among other things: opening and locking the tap; determining how much water each user can take; resolving disputes amongst users; collecting money for repairs, and occasionally

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<sup>34</sup> Interview with *Oba* and his *olóyès* March 9, 2018

<sup>35</sup> The direct translation of *Àsàkóso* is a manager. However, we selected 'supervisor' because of the nature of the relationship between the supervisors and water users, which does not reflect a manager's executive or overarching decision-making role.

monitoring for vandalism. The standpipe supervisors also liaise directly with the local WCOS staff for ongoing tap repairs and maintenance. Explicating these classificatory principles is an initial step to analyse and understand the stakes of struggle and the actors' political stances (actions) at the standpipe; one that engenders conflict and requires the supervisor to adjudicate by exercising their authority. For example, water users would shunt queues to take more water than the average user (loss of time for other users) and refuse contributions to financial expenses.<sup>36</sup>

## **6.5 Appropriation and legitimation of authority through an appropriated space**

To appropriate authority and dominate the physical space around the standpipe, the supervisors must win the initial individually waged social struggles over the profits of social space in *Ìgànná*. With their localisation (owner/occupants of adjoining properties), they accumulate symbolic profits from the everyday social relations with the community and commercial actors. Two such profits of localisation that enable the conversion of these capitals toward specific symbolic profits are evident if we consider their shop (Figure 6-5) as the localised physical structure.

### **6.5.1 The shop**

First, the *rent situation* allows the supervisors to trade their economic and social capital for the acquisition of symbolic capital by their proximity to the standpipe. This symbolic capital (earned as a function of their generosity) is earned as a profit from the investments made between their cultural and economic capital. Of note here is the cultural practice called '*àwìn*' (translatable to 'credit'), where the supervisor sells their goods on credit to their customers. *Àwìn* is a customarily derived commercial credit mechanism in transactions and exchanges for goods among the *Yòrùbás*. According to Ojo (2007, p. 32), it is a "business of trust" that both large and small scale enterprises engage in. *Àwìn* allows an individual to take economic goods now and make financial payments over a period or in full later. In these symbolic interactions, the repeated material and symbolic exchanges endorse or validate a 'trustable' or 'generous' character in the supervisor, which becomes reproduced through the labour of time and space.

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<sup>36</sup> Interview with supervisor A, March 9, 2018.



**Figure 6-5: One of the supervisors' shops**

Equally, the supervisors' social capital reproduction happens through sociability because of the bodily investment of time, energy, and space (their shop). Their regularity at the shop (their source of income) makes them situated, grounded, and legitimises their permanence or stability (providing some certainty and sanctuary) from the community members' perspective. The supervisor's shop is used as a landing and storage space for travellers traversing the town or travelling out of town. It is common for some community members to leave goods and items at the supervisors' shops or ask for favours, such as relaying messages to other community members. Others use the shops as a 'resting' place when commuting around town. Using Bourdieu's theory of symbolic capital, Schiltz (1980, p. 189), in his field research in *Ìgànná*, highlights the social production of "reputation" of "being helpful" as a collectively produced phenomenon where a wealthy man's economic capital interacts with social capital. In this case of *Ìgànná*, the supervisor accumulated symbolic capital by the relationship between their social and cultural capitals. Over time, these symbolic exchanges have produced disproportionate symbolic profits of 'honour' and 'integrity' and the corresponding symbolic capital essential to the exercise of symbolic power needed to appropriate authority at the standpipe. While these exchanges are recognised as a form of generosity by the community and commercial actors, sitting idly for long hours,

especially on days when “trade is slow” (*ojà se dí è*), can be boring.<sup>37</sup> Essentially, these symbolic exchanges benefit the supervisor as it does to the other actors. The abundance of ‘free time’ available to the supervisor to sit at the shop most times of the day, the energy invested in re-arranging and protecting goods, or relaying messages, is transformed into cultural and social capital and repaid by the symbolic investments made by the consumers of those symbolic investments.

Second, is their *profit of occupation* – the ‘possession’ of the shop on a ‘temporary-permanent’ basis; temporary because of the economic capital invested through rent paying, and permanent if the supervisor possesses some ownership rights to the property or resides there. Supervisors as occupants of such properties may be a shop owner or a tenant running a local business on the property. Possessing the shop space is temporary due to their rent-paying status (one of the supervisors arrives in the morning and returns to her home in the evening). It is also permanent due to their daily attendance and presence at the shop, arriving as early as 7 am and leaving as late as 7 pm.<sup>38</sup> Symbolic power accrued from this profit of localisation works on the differentiated perspectives (in peoples’ minds) shared by the community members at large. The differentiating principle here is between what is hidden and what is known. Without intimate interactions with the supervisor or those situated within the same locale, individuals not rooted in that locale or not having close connections there are unlikely to be aware of how strong, weak or transient the supervisors’ rootedness at the shops is. This distance or differences in position forces community members situated farther away from the shop to invest themselves more intensely in their interactions with the supervisor.

Consequently, they increase the symbolic capital allocated to re-affirming the supervisors’ ‘recognition’. Essentially, occupying the shops on a *temporary-permanent* basis enables the supervisors to accumulate symbolic capital from extensive non-standpipe related interactions with everyday community members. Furthermore, cognitive structures of perception (production of common-sense) symbolically produced in this manner enable the legitimate naming of individuals who by *de facto* are situated close to the standpipe. Thus, within this symbolic system, the material and symbolic relations of power of the supervisors’ authority demonstrates there is, in essence, a constellation of powers (power centre); therefore, a product of a group of aggregated interests – the dominant group.

### **6.5.2 Legitimation of legitimate authority – normalising order**

To consolidate and sustain authority, the ‘supervisor’ must strategically normalise particular behaviour by administering specific corrective techniques on the dominated groups (commercial actors in this case). Equal water access at the standpipe as the stake of struggle is also used as an ideological

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<sup>37</sup> Interview with supervisor A, March 9, 2018.

<sup>38</sup> Interview with supervisor A, March 9, 2018.

instrument of domination; a norm deployed to normalise behaviour and entrench domination. The norm at the standpipe is equitable access to water for every user group. However, it is also the practical sense communicated to the groups to disempower the commercial actors. Because of its subjective nature, it manifests objectively at the standpipe as orderliness that requires a labour of time, energy, and money by the supervisor.

### 6.5.3 Low water pressure as a sub-stake of symbolic struggle

An opportunity to normalise behaviour and authority presents itself in the daily but consistent symbolic struggles represented by low water pressure. In the conflict instigated by low water pressure, the corresponding ideological instrument or strategy used to dominate is water scarcity, presented as a disruptive force for water access for all actors if the symbolic order is compromised. In other words, water scarcity as a threat to equitable water access may further exacerbate abnormal or disorderly practices at the standpipe. The symbolic function of this strategy is to inflict gentle violence on individuals or groups that are already hierarchised and differentiated. It binds the whole group. Queue jumping or shunting is a form of disorderly behaviour, an ‘abnormal’ conduct at the standpipe that requires correct technique to expunge or moderate. To understand the specific function of the preservation of equal access as an ideology in relation to queue shunting, we should interpret it as a socially constructed idea through one of the material conditions responsible for its production – low water pressure. The social history and material production of low water pressure as a symbolic container of state power in *Ìgànná* may be hidden. However, it is objectively and cognitively understood at the standpipe by the users because it is immanent in the material and symbolic interactions around the standpipe as ‘*a stake of a stake*’ of symbolic struggles. A stake of a stake implies a hierarchy of stakes in which the primary stake (equal and sustainable access) is threatened by the numerous iterations of issues that become unified around certain specificities; for example, similarities in position, structure, evolutionary origin, and function, however differently those issues are constituted.

The idea of ‘low’ water pressure automatically implies what is dialectically possible: a high (regular) water pressure. Its doubly determined attribute is linked, on the one hand, to the specific interests of the supervisor, her supporters, and the commercial and community actors' interests; but also to the specific interests of the WCOS who unwittingly produce low water pressure. Because it is dated and constituted *ab initio* largely from the sociopolitical relations between the contractor, government officials, the construction engineer, and the design engineers who manufactured the pump, its social history predates the reservoir or the standpipe. Anand (2011, 2016), in the study on Mumbai water infrastructure, showed how the politics of water pressure is constructed as an outcome of power relations in a complex history that modulates democratic political behaviours such as citizen participation in water governance.

With its source at the reservoir tank (and the pump station), low water pressure is localised at the different standpipe locations across the 70 m to 100 m intervals. Hence, the social and political struggles it generates at different locales are characterised by a fluid, dispersed, and subjective power because of its differentiated impacts at each locale. Because it activates an automatic increase in time to fetch water, queue shunting incidences increase when water pressure is low. Therefore, users become less patient when commercial actors fetch water due to their excessive water abstraction (sometimes three to five 50 litre jerry cans).

In this case, low water pressure threatens the symbolic order. Hence, it becomes the specific discourse upon which an instrument of domination (equitable access to water: the norm at the standpipe) is created, one that sees the tub (Figure 6-6) playing a dual role of a “structured structure” (Bourdieu, 1979, p. 77) and an instrument of knowledge and domination. Here, the construction and normalisation of social consensus further concentrates authority in the ‘supervisor’ through the symbolic struggles exacted by water pressure.



**Figure 6-6: The 25-litre tub**

The tub objectifies the fluid power of water pressure because the dominant group uses it to compare, partition, exclude and differentiate commercial actors from community actors. Symbolically produced by the supervisor (who bought the tub with the financial contributions from the water users), it is used to measure what amount of water can be fetched; yet used to normalise behaviours that institutionalise and maintain authority and order (differences) between the dominant and dominated groups.<sup>39</sup> A range of interests, largely of the community actors that coalesce around the following, were

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<sup>39</sup> Interview with supervisor B, March 9, 2018

considered when selecting the 25-litre tub as a strategy. First, older women that are unable to carry more than four to ten litres of water.<sup>40</sup> Second, synthesised knowledge of the duration and times of low water pressure (unpredictable but often late afternoons or after excess abstraction from the standpipe). Third, peak hours for water collection, often early mornings when students and families prepare for work or school, after school from 2.30 pm when students close and return home, and late afternoon when dinner preparations begin. Fourth, knowledge of the declining pressure over the spatial configuration of the standpipes from the reservoir and an estimate of the different water abstraction volumes of individual (groups) users.<sup>41</sup> As a symbol of power, the tub presents the collectively derived interest of the supervisors as the definition of good and desirable (common-sense), and the interest of the commercial actors as inadequate and abnormal, using language as a “*sign of authority*” to appeal to the linguistic habitus (Bourdieu, 1989a, p. 502) of the commercial actors. This strategy is needed to maintain order and ensure compliance with the established rule using the *gratification-punishment* technique. One of the supervisors explained the basis for restricting water users at the standpipe to one tub (25 litre) each per round, due to over-abstraction by commercial actors during times of low water pressure:

Àwa la sòfin pé enikéni kò gbodo pon ju basin yíí (25 litre plastic basin) kan lo lénu èrò, kò ba gbé jerry can méwa wa” (42).

(translates to)

we made the rule that each individual can only draw one basin (25 litre plastic basin) per round from the tap, even if they brought ten big jerry cans

Using the plural ‘we’ instead of ‘I’ as an individual is a sign of authority of one to speak for many (or all) and yet to be believed (Bourdieu, 1989a). Here, language as a social practice is used to channel standard societal norms and knowledge and exercise power and authority (Fairclough, 2013). To gratify the commercial actors, the supervisor with their power of world-making guarantees their access to water by projecting the tub as the fair and objective measure of water abstraction. The commercial actors are gratified if they agree to the rule of a tub per turn but are punished with halting their access to water if they reject the rule. This technique fulfils both the artificial and objective order: the rule that sees 25 litres per person as the measurable outcome and the duration of fetching water as fair on all and equitable access – in short, the interest of the dominating group. Accepting this new field of rationality, the commercial actors have participated in their subjugation for positive outcomes.

This remarkable ability to resolve conflict do not translate when territorial contestations are imagined and rooted in exclusion. Narratives behind territorial contestations are framed and justified as

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<sup>40</sup> Interview with an older woman, March 9, 2018

<sup>41</sup> Interview with supervisor B, March 9, 2018

<sup>42</sup> Interview with supervisor B, March 9, 2018

a struggle for access to potable water (Boelens et al., 2016). They are embedded in imagined territories (Steger & Paul, 2013) based on their historical experience with acute water scarcity. Providing a justification for erecting a standpipe within their territory in anticipation of the second section of the pipe-laying, one of the female respondents at a focus group meeting put this succinctly:

We want our own (referring to the standpipe) here, so that we can stop complaining that what they do to us is unfair. If you want water here, you will need to get to the dam, if we want to fetch water if that owner refuses to open the borehole. We leave early in the morning to go to the dam at least three times daily. Even me, as old as I am, I go to the dam and carry a small bucket<sup>43</sup>

Contested imaginaries of this nature are a response to historical deprivation of a resource with strong utilitarian value such as water as stated by one of the respondents: “The borehole government drilled for us is no longer functioning and we have never had government pipes in this area”<sup>44</sup>

Notwithstanding the limited documented evidence of the people’s response to the impact of failed water projects during the colonial period, evidence from the field suggest that the territorialization of water infrastructure and the exclusion of others within proximity may have arisen from the lack of, or access to clean potable water over the years. Clear delineation of territories also features in the narrative and their claim to potable water. Pointing his hand to a standpipe a hundred and fifty meters away and an imaginary line drawn to separate the two areas, a participant in one of the focus groups meeting stated that: “There is a difference you know, households are different. From here to that end is *abá* Mogaji. They have their own bale and we cannot make rules for them”<sup>45</sup>. Their justifications are informed by the linkage between the authority of traditional institutions at the local level, arguably, the historical experiences between both groups in relation to existing standpipes.

## 6.6 Conclusions

In this article, we draw on two lines of literature: the everyday relations of water infrastructure governance and state-society boundaries, to examine rural water governance and access in *Ìgànná*, southwest Nigeria. By integrating Bourdieu’s concept of social space and symbolic power with Foucault’s disciplinary power, we interrogate the production of water user classes, the accumulation of authority around the standpipes as a re-appropriated physical space, and its impact on equitable water access to different classes of water users. Specifically, we take water infrastructure (standpipe) as a *boundary marker* between state and society to analyse how individuals appropriate an ‘unregulated

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<sup>43</sup> Focus group discussion, May 5, 2017.

<sup>44</sup> Focus group discussion, May 6, 2017

<sup>45</sup> Interview with Bale, March 11, 2018



space' and accumulate authority to govern the standpipe. The logic of the standpipe as a conceptual-analytical boundary marker enabled much more profound attention to the empirics of power negotiations, resistance, domination, and the maintenance of order; specifically, to the different relations of forces, communications, mode of reproduction, and incorporeal and objective outcomes imposed on water users. We identify four differentiating characteristics (water extraction, geographical locations, mobility, and water use/consumption) of the four groups of water users and managers: community, commercial, institutional actors, and supervisors.

We see three theoretical contributions here. First, the boundary marking effect of the standpipe allows us to isolate state power and social power through the effects they generate around and through the standpipe. On balance, we demonstrate that within 'uninstitutionalised' spaces, the power to make infrastructure work relies on the users even if state responsibilities are partially compromised. Secondly, the absence of physical and active representation of state power at the standpipe presents an opportunity to analyse specific structural registers that makes a state durable. These include instruments of state violence, authority, community expectations, and order around the standpipe. We find no evidence to suggest that state actors and their apparatus (situated) attempt to consolidate state powers because of the absence of state mechanisms and instruments of violence often used to maintain order and authority. Instead, we conclude that state power through the standpipe (water scheme) operates as a form of a deeply entrenched benign state paternalism, which while acknowledging the state's presence, only carries state powers symbolically through low water pressure in this instance. Thus, we imagine the state as not *always* seeking to consolidate its powers or control spaces and bodies through material appropriation. This view of the state raises theoretical questions about what constitutes a weak or failing state, whether it is a projection of an expectation of a state that is inconsistent with its capacity or a capacity it cannot attain. Such a reconceptualisation can further our understanding of the state's capacity for water provision. Third, the concept of a *hierarchy of stakes* of social and political struggles inspires opportunities for further theoretical elaboration. Struggles instigated by low water pressure from the standpipe provided an opportunity for the supervisor to consolidate their authority using a tub to achieve that objective. Strategies of domination by groups and individuals who make vital decisions for equitable water access are steeped in established cultural and political practices and values that are often inconsistent with or negate formal governance systems. As such, understanding power as simultaneously diffuse and fluid, and topologically unstable and uncertain, can yield useful empirical analysis of water access–infrastructure relations within broader state–society relations of power in SSA.

We also see two insights for policy practice to address the need to better integrate power relations and political ecology research into policy (Loftus, 2020; Whaley, 2018). First, our study shows that the *Òyó* state government's intended household water access ratio (50 litres/day/person) is threatened and cannot be guaranteed by the means they intend to achieve: constructing standpipes at 70 m – 100 m intervals. Second, by tracking issues within a hierarchy of stakes of social and political struggles around

such infrastructure, we can better isolate our expectations of state governments and community management organisations and allocate specific responsibilities to them; for example, low water pressure as an effect of state power relations that only the state can resolve. This insight may assist in how to structure community management systems for more effective rural water governance by focusing interventions on ‘what matters’ the most to groups, units, or specific spaces. Lastly, the diffuse and indeterminate nature of power relations around the standpipe suggests that before the standpipe had become a space of social and political struggle, the supervisors had acquired prestige and authority before it was exercised at the introduction of the standpipe. We demonstrate that earlier social and political struggles pre-invest authority on certain individuals; in this case, those that have acquired the profits of localisation, against the current belief that expert power is formed in the process of resource-making (Käkönen, 2020). Because of the supervisors’ location and situatedness, they could trade their shop and time to accumulate symbolic capital. Individuals within communities with a high level of recognition and symbolic capital could be identified to fill community water management committees, because spatial proximity determines who garners authority for the day-to-day management of water. Through this finding, we propose a shift away from the traditional generic approach for selecting members of community management groups where community kings or chiefs decide and nominate.

Future research could employ methods that quantify specific actions and practices through which normalising and validating practices are engendered, because they are real and repetitive actions that could be mathematically and statistically represented. Thus, demographic differences, information on mobility for commercial actors, water consumption, water extraction rates, and times during rainy and dry seasons, are promissory for quantification towards more generalisable water governance metrics. In addition, our research suggests a need for further research on the durability of affective notions of injustice, due to historically poor access to potable water in the community and many other rural communities across the country.

# Chapter 7: Evaluating water infrastructure renovation in the Nigerian Federal Ministry of Water Resources' budgets 2014–2020

Adeniran, A. B. (2022). Evaluating water infrastructure renovation in the Nigerian Federal Ministry of Water Resources' budgets 2014-2020, *Public Works Management & Policy* [UNDER REVIEW - Unpublished at the time of thesis submission]

**Sub-question 4:** As a strategy of power, how does infrastructure failure as a water policy and governance concept operate within Nigeria's water governance and with what effects?

## Chapter introduction

This chapter explores the financial aspects of water infrastructure renovation by analysing the Federal Ministry of Water Resources' budget, having examined it in the literature (Chapter 1), and how development policies and plans reproduce it. This chapter argues that budget expenditure should be taken seriously as a policy and research issue to ensure optimal use of infrastructure financing. The chapter compares the total, capital, and renovation budgets of the FMWR between 2014 and 2020. The words used to describe infrastructure failure and renovation in the budgets are classified, a key contribution to the scant literature on an often overlooked aspect of water infrastructure finance and governance.

I proposed a simple *infrastructure failure* model that explains the cyclical processes of infrastructure development-failure-renovation. The pattern enables a tendency to perpetuate financial misappropriation of public funds because it is reinforced by specific institutional practices; for example, budget crossovers. Analysis of the types and count of rehabilitated water infrastructure across the river basin development authorities shows how federal budgetary allocation maintains existing spatial imbalances in distribution and development.

The study sets up the final chapter (Chapter 8) of the thesis, where I explored the history of infrastructure renovation and its use in Nigeria's water governance.

## **Abstract**

Analysis of sector budgetary allocation and expenditure often ignores rehabilitation or renovation costs, despite the repeated failure of water infrastructure and financial corruption in the water resources sector. This article analyses the Nigerian Federal Ministry of Water Resources (FMWR) budgets between 2014 and 2020, focusing on infrastructure development and renovation allocations. Results show that renovation expenditure was less than 10% of mean capital on an annual basis but peaked at 24% of 6-year average across the ministries, departments and agencies (MDAs). Water schemes, dams and irrigation projects represent approximately 44 percent of renovated facilities. Spatial distribution of renovated facilities is 48 percent in the northern region, 33 percent in the southern region. The article presents an illustrative model showing a cyclical pattern of renovation financing and the descriptors of infrastructure failure.

## **7.1 Introduction**

A lack of infrastructure financing impedes achieving the Sustainable Development Goals (SDGs) in most African countries, especially for developing new sources of water infrastructure to meet SDG 6 (Eberhard, 2019; UN-Water, 2018; WHO, 2017). Analysis and models of water infrastructure financing often do not account for the specific activities and budget elements, such as water infrastructure rehabilitation and renovation. In Nigeria, this is despite the repeated policy attempts at federal and state levels aimed at rehabilitating water and sanitation projects (The World Bank, 1990, 2006a). This challenge has led to the development of the integrated financing framework at the global level for replication across countries (United Nations, 2019a). Nigeria views water infrastructure development as a critical strategy to meet the SDGs (OSSAP-SDGs, 2020) and has adopted the Integrated National Financing Frameworks (INFFs) to finance the SDGs (United Nations, 2019a). The financing framework is an integrated approach to country-determined national financing frameworks that explore multiple financial sources and implementation instruments within the countries.

The Nigerian INFFs seek to domesticate the SDGs by connecting them to the Economic Recovery and Growth Plan (ERGP) 2017–2020 (Budget Office of the Federation, 2017) and development finance. Nigeria requires approximately US\$332 billion to meet its total SDGs finance needs (United Nations, 2021b) and an estimated US\$23 billion to meet its basic water and sanitation targets between 2020–2030 (Hutton & Varughese, 2016; IMF, 2020). The funding issue crosscuts governance levels, but little is known of how policy concepts like infrastructure renovation impact national finance and budget, when repeated malfunction of these water infrastructures is put into perspective. Moreover, a breakdown of different subunits in the budgetary data will show which infrastructure investments require additional repairs.

As part of the broader public expenditure and financing strategy, sector budgetary allocation is crucial to this financing framework. However, Nigerian budgeting processes are open to a range of financial corruption, misappropriation of funds, and political interference (Macheve et al., 2015; Rogger, 2014), which affect the delivery of sustainable water infrastructure (Bayliss, 2013; Federal Government of Nigeria, 2015; Uchechi et al., 2014). Reporting on the FMWR, the 2017 federal audit report on the MDAs noted that the Nigerian “Government may have lost a sum of ₦343,957,350.60 (US\$1,124,815) as there is no evidence of work done or service rendered” (Office of the Auditor-General for the Federation, 2019, p. 90). Missing money could be due to unreturned payment vouchers, overdrawn accounts, extreme power of FMWR headquarters over the river basins and inadequate budgetary provisions for uncompleted projects (Federal Government of Nigeria, 2015; Office of the Auditor-General for the Federation, 2019). In Nigeria, civil society organisations (CSOs) such as the Socio-Economic Rights and Accountability Project (SERAP) and Budgit have been critical in ensuring that budgetary expenditures are free from political and financial corruption (SERAP Nigeria, 2021; Tracka, 2017).

With slow economic recovery post-Covid-19 being a crucial challenge for developing countries (OECD/UNCDF, 2020), ensuring that long-term public expenditure on water infrastructure development is targeted appropriately will make new and existing public finances produce optimal outcomes in the water resources sector, and provide viable and sustainable water infrastructure. Taking stock and identifying gaps in budgeting practice can improve how and where to direct public investments in water infrastructure development to meet the SDGs. Given the above, this article analyses the Nigerian FMWR budgets between 2014 and 2020. This study is not a comprehensive analysis of all FMWR expenditures but an exploration of allocated rehabilitation budgets within the ministry's total budget. Specific questions to answer are:

- What is the trend and distribution of the total, capital, and rehabilitation budgets of the FMWR?
- What types of water-related infrastructures does the FMWR rehabilitate?
- What are the conceptual and empirical issues for infrastructure renovation in the FMWR budgets?

## ***7.2 Analytical framework***

Water infrastructure financing models in developing countries often focus on funding types, sources and large water infrastructure projects in general (Briscoe, 1999b, 1999a). In South Africa, Cornelius Ruiters's review of existing financing frameworks shows that the various frameworks currently in use across countries require a paradigm shift because they do not adequately account for the structural imbalances in the economy (Ruiters, 2013). Institutional capacity and performance are critical components of sustainable water infrastructure financing and development (Rasul & Rogger, 2018).

Therefore, accounting for the specific activities and elements of institutional budgets is of primary importance to enhance service quality, deliver efficient public services, and improve overall government expenditure (Ruiters & Matji, 2016).

Few studies have examined disaggregated budgetary expenditure analysis as a part of water infrastructure financing in Nigeria. Ho (2018, p. 752) argues that performance budget management represents a shift from the “legislative process outcomes of budgets to a focus on the financial management aspects”. The specific activities in the total budget cycle from preparation to evaluation can be assessed to focus on “value for money” to achieve this level of performance (p. 753). Line items are one of those specific activities in the performance budget management system that provide vital evidence for improved budgeting practices and accountability (Finkler et al., 2018; Ho, 2018; Saleth & Dinar, 2004; Shim et al., 2012). Such studies examine sectoral budgetary expenditure and performance on water management, often focusing on capital budget analysis (Kanayo & Ehigiamusoe, 2014) or project types completion (Rasul & Rogger, 2018) and the effect of personnel costs on-budget performance (Onyiah et al., 2016). Capital budgets are one way of measuring government commitments in critical infrastructures in different sectors such as water, health, and education (Finkler et al., 2018; Kanayo & Ehigiamusoe, 2014).

Budget expenditure is a vital indicator of the government's interest and policy commitments, and its analysis is vital for increased transparency and public accountability (Balaguer-Coll, 2016). At the ministerial and sub-departmental levels, budgetary accountability can be improved by performance-oriented budget documentation. Ho (2018) argues that this allows the specifics of accountability of line-item spending to be paired with other forms of documented expenditure. Ho's main argument is that a multi-level analysis of ministry-level budgeting processes must include departmental budget cycles to achieve fiscal and public accountability.

## **7.3 Methods**

### **7.3.1 Data sources and selection**

A qualitative research approach was used to collect and analyse data. The data is sourced primarily from the Federal Ministry of Water Resources between 2014 –2020, the Central Bank of Nigeria and cross-checked with information on the official website of the Nigerian Office of the Bureau of Statistics. Additional information comes from the Central Bank of Nigeria and the Budget Office of the Federation. The data was limited to 2014 because it marked the completion and release of the national water resources masterplan (NWRMP) (Federal Ministry of Water Resources & JICA, 2014b).

### **7.3.2 Data analysis and limitations**

A trend analysis and trend evaluation of the data was conducted to understand how and why investments have changed over time (Rae, 2014). In addition, content analysis and a narrative synthesis was used to count the frequency tally of words and discourses of infrastructure failure and renovation, and to describe and synthesise the results (Campbell et al., 2018; Popay et al., 2006). Allocations in the Nigerian Naira was converted to US Dollar using the annual conversion rates from the Central Bank of Nigeria. All converted data are nominal figures from the budget. Information analysed for infrastructure renovation focused mainly on the River Basin Development Authorities (RBDAs), the principal institutional agency of the FMWR responsible for the nationwide implementation of national water policies and planning. The analytics presented here also target rehabilitation or renovation connected to water supply and agriculture facilities, not auxiliary infrastructures like roads, housing, and office infrastructures. Descriptive and quantitative analysis of the data was carried out using measures of central tendency, such as mean, to assess the trends. The article referred, in most cases, to infrastructure responses or interventions as renovation or rehabilitation. This choice was adopted because of the different names used to classify rehabilitated infrastructures in the budgets. The major limitation of the study was a lack of access to the 2019 budget.

## ***7.4 The Federal Ministry of Water Resources and national water policies***

The FMWR is one of Nigeria's 943 ministries, departments, and agencies (MDAs, henceforth) (Demarest et al., 2020). The FMWR (Figure 7-1) consists of 16 MDAs – the FMWR headquarters and 15 MDAs. The RBDAs ([Appendix H](#)) perform a crucial infrastructure-related function for the FMWR. Section 4 (1b) of the RBDA Act, 1987 mandates them “to construct, operate and maintain dams, dikes, polders, wells, boreholes, irrigation and drainage systems, and other works necessary for the achievement of the Authority's functions” (Federal Government of Nigeria 1987; Federal Military Government of Nigeria 1979). Analyses of the RBDAs are often conducted using institutional or managerial approaches (Akindele & Adebo, 2004; Akpabio et al., 2007; World Bank, 2019), rather than through their financial expenditure, especially in water infrastructure delivery, a core aspect of their dated constitutional responsibility (Federal Military Government of Nigeria, 1979).

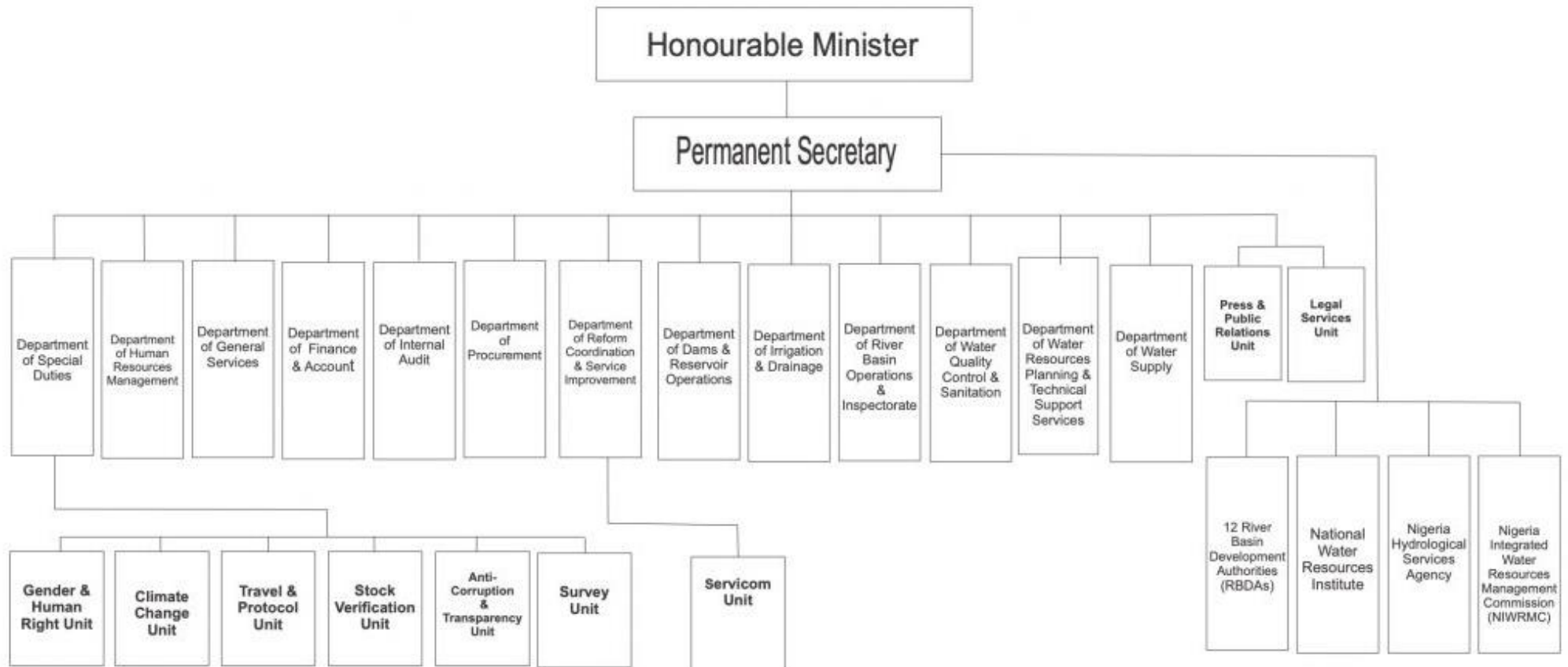
Although the RBDAs operate as relatively independent agencies, they are still subject to specific control from the FMWR. The 2016 National Water Resources Policy highlights eight key areas essential to Nigeria's growth and economic development – agriculture, health, power, mining, tourism, trade, industry, and education – and recognised water as “the most important natural resource” in Nigeria (Federal Ministry of Water Resources, 2016a, p. 5). As a regulatory framework, the policy centralises water regulation at the federal level, and delineates and elaborates on the specific functions of each actor

in the water sector. Climate change mitigation focusing “on desertification, flooding, coastal inundation and rapid drying up of lakes and rivers” is a key feature of the policy that differentiates it from past policies (Federal Ministry of Water Resources, 2016a, p. 15). The 2016 Water Resources Bill followed up the water policy to establish the Nigerian Water Resources Regulatory Commission, an independent body with members drawn from seven federal government ministries: agriculture; water resources; environment; housing and urban development; energy (power sector); health, and transportation (National Assembly of Nigeria, 2016, 2020). The water bill consists of 14 parts and 132 sections.

Dams and reservoirs are the leading natural and engineered supply-side assets. There is no comprehensive inventory of water resource assets at the federal level. However, a recent study by Adeniran et al. (2021) provides a detailed spatial distribution of dams in Nigeria, their ownership, and purpose for their development. These dams are used for different purposes and of different construction types. The current administration's focus has been on rehabilitation and completing uncompleted and ongoing projects (Adamu, 2016). This position influences the rationales for budgetary allocation. They are based on the priorities set out by the current government through the Minister, which feeds into the national and regional level commitments to WASH infrastructure development (Suleiman, 2015). The NWRMP recommended the rehabilitation of 87 dams (Federal Ministry of Water Resources & JICA, 2014c) while planning to rehabilitate 100,086 boreholes to meet SDG 6 by 2030 (Federal Ministry of Water Resources, 2016b).



## ORGANOGRAM OF FEDERAL MINISTRY OF WATER RESOURCES



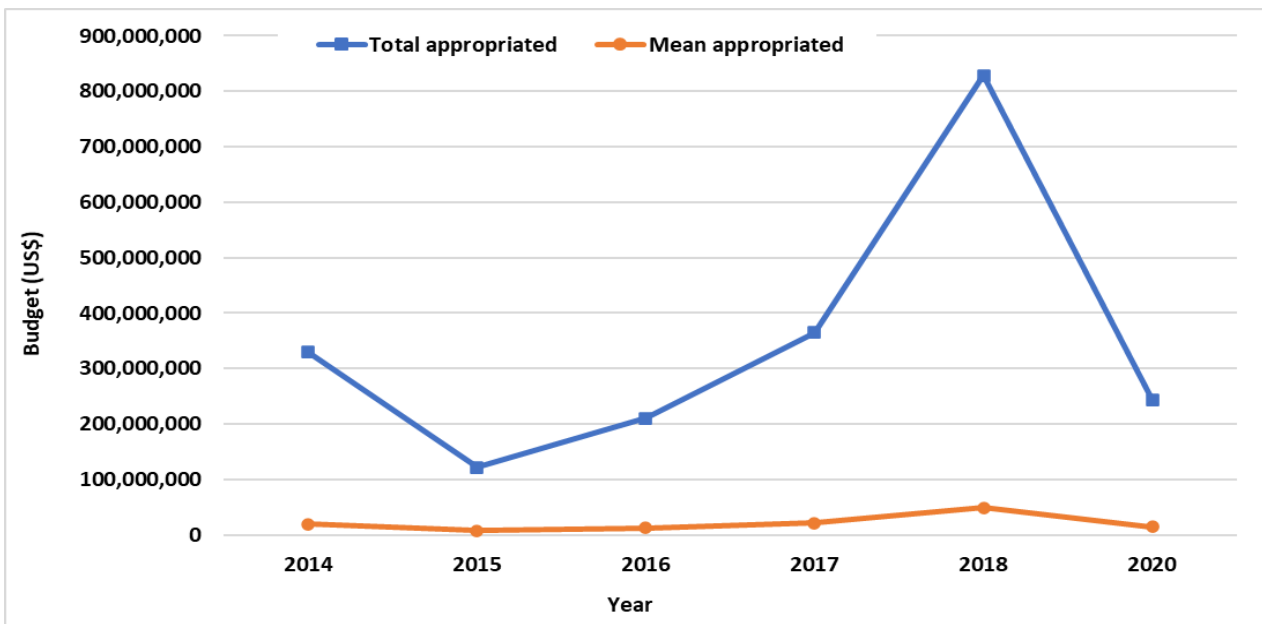
**Figure 7-1: Organogram of the Federal Ministry of Water Resources.**

**Source: (Federal Ministry of Water Resources, 2021)**

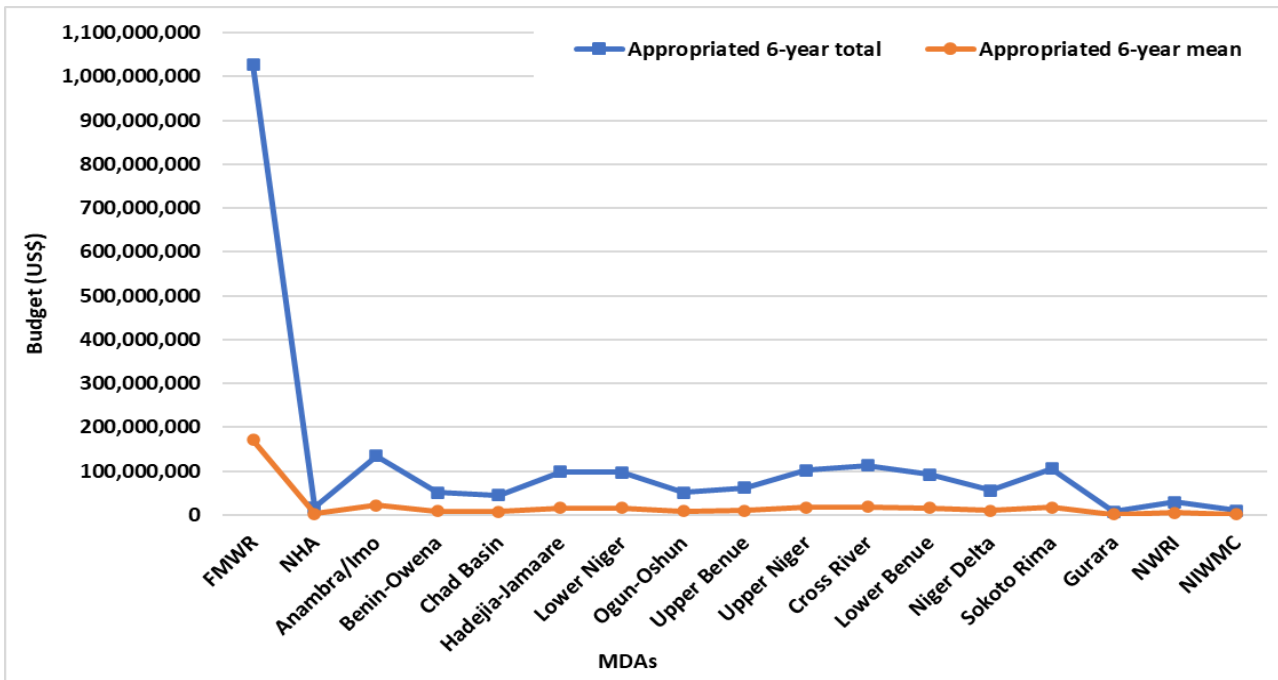
## 7.5 Results

### Main budget

This section presents the results of three main budget line items analysed in the FMWR’s appropriated budget over 2014–2020: the total appropriated budget, the capital budget, and the repairs budget. This analysis excludes the year 2019 and the disaggregated data on the 17 MDAs. Additional analysis focused on the RBDAs as the primary institutional mechanism through which the FMWR achieves its water infrastructure development objectives. Figure 7-2 shows the trend in the federal appropriation for the FMWR. Figure 7-2a shows the total appropriated budget (and the mean) from the federal government to the FMWR from 2014 to 2020. The increased investment in the ministry began after the current president’s inauguration in 2015, reaching a peak funding of approximately US\$800,000 in 2018. Funding increased between 2017 and 2018 by 56 percent, falling by just over 60 percent by 2020. This exponential jump did not reflect in the mean budgets over this period.



a



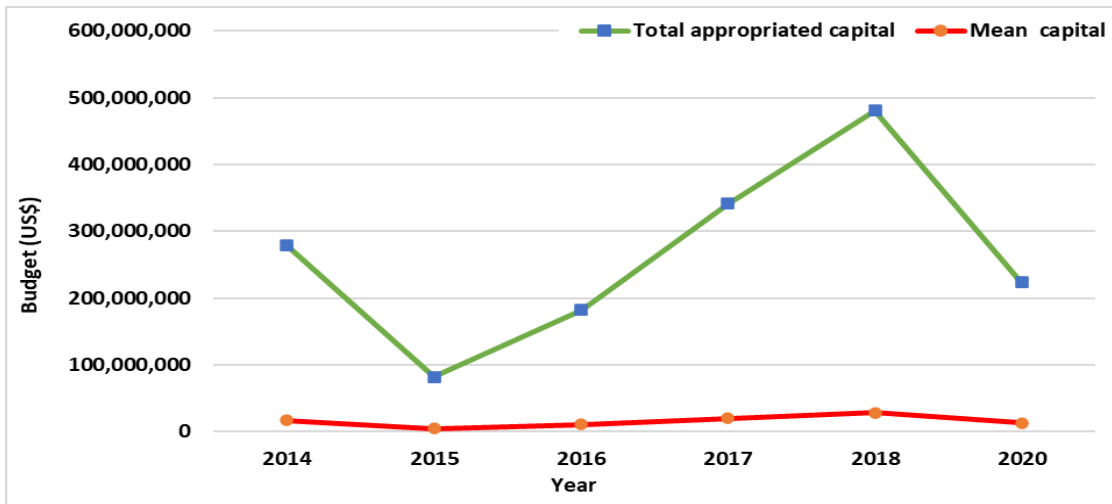
b

**Figure 7-2: (a) Total and mean budget for Federal Ministry of Water Resources 2014-2020; (b) Six-year total and mean for each ministry, department, and agency**

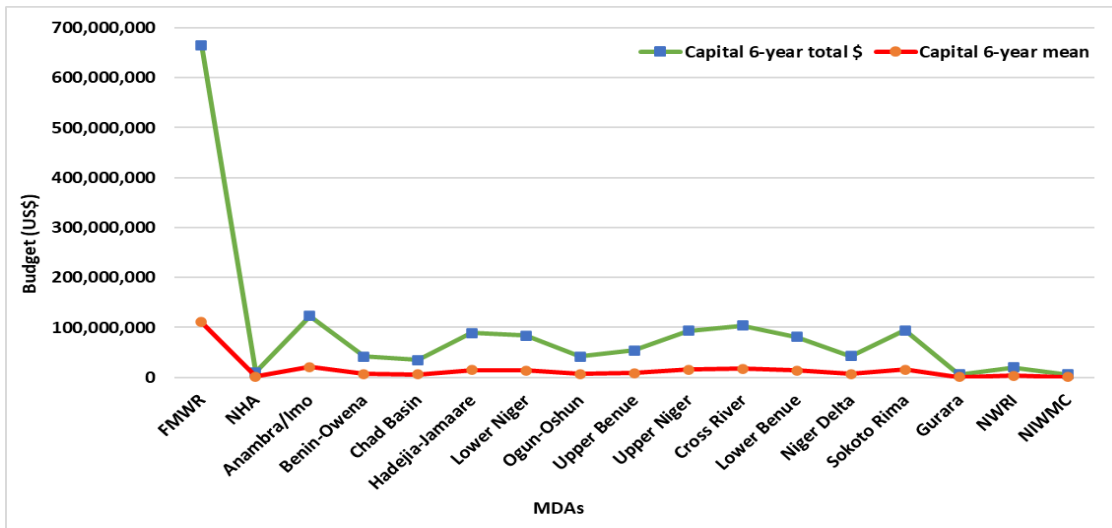
Similarly, the drop observed in 2018 to 2020 was not pronounced if the mean is considered. When the allocation is disaggregated across the 17 MDAs that constitute the FMWR over the six years (Figure 7-2b), there is a marked difference between the total appropriated budget for the FMWR HQ and the rest. This difference translates to a total of US\$1.03 billion (34%) for the FMWR HQ, compared to US\$1.07 billion (66%).

Anambra/Imo RBDA received the highest appropriated allocation for six years, while the National Integrated Water Resources Commission (NIWMC) received the lowest. This disparity is explained by the fact that the NIWMC is only an administrative department under the FMWR and does not engage in specific water infrastructure development.

In Figure 7-3, the capital budgets follow a similar trend. Capital investments are used for building new water infrastructure and are broken down into two primary categories: first, capital expenditure on fixed assets, including administrative assets like vehicles and computers; second, construction of fixed assets, including water, electricity, and agricultural facilities and other infrastructure. The focus of this analysis is on the latter. In Figure 7-3a, the dip below the US\$100 million mark in 2015 corresponds with the time when serious allegations of political and financial corruption in Nigeria and the possibility of a bankrupt Nigeria were critical topics of political debate (The Economist Intelligence Unit, 2014). The current president had campaigned vigorously against tackling corruption in the public sector as one of the three key campaign issues (The Economist Intelligence Unit, 2014).



a



b

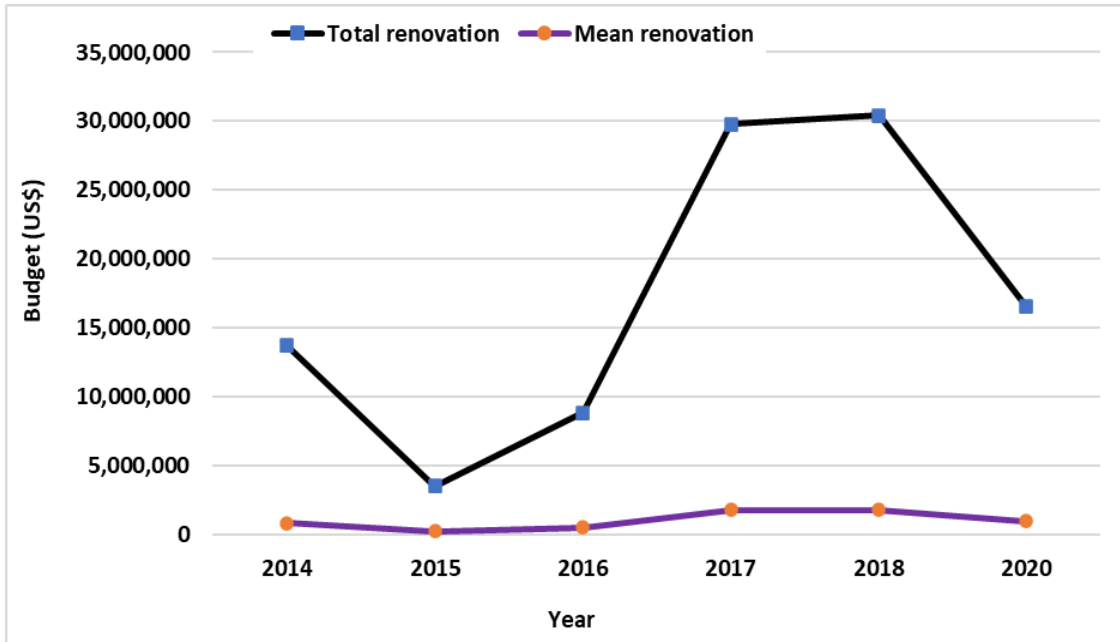
**Figure 7-3: (a) Total and mean capital budget for Federal Ministry of Water Resources 2014-2020; (b) Six-year total and mean capital budget for each ministry, department, and agency**

The difference in the scale and direction of capital investment in the FMWR is notable and partly explained by the difference in dollar exchange rates. In 2015 the US dollar was exchanged in the official market for N158 to US\$1. By 2020, it was N411 to US\$1. The wide disparity between both years suggests a critical link between a stable foreign exchange and the nation’s financial capacity to develop water infrastructure, because more money would have been made available if the Naira had not entered a freefall.

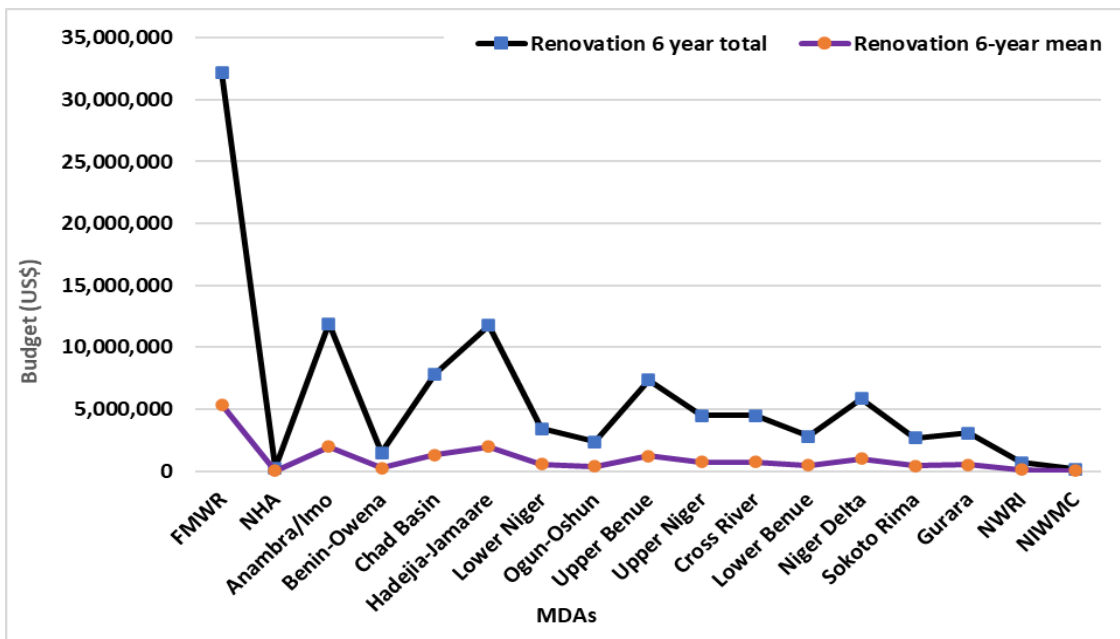
In Figure 7-3b, Cross River and Anambra-Imo RBDA in the southeast and south-south have the highest six-year capital investment of all the MDAs, excluding the FMWR. The figure also demonstrates that the FMWR HQ has significant direct investments in water resources development. It is difficult to say why the FMWR HQ has that disproportionate capital investment. One notable point is the active role the ministry is playing in the water, sanitation and health (WASH) programs to meet the SDGs. In addition, the Minister described in a video interview in 2021 (This Day, 2021) how many of the zonal intervention projects by the federal senators and house of representatives members contribute to this portfolio. Through these legislative constituency projects, members of the national assembly have specific allocations that are channelled through the FMWR to develop water infrastructure (National Assembly of Nigeria, 2015; Orimogunje, 2015; Tracka, 2017). Another critical point is the commitment of the Minister and the office of the presidency to complete several water projects that have been abandoned for an extended period.

The annual and six-year renovation budget is presented in Figure 7-4. In Figure 7-4a, a similar drop is noticeable from 2014 to 2015 and a subsequent rise from 2015 following the capital and appropriated budgets trends. Rehabilitation and repairs as a line item fall under the facilities catered for under the capital budgets, including different fixed assets like roads and houses. The mean figures show a modest increase also consistent with the ebb and rise of the total renovation figures. An exception in the trend of means is the decline between 2015 and 2016, where the mean allocation was unchanged despite the 155 percent (US\$3.51 to US\$8.81) increase in total renovation costs. This change suggests that, as a whole, the FMWR HQ allocation for renovating infrastructure facilities did not change much on average.

The disaggregated information in Figure 7-4b shows that over the six years, Anambra-Imo (southeast), Hadejia-Jamaare (northwest), and Niger Delta (south-south) RBDA had the highest rehabilitation budgets aside from the FMWR. On the other end, the non-RBDA agencies had the lowest allocation for rehabilitation and repairs, understandably so because of their different constitutional mandates. This breakdown also indicates that the geographical distribution of federal investment in different regions of the country in water infrastructure is relatively fair against the claims of uneven infrastructure investments and marginalisation made by different ethnic groups and political regions (Obomanu, 2020; Onolememen, 2020).



a

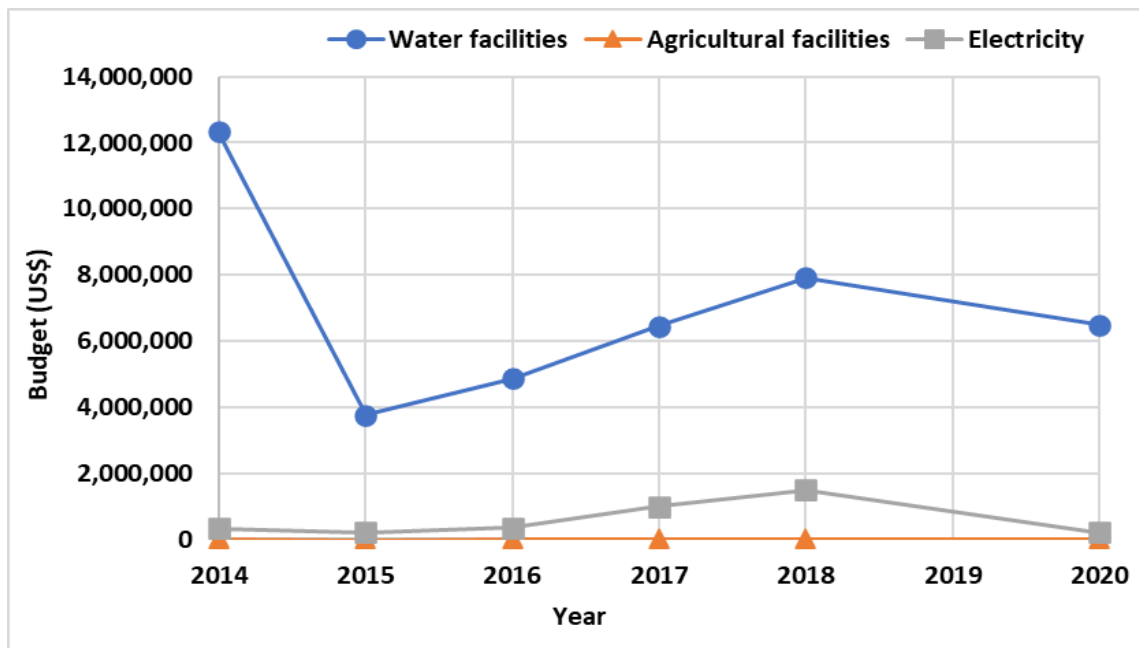


b

Figure 7-4: (a) Total and mean renovation budget for Federal Ministry of Water Resources 2014-2020 (b) Six-year total and mean renovation budget for each ministry, department, and agencies

*Comparison of capital budgets for water, agriculture, and electricity facilities*

Figure 7-5 shows a further disaggregation of the capital budget to capture the three core areas of the FMWR's constitutional mandate: agriculture, water and hydroelectric power. This demarcation is needed to establish the direction of FMWR's investments in non-sector-specific infrastructures (e.g., irrigation and hydroelectric power). The Federal Ministry of Agriculture and the Federal Ministry of Power are two standalone ministries at the federal level whose specific responsibilities are to administer agricultural and energy resources, respectively.



**Figure 7-5: Mean capital budget for water facilities, agricultural facilities and electricity 2014–2020**

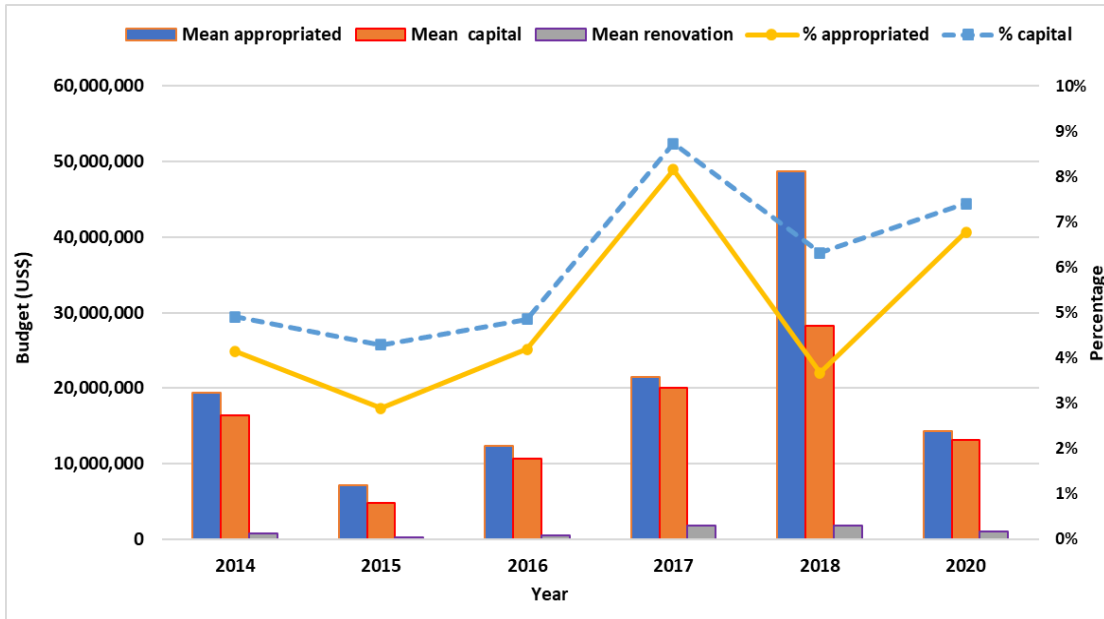
As expected, annual mean capital investment in water facilities is significantly and consistently higher than in agriculture and electricity facilities. Two key reasons explain this constant growth. First, the 2013 AMCOW declaration in Abuja, where the Nigerian government hosted the presidential summit, represents a commitment by the Nigerian State (State House, 2013). Second, the general interest of the newly sworn-in president in the development of water supply infrastructure had seen a reprioritisation of water infrastructure, especially in repairs and renovation (Adeniran et al., 2021). Between 2014 and 2020, capital investment in water facilities shrunk by 33 percent in 2018 and 66 percent in 2015, as shown in Figure 7-5. In comparison to the capital budgets (total and mean), 2014 stands out because of the highest capital investment in water facilities at US\$12 million. This is a notable case because of the 60 percent and 42 percent difference between the total appropriated capital and mean capital in 2014 and 2018 respectively. This drop is due to the declining federal income caused by the low crude oil

production. In short, the FMWR HQ has increased its investments in electricity and hydroelectric power development while reducing its capital investment in WASH-specific infrastructures.

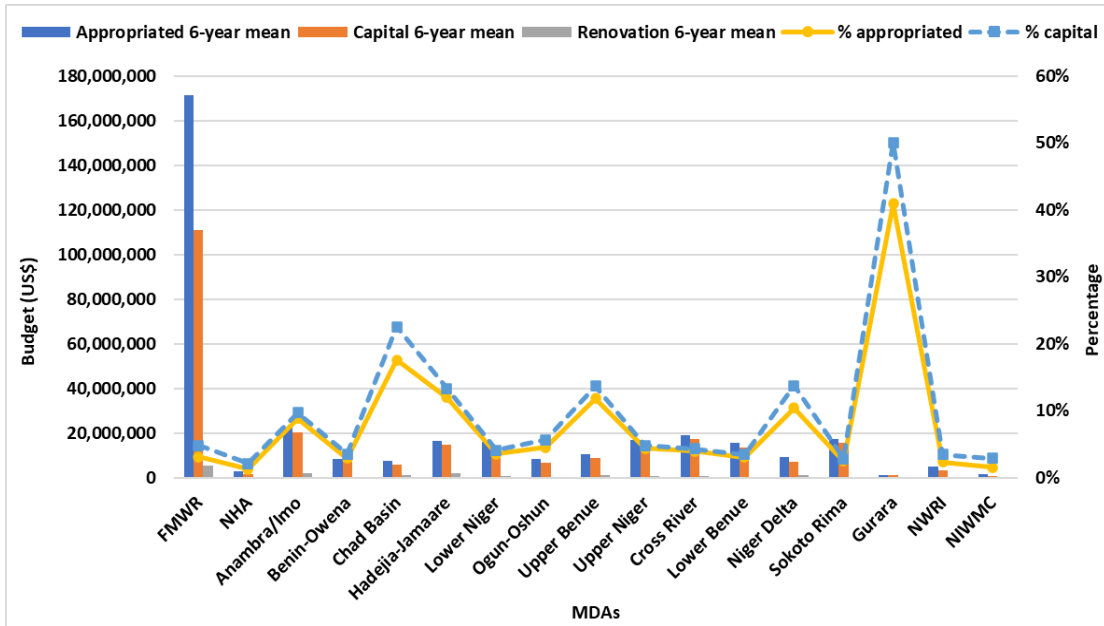
Figure 7-6 compares the mean appropriated, capital, and renovation budgets over the years for the FMWR and the six years for each MDAs. Figure 7-6a shows the renovation budget as a percentage of appropriated and capital budgets. At its annual peak in 2017, the renovation budget accounted for approximately nine per cent of capital investment and eight per cent of the appropriated budget. The difference of one per cent between capital and appropriated budgets suggests a consistent pattern of renovation expenditure. The other years followed a similar trend except in 2018, where the margin increased to two percent. This percentage difference suggests that despite the steady allocation in 2017 and 2018, the FMWR HQ allocated more of its budget to infrastructure rehabilitation. The increased renovation budget is linked to the federal water minister's repair and rehabilitation agenda. In 2016, the Minister identified uncompleted projects as a major hindrance to sustainable water access for national development and committed to rehabilitating 116 projects nationwide (Adamu, 2016). Additionally, the Partnership for Expanded Water supply, Sanitation and Hygiene (PEWASH) programme aimed to renovate 100,000 boreholes and wells nationwide to meet SDG 6 by 2030 (Federal Ministry of Water Resources, 2016b).

The distribution in Figure 7-6b shows that over the six years mean renovation expenditure topped 50 percent of the mean six-year capital with the Gurara water management authority. Amongst the RBDAs, however, allocation to the Chad Basin was highest despite having the third-highest mean rehabilitation budget. During this period, the Chad Basin's mean rehabilitation budget accounted for 23 percent of its mean capital budget and 18 percent of its mean total appropriated budget. Essentially, the high rehabilitation percentages for both Hadejia-Jamaare and Chad Basin could be due to the persistent insecurity in the northeast region of Nigeria, where reports of damages to water, electricity and agriculture facilities have been reported (Kergna et al., 2014; Mitchell, 2019).





a



b

Figure 7-6: (a) Mean renovation budget as a percentage of the mean total appropriated and capital 2014 -2020 (b) Six-year renovation budget as a percentage of total appropriated and capital for each ministry, department, and agencies

## 7.6 Rehabilitation analysis

### 7.6.1 Water infrastructure types

Rehabilitation and repairs have a specific heading and a budget code as a line item. Various types of water infrastructure that are renovated vary from water schemes, water treatment plants and different types of machinery in farm settlements. Table 7-1 lists the types of water infrastructure mentioned in the budgets and the total number per year. The classification of project types offers a more nuanced representation of institutional behaviour and financial commitment if project completion rates or quality are considered (Rasul and Rogger, 2018).

**Table 7-1: Types of water and agricultural infrastructure renovated in the budgets  
2014–2020**

Year	Water schemes	Wells	Boreholes	Dams	Waterworks	Irrigation projects	Hand pumps	Water treatment	Agriculture	Total
2014	14	0	6	11	3	13	0	0	2	49
2015	8	0	5	7	3	12	0	0	2	37
2016	13	0	8	6	4	6	0	0	0	37
2017	13	0	11	16	9	18	0	0	1	68
2018	19	1	13	25	13	20	1	3	0	95
2020	24	1	11	19	11	20	0	0	7	93
<b>Total</b>	91	2	54	84	43	89	1	3	12	379
<b>Mean</b>	15.2	0.3	9.0	14.0	7.2	14.8	0.2	0.5	2.4	63.2

Table 7-1 shows that 379 renovation projects were carried out on the water and agriculture infrastructures and facilities between 2014 and 2020 (excluding 2019). Renovation of water schemes (91), waterworks (43) and boreholes (54) for potable water supply are the most common infrastructure renovations for water supply. Renovation works on dams is the third most common (83), but due to the largely multipurpose nature of most Nigerian dams at 60 percent (A. Adeniran et al., 2021), they have not been classified under water supply. Irrigation facilities (89) are the most renovated agriculture-specific projects. Column 10 (agriculture) is included to capture the investments in specific farm settlement projects. On average, over the six years, the FMWR consistently invested in water and agriculture facilities. The table also shows what water supply technologies are rehabilitated. Hand pumps and wells, which are common in rural areas and peri-urban centres (FMWR et al., 2020; Oluwasanya et al., 2011), have received less rehabilitation investment compared to centralised systems like water schemes and waterworks.

## 7.6.2 Water infrastructure count

Table 7-2 shows the trend, distribution and breakdown of water infrastructure by FMWR and the RBDA from 2014–2020. The steady increase from 2015 with an average of 2.8 (lowest) to 7.2 (highest) infrastructures in 2020 is consistent with investments in rehabilitation. A year-by-year observation shows that in Hadejia-Jamaare’s case, approximately 24 percent of their renovated infrastructure occurred in 2015, despite the significant drop in the total appropriated and capital budget for that year.

**Table 7-2: Types of water and agricultural infrastructure renovated in the budgets 2014-2020 by RBDA**

<b>MDAs</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2020</b>	<b>Total</b>
FMWR	12	7	11	15	15	14	74
Anambra/Imo	7	6	8	12	12	11	56
Benin-Owena	2	1	1	3	3	7	17
Chad Basin	2	2	2	4	2	4	16
Hadejia-Jamaare	9	12	1	6	10	13	51
Lower Niger	3	0	3	5	14	7	32
Ogun-Oshun	5	1	1	2	13	12	34
Upper Benue	2	2	1	1	3	0	9
Upper Niger	5	4	3	2	7	8	29
Cross River	0	0	0	0	1	3	4
Lower Benue	1	1	0	11	5	2	20
Niger Delta	1	1	3	1	3	3	12
Sokoto Rima	0	0	3	6	6	9	24
<b>Total</b>	<b>49</b>	<b>37</b>	<b>37</b>	<b>68</b>	<b>94</b>	<b>93</b>	<b>378</b>
<b>Mean</b>	<b>3.8</b>	<b>2.8</b>	<b>2.8</b>	<b>5.2</b>	<b>7.2</b>	<b>7.2</b>	<b>29.1</b>

Table 7-2 also shows that 56 different water and agriculture facilities were renovated over the six years by the Anambra-Imo RBDA, the highest number outside the FMWR HQ, followed by Hadejia-Jamaare RBDA (51) in the northeast. Two of the three RBDA with the lowest number of renovated projects are located in the south-south region: Cross River (4) and Niger Delta (12), while the rest are evenly distributed. Years where no renovations were carried out are few. Only four RBDA (Cross River, Upper Benue, Sokoto Rima, and Lower Niger) had years without water and agriculture-specific infrastructure rehabilitation budgets. Of these four, Cross River RBDA has the highest and most consistent number with no infrastructure rehabilitated from 2014 to 2017.

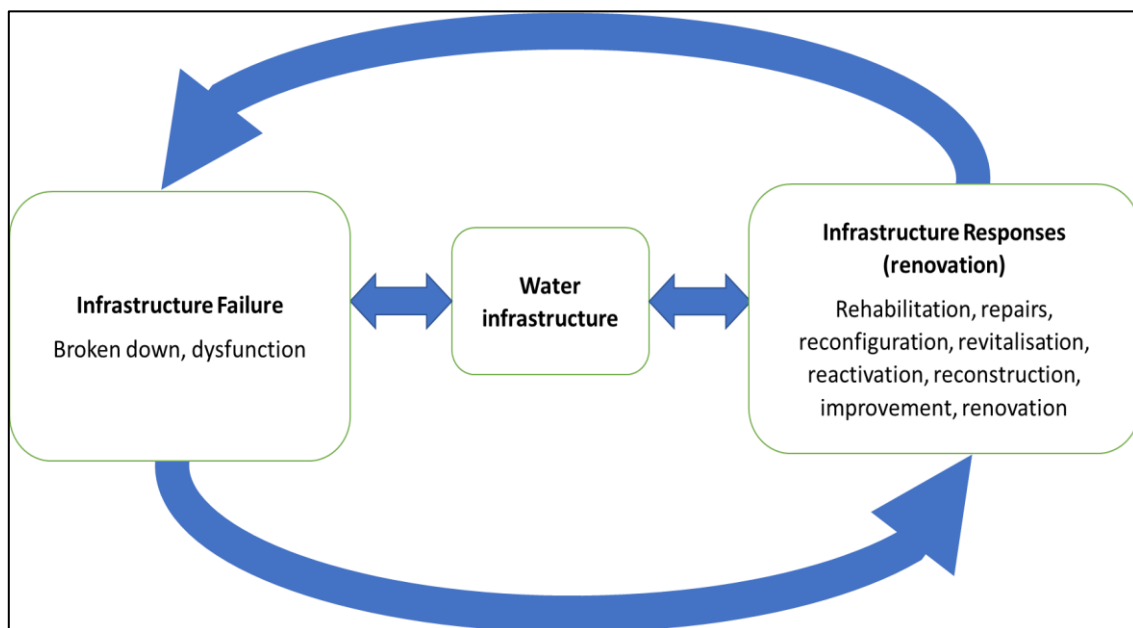
### 7.6.3 Description of infrastructure failure and renovation

Names and definitions are crucial when denoting or describing policy concepts because of their ability to mask particular discourses and practices. Table 7-3 shows the various names (descriptors) used in the budget to describe infrastructure failure and the corresponding responses. The responses or interventions give insight into what technological modification is carried out to water infrastructure; the main budget line item is described as ‘rehabilitation/repairs’ throughout all the budgets analysed. The consistent appearance in the budgets examined explains why both concepts are present in all six years examined. In the 2018 budget, *rehabilitation* was mentioned 218 times. The next most commonly used descriptor is reconfiguration, which suggests redesigning or reconditioning a specific water infrastructure. Redesigned infrastructure might mean changing or upgrading specific technology; for example, changing a pump technology or fixing a well with an electric pump. Although renovation is used less frequently throughout the budgets, the choice in this paper to characterise all types of infrastructure responses to failed or failing infrastructure is personal. Only two of the six budgets examined mentioned renovation, suggesting a need to explore the nuances around infrastructure failure as a policy field in Nigeria and Africa broadly. Exploring the variations across years suggests that, in 2017, a range of infrastructure interventions to reconstruct and improve water infrastructure was standard.

**Table 7-3: Descriptors used in the budgets for infrastructure failure and renovation**

<b>Year</b>	<b>Rehabilitation</b>	<b>Repairs</b>	<b>Dysfunction</b>	<b>Renovation</b>	<b>Reconfiguration</b>	<b>Revitalisation</b>	<b>Reactivation</b>	<b>Reconstruction</b>	<b>Broken down</b>	<b>Improvement</b>
2014	x	x			x					
2015	x	x								
2016	x	x								
2017	x	x	x					x	x	x
2018	x	x	x	x	x					
2020	x	x		x	x	x	x			
<b>Total</b>	<b>6</b>	<b>6</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>

To better describe the nature of infrastructure failure in the budgets, the article presents a simple classification model of infrastructure interventions based on the types of technical responses described above and the descriptors for the failure (Figure 7-7). The feedback loop suggests the recurring loop between infrastructure failure and infrastructure responses, where broken down or dysfunctional water infrastructures are rehabilitated, reconfigured or revitalised. Failed water infrastructures can mean poor performing or deteriorating infrastructures that are failing to deliver optimal efficiency; therefore, requiring social and material intervention to improve it.



**Figure 7-7: A simple illustrative model for infrastructure failure and renovation**

It could also mean completely broken down or dysfunctional and decaying facilities, a common feature across state and federal levels (Macheve et al., 2015; Otun et al., 2011). Such projects are abandoned for an extended period of years (e.g., Ikerre gorge dam, Mambilla hydropower dam) and require major revitalisation, reconfiguration or complete reconstruction. A third category is infrastructures that are failing or poor performing due to outdated technological components. Reconfiguring such infrastructure means adapting it to new climatic, technological and societal demands. These classifications are vital for explicitly representing the budgetary components and tracking budgetary compliance and performance.

## **7.7 Discussion**

### **7.7.1 Variations in budgetary investments**

Generally, most investment decisions on capital and renovated infrastructures follow the pattern of overall appropriated budgets. However, spatial differences in budgetary allocations exist between RBDAs. Such information offers both negative and positive views of politically contested federal funding. Against the common argument of marginalisation against southeast Nigeria in federal investments, Anambra-Imo RBDA has the highest appropriated capital budgets over the six years examined. Simply put, Anambra-Imo has the largest financial capacity to construct new water infrastructure of all the RBDAs. Long-term capital investments improved significantly from 2014, indicating that the federal government's declarations of its development intentions are matched with financial investments, however inadequate. Overall improvements in capital expenditure by the federal government have occurred regardless of the inflationary trends in the country and the declining value of the Naira to the US Dollar (World Bank, 2019). Fiscal stability of the international exchange rate can ensure that more money is available to invest in the sector.

### **7.7.2 Increased capital investment by FMWR over the years**

The FMWR has expanded its capital expenditure over this period, signalling increased participation in lower-level infrastructure development and planning. This expansion translates to an expansion of powers. At the same time, this expansion is due to the different commitments at the federal level towards improving WASH and SDGs (Federal Ministry of Water Resources, 2016b). Taking these lower-level tasks upon itself will further entrench the institutional overlaps (Ngene et al., 2021) between the FMWR and its departments, in areas like borehole construction and water scheme development. The RBDAs have the constitutional responsibility for those projects, especially water supply and irrigation development (Federal Ministry of Water Resources, 2016a). Instead, the FMWR should focus on policy and national-level planning, institutional development and management, and oversight of the RBDAs. The FMWR will free up institutional capital and resources, attract financing capital, and plan cooperatively with states and local governments by divesting its investment away from infrastructure development to engage national, regional, and global level responsibilities.

### **7.7.3 Improving accountability and governance**

Determined efforts at the federal level can be channelled towards programs such as the Presidential Water Summit in 2013 (State House, 2013), put forward by the African Ministers Council on Water (AMCOW) and attended by many key actors and stakeholders in the water supply sector. Such a program set concrete deliverables for the water sector, especially in governance and finance-related

matters. For example, at the Presidential Water Summit, good governance, accountability and management were some of the key commitments agreed upon to improve water sector performance (State House, 2013). An additional question on what constitutes abandoned projects is urgently needed to denaturalise such concepts. Why is money allocated for such projects? Are valuations carried out on those facilities, and how frequently? Other line items are highly vague and require further clarification. The specific information required to make an informed decision about their validity will ensure public accountability. For example, one of the groups of rehabilitated infrastructure items is street lights, which was not spelt out as in the case of roads and other types of infrastructure. With the call for Nigeria to triple its investments to achieve the SDGs, budgetary openness and accountability must be part of that package infrastructure expenditure (The World Bank, 2017a).

Freeing up institutional space at the federal level offers an opportunity to improve the financial performance and governance of the RBDAs. Institutional space refers to financial and policy capacities of the FMWR. In July 2020, an investigation into audited accounts of federally funded agencies between 2014–2018 by the Nigerian House of Representatives Committee on Public Accounts led to an arrest warrant issued to the immediate past managing director of one of the 12 RBDAs, for refusing to appear before the committee (NAN, 2020). This summons is not an isolated incident. However, it requires the FMWR to strengthen its oversight responsibility on the RBDAs. Although the 2020 National Water Resources Bill (National Assembly of Nigeria, 2020) has taken steps to make the appointment of RBDA managing directors more competitive and transparent, approaching this challenge in multiple ways is crucial. One way to revisit this challenge is through the Government's White Paper on the *Report of the Presidential Committee on Restructuring and Rationalisation of Federal Government Parastatals, Commissions and Agencies* (Federal Government of Nigeria, 2014). Otherwise known as the *Oronsaye Report* after the committee chairman, the report recommended fundamental governance changes in the FMWR. One such proposal was for the Communiqué to rearrange the board and management of the RBDAs by appointing a seven-member governing board to manage the 12 RBDAs. However, this proposal was rejected by the federal government in 2014 (Federal Government of Nigeria, 2014).

#### **7.7.4 Cyclical infrastructure failure and renovation pattern**

Constructed water infrastructures have a cyclical tendency to fail and be renovated. Infrastructure failure, also termed project failure (Danert et al., 2020; Nweze, 2016; Otun et al., 2011), poses a critical challenge to the SDGs (The World Bank, 2017b). The insights gleaned from the budgets suggest that this cycle has taken a life of its own and become a ‘norm’ in budget planning. As shown in the infrastructure-renovation model, the languages used to assume the need to fix what is broken are valid in a sense. Words such as *dysfunction* and *broken down* are used to characterise failing or failed water infrastructure. A vital question is how this idea perpetuates unsustainably designed and dysfunctional water infrastructures. The growing scholarship on functionality and sustainability of water infrastructure



(Adams et al., 2020; Oloke & Olugboye, 2014) recognises this challenge and can use this insight to deeply understand the connecting factors between the financial and technical, institutional, and social aspects of infrastructure failure and renovation cycles. This nexus is critical as it effectively bridges the structural level decisions at the pre-planning stage with the micro-level relations at the water use and consumption stage. The analysis also reveals certain institutional practices that are not yet captured in the literature but are critical to adequate monitoring of water infrastructure investments. For example, the different categories of words used to describe infrastructure renovation can shed light on the types of interventions.

The reproduction of infrastructure failure is closely linked to constructing new water infrastructures without adequately renovating existing ones for optimal production and efficiency. The cycle created by fixing what is broken allows a seamless and repetitive pattern of intervention, where the need to question why it was broken is left unchecked. New constructions and renovations have historically been central to all policy interventions to address water access and water resources development issues as supply-side interventions. The development of more water infrastructures will expand the number and scope of rehabilitation intervention. In that sense, new constructions facilitate the infrastructure failure-renovation cycle. By stopping further development of dams or water infrastructure, capital investments can be diverted to rehabilitate existing water infrastructures or make them fully functional. Additional opportunities to clarify the infrastructure types and the budget represent progress towards accountability, because the infrastructure failure-renovation cycle presents an avenue to check fiscal corruption. The question then arises: What is the acceptable ratio of renovation-capital investment that will limit or stop the reproduction of this cycle?

The unequal distribution of rehabilitated water infrastructure and the types across political regions is noteworthy. Renovation of water schemes varies according to location and facilities, ranging from hospitals to schools, primarily by integrating sanitation and health policies into the broader water supply framework. However sensible this policy objective is, it has extended the responsibility of the FMWR into the Federal Ministry of Health's terrain. The unequal distributions also vary according to the source of water infrastructure as boreholes, and small earth dams, are commonly rehabilitated. Since most research on dam development focuses primarily on large dams (Moran et al., 2018), a more sustainable plan for small and medium dam rehabilitation is critically needed, considering their prevalence across the country (Alhassan et al., 2019).

### **7.7.5 Legislative and policy issues**

Corruption and misuse of public funds by legislative officeholders at national and state levels is a problematic water governance issue. Otherwise known as legislative constituency budgets or constituency development funds, they are similar to legislative earmarks in the United States and popular

in many developing countries (Center for International Development, 2009). Orimogunje (2015) described a legislative constituency project as “any project that is conceived, designed or executed within a legislative constituency with the collaboration, input or influence of the legislator(s) representing that particular constituency in the legislature” (2015, p. 181).

### 7.7.6 Budgetary issues and infrastructure financing

The budgets contain several inconsistencies, especially with budgetary items such as the recurrence of water infrastructure schemes, sometimes for 4–6 years. Crossovers in the budgets appropriate money for new or renovated projects. From an external analyst’s perspective, with particular interest in why the recurrence persists, these crossovers require additional explanations. For example, the Aghenebode waterworks, rehabilitated in 2018, was ongoing in the 2020 budget (Federal Republic of Nigeria, 2020). Another point worth noting is the ‘revenue-generating assets’ category, budgeted for under rehabilitation and repairs. Revenue-generating assets ought to be self-sustaining; then, the vital question is to understand whether a valuation of those assets is explicitly conducted – how much do they generate? Further clarification on such line items can help dispel claims about corruption and lack of accountability.

These issues play into the broader infrastructure financing debates (Bayliss, 2013; Briscoe, 1999b). Projects described as completed on paper are not completed on the ground, prompting the need for ground-truthing written information. A helpful illustration is the use of the Abacha loot to finance water infrastructure. The field monitoring exercise of the Abacha loot found that water projects stated by the Ministry of Water Resources as completed and functioning in their reports were still under construction (The World Bank, 2006b). The *Abacha loot* is public funds looted by the late Nigerian head of state, General Sani Abacha, who died in 1998 after five years in power. An estimated US\$5–6 billion was stolen from the Nigerian State and stashed in banks in the United States, Switzerland, Liechtenstein, United Kingdom, Luxembourg and other unknown destinations around the world (Enweremadu, 2013). In 2005, after litigation, Switzerland became the first country to authorise the repatriation of the funds through its supreme court. Working with the Nigerian Ministry of Finance, the World Bank agreed to use the funds to fund MDG-related capital expenditures in the Nigerian government budget directly. The Nigerian government received a total of US\$505.5 million from 2005–2006 and spent US\$57.6 million on water projects such as the Goronyo Dam (The World Bank, 2006b). The financing strategy for the SDGs also considers repatriated funds as a source of water infrastructure financing (United Nations, 2021a), which inevitably provides a solid basis for developing countries to fight for and access misappropriated or stolen public funds, kept in Europe and North America.

## 7.8 Conclusions

This article analyses the Nigerian Federal Ministry of Water Resources' budget from 2014 to 2020. The analysis used a descriptive quantitative approach and content approach to examine the total appropriated, capital and rehabilitation budgets, to understand the trend over the years and the distribution across the ministries, departments and agencies (MDAs). The results show that spatial variations in budgetary allocations are evident across the RBDAs, and increased capital investment by FMWR over the years has occurred due to its increased involvement in water infrastructure development. This relationship extends into the broader legislative and policy issues where federal legislative constituency budgets become intertwined with FMWR as they implement such projects.

Infrastructure failure and renovation occur cyclically to mask broader budgetary issues and infrastructure financing problems. In this sense, revisiting institutional practices around budget planning and preparation is necessary to shed light on inequities buried in the process and the conflict that arises from overlapping intra-institutional responsibilities. The rehabilitation and renovation budgets descriptors helped develop a simple infrastructure failure-renovation model to show the self-reinforcing relationship between the two concepts.

Based on this analysis, the following recommendations are proposed:

- Increase transparency about what needs to be rehabilitated. If possible, adding an addendum as an explanatory note to the budget documents will enhance public scrutiny.
- Infrastructure projects or facilities that occur more than two years consecutively in the budget should be flagged for administrative oversight. Where this is not possible, the ministry or department should provide a detailed explanation for the recurrence.
- Expenditures should be better tailored towards water-specific infrastructure rather than electricity or agriculture. This specification would require some institutional rearrangement to cut off redundant projects such as agricultural farms that are the constitutional responsibility of the Federal Ministry of Agriculture and Rural Development. Similar recommendations were presented in the 1995 NWRDP (JICA & FMWRRD, 1995b).
- Develop new mechanisms to understand and categorise the complex interventions in infrastructure renovation. Since it is impossible to scrap infrastructure renovation, specific parameters should be defined to tease out the different aspects it entails. Through this analysis, a systematic method to determine what percentage of an allocated budget should be spent on infrastructure renovation can be established.
- Divert capital investments for the development of new infrastructures to focus on renovating existing water infrastructure. The budgets are stressed too thinly on building new infrastructures that never get completed or renovated. Lessons could be gleaned from previous national water rehabilitation projects (The World Bank, 2001a). Meanwhile, reviewing the excessive focus on

measuring budget performance, based on capital expenditure, will help refocus the rehabilitation and renovation processes in budgetary performance management.

Future research areas should address the following three areas. First, the financial impact of political insecurity on water, agriculture and hydroelectric infrastructures needs to be determined, since research showing how this insecurity contributes to infrastructure renovation is sparse. Understanding how these changing political dynamics within the country affects water infrastructure expenditure is critical. Second, studies that systematically correlate capital investments on new infrastructure development with renovated infrastructure will help establish a better structure for distributing budgetary allocations across the MDAs, particularly the RBDAs. Third, conduct an empirical analysis of one to three water infrastructure systems using this approach to demonstrate the frequency and nature of infrastructure renovations. Such a study will shed more light on the nature of the failure and operational or administrative issues that need addressing. The final research area connects the first two. Further development of the conceptual map presented in this article will facilitate deeper exploration and discussions in managing the infrastructure failure-renovation dynamics.

## Chapter 8: Differentiating infrastructure failure: Coloniality, space, and the footprints of population size threshold

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**Sub-question 4:** As a strategy of power, how does infrastructure failure as a water policy and governance concept operate within Nigeria's water governance and with what effects?

### Chapter introduction

Chapter 8 digs deep into colonial history to show the foundations of infrastructure failure in colonial Nigeria's water governance, particularly rural water governance. This genealogical analysis uses the concept of the *apparatus* and the logic of *resistance* (Chapter 5) to understand:

- the underlying political ideology of infrastructure failure;
- the conditions under which infrastructure failure developed; and
- subsequent changes to the use of infrastructure failure during the period.

Building on colonial and post-colonial scholarship, the chapter describes how racial paternalism as a political ideology within a power matrix (Mignolo & Escobar, 2013; Ndlovu-Gatsheni, 2013; Quijano, 2000), passes through colonial officials (Hondius, 2017) to divide water infrastructures, spaces, and bodies in unequal and unjust ways (Fanon, 1968; Rodney, 1973). I have provided a theoretical elaboration of racial-colonial/state paternalism and genealogical analysis in this chapter.

I propose a definition of infrastructure failure as *an insidious and unchallenged administrative and/or policy decision exercised within the public space and assumed as grounded in evidence*. This definition helps to capture the inherent inequities built into the design and administration of the standpipe as the cause of its persistent failure. The chapter finds that different spaces were divided, and groups created, through an arbitrary idea I termed *population size threshold*. The demarcation of rural and urban water governance, the prevalence of decentralised systems, and the enduring inequities identified in the literature (Chapter 1), described in policy and governance practice (Chapters 2 and 5), contested at the Nigerian state level (Chapter 5), and with ramification for everyday lives (Chapter 6) began during this period. The types and patterns of infrastructure failure we see today underwent many reformulations in the colonial period. The main contribution of this chapter is that the development of

the *community* (public) standpipe and its continued use requires drastic reconsideration because of its historical origins.

### **Abstract**

Produced in coloniality, infrastructure failure as a water governance concept is inextricably linked to increased water access and sustainability of water supply infrastructure in African countries. Using Nigeria as a case, I argue in this article that, deployed in the ultimate service of paternalism, infrastructure failure as an apparatus of power is shaped in coloniality, and deployed in the state's political, spatial, and bodily transformation projects. By disassembling the system that constitutes it, I uncover *population size threshold*, a non-discursive apparatus employed by colonial administrators to differentiate, classify, and hierarchize water infrastructure and its distributions in Nigeria. Eventually, infrastructure failure perpetuates inequitable water access as it grafts itself into colonial spaces and bodies, marking what is rural or urban for water governance or which populations enjoy particular water infrastructure. I identify two regimes: the ideological development between 1914 and 1940; and its administrative practice between 1940 and 1960, when it was officially named and used. I then show how infrastructure failure facilitated policy, administrative and institutional changes to water access regimes through a productive exchange of power relations.

## **8.1 Introduction**

From the expropriation of peoples, their land and water sources, to projects and policies that re-organize and re-classify spaces and populations, infrastructure<sup>46</sup> renovation (rehabilitation, repairs)<sup>47</sup> as a water governance concept is inextricably linked to increased water access and sustainability of water supply infrastructure in many African (SSA henceforth) countries. It was employed to ameliorate the health and hygiene conditions of Indigenous Africans in the colonial<sup>48</sup> era. What then is infrastructure renovation, and why does it endure? Using archival research, I attempt to disrupt the existing *ethos* of infrastructure renovation by “revaluing our values” (Garland, 2014, p. 372) around its use and conceptualization. Analysis in this article covers the period between 1914–1960 to deconstruct how infrastructure failure in its micro-relations of power relate to “the greater strategy of power” (Foucault, 1980, p. 199).

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<sup>46</sup> Infrastructure in this article implies standpipes or waterpoints generally.

<sup>47</sup> Historical changes to the word have occurred in policy language, from rehabilitation in the 1980s to combine or use renovation, rehabilitation, and repairs interchangeably in the 2000s.

<sup>48</sup> I take colonial Nigeria as the period between 1914, following the amalgamation of the northern and southern protectorates and formalization of indirect rule, and 1960 when Nigeria gained political independence from Britain.

As a dialectical outcome of infrastructure failure, infrastructure renovation is at once mutually constitutive because one cannot exist without the other, and mutually reinforcing, accounted for by its transmutations over time. Thus, a perfunctory and uncritical assessment of this phenomenon may interpret it as the rational response to project failure – *repair what is (we have) broken* – by default. Building on this logic, I define infrastructure renovation-failure<sup>49</sup> as an insidious and unchallenged administrative and/or policy decision exercised within the public space and assumed as grounded in ‘evidence’. I argue in this article that, deployed in the ultimate service of paternalism, infrastructure renovation-failure as a discursive apparatus is moulded and curated in coloniality, and deployed in the state’s political, spatial, and bodily transformation projects. In this sense, infrastructure renovation-failure musters its productive powers to endear and enrol peoples and integrate them into the political project of helplessness and domination.

My argument here is that, by conception and design, infrastructure renovation as a historical construct is trans-spatial and trans-bodies: an outcome of a web of relations involving material and symbolic exchange of favours; complex rationalizations; normalization of judgements of its superficial temporary benefits; legitimation of discourses that shift responsibilities (of justice and access) and discourages resistance; and the struggles of domination of, and by, specific knowledge. All these layered and interrelated elements are exercised using specific strategies of power. Infrastructure failure of the standpipe is fundamentally an invention of the political-administrative class, inspired by dissent, dispersion, and the intrinsic need to hierarchize and differentiate spaces and populations. Building on colonial and post-colonial (post-independence) historical scholarship in rural and urban Africa (e.g., (Acey, 2007; Alozie, 2020; Nilsson & Nyanchaga, 2008; Njoh & Akiwumi, 2011), I aim to expose the constituting logic of infrastructure renovation-failure and its ‘genesis’, re-formulation, deformation, and elaboration in colonial Nigeria.

Infrastructure failure of standpipes is a symbol of inequitable water access in many SSA countries at national (The World Bank, 2017; Andres *et al.*, 2018a) and regional levels (Deshpande *et al.*, 2020; Hope & Ballon, 2019). Nigeria is a fascinating landscape to study the footprints of colonial water governance because millions are denied a present and future of sustainable water access (Andres *et al.*, 2018b; Federal Ministry of Water Resources (FMWR), 2020), due to spatially differentiated infrastructure inequities between rural and urban levels of access, states and regions, and household access and consumption (FMWR *et al.*, 2020; NPC & ICF, 2019). However, standpipes remain an “important strategy” for increased access to water (Eberhard, 2019, p. 55). As a policy mechanism, infrastructure renovation is infused in Nigeria’s plan to achieve the Sustainable Development Goals target of 100 percent water access by 2030 through the ‘hardware’ component of the programme strategy

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<sup>49</sup> Conceptually for all references to infrastructure renovation or failure in this article.

for the Partnership for Expanded Water Supply, Sanitation & Hygiene (PEWASH); the plan will *repair* 77,693 standpipes between 2016–2030 (Federal Ministry of Water Resources, 2016b).

Fiscally, Nigeria's FMWR 2020 appropriation budget on water supply infrastructure dedicated approximately 13 percent of water facility rehabilitation funds to 'borehole rehabilitation', a 6 percent increase from 2016 (Federal Republic of Nigeria, 2020). Funds and policy initiatives come from globally powerful and politically impactful multilateral institutions and states like the European Union (EU) and World Bank. In 2019, Nigeria received US\$174 million of the US\$2.99 billion for drinking water and sanitation aid provided to African countries (WHO, 2020). Doubling as knowledge networks, institutions like the EU and World Bank generate and push ideological and technical knowledge in conjunction with development institutes and universities, mainly in Europe and the United States with a long colonial history.

## **8.2 Paternalism, coloniality and infrastructure renovation**

Philosophical debates on paternalism as a liberal form of power (political, ideological) have their roots in the work of John Stuart Mill's critique of political paternalism and parental paternalism with its utilitarian effect on personal liberty, dignity, and choice/agency (Dworkin, 2020; Fuchs, 2001; Mill, 1859). Studies of racial paternalism are largely found in the United States and, more recently, in other settler-colonial states like Australia (Howard-Wagner, 2017). Scholarly debates about the nature of racial paternalism in Africa are practically nonexistent. Few scholarships attempt to link colonial paternalism to post-Apartheid literature (Emmett, 2015) and the tourism industry's use and perpetuation of the South African Bushmen as *inferior* (Koot, 2020). As such, derivatives of state paternalism rooted in racial paternalism on the African continent, and its critique as an ideology of the state in a liberal and neoliberal regime, are left unscrutinised. Engaging neoliberalism and development in Africa without a correlating exploration of its conceptual relationship to racial paternalism will limit our understanding of its contemporary effect on individual and societal structures of power.

One common issue with current scholarships is their emergence and articulation from settler-colonial states. This tendency universalises the distinctive dynamics of unequal power relations and the legacies of paternalism in different contexts. Deinke Hondius's historiographical work is important to understand racial paternalism in non-settler African states because it delineates the nature of Blackness in Europe from Blackness in the United States. Hondius (2017) distinguishes his approach because of the universalisation tendencies of Elkins' interpretation of slaves, and the timing of the release of Elkins' book when Afro-American resistance to racial hegemony was at its peak in the 20th century. Hondius (2017) argues that Elkins' criticism of Ulrich Phillips' thesis on the justification of paternalism (and hence slavery) was rooted in the infantilisation hypothesis, which dominated the early 1900s until the mid-1920s. By the mid-1930s, Elkins describes the emergence of what he called egalitarian



libertarianism, which he argued allowed “absolute power infantilise” (Elkins, 1987, p. 25). Racial paternalism encapsulates the ideological and material components of race to capture its symbolic forms. Tsvetan Todorov calls this *racialism* a component of anti-black racism (Todorov, 1993).

One way to understand the congruence is through colonial and racial alterity (Alozie, 2020; Fanon, 1967), whose foundations lie in white fear of blacks. Alterity exists as a mental and spatial category of segregation that is forced upon individuals and groups (Fredrickson, 1971). Conversely, through their bodily encounters with the world, black individuals actively maintain their distance and oppose self in response to what Fanon calls "alterity of rupture, of conflict and of battle" (Fanon, 1967, p. 222). Hondius classifies five varieties of anti-black racism (Table 8-1) as the product of white fears.

**Table 8-1: Five varieties of anti-black racism**

Blacks as nonhumans:	1. Blacks as “wild, dangerous animals”
Beastialisation:	2. Blacks as “domestic animals, cattle, livestock”
Blacks as inferior or incomplete humans:	3. Blacks as permanent children, unfit for self-rule
	4. Blacks as exotic, favourite, special exception: romantic racialism
	5. Blacks as inferior “race”: scientific racialism
Inspired by: George Fredrickson, <i>The Black Image in the White Mind</i> , New York, 1971, 56-67	

**Source:** (Hondius, 2017, p. 38)

Racial-colonial ideologies are intrinsically paternalistic. As a starting point, a detailed excerpt of Ake's argument is necessary to understand the universal effect of the logic of colonial relations that interprets colonialism as a sympathetic action rather than the violating and racially girded ideology it represents. Ake writes that:

The logic of colonial relations and the concrete interests inherent in these relations determine the dominant ideology of the colonial system. It is customary to make much of the differences between the colonial practices and ideologies of the Portuguese, Belgians, French, Germans, English, Italians, and Spaniards. We have been sufficiently impressed by these distinctions that we now talk about enlightened colonisers and unenlightened ones, those who took seriously their mission civilisatorice and those who merely exploited. The fact of every matter is that colonialism is an objective relation which is the same everywhere. And the colonial relation demands, indeed imposes, a particular political system and particular ideologies congruent with its objective character. Thus, all colonisers used essentially the same ideology. They all developed very similar justification for colonialism from the same premises, namely that colonialism was beneficial to the colonised in the fundamental sense of improving the quality of their lives.

Colonialism became not self-seeking, not exploitation, but salvation. The very terminology that the colonisers used to describe colonialism reflected the substance of their ideology. Thus, they described the colonies as 'protectorates,' implying that the colonial power was really fiduciary and that its *raison d'état* was protection of the colonies. The British often preferred to think of colonialism as a 'mandate' to help backward peoples, the French and the Portuguese and Belgians as a civilising mission or 'tutelage'. (Ake, 1981, p. 199)

Despite Ake's deep understanding and analysis of the colonial system and its effect on state formation, Ake painfully misses the epistemic dimensions of ideologies by agreeing with the colonialists. He notes that "one could not pretend that the colonised were civilised or equal to everyone else...the colonised had to be treated in a manner commensurate with their stage of development as men, and this, unfortunately, meant limiting their participation and their claims in the community of civilised men temporarily" (Ake, 1981, p. 200). Clearly, in making this declaration, Ake adopted the colonialist's definition of civilisation which in itself sets the agenda for what is to be debated. Scholars such as William Mpfu have provided a decent analysis and a deconstructive account of colonialism's ontological and epistemic implication in contemporary African state formation and practices (Mpfu, 2018), drawing on the works of decolonial scholars such as Walter Mignolo and Arturo Escobar. The second logic of colonialism concerns the paternalistic nature of the colonial government. Fanon tackles the second logic more head-on as he highlights the role of ignorance in the construction of paternal care. He proposes that:

In certain regions of Africa, driveling paternalism with regard to the blacks and the loathsome idea derived from Western culture that the black man is impervious to logic and the sciences reign in all their nakedness. (Fanon, 1968, p. 96)

To be impervious to logic is to maintain a level of ignorance that requires one to be taught, scolded, or reshaped into a particular object or idea. The internal contradiction of paternalism is a dilemma that occurs as *care* and *revolt* in the minds of the dominated. The impression of paternal care can be presented by the dominant as care, which resonates with the dominated as a disbursement of generosity. Alternatively, the necessity to revolt can be instigated or aroused if the elements that bind the *contract of care* are compromised. The contract of care between the colonised Africans and the colonial government uses a range of strategies and tactics that I shall call here *apparatus*, following Michel Foucault. Through this idea of the contract of care and the possible escapes that paternal domination in colonial paternalism provides, we can observe the different stages and types of paternalism in colonial governance in Nigeria. To be allowed into the liberal order on their own terms, the degree of autonomy that colonised peoples desire must be contested and fought for, either by themselves or through the help of others. However, the conditions of possibility for this autonomy to be achieved or regained, as the case may be, must be present within and beyond the limitation imposed by the entire colonial schema.

Infrastructure failure plays into the greater strategy of coloniality of power (Quijano, 2000, 2007; Quijano & Wallerstein, 1992), a matrix where “racial social classification” forms the underlying logic of spatial and global demographic classification (Mignolo & Escobar, 2013, p. 25). In this matrix, coloniality of knowledge enforces the Eurocentric perspective of knowledge as total(izing). That is, “power of the written word forged with the established racial hierarchy” (Mignolo & Escobar, 2013, p. 88) for knowledge production, use, and dissemination. Coloniality of knowledge enrolls technological infrastructure in its operations (Escobar, 2007, 2014). The “coloniality of being” (Mignolo, 2013, p. 94) connects these subjectivities and mechanisms of power with the lived experiences of the colonized. Maldonado-Torres (2013, p. 97) argued that Frantz Fanon was able to connect “the genetic, the existential, and the historical dimensions where Being shows most evidently its colonial side and its fractures”. Colonization of being is both an epistemological and ontological project, a condition which Maldonado-Torres (2013) described as the imposition of worldviews that produce (counter) discourses through its contact and enforcement on resisting subjects. Thus, coloniality and its correlate, colonialism, contain a power of projection into the future of its subject by tactically distorting, disfiguring, and destroying their past and future (Fanon, 1968).

Rising under the archetypal discourse of race and racialism, the colonial state and its political ideology feature paternalism in the declaration of Crown care and protection towards its subjects (Lugard, 1922). Building on the scholarship on racial paternalism<sup>50</sup> and infantilism (Elkins, 1987), Hondius (2017) believes that paternalism in all its complexities maintains obduracy and order in unequal power relations. Similarly, paternalism as a “type of governance” (Hondius, 2017, p. 32) allows unfettered protraction of structural inequalities because it presents limited alternatives to the less powerful in an asymmetrical relation of power. Hondius (2017) argues that Elkin’s criticism of Ulrich Phillips’ thesis of the justification of paternalism (Elkins, 1987), hence slavery, was rooted in the infantilization hypothesis that dominated the early 1900s until the mid-1920s. Elkins describes the emergence of what he called “egalitarian libertarianism” in the mid-1930s, which he argued allowed “the infantilization tendencies of absolute power” (Elkins, 1987, p. 305). Arguably, coloniality in the post-first world war differed in intensity and tools of its suppressions, making the logic of absolute power in its operation unsubstantiated; however, its method of entry in non-settler colonial spaces is of absolute power and domination. Despite the complexity of paternalism and its subtle violence, it presents opportunities to escape domination.

European colonial educational and cultural patterns were imbued with paternalism, which Walter Rodney argued exalts “negative and static social features” of African culture in the form of a “mock respect” (Rodney, 1973, pp. 76–77). The imbrication of education and culture explains how colonial paternalism and racial European paternalism is exercised within colonial spaces in Africa by

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<sup>50</sup> Please see Hondius (2017) for a detailed historical analysis of racial paternalism and infantilism between Europe and Africa.

infantilizing the Indigenes. Colonial paternalism can be thought of within the remit of ‘antagonism of strategies’ where relations of opposing forces operate within an asymmetrical power relationship. Insidious in its character, the ‘protective’ and ‘caring’ power of political paternalism (the Crown) is mobilized as an overarching strategy in the architecture of the coloniality of power in Africa. Given the above, I argue that infrastructure failure as a mechanism of power, a techno-managerial apparatus, does not only repress. In addition, it re-produces and re-generates discourses and knowledge types. It divides spaces and things and transforms bodies by replacing the old (mediocre/abnormal) with the new (modern/normal). Hence, for state/societal level epistemological reconstruction to occur, “the mechanisms of power that function outside, below and alongside the state apparatuses, on a much more minute and everyday level” needs to change (Foucault, 1980, p. 60). Deconstructing these historical subjectivities is an essential research need (Mignolo, 2007b, 2017), more so in Africa (Hondius, 2017). Thus, deconstructing this colonial apparatus means delinking it from the broader administrative apparatus it operates insidiously under. As Mignolo (2013, p. 313) noted: “One strategy of delinking is to de-naturalize concepts and conceptual fields that totalize A reality.”

### **8.3 Power and infrastructure failure as a broader logic of colonial paternalism**

Genealogical analysis seeks to uncover the constitution of a subject or phenomenon within a historical framework by the processes of its *descent* and *emergence*, planes that specify its attributes and differentiates them accordingly. I begin by mapping the contestations of colonial political paternalism between the United States and Britain as a major “antagonism of strategies” (Foucault, 1982, p. 789). Within the surface of emergence of this major Foucaultian event, a specific ideological change in colonial Britain’s developmental outlook towards Nigeria and Africa emerged. Minor events such as the creation of the Third Colonial Development and Welfare Act (Third CDWA, henceforth) in 1940 as a strategic legislative action signalled an ideological change from development, for Britain, to development and welfare for the Indigenous peoples of the colonies (ODI, 1964; Wicker, 1958). Thus, one can see how strategies are exercised as the means, manners, and procedures used to conduct a confrontation or social struggle for domination (Foucault, 1982). Strategies work through the *dispositif* (henceforth, *apparatus*), a “heterogeneous ensemble consisting of discourses, institutions, architectural forms, regulatory decisions, laws, administrative measures, scientific statements, philosophical, moral and philanthropic propositions” (Foucault, 1980, p. 194), as the main instrument of domination. Here, I establish the conceptual and ideological genesis of infrastructure failure. This newly produced field of rationality worked within an existing administrative apparatus which I. F. Nicholson referred to as the *administocracy*:

rather rudimentary, skeletal, and static, was in fact, no fixed ‘scaffolding’ or ‘steel-gird’ of alien law and order, as often suggested, but something much more elastic,

organic human, frail perhaps, but resilient, the product of hundreds of major and minor decisions and adaptations (Nicholson, 1969, p. 216).

A Lugardian design<sup>51</sup> that perpetuated the liberal/colonial administrative order, the administocracy became the conduit for political and ideological subjectivities like paternalism. The regions, provinces, districts, and native authorities (in descending order) constitute the political-administrative structure of the colonial government under indirect rule. The 1929 Colonial Development Act (and subsequent imperial development policy) were implemented through this administrative structure. The transition from economic imperialism to economist and patrimonial imperialism necessitated the creation of new institutions and administrative apparatuses, undertaken without engaging the underlying philosophies of the administocracy.

At the provincial and regional level, the Public Works Department (PWD) held the ownership and management rights of water infrastructure, including dams, wells, and standpipes, in Òyó Province through the ‘Water Authority’ (Acey, 2012). The District Officer (a government officer) managed rural water supplies and health services in rural areas with the native authorities, firmly establishing the health-potable water nexus. Decisions related to water supply and environment-related matters at the local level rested on the ‘Native Authority’, who usually was the local *Oba* or *Baale* depending on the size of the domain. The 1942 Water Ordinance Act described the *Oba* or *Baale* as a ‘Prescribed Authority’<sup>52</sup> whose titular responsibility empowered them to represent the people in negotiations with the Water Authority, make water-related decisions (e.g., type of water infrastructure), and levy or amend water rates (H. M. Stationery Office, 1938). This governance and institutional arrangement provided the required legitimacy and authority to implement colonial government policies with limited resistance from the people.

After analyzing the planes of relations that constitute this greater power strategy, the geopolitical “hazardous play of domination” (Foucault, 1984, p. 83) between both powers, I demonstrate the connection between the administrative apparatus and political knowledge as one of a mutually influencing relationship. Knowledge as a proxy of power is located at different coordinates within the web of power relations. It concurrently emanates from the apparatus and conditions (determines, transforms, or constrains) it. With spatial ordering firmly established, I attempt to disassemble the ensemble, which constitutes infrastructure failure by uncovering the fundamental non-discursive

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<sup>51</sup> Post Lugardian colonial history is a framework to understand the development and entrenchment of political-administrative governance in colonial Nigeria. Rapidly changing in character and scope from the time of amalgamation of southern and northern protectorates in 1914 till independence in 1960, the framework with its underlying ideological and philosophical positions remained intact. The implementation of the Colonial Development Acts (and subsequent imperial development policy) occurred through this political-administrative system. Also, the transition from economic imperialism to economist and patrimonial imperialism necessitated the creation of new institutions and administrative apparatuses without engaging the underlying philosophies of the administocracy.

<sup>52</sup> The Waterworks Ordinance, 1952, Òyó Division assessment, Chapter 227.

apparatus employed by a micro-institutional apparatus, PWD, to differentiate – *population size threshold* (PST). Implicit to the use of the standpipe in constructing the infrastructural and social space is the undeclared and unrecognized principle of PST, upon which *the foundation of differentiation, classification, and hierarchization of water infrastructure and its distributions are constructed in Nigeria*.

I argue that population size threshold is the rationale for configuring communities (of interests) as pseudo homogenous entities. Population size threshold is exercised to delineate and differentiate spatial boundaries (rural vs urban), infrastructural boundaries (standpipes for ‘public use’ vs piped water into homes), and water access, all for the ‘good’ intention of managing water to increase access (Nigeria Legislative Council, 1946). For delimiting population ratio of 1:500 (1:250) for the use of public standpipes or classifying ‘rural’ areas as 5,000 or less, *population size threshold*, random in its use, unscientific in its emergence, but contingent in its application, permits us to forget and disregard the histories of spatial segregation (now symbolic), of domination and struggles, of condescension and patronizing superiority-paternalism, and of ideologies inscribed in the standpipe and the dispositions of the bodies around which it is constructed.

Functional overdetermination of population size threshold works conjunctively with strategic elaboration as a doubly determined process to constitute the apparatus and allow for its discontinuity – in short, its perpetuation (Foucault, 1980); specifically, the historical construction and use of population size threshold to allocate space and resources (financial, technical, and administrative) around the standpipe. As new developments in technical knowledge emerged and sociopolitical realities became transformed, the apparatus continued its works as “strategies of relations of forces supporting, and supported by, types of knowledge” (Foucault, 1980, p. 196), transforming higher-level power relations at the Public Works Department. The system's paternalistic foundations have been ‘forgotten’, and its effects made durable in spaces and bodies at this stage. Thus, the discontinuities and ruptures become observable and traceable from structural changes at the Public Works Department and the broader administocracy. Subsequent discontinuities include the centralization and regionalization of water resources management in 1947 and, finally, its strategic completion (*remplissement*) (Foucault, 1980, p. 196), nationalization in 1953.

## **8.4 Expanding water access? Ideological origins of infrastructure failure 1914–1940**

### **8.4.1 Lugard’s legacy or Nigeria’s burden? 1914 – 1929**

Welfare colonialism was a product of paternalism and belief in public duty. It marked a genuine, if now forgotten, revival in colonial development after the sense

of fragility and decline of empire of the interwar years, up to the Suez debacle of 1956. While brief, this period coincided with the ascendancy of the liberal-democratic consensus which underlay the welfare state and the building of West European social democracy. It formed the foundation for the demand for fair dealing towards the Third World. (Prins, 1990, p. 712)

One cannot speak of structural power during the colonial era without mentioning the colonial policy of indirect rule. Indirect rule (Cameron, 1934; Wallbank, 1934; Lugard, 1922) was a colonial governance policy where the colonial government used existing Indigenous political governance structures – in Nigeria’s case, its ethnic institutional structure for control of its people. Lugard’s logic of indirect rule was aptly explained by A.C. Burns, the Chief Secretary of Nigeria at the time of amalgamation in 1914:

It was the inevitable task of the early administration to break the power of the various states by armed force, to reconstitute the native courts and the system of taxation, and to reform the native administration. The system which has been called 'Indirect rule through the native chiefs' was set up. Its cardinal features were the recognition of the fact that native rulers were not fitted for independent government, but that under supervision by a political staff (whose policy and methods were co-ordinated in all the different states by a close touch with headquarters), they could be educated to conduct their own affairs and to control a reorganised native executive and judiciary. A portion of the reformed tax was assigned to them for the payment of both the executive and the judges, all of whom, from the Emir himself down to the heads of districts (and in some cases even the heads of villages), were gradually placed on fixed salaries, and had fixed duties.....Powers of legislation, of the initiation of new or increased taxation, of maintaining armed forces, and of the disposal of land, were retained in the control of the Government. (Burns, 1919b, pp. 102–103)

Lugard arrived at this conclusion by referencing and adapting the work of sociologists and historians from the United States and Britain; for example, irredeemable racial ideologues and white supremacists like Lothrop Stoddard and English journalist, Meredith Townsend, who argued for paternalism for the Black African population. I will quote here extensively to show Townsend’s justification for paternalism:

Throughout the history of mankind, black men, brown men, and white men have been divided from each other by lines which have never been passed, and by differences apparently wholly independent of their own volition. None of the black races, for instance, whether Negro or Australasian, have shown within the historic time the capacity to develop civilization. They have never passed the boundaries of their own habitats as conquerors, and never exercised the smallest influences over peoples not black. They have never founded a stone city, have never built a ship, have never produced a literature, have never suggested a creed. If they all perished to-morrow the world would be the richer by the whole resources of Africa probably the richest division of the globe which would then for the first time be utilized. They have been the most self-governed of mankind; they hold some of the world’s most fertile lands; they sit on some of its most magnificent rivers everything the Egyptians on the Nile had, the Negro on the Quorra or the Congo also had and they have never

advanced out of the foulest savagery. There is no evidence whatever that if Africa were left to itself for ten thousand years it would progress in the smallest degree. (Townsend, 1903, pp. 92–93)

Nicholson (1969, p. 217) referred to this period (post-institutionalisation of indirect rule) as one of an “administocracy,” heralded by Lugard but implanted and made durable by Lugard’s successors, Hugh Clifford and Donald Cameron. The effect of this administrative apparatus, designed and projected as a rational approach to protecting the health challenges of European staff, was to set a foundation for a new regime of water supply and infrastructure policy in Nigeria. By examining the content of Donald Cameron’s speech, a colonial governor of Nigeria, Ormsby-Gore (1935), argued that the intention behind the policy was genuine. The Governor encapsulates this intention in his speech where he described the purpose of the policy as a mechanism through which the traditional state is refined and developed into a *modern* state by applying existing customary governance tools and instruments of state control. He stated that:

Indirect administration is designed to adapt for the purposes of local government the tribal institutions which the Native peoples of Africa have evolved for themselves, so that the latter may develop in a constitutional manner from their own past, guided and restrained by traditions and sanctions which they have inherited, moulded and modified as they may be on the advice of British officers and by the general control of those officers.<sup>53</sup> (Cameron, 1934, p. 199)

However, the British officers maintained control of the relationship through the hierarchy of colonial government structure, even though their role was to provide *advice*. This arrangement helped reinforce colonial state paternalism that sees the colonial government (post-independence states) “as the father and the people the children” (Coleman, 1958, p. 180). Crowder (1964), captured this relationship clearly, stating that:

The relation between the British political officer and the chief was in general that of an adviser who only in extreme circumstances interfered with the chief and the native authority under him. However, where chiefs governed small political units, and in particular, where their traditional executive authority was questionable, the political officer found himself interfering in native authority affairs more frequently than ideally he should. This was true in many parts of East Africa and in parts of Yorubaland, where the borderline between ‘advisory’ and ‘supervisory’ in the activities of the political officer was not always clear. (Crowder, 1964, p. 198)

Notwithstanding, Cameron further emphasised the consequences of drifting away from this underlying value and the role of government officers in that relationship. He noted that:

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<sup>53</sup> Address by the Governor, Sir Donald Cameron, Legislative Council Papers, Lagos, Nigeria, 1933



The Native authority that is not acceptable to the people and is maintained only because we impose it on them, is therefore almost certainly bound to fail, and it would be better to endeavour in the first instance to administer the people directly. Native administration, indirect as well as direct, is a means and not an end, and our work but commences when the Native Administration is constituted as an instrument through which the people of the unit may be administered under the direction of the Administrative staff. (Cameron, 1934, p. 203)

*Obas* and local chiefs, referred to as ‘Native Authority,’ acted as colonial government representatives in local administration who exercised political power over the people. With this system in place, local governance structures became subordinate and incorporated to the colonial administrative structure. The political implication of this governance apparatus by the British colonial government has been critiqued by those that argue that indirect rule allowed the elimination of community decision-making once the traditional rulers had been drafted into the colonial administrative apparatus, dispelling any form of community participation in governance (Lloyd, 1974). The first constitutional provision for engaging the traditional rulers in Nigeria in colonial political governance started with the 1914 constitution, the first legal apparatus allowing the inclusion of six<sup>54</sup> traditional rulers (Iyeh, 2014). The 1933 Native Authority Ordinance was the legal apparatus that empowered the Native Authority to prevent water pollution “in any stream, water course, or water hole, and preventing the obstruction of any stream or water-course” (section 8e).<sup>55</sup> Punishment for flouting such offences were excluded from the jurisdiction of the Native courts but set at the discretion of the Resident Officer or the Native Authority, which may not exceed a prison term (maximum six months), or a fine (25 pounds) (section 11).

Colonial government influences in rural areas on matters of land or property rights were not directly evident in the day-to-day life of the peoples. Under the outlined arrangement, broader community participation in water governance was restricted to peoples’ engagement with the native authorities, whose institutions and rules the people conscientiously observed. Contact between local water users in the community and government water managers was minimal and tokenistic, in part due to the colonial governance structure that pursued the principle of indirect rule using existing traditional governance structures. To avoid any form of resistance to domination from the local people, colonial government officers demonstrated an understanding of the limits of their power. To illustrate, such insight was shown in a letter from the Director of the waterworks to the Western Region Chief Secretary in 1946 on matters for the Native Authority and Water Authority, when asked by the Secretary to withdraw administrative responsibilities from the Native Authority:

There are moreover certain duties which might more properly be thought to come within the province of the Native authorities than of the water authority as at present

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<sup>54</sup> The Alaafin of Òyó was one of the six traditional rulers included in the council.

<sup>55</sup> Native Authority Ordinance, 1933 extracted from (Perham, 1933).

constituted, such as the control of boating and fishing on native administration reservoirs. This is a matter with which native authorities are particularly suited to deal with, and for political reasons, it is suggested it would be wrong to ask native authorities to finance water schemes and to take nominal control of them, but to give them no real responsibilities. In this connection, it is suggested that it might be better to amend chapter 63 in order to enable native authorities who own waterworks to make rules in regard to such matter.<sup>56</sup>

Subsequent constitutional amendments gave increased elective and participatory powers to the *Obas*. Nevertheless, their role as the ‘implementer’ of colonial laws remained intact, and their position within the hierarchy of the administrative apparatus was unchanged. The descent of the McPherson constitution in 1952 began the decline of traditional rulers’ powers in Nigeria at large, and the western region specifically. The local government law of 1952 subordinated the traditional rulers further beyond the confrontations between the Alaafin and colonial government (Reed, 1982). Prior to the election, some educated and young elites of the Indigenous party, the Action Group (AG), had raised concerns about the continued role of traditional institutions in government. That role prior to the 1954 Littleton constitution was one in which the *Oba* had powers to appoint representatives to the council. One such protestation was from Bola Ige<sup>57</sup> who, as a key member of the party, challenged the party’s position of allowing:

extraneous bodies with no legal or constitutional status to perform the functions of these organs. The result is that the party was virtually being run by elders who have had their day, who are unable to adjust themselves to modern progressive thinking, and nevertheless, consider themselves the bona fide owners of the AG. (Ayoade, 1985, p. 171).

While Bola Ige did not explicitly mention the traditional rulers, reference to age (elders) and tradition (modern progressive thinking), two characteristics of traditional *Yoruba* monarchic institutions suggest so. The regionalisation of all water resources management in the western region and the changes to the local government laws further weakened native institutions. As Indigenous Nigerians took over political power from the British in 1954, they made efforts to consolidate their statutory and institutional power in relation to the traditional rulers.<sup>58</sup> The new Western Region government abolished the 1942 Water Ordinance Act that conferred the Prescribed Authority title on the Alaafin and replaced it with a new 1954 Water Ordinance Act. Following this revocation and the establishment of local governments councils after the 1953 elections, the powers and responsibilities of Prescribed Authorities were transferred to the local councils. This change made the *Oba* play more of an advisory or consultative role to the government officers, rather than as an active decision-maker on all matters of community

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<sup>56</sup> National Archives, Ibadan, 1946 no 6709/84, 13/11/ 1946

<sup>57</sup> Bola Ige later became the democratic governor of *Òyó* State from 1979–1983.

<sup>58</sup> *ibid*

water access. By 1957, the title of prescribed authority was abolished and replaced with a new act,<sup>59</sup> paving way for the deposition of the *Alaafin* of *Òyó* by the Premier of the Western Region for outrightly supporting an opposition government (Lynn, 2006).

Indigenous opposition to this political domination in the water supply arena at the structural, individual and collective levels were highlighted by other scholars (Duffield, 1971; Ikime, 1968; Coleman, 1958, p. 179). Objections by the Indigenous populations according to Coleman (1958) resulted in protests around water rates levies<sup>60</sup> in Lagos in 1908. These protests led to the emergence of protest movements in colonial Nigeria and formed the beginning of Indigenous resistance to colonial segregationist policies at the political level. The peoples' argument was twofold. First, that there was an abundance of clean water for the indigenes sourced from their rivers and streams, therefore, the imposition of taxes was a prejudiced action against the indigenes because the water supply infrastructure was constructed for the needs of European officers. Second, that although "50 percent of the unofficial members of the legislative council are indigenes" (Lugard, 1922, p. 87), they are not regarded as true representatives of the people because their membership was by government appointment (Lugard, 1922). These two issues of participation and discrimination continued to dominate water governance until the time of this research.

#### 8.4.2 Forging development and 'welfare' in racial-political paternalism

After visiting the city of Bathurst for the 1933 Casablanca conference, the US President, Frank Delano Roosevelt (1932–45), had an 'epiphany' about the living conditions of British colonial subjects, albeit steeped in a utilitarian and paternalistic animus. Scholars have argued that US foreign policy under Roosevelt, particularly his position on British colonies and protectorates, contributed additional pressure on the imperial government to ratchet up policies that focus on social services for the populations of these territories (Dulles & Ridinger, 1955). In his book *As He Saw It*, Roosevelt's son, Elliot, described the conversation with his father where his father described the conditions of the Gambians at Bathurst to Churchill, the British Prime Minister. Elliot remarked that his father felt "the problems of the colonies and colonial markets were at the core of all chances for future peace", remarking that the "colonial system means war" (Roosevelt, 1946, p. 74). The paternalistic ideology was at the heart of this pursuit of freedom and liberty for the colonies. Roosevelt thought that once the Africans "reached maturity" (Roosevelt, 1946, p. 77), they could access political independence. The logic that some form of *political maturity* was required before political independence from Britain sits in agreement with the American

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<sup>59</sup> National Archives, Ibadan 3rd January 1957, letter from the provincial adviser, *Òyó* province, to the prescribed authority, the *Alaafin* of *Òyó*

<sup>60</sup> The government imposed the levies to maintain the water supply development for Lagos and repay the loan for its construction.

form of racial paternalism (Dworkin, 2020; Elkins, 1987; Hondius, 2017). This logic is consistent with the ‘limited capacity’ argument that Africans lack self-governing capabilities unless represented within the colonially-framed liberal structures and order.

At the imperial government level, the undersecretary for the colonies in London, and Governor-General of Nigeria, Bernard Bourdillon, criticized the traditional approach to colonial development and the irredeemable nature of the colonial development approach.<sup>61</sup> Bourdillon argued that Indigenous Africans should be educated to develop their human capital and a new approach that prepared Nigerians for imminent independence and management of their affairs through constitutional changes (Bourdillon, 1944; Bourdillon & Palmer, 1945). Again, the Africans were framed as lacking political capacity, needing time, specific knowledge, and resources to attain political maturity. In this contest of political paternalism, the colonized African always paid dearly for the internal contradictions of coloniality in mind and physical body. However, such pronouncements and policy positions hastened the process of this ideological transformation of the colonial state from one of paternalistic development solely for the British mainland, designed to serve the imperial government’s interest, to one that integrates the developmental needs of the colonized territories (Dulles & Ridinger, 1955). Aside from these high-level political and policy interventions, other events in Africa and Europe that shaped these transitions include missionary activities in Africa, intervention and the rise of Hitler, and ultimately the second world war (Smyth, 2004). Administratively, contingent and robust responses to these structural changes on the ground relied upon and maintained Lugard’s administracracy and the extent to which colonial officers embodied and communicated the strategic outcomes of the ideological apparatus.

Paternalism was framed as a sympathetic and beneficent cause for colonial political officers to pursue. C.L. Temple, a lieutenant governor in northern Nigeria and earlier protagonist of racial and spatial segregation, distinguished the conditions of paternalistic relations to the Indigenes and highlighted its application to specific colonial spaces. Such spatial and interpersonal policies should be applied to “native communities which are living in a condition, climatic or other, which preclude the entry among them of any large proportions of Europeans and not to those where natives and Europeans are intermingled” (Temple, 1918, p. iii). Temple and Lugard’s books were the administrative panopticon and the operational manual for post-Lugard colonial relations in Nigeria. Temple suggested in his book that the colonial officer operates within a doubly determined but contradictory relation of sympathy-domination. Sympathy for the white man, as a victim, “whose administrative work lies among the native races is placed in an abnormal condition” yet is required to dominate the people amongst whom he works, that “are living under abnormal conditions” (Temple, 1918, p. 17). In other words, the white man needed sympathy for himself and must be capable of offering sympathy to the Indigenous peoples. Temple considered the most important skill of a Resident Officer as an “inborn sympathy and liking for

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<sup>61</sup> Please see Constantine (1984) for a detailed exploration of the transition between colonial development ideologies

the native and his affairs” (Temple, 1918, p. 69). At the twilight of the colonial government, the departing colonial Secretary acknowledged and warned against the tendencies to perpetuate the “incorrigible paternalism of the Colonial Office”<sup>62</sup> in its relationship to an inevitably independent Nigeria – an indication that colonial officials across levels recognized the paternalistic tendencies of colonial relations of power within Nigeria.

The 1940 CDWA as a policy apparatus had two profound effects on water supply infrastructure governance and development in colonial Nigeria. First, series of re-organizations of the water management apparatuses created a rural–urban divide when different juridical, discursive, administrative, and technological apparatuses were operationalised. Demarcating rural and urban water supplies and management entrenched inequitable administrative and technical practices. Urban water infrastructure consists of dams and pipes, while rural water consists of drilled wells. Second, standpipes as the ‘rational strategy’ for delivering rural water infrastructure were stabilized and proliferated, leading to increased numbers of constructed and renovated new wells and standpipes<sup>63</sup>, undertaken by the Colonial Geological Survey staff (Teale, 1945, p. 251). The increased number of wells and standpipes was a preceding condition for the emergence of ‘project failures’ as an officially declared cause of low water access, which by 1949 Òyó Province had the highest number of dams (15) and second-highest number of completed wells (108) in the Western Region.<sup>64</sup> Following the formulation and enactment of the Third CDWA, the colonial Secretary of State requested the development of the Ten-year development plan (henceforth, Ten-year plan) (ODI, 1964). Its strategic imperative was to formulate an effective water policy that would expand water supply to urban and ‘rural’ areas due to the inadequate access to potable water. To achieve this urgent need, the PWD constructed a trifecta of further imperatives: economic imperative (construction cost vs maintenance and cost recovery); infrastructure imperative (lack of road access to ‘remote’ parts of the country, Western Region); and demographic imperative (population distribution).

British geologists designed the sociological knowledge of the 1930s to 1950s water infrastructure development in Nigeria (Hungerford & Smiley, 2016). Teale described this period as the “advisory” period where problems of water supply development relied on expert geological advice from the colonial geological survey, whose influence is not fully understood but will impact “the future of the development of the colonies” (Teale, 1945, p. 254). British geologists provided technological and ideological knowledge for water infrastructure development, specifically groundwater development and the proliferation of boreholes. Frank Dixey's books, *A Practical Handbook of Water Supply* (Dixey, 1950) and *Rural Water Supplies in Africa* (Dixey, 1946), promoted groundwater boreholes and wells as

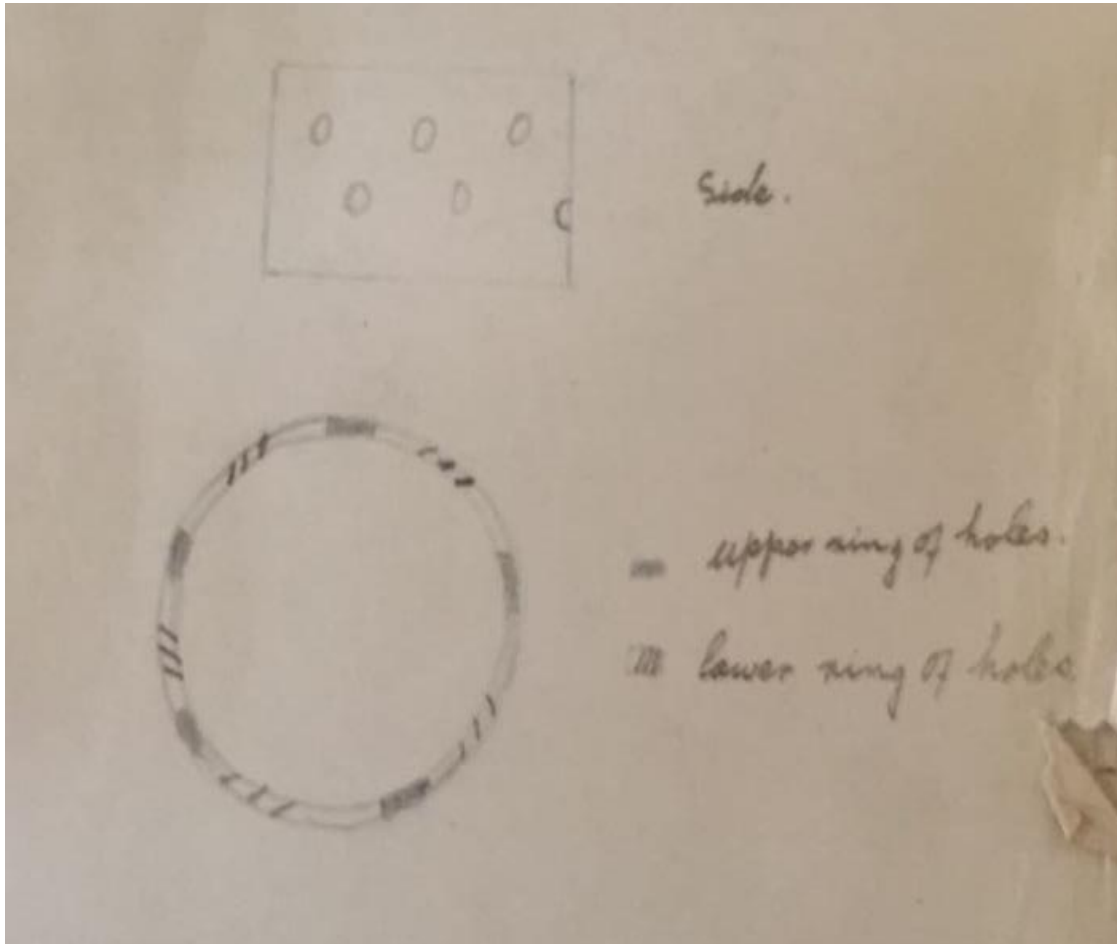
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<sup>62</sup> ‘Nigeria’: brief by M.E. Allen for Lord Home outlining CRO views of CO policy towards Nigeria. Minute by A.W. Snelling. No 445 DO 177/84, No. 4.

<sup>63</sup> Renovations carried out before the Third CDWA were primarily on pre-colonial traditional dug wells.

<sup>64</sup> Annual report, rural water supplies 1949–50, Western Region 17th June 1950 No. 20645/135. NAI

the groundwater development technological apparatus for rural water supplies. Dixey's books pivoted this knowledge domination and played fundamental roles in borehole and well adoption, design (Figure 8-1), and construction, for two reasons. First, the timely publication of his book's first edition occurred



**Figure 8-1: A technical design adapted from Dixey's book. Source: National Archives, *Ìbàdàn***

in 1931 when active colonial political and administrative expansion into the hinterlands began, and two years after establishing the 1929 colonial development act (CDA). Second, as an invaluable resource for every water expert on urban water schemes, borehole drilling and hydrogeology more broadly, Dixey's book facilitated the design of the *Ìbàdàn* urban water supply project in 1931, the first major water and electricity scheme in *Ìbàdàn*<sup>65</sup>, and the most populous Nigerian city (Mabogunje, 1968; Nigeria, 1933). In this advisory phase, Dixey became the first geological adviser to the Nigerian colonial government in 1948 (Thurston, 1995).

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<sup>65</sup> Memo from Director of public works, *Ìbàdàn*, to Secretary to the government, Lagos. 15th August 1925. NAI

Conversely, the book also includes two critical problems for water infrastructure development. First, the ideological and empirical arguments for prioritizing groundwater development as a colonial water supply development strategy. Empirically, the bulk of evidence in Dixey's book came from the Union of Southern Africa with different geological attributes and sociopolitical realities. Dixey drew his core arguments for water boring from reports written by Beeby-Thompson (Thompson, 1935) and A.D. Lewis (Director of irrigation in Union of South Africa) who spent their entire careers in eastern and South Africa. Colonial alterity in the Union of South Africa differed in practice and spatialization principles to other non-settler colonies as envisaged by C.L. Temple. Spatial segregation in South Africa was unabashedly based on racial segregation, which metamorphosed into racial apartheid in 1948. Alozie (2020) showed that the distinctions between settler colonies and non-settler colonies made no difference to the intensity of commercial or mercantile exploitation. Spatial ordering and contact between colonial administrative officers and the Indigenes differed on ground. While this is true for mercantile exploitation, each regional context with its geological and ecological particulars influenced sociotechnical and political relations differently. For example, knowledge transfer by water experts caused major project failure in African colonies, as Dixey reported:

In one such scheme in Africa a heavy boring plant was transported at great cost to an isolated region on no grounds other than that topographically the country was considered to resemble a certain part of the great artesian basin of Australia (Dixey, 1950, p. 15)

Secondly, Dixey understood the ideological basis of water supply problems as "intimately related to problems of agricultural development and research" (Dixey, 1950, p. 5). Such conceptualization followed imperial Britain's development ambition embedded in the 1929 CDA and his extensive field research experience in racially segregated eastern and southern Africa (Dunham, 1983). Dixey built his arguments on the imperial government's commercial interest partly because major technical reports promoting improved 'social' service in the colonies favoured commercial agricultural development (ODI, 1964). Primarily, under this water access and use hierarchy, the agricultural imperative to satisfy white settlers' agricultural and resettlement interests stood above the dispossessed Indigenous peoples. How these contingent and insidious practices and strategies became entrenched in water governance over time is explained by exploring the fundamental apparatus of differentiation employed by a micro-institutional apparatus – population size. Colonial water supply systems were "a technical, social and moral fix" for a disease-ridden populations in the colonies (Broich, 2007, p. 349).

## 8.5 Population size threshold and the origins of infrastructure failure 1940–1960

Decisions and estimates based on a *minimum/maximum* population size threshold have had a long-lasting effect on water governance. Population size threshold is an arbitrary construct, a non-discursive apparatus of the broader water management strategy whose strategic imperative is to increase access to potable water and eradicate water-related diseases. Pursuing this urgent need, the intention to which it is used is to govern by exercising its four-fold strategic function. First, to hierarchize and differentiate physical spaces within Nigeria for the governance of water. Second, to dominate the administrative, institutional, and technological struggles within the PWD, opposition from other government officials and appointees, and manage conflict with other elements of the broader administrative apparatus (e.g., Native Authority). Third, to conceal the socially constructed logic of sickness and uncleanness that underpin eradicating water-related diseases (Ranganathan, 2018). Fourth, to conceal the recurrent challenge of *project failure* thought to be caused by inadequate availability of geologists.

I identify three formidable arguments against population size threshold as a differentiating principle for spatial and administrative policies and resources. First, population estimates used in the 1930s and 1940s were highly inaccurate. Birth rates and death rates (vital parameters of demographic estimation) used for 1931 census estimates were unreliable because they extrapolated Lagos data for other regions. According to the 1938 annual report: “Our only exact knowledge of the trend of the birth-rates and death-rates is derived from Lagos data” (H.M. Stationery Office, 1938, p. 13). Fabrication of towns over 20,000 people, population dispersion in the South due to the 1929 and 1930 riots, and conflicting ideas between the people and enumerators, primarily in southern Nigeria, on the role of the census were substantial grounds for these inaccuracies (Arnett, 1933). The colonial office had no advisory position on demographic statistical work to assist with the demographic challenges faced in development planning until 1946 (Thurston, 1995).

Second, population distribution and density estimates were difficult to establish. Therefore, using population distribution to prepare water scheme consumer estimates was flawed. While preparing for the main scheme of the *Ìbàdàn* water supply scheme, the PWD water engineer described the difficulty to provide an accurate estimate of the number of water consumers, despite meeting with the government statistician:

The great difficulty of stating the number of prospective water consumers with any degree of accuracy is fully appreciated by me. The general opinion seems to be that 100,000 would be a safe figure to estimate upon for the present and probably for some years. I propose to work on the basis of 10 gallons per head per day for an estimated population of 100,000, that is one million gallons per day.<sup>66</sup>

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<sup>66</sup> Memo from the PWD Water Engineer, *Ìbàdàn* Division, to the Director of Public Works, Lagos, 2nd March 1933. No. 485/703A, NAI



Third, statistical methods were insufficiently developed to account for and integrate contextual attributes in the population matrix. Many of the ‘water engineers’ were trained British geologists (and a few like Teale from Australia) whose knowledge of tropical hydrogeology was evolving with the changing state of the discipline. Meinzer (1934, p. 20) noted that a vital distinction between British hydrogeologists and their European counterparts at the time was the typically “descriptive” nature of the former’s work compared to the quantitative and systematic presentation produced by the latter. Mather (2004, p. 6) refers to the period between 1900 and 1945 in British geological survey development as that of “missed opportunities” because its conservative approach to geological research preferred the descriptive methods; for example, groundwater water rights rather than the intellectual development of quantitative methods. Thus, the selection of this apparatus was not grounded in or supported by any comprehensive ‘scientific’ knowledge – in short, ‘truth’. These conditions of the emergence of infrastructure renovation as a strategic imperative required old institutional practices reinvented or reformed and new strategies produced by elaborating population size threshold. Specifically, this strategic transformation was to respond to intersecting issues between initial differentiation of rural–urban dichotomy, production of the 1945 CDWA, the effect of knowledge provided by the colonial geological survey and, more fundamentally, the problems embedded in the history of the standpipe.

### **8.5.1 Standpipes and infrastructure failure**

Public standpipes were first used in Nigeria with the urban water supply in Lagos colony and other parts of the protectorates<sup>67</sup>; however, the first recorded machine-drilled well (borehole) in Nigeria was constructed in 1933 (Hazell, 2004). Before the 1945 CDWA, there was little evidence showing that infrastructure failures posed any problems as a socially constructed phenomenon. Infrastructure renovation as a concept was first institutionally acknowledged in the Ten-year plan with a specific apparatus dedicated to waterpoint failures. The Ten-year Plan intended to “recondition” or “improve” 18,000 existing waterpoints (boreholes and wells) across Nigeria to achieve a ratio of 1:500 (one well for 500 persons) and 11.5 litres per day per family (Nigeria Legislative Council, 1946, p. 9). However, the rapid expansion of boreholes and wells did not lead to a corresponding increase in water access after the third CDWA, as unequal and low water access persisted. The rural water supply policy channelled approximately 63 percent of the funds to well sinking 7,200 new wells (Figure 8-2) and boreholes, and

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<sup>67</sup> Correspondence between Acting Director of the Public Works and Chief Secretary of Western Region, 15th August 1925

renovated equal numbers between 1948 and 1952.<sup>68</sup> Between the 1949 and 1953 programmes, there was a 150 percent increase in planned renovations from 19 to 296<sup>69</sup> respectively.



**Figure 8-2: The standard ‘traditional’ wells adopted and improvised by the government. Source: (Duckworth, 1952, p. 173)**

Problems of failed standpipe projects are complex and rooted in the underlying historical inequities. Introducing the standpipe as a technological apparatus, an urgent need to fix an existing problem (water supply and health) evoked technical and technological problems that were unique to rural water supplies.<sup>70</sup> Despite being a critical part of the colonial architecture, Dixey breaks with the establishment by alluding that renovations or reconstructed water infrastructure are primarily due to the lack of comprehensive hydrological investigation, a geologists’ primary function that he advocated for (Dixey, 1950). Colonial administrators viewed infrastructure failure generally as a technical problem that includes poorly fabricated well rings.<sup>71</sup> In 1947, the Assistant District Officer of Òyó division noted

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<sup>68</sup> Memo from Secretary of Western Province to Secretary to the Nigerian government, 15th July 1949. No. 43982/128. NAI

<sup>69</sup> Annual report, rural water supplies 1949–50, Western Region 17th June 1950 No. 20645/135. NAI

<sup>70</sup> Memo, National Director of public works to Area Directors of public works, 12th December 1945. No. 12077/441, NAI

<sup>71</sup> Assistant District Officer, Ilesha division to Provincial Engineer, 15th August 1949. NAI

that “part of the shortage is due to the construction of the wells, of which the mostly built around six years ago have cemented joints and so are in effect watertight concrete tubes sunk into the earth with a very slow rate of evaporation”.<sup>72</sup>

Much like Dixey, the PWD framed these technical issues as an effect of a perennial shortage of technical staff and expertise to conduct hydrological investigations. I argue that this framing is historically used to mask corrupt practices and other administrative ineptitudes in the PWD. Indeed, staff shortage posed significant challenges during this period for several reasons, including sickness and work pressure.<sup>73</sup> It so persisted in Òyó Province throughout 1946 that in August 1946, the provincial engineer reported that “the staff situation has in no way improved”.<sup>74</sup> Staff shortage affected both rural and urban water supply programmes such that urban programme plans, estimates reports, and bill of quantities for provincial cities like *Ìlorin*, *Ìlëshà* and *Ìkirun* were prepared at the London office of the consulting engineers.<sup>75</sup> Additionally, forced scheme conversions from dams and standpipes to wells and boreholes affected towns such as *Fìdítì*.<sup>76</sup>

Corruption by the contractors and PWD staff exacerbated these technical and staff shortage issues. Shoddy construction of wells and boreholes, and unsatisfactory project delivery marred water supply in Òyó Province, despite the strict administrative procedures laid out by the provincial government for the construction of drilled wells<sup>77</sup>, such as consultants maintaining “close contact with the provincial engineers” during the construction process.<sup>78</sup> Consulting engineers prepared proposals that were “extremely vague, leading to the selection of wrong sites for well siting”<sup>79</sup>, and it was not uncommon that plans and proposals were prepared “in a few days without any investigation”.<sup>80</sup> Financial authorization of water schemes was undertaken without investigation, thereby neglecting due diligence for hydrological investigations.<sup>81</sup> These administrative issues preceded the official recognition of infrastructure failure, and had earlier been framed as corrupt practices by PWD staff and the colonial authority. The member for Lagos, Hon. Akerele, described in the Nigerian Legislative Council the

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<sup>72</sup>Correspondence between Assistant District Officer Òyó Division and Senior District Officer Òyó Division, 25 February 1947, NAI

<sup>73</sup> Memo, Provincial Engineer, Òyó division to Area Director of public works, *Ìbàdàn* 21st February 1946. No.5296/46, NAI

<sup>74</sup> July monthly report, Provincial Engineer, 12th August 1946, NAI

<sup>75</sup> Memo from Director of Public Works, Nigeria to Provincial directors of public works. Urban water supplies appointment of consulting engineers, 12th December 1945. No. 12077, NAI

<sup>76</sup> Memo from District Officer Ife/Ilesha Division to the Resident Officer Òyó Province, 21st December 1944. No. 995/112, NAI

<sup>77</sup> Correspondence between Resident Officer, Òyó Province and Deputy director of public works, Western Province, *Ìbàdàn* 3rd November 1949 No. 394/682, NAI

<sup>78</sup> Memo from Director of Public Works to Provincial Engineers 12th December 1945, no. 12077, NAI

<sup>79</sup> Correspondence between Resident Officer, Òyó Province and Deputy director of public works, Western Province, *Ìbàdàn* 3rd November 1949 No. 394/682 NAI

<sup>80</sup> Quarterly report by Provincial engineer, 29th Nov 1945. No. 5286/34A. NAI

<sup>81</sup> Letter from Ife/Ilesha District Officer to Òyó Provincial Engineer, 20th June 1945. No. 995/258. NAI

dismissal of a PWD contractor for cabling home “a sum of one thousand pounds when his salary was only four hundred pounds per annum”.<sup>82</sup> A long-standing issue for European political officers<sup>83</sup>, the issue so aroused public disorder that in 1930 a bill was passed in the legislative council creating a budget head to ensure that government money lost through embezzlement, carelessness, neglect, or theft by government officials was provided for through the “Loss of government money” fund.<sup>84</sup>

## **8.6 Transforming spaces and bodies**

### **8.6.1 Spatial segregation, water infrastructure development and insanitary health conditions**

The primary function of the 1929 Colonial Development Act was to be one of the surest foundations of prosperity in the United Kingdom (Bourdillon, 1944). It was vested with the powers to make advances “for the purpose of aiding and developing agriculture and industry in the colony or territory, and thereby promoting commerce with or industry in the United Kingdom” (H. M. Government, 1929, p. 1). In short, self-sufficiency and ad hoc support for development schemes underpin the relations between the imperial government and the colonies and protectorates, since the Act contained no mention of *welfare*. Constantine (1984, p. 220) concluded that: “Whatever the value of aid to the colonies themselves, the primary function of the Colonial Development Act was to ease the economic difficulties of the United Kingdom”. The 1929 economic depression precipitated the debates to explore and expand mercantile interest across the empire.<sup>85</sup> The effect of this financial depression was felt on the development of the *Ìbàdàn* water supply scheme (damming of Ogunpa, Awna, and later, Eleyele rivers), which started in 1925 but was not completed until the mid-1930s due to the paucity of funds caused by the depression. Ad hoc assistance meant that financial assistance for development schemes such as water supply was based on specific requests made by each colony or protectorate, which may have been declined or approved depending on the administrative discretion of the secretary of the colonies. Each of these colonies must also be self-sufficient. In this sense, concerns for the Indigenous peoples was neither debated nor thought of as capital worth investing in. The CDA led to the creation of the colonial development fund not out of an altruistic intent of the imperial government but mainly by self-interest. This is rooted in the policy of spatial segregation between the Europeans and the Indigenous peoples:

The question of the segregation of Europeans and natives is one which merits a word here. We have learnt that malarial germs—and at times those of yellow-fever also—

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<sup>82</sup> Nigerian Legislative Council debates, March 8th, 1945

<sup>83</sup> Nigerian Legislative Council debates, March 7th, 1945

<sup>84</sup> Nigerian Legislative Council debates, 29th September 1930

<sup>85</sup> Colonial Development Bill. HC Deb 17 July 1929 vol 230 cc471-526

are present in the blood of most natives, especially of native children, and their dark huts and insanitary surroundings foster mosquitoes, by which these diseases are conveyed. Doctors, therefore, urge that Europeans should not sleep in proximity to natives, in order to avoid infection. (Lugard, 1922, p. 148)

This health policy apparatus idea of seeing indigenes as “hosts” influenced the primal position for the construction of the European and native quarters (Lugard, 1922, p. 147) and, by extension, the introduction of all different access to public services – water supply. The 1919 annual report is clear about whom the health policy is designed for:

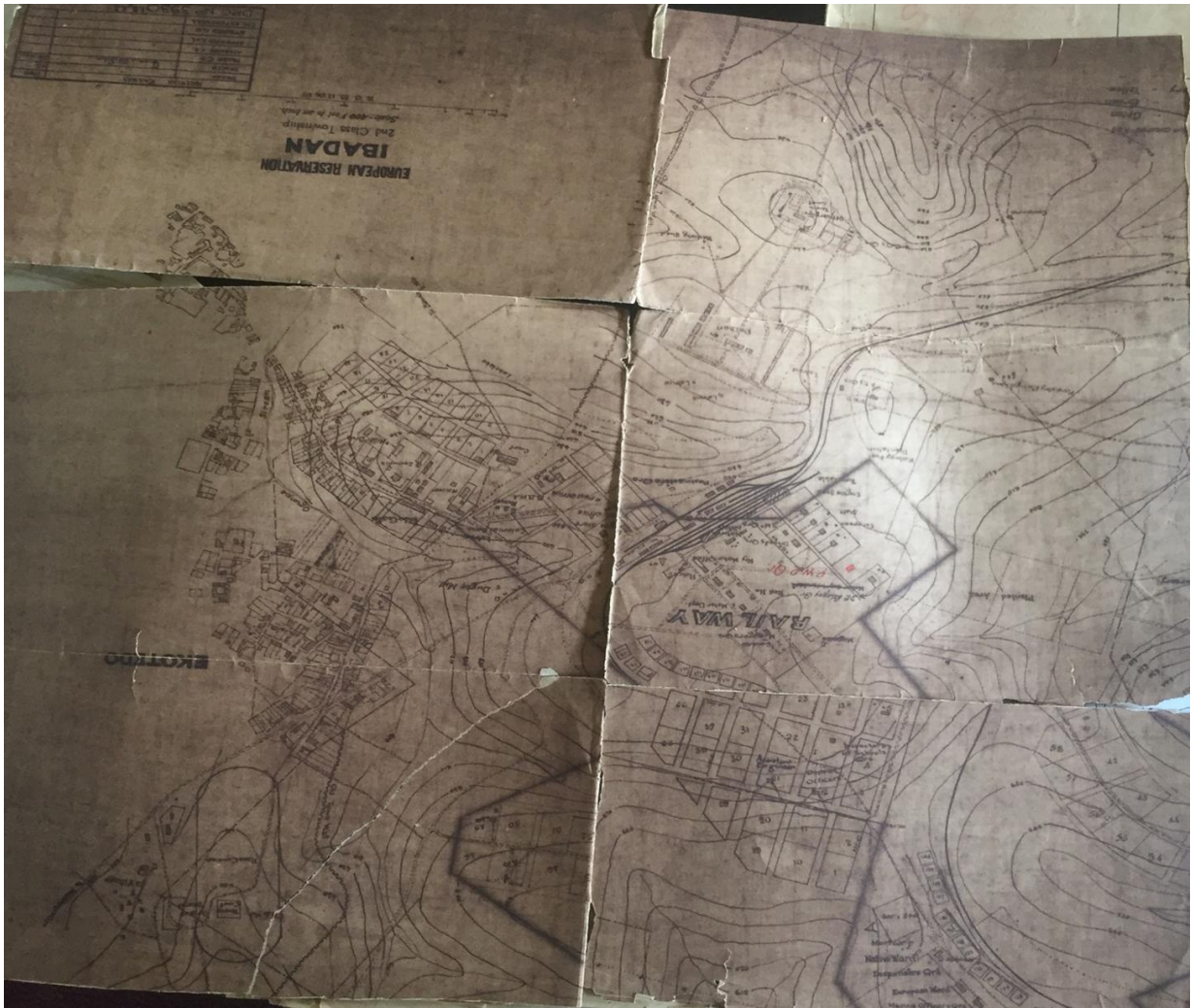
While it cannot yet be claimed that the country is a healthy one, the fact remains that much has been done within recent years to improve it. Anti-mosquito and other sanitary measures have reduced the European mortality considerably, and the increased knowledge and experience of tropical diseases and the means to combat them must in time make Nigeria, if not a healthy country, at least one in which Europeans can live with a fair amount of comfort and security. (Burns, 1919a, p. 92)

This reference to medical segregation played out during the bubonic plague in 1924 (Bigon, 2016). For Lugard, “the necessity of eliminating native villages from proximity to a stream which supplies water” is one of the reasons for providing pipe-borne water to the communities (Lugard, 1912, p. 33). As such, residential segregation became the basis for differentiated access to water. For example, *Ìbàdàn* with the largest Indigenous population in the country was classified as a 2<sup>nd</sup> class township (Figure 8-3).<sup>86</sup> Spatial segregation as an administrative apparatus operates as a non-discursive device. It not only discriminates or puts to work to exclude along racial lines, but also differentiates and hierarchizes according to the various positions occupied by different bodies within the system.

In 1919 the Director of public works was the Water Authority, whose role was the collection of water rates. Water rates were imposed by the town council based on a principle contained in ordinance 13 of 1919, which states that: “A general water rate is levied in respect of all tenements within certain areas of the township, at the rate of 5"/° of the annual value” (Burns, 1919a, p. 96). At that time, there was an estimated population of 3000 Europeans (including wives and families) and 16,250,000 Indigenous Nigerians (H. M. Stationery Office, 1921, p. 8). By 1945, the disparity in infrastructure and welfare investments on a regional and individual scale was evident from the per capita expenditure among all British colonies on economic development and social services. The West African group (Gambia, Nigeria, Gold Coast and Sierra Leone) with the highest population (26,294,000) had the lowest expenditure per head of the seven groups of British colonies and protectorates (Bourdillon, 1945, p. 85).

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<sup>86</sup> National Archives, Ibadan, 1946 no 3930/27, 1927



**Figure 8-3: Map of *Ìbàdàn* showing the spatial distribution of residential clusters and infrastructures. Source: National Archives, *Ìbàdàn*.**

### **8.6.2 *Ìbàdàn* water supply scheme 1929**

The purpose of the *Ìbàdàn* water supply scheme was to provide water supply to the “European residential areas both government and traders, to the WAFF cantonment, and to the township generally including trading plots, residences in the business - cum - trading areas and government offices”.<sup>87</sup> Further evidence of questionable and unscientific decisions on water access was the decision to base the water consumption rate on 30 gallons per person per day for Europeans and 7 gallons per person per day for Indigenes, making a total of 17,000 gallons/day (ibid). Although the water pipes were going to run through areas inhabited by the Indigenous population, there was no plan to connect those populations. Save for the advocacy of the senior Resident Officer for *Òyó* Province, the two standpipes

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<sup>87</sup> Correspondence between Acting Director of the Public Works and Chief Secretary of Western Region, 15th August 1925

included intense persuasion from the Resident Officer, allocating an additional 3,000 gallons/day for a population of nearly 100,000 people (*ibid*). How is it that a people who were known to have high personal and environmental hygiene become *hosts*?

Great regard, however, has always been paid to personal cleanliness, and for this the tribe is specially remarkable. The word Obun (filthy) as applied to a person carries with it such a feeling of disgust which beggars description. (Johnson, 1921, p. 100)

While the international pressure<sup>88</sup> grew on the British colonial authority to improve the welfare of Nigerians, the Lugard's legacy persisted and its ghost continued to haunt water access. The connection between sanitation (health) and water supply is because provision of water supply was thought to be the solution for malaria control, since traditional water storage facilities and local pools or springs were considered a fertile breeding space for the larvae at individual homes. The 1938 Annual report note that:

The question of water supply is closely linked with that of mosquito control, in as much as the pools and runnels associated with wells and domestic storage jars afford excellent breeding places for *Aedes* larvae. The discovery and removal of such danger spots is particularly difficult in some of the northern towns where religious or social prejudice precludes male inspectors' entering the women's section of the compound, but this obstacle is being slowly surmounted by the employment of female Sanitary Inspectors.<sup>89</sup>

Water rates were used for the maintenance of the scheme and cost recovery, and contribution to the renewal funds. Rate collection was carried out by the senior engineer at the PWD for government water stations and other private water users (mostly Europeans) and the native administration levied and collected water rates for water selling stations within Indigenous territories. The underlying principles for levying water rates was inscribed in the 1932 Waterworks Ordinance (Cap 227) and re-worked in the 1952 Waterworks Ordinance,<sup>90</sup> which imposed a charge on any adult 16 years and above. Largely, water schemes should be self-maintaining through the imposition of this tariff. The Prescribed Authority is responsible for determining a suitable charge in consultation with the PWD officials. The unscientific manner by which decisions were made also impacted calculations of water rates, although there is no evidence of a clear intention to inflict inequity. Assessment of water rates for the *Ìbàdàn* water supply was based on the income, race, and consumption (inferred), which were measured against the estimated

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<sup>88</sup> "Criticisms from journalists such as Morley Richards of colonial behaviour towards the Gambians two months before the war. I question whether they have escaped from their slavery. They are taxed, directly and indirectly, out of all proportion to their miserable cost of living.... They pay heavy duties on staple foods—rice and sugar.... They even pay an export duty of 10s [shillings] a ton on the ground nuts they send out of the country, almost their only earning source. They are in bondage, these black Britons—in debt from the cradle to the grave...in order to pay salaries to white Britons who administer where little administration is required but do not develop when development is most urgently needed"; Quoted from Wright, 1995

<sup>89</sup> Colonial Report: Annual Report on the Social and Economic Progress of the People of Nigeria, 1938.

<sup>90</sup> National Archives, Ibadan, The Waterworks Ordinance, 1952, *Òyó* Division assessment, Chapter 227

cost of water production. To illustrate, the consumption rate for government officials was estimated at 150 gallons per day based on the observation that they are “touring officers”.<sup>91</sup> The distinction was also based on metered sites occupied largely by European Government officials and traders, and unimproved sites (unmetered) occupied by African staff.

### 8.6.3 Deconstructing the rural–urban divide

The decision to differentiate what was ‘rural’ or ‘urban’ for water supply and infrastructure development and management in the Ten-year plan (Nigeria Legislative Council, 1946) was, according to the Chief Secretary to the Nigerian government, a “*convenient* method of estimating the total number of supplies required”.<sup>92</sup> The development secretary elaborated on the method that informed this decision while presenting the preliminary report in the Nigerian Legislative Council: “It is not difficult to work out almost on an arithmetical basis how many wells are needed to give water supply to the rural population: and by a simple multiplication sum one-half of which was supplied by the director of public works and by the other arithmetic calculation based on population, we arrived at the overall urban water supply quota.”<sup>93</sup> The development secretary approved technical decisions to determine population aggregates in the plan before being sent to the Colonial Development Advisory Committee, a select committee that advises the secretary to the colonies. Nigerian representatives, many of whom were excluded from developing the Ten-year plan, subsequently debated and criticized the process.

The Ten-year plan defined urban water supplies as “those serving a population of over 5,000 within a radius of 2 1/2 miles” (Nigeria Legislative Council, 1946), although the prior funding arrangement for rural water supply schemes referred to “schemes for villages with population less than 5,000”.<sup>94</sup> This *convenient* method allowed the district engineer to decide population estimates without consulting with a government statistician independently. This absolute privilege and decision-making power played out with the 1945–1955 rural water supply schemes.<sup>95</sup> Thus, a rural–urban dichotomy was enacted and exercised to differentiate the economy of the division of spatial, technical, economic, and administrative labour, which emerged from the confrontations between and pressures from three intersecting imperatives. First, lack of road access to remote communities required that certain spaces were

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<sup>91</sup> National Archives, Ibadan, Assessment of water rate moor plantation and Ogunpa waterworks, divisional engineer, Ibadan Division to Resident, Òyó province. 11th May 1934. No. 1158/762

<sup>92</sup> Memo from Chief Secretary to the Government of Nigeria to regional heads, 16th April 1946, No. 20644/78, NAI

<sup>93</sup> Development Secretary, Legislative Council debates, March 5th, 1945. Nigerian Legislative Council debates

<sup>94</sup> Memo from Regional Secretary of Western Region to Resident Officer, Òyó Province, 13th December 1944. NAI

<sup>95</sup> Memo from District Officer Òyó Division to Resident Òyó Province, 22nd December 1944. No. 574/53 NAI



hierarchized and delimited because field officers' and geologists' primary mode of transportation was by foot (Hazell, 2004). Second, economic pressures meant the transfer of construction costs to the Native Administration. For example, urban water supplies would be financed by a "free grant of 30 percent of installation of each supply" while the remaining 70 percent would be paid by the "Native Administration or other authority responsible for the water supply concerned".<sup>96</sup> Third, major provincial towns and cities such as *Ìbàdàn*, *Ògbómòshó*, *Òyó*, and others were affected by these decisions as they struggled to meet the financial and infrastructural requirements.<sup>97</sup>

Rural water supply was further *bifurcated* into Category A (technical) and Category B (administrative). Category A needed expert supervision and required "the greatest economy in manpower and plant"<sup>98</sup> to which more technical and engineering capacities were devoted, and Category B included those not needing. Invariably, rural water supply programmes involving impounded streams and ponds were given more technical and managerial priority than wells and bores. By 1947, the strategic effect of population size threshold on the water infrastructure and governance landscape had conflicted with administrative procedures on water schemes construction, economic imperatives of the PWD, and infrastructure-related issues (e.g., unavailable materials for construction and staff shortage). The imploded administrative site of social struggle led to the emergence of yet another policy apparatus.

#### 8.6.4 Regionalisation and nationalisation as centralisation

At the regional level, PWD centralized the water governance institutional and policy apparatuses in 1947 for urban and rural water supply, to cater for "investigation, construction and maintenance" of all water supply facilities.<sup>99</sup> With this arrangement in place, inequitable access in the distribution of water supply infrastructure had been re-formulated, partly driven by the urgent need to utilize water supply staff fully. A large scale programme followed in 1948 to regionalize and differentiate rural water supply. Procedural decisions that further cemented these bifurcations include:

1. Approval for distributed pipe networks for any rural water supply scheme will be at the government's discretion but after the Native Administration has agreed to the cost. This implies that the main water infrastructure will be wells (drilled or open).

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<sup>96</sup> Circular: Financial procedure in connection with Urban Water Supplies, No. 96/1945, M.P. No.43961. NAI

<sup>97</sup> Meeting minutes, sub-committee on water supply, *Òyó* Province, 3rd April 1947, NAI.

<sup>98</sup> Meeting minutes of *Òyó* Provincial development committee, 15th March 1947. No.501A, NAI

<sup>99</sup> Memo from Acting Permanent Secretary at PWD headquarters to all provinces. 14 Nov 1947, 14546/564, NAI

2. All wells will be fitted strictly with hand pumps except where water depths exceed 120 feet and such wells will be fitted with power pumps to be paid for by Native Administration that are “wealthy enough”<sup>100</sup>

Regionalization also signified the demarcation between technical and administrative staff of the former rural water supply section within the PWD, granting autonomy to the technical staff and subordinating the administrative. The policy made the role of the senior executive engineer for rural water supply redundant. It retained the senior executive engineer for urban water supply by absorbing the administrative staff into the regional administrative framework, leaving the drilling section of rural water supply development ‘schemes’ to operate, as it were. Hence, the 1953–54 financial year rural water supply programme in *Òyó* division only sunk wells in all the divisional areas.<sup>101</sup> Decisions around the geographical location of new wells made by the Water Authority maintained the existing hierarchy of traditional authority, hierarchized new spaces within the community and rendered them visible and authoritative. The 1952 rural water supply programme marked four new wells for construction in *Ìgànná*, a community of 9,000 in *Òyó* Province, all to be located on a particular road (old *Òkehò* road) that leads to the *Oba*’s palace: “One in *Shabìgànná*’s compound, one in the dispensary compound, one in Baptist school compound and one on the hill leading to *Òfíkí* River.”<sup>102</sup> These spatial re-allocations transformed the dispensary and the school to new spaces of privilege and authority.

The strategic imperatives for the 1953 nationalization policy were shaped by two critical outcomes of the regionalization policy: first, the unsustainability of rural water supplies provided by boreholes and wells; second, low potable water access despite increased water infrastructure development. The new policy apparatus would function strategically as a whole-of-catchment water resources management strategy, similar to the Tennessee Valley Authority, urgently needed for the burgeoning water schemes across the country. The national policy contained specific changes to “water access and water rights, control of whole catchment, underlying principles of levying water rates” that would extend to all other British colonies in Africa.<sup>103</sup> With minimal improvements to water access in 1954, the *Òyó* Resident Officer questioned the sustainability of standpipes and wells for water delivery in future water supply policy – “Are we satisfied that wells are the complete answer?”<sup>104</sup> – to acknowledge water scarcity in *Òyó* Province as an issue of great concern to the government.

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<sup>100</sup> Meeting minutes, 21st May 1948, NAI

<sup>101</sup> Rural water supply programme 1953–54, Resident Engineer, *Òyó* division, 28th February 1953, NAI

<sup>102</sup> *Ibid.*

<sup>103</sup> Circular from the Secretary of state of Nigeria Government to all the regional governments, 19th September 1953, circular 901/53

<sup>104</sup> *Òyó* Division Resident Officer’s note – Shaki 1956, NAI

### 8.6.5 Bodily divisions – Struggle for water access and micro-elaboration of population size threshold

The *Fiditi* case illustrates how the strategic outcomes of population size threshold simultaneously reinforce and oppose other elements within the system, while evoking historical social and political struggles around water access and rights. Through this process of functional overdetermination analysed through antagonism of strategies between the Public Works Department and *Fiditi* Native Authority, population size threshold was re-formulated by drawing on the *means of escape* provided by each party. *Fiditi* had an estimated population of 6,756 in 1944.<sup>105</sup> Like other towns in *Òyó* Province with ‘water borne diseases’, *Fiditi* chiefs had requested tap borne water consisting of dams and standpipes that are considered more sustainable and in line with the PWD policy. Responding through the 1945 plan, the Public Works Department did not place them in Category A despite meeting all the financial and labour requirements. However, the Public Works Department recognized *Fiditi*'s population as “slightly over 5,000”.<sup>106</sup>

*Fiditi*'s Native Authority, in their political struggle for a different type of water infrastructure for potable water access, invoked a kind of gentle violence, a gentle threat of future insubordination. Potable water being a resource they have been historically excluded from, they resisted this continued lack by applying violence where the strategic effect of a discursive apparatus, an administrative decision, recurring health challenges, and repeated attempts at meeting their water supply needs, intersect. Their everyday resistance is not defensive (Scott, 1989) because it does not resist an expropriation of a particular resource or the direct incidence of domination. Instead, it is a mechanism whose strategic function is to obtain a juridically prescribed right drawing on the productive nature of power (Foucault, 2001; Nilson, 1998). Their juridical rights rely on a master logic of a paternalistic colonial-liberal order that regulates the boundaries and limits of both the PWD official and the administration. As a method of communication, their argument in the public petition (a letter) reveals how this productive nature of power was exercised. The extensive heading of the letter is quoted below for perspective on the means of rationally representing their truth:

The prolonged silence over the question of water scheme for *Fiditi*, a district town of *Òyó*, which is known and reputed for its periodic infestation by guinea worm and other water-borne diseases, is calculated to be a grave manifestation of disregard for the safety and welfare of people concerned and demonstration of unwillingness on the part of Authorities concerned to bestow benefits on us for the taxes we loyally paid and are loyally paying.<sup>107</sup>

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<sup>105</sup> Memo from District officer *Òyó* Division to Resident *Òyó* province, 22nd December 1944. No. 574/53 NAI

<sup>106</sup> *Ibid.*

<sup>107</sup> Petition by the *Fiditi*-in-council to the Resident, *Òyó* province 5th February 1945, NAI

Procedurally, the tone is at once confrontational and subtle, one of the instances where injustice and inequity were expressed communally. Writing etiquette and curtsies at the time was apparent in many written petitions, requests for water schemes, complaints, and gifts. The correspondences were drafted with utmost caution and a need to speak “respectfully” to government authorities.<sup>108</sup> It always began with “our good friend” and ended with “your good friend”, a sign of reverence from already subjugated chiefs and kings.<sup>109</sup> The Native Authority’s manners reflected the tenuous relationship between the colonial government and Indigenous communities. For the *Fiditi* Chiefs, the change in tone and outright demand for reciprocity expected as a dutiful subject of the Crown were the *means of escape* for perpetuating further struggles through a future opposition to the status quo. In other words, the threats of future insubordination through economic sabotage are presented to the PWD. By offering to contribute physical labour to the construction efforts and suggesting a “less expensive scheme of well-sinking for the people of *Fiditi* who are in no less behind in contributing towards the war efforts,”<sup>110</sup> the *Fiditi* chiefs had craftily blended insubordination and provided an escape in a struggle for water access.

## 8.7 Conclusion

This article traces the genealogy of infrastructure failure in colonial Nigeria, aiming to enhance current knowledge of its use in water governance and policy research and practice in Nigeria and Africa broadly. The inequities stem from population size threshold as the fundamental principle for spatial, policy, and administrative classification of bodies and spaces. During Nigeria’s early colonial period, ideological differences between two paternalistic powers produced a version of ‘care’ for the already objectified and racially profiled group, later passed on to the administrative staff. Power to deploy population size threshold is rooted in the coloniality of power matrix that brings knowledge and poor hygiene as a rational strategy to transform bodies and spaces. By connecting ideas of sympathy and abnormality with political paternalism, colonial officers implemented this ideological change through Development Acts, which set the stage for the large-scale deprivation of large sections of what was classed as ‘rural’.

During the welfare period, state efforts through the Ten-year plan yielded minimal results, as many locals remained left out of potable water access despite the rapid development of standpipes in the rural areas. Thus, a further need to divide and re-classify Indigenous Nigerians and spaces through a combination of policies, infrastructures, and legislations. In the mid to late 1940s, an admixture of paternalism and welfarism demanded beneficence towards the Indigenes. However, core problems with

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<sup>108</sup> Letter to PWD from Native Administration *Ìbàdàn* Chiefs. 8th June 1934

<sup>109</sup> Letter from *Ìbàdàn* Chiefs to the District Officer to expedite action on the *Ìbàdàn* water and electricity scheme. 5th June 1934, NAI

<sup>110</sup> Petition by the *Fiditi*-in-council to the Resident, *Òyó* province 5th February 1945, NAI

divisions and classifications based on population size threshold continued to haunt administrators and local peoples. Standpipe and waterpoint failures were wrongly characterized as technical failures and staff shortage: two reasons frequently used to mask much more profound structural inequities inherent in the design of the standpipes and wells (e.g., administrative corruption). From the responses and types of strategies used for resistance, the spatial and bodily transformations set off by population size threshold had found their way into colonised bodies. At this point, the Nigerians had adopted the label of sickness and disease, and the standpipes continued to fail to date, despite trialling different management options over time.

Whether to abolish the community standpipe altogether (Harvey & Reed, 2007) is a critical question because the sustainability of the community management model, its main mode of management, is in question (Whaley & Cleaver, 2017). Should we then accept the inherent uncertainty in the standpipe to be consistent with the unpredictable and contingent nature of human actions and relations? If it is the case that the standpipe reproduces inequitable water access, mostly in developing countries, shall we then proceed to conceptually disassemble this technological enterprise embedded in an arch-system of domination and segregation? Further research to understand the transmutations of population size threshold and infrastructure failure in post-independence Nigeria is vitally needed. Specifically, the micro-level analysis explains how specific strategies work to engender and normalize it, because it is through this approach that its structural effects can be dismantled. I hope this article has provided an initial step in that process.



# CONCLUSIONS

# Conclusions

## Contributions

These contributions are specific to Nigeria and other African countries in general. They are grouped into two separate but related themes: contributions to knowledge; and methodological contributions.

### ***Contributions to knowledge***

#### **First structured review on water infrastructure governance in Nigeria**

The thesis filled a critical literature gap in the field of water infrastructure governance. Specifically, this new knowledge shows the need to develop new conceptual tools for empirical research that centralises power and politics in water infrastructure governance in Nigeria. I argued that Nigeria's current water infrastructure governance research typically ignores politics, power, history, and contextual differences, and the interventions are apolitical and technologically focused. Addressing future technological and technical problems in supply-side interventions must pay attention to the spatial imbalances, nationally and particularly between the global North and global South. Such imbalances exist in the different conceptualisations of rural and urban research, which plays out in the excessive financial, policy and political attention devoted to urban centres over rural areas. These problems should be framed with a deep understanding of the embedded power relations in agenda setting, decision-making and choices about water distributions and the use of technological knowledge. Precisely, the continued use of public standpipes and wells as the main water supply infrastructure in most rural areas and the implementation of the community management approaches are useful examples. In addition, the enormous power of state and non-state actors in water infrastructure development needs curtailing by extending the powers to make choices about water infrastructure technologies and governance approaches to water user groups and communities.

#### **Filling major knowledge gaps through historical analysis**

The thesis contributes to the scant literature on water infrastructure history and water governance in Nigeria. Unpacking policy concepts such as infrastructure renovation through a historical analysis shows how the organising ideological principles, rationales, and techniques operate at different infrastructural development stages to produce infrastructure failure and perpetuate infrastructure inequity. The historical analysis connected local experiences with multiple strategies used at different organisational levels to resist domination. Therefore, it reinforces the importance of alliances and collaboration to political and governance transformation. Such alliances must be based on similar



ideological understanding. With the link between history and power, a shorter historical analysis of authority confirms how important ideologies and ideas emerge to shape people, power, places and spaces; and vice versa. This relationship explains who gets displaced from water access and decision-making and who gets listened to; in short, whose agency matters in water governance.

## **Rethinking orthodoxies**

My thesis demonstrated the need to rethink conventional theories and concepts in water infrastructure governance research and practice in general for most African countries, and Nigeria in this case. The hydraulic mission as a theory is shown to be partially inadequate to analyse Nigeria as a developmental nation-state. To analyse countries without sustained autocracy or stable democracies with the hydraulic mission is to go against one of the fundamental assumptions of the theory itself on hegemonic power, ideology, and the form of national-level hydraulic bureaucracies. The theoretical understanding of a state, the interpretation of state power and its use, and the nature of ideology are three fault lines that render the hydraulic mission theoretically limited in explaining Nigeria's hydraulic mission. Specifically, the thesis argued that the Nigerian State was unable to achieve the synergies between technical knowledge and expertise, policy and legal consolidation, and political ideology, due to the punctuated history of its political system and internal resistance from state and society agents. The analysis shifted from the use of state power to mobilise and consolidate political power in the centre. Instead, my analysis focused on how the *resistance* from various social and political groups produce alternate modes of accumulation of power and authority.

The thesis also contributed to the literature and practice of community management systems. I have argued that spatial proximity to a standpipe should be a critical criterion when selecting members of community management teams (Chapter 7); the reason being that practical authority for everyday water governance is more important and more effectively negotiated by individuals having some form of permanence close to the standpipe. In other words, individuals situated closer to a standpipe and having some regularity at the place earn the necessary authority to govern. Rather than relying entirely on the traditional governance structure when selecting these members, individuals with proximity should be targeted and included as part of the community management team. This insight came from an understanding of the diffuse nature of power and practical authority around the standpipe.

## **Politicising water infrastructure governance in Nigeria**

By viewing the Nigerian State as a historical construct, I explained aspects of water resources management that have produced and sustained infrastructure failure. Specifically, crucial national development issues (e.g., infrastructure renovation and repeated malfunction of water infrastructure) have historical links to colonial governance ideologies and practices. This re-imagination of the state-

society relationship did not exclude the peoples as citizens because the strategies and ideological components of power are often intended or designed to codify and modify spaces and peoples. Instead, the state-society relations as a historical construct embraces the diverse social, political, ecological, and cultural experiences, and the interconnectedness of the Nigerian peoples as the basis of analysis. In this sense, my thesis demonstrated that future water infrastructure governance must centre this relational thinking by recognising the effects of power in its different forms on the policy choices, governance processes, individual values and beliefs, and broader society-nature relationship. In other words, politicising water infrastructure governance entails integrating social and political struggles as the foundation for, and a measure of, supply-side water infrastructure development. This contribution to the water infrastructure governance literature in Nigeria and Africa enables us to politicise different infrastructure interventions and ask uncomfortable political questions about key actors in the process.

## ***Methodological contributions***

These are primarily in the field of power research, water infrastructure and water governance studies.

## **Power-governance conceptual framework**

This thesis proposed a conceptual framework to broadly examine power and politics in water governance in Nigeria and Africa. The *power-governance* framework (Chapter 3) recognises the interconnectedness of the social, political, economic, and ecological relations of water governance, and the state's central role in mediating these connections. Its framing foregrounds Nigeria's contextual variations, time (historical evolution), and scale as intersecting elements of these relations. The framework builds on the works of Carmel (2019) and Pahl-Wostl (2015) to describe how governance happens in practical terms by emphasising space, time, and meaning-making as crucial features of political action.

The power-governance framework is applicable beyond Nigeria because it emphasises contextual conditions and encourages different methodological approaches that view researcher positionality as integral to water governance analysis. The framework positions power and politics squarely in this analysis and stresses the role of objects, culture, and other intangible components of human action as power strategies; for example, policy, reports, ideas. Lastly, it centres history as a fundamental analytical element of water governance, enabling a historically nuanced diagnosis of problems related to water resources and water infrastructure governance in Africa.

Using the historical elements of this framework, I have shown in this thesis how systemic and structural transformations to the Nigerian state created enduring water governance and infrastructure development issues in Nigeria (Chapter 5). Likewise, I have demonstrated how relations of power, hegemony, and authority are operationalized at regional/structural level (Chapter 4) and local/individual

level (Chapter 6). Bringing together these levels of governance, I showed in Chapter 8 the complex historical processes through which dominant policy decisions on water infrastructure are made and reproduced. Trawling through the messy interactions between the state (colonial/Nigerian) and the Nigerian Indigenous populations helped to expose how greater strategies of power was used to delineate spaces, infrastructure, and re-form peoples.

### ***Proposed infrastructure failure model***

The simple infrastructure failure model (Figure 7-7) shows the cyclical pattern of water infrastructure development, failure and renovation, using insights from the federal budgets. The model captures information on failing or decaying water infrastructure and specific institutional and financial practices, facilitating its unchecked use in water infrastructure development. Adding more descriptors from different social and political contexts can expand the model's usefulness as a diagnostic tool and show the range of interventions engaged in renovating failed or decaying water infrastructures.

### **Revisiting power and governance transformations through an analysis of stakes**

This thesis argued that powerful actors – for example, experts, corporations, and individuals – are pre-invested with authority before the observed processes of resource-making (Chapter 6). With insights from an analysis of stakes and symbolic power, I demonstrated that power and authority are not entirely produced during the resource-making process. Instead, individuals inherit authority from past intentional and unintentional interactions and experiences that they bring to the site of social and political struggles. Hence, the legitimate power of individuals to speak truth observed in specific spaces requires looking at how those spaces were historically produced. A change in the analytical focus of power analysis is necessary to appreciate this view. Specifically, we must link the locus of power to the stakes of social and political struggles and the hierarchy in which they exist. To differentiate the hierarchy of stakes, we should revisit social and political struggles by analysing the pre-determined rules and conditions of formation of the primary stake. Using this conceptual proposition, we can quantify the pre-construction issues that contribute to infrastructure failure. In addition, this thinking will be helpful when analysing the emergence of new forms of domination or influence by authorities within unregulated or marginalised spaces (Harris, 2020).

The main limitations of the research include the lack of French language documents. Only Chapter 4 on the Transaqua project used documents written in French. In addition, a lack of access to some key political actors (e.g., Lake Chad Basin Commission Executive Secretary) and the library of the Federal Ministry of Water Resources did not allow a deeper exploration of certain aspects of water infrastructure development. A good example is the merging and unmerging of the Federal Ministry of Water Resources

with the Federal Ministry of Agriculture and Rural Development at least three times between 1983 and 2013. Finally, political insecurity and tensions from preparation for the 2019 general election significantly hindered my movement because follow-up trips to the field sites were cancelled due to kidnapping threats, especially in 2018.

## ***Future research***

### **Developing a comprehensive history program on water infrastructure**

Future research gaps in water infrastructure governance can be filled using multiple information-gathering approaches to catalogue the actual number of water infrastructure projects in Nigeria. Data on their current technical status, social conditions, and the political issues that have led to their abandonment or decay, can be gathered systematically to inform future interventions. This thesis offers a framework to build such a program. The effects of water policies and legislation at state and federal levels on water infrastructure development need further scrutiny to establish how they perpetuate or create inequities or where they have become inconsistent with the changing social and political order. A comprehensive historical program is a starting point. This program should also access state and federal legislature libraries, the Nigerian Institute of International Affairs, National Archives (Lagos, Abuja, Enugu) and other important historical sites.

Examining past policies and legislations as part of this infrastructure history program can shed light on discourses and knowledge that have maintained dominant themes in policymaking and practices that constrain alternative pathways. This historical research program can be organised on a state, regional or national basis to better account for the differentiated effects of policy and governance outcomes in Nigeria. Data from such a historical research project will assist in investigating time and temporality in water infrastructure development and governance changes, at local and state government levels. Theoretical contribution from social theories of space-time-power and temporality will be helpful. Specific concepts to explore would include Pierre Bourdieu's hysteresis effect (Bourdieu, 2013), during changes to a sociopolitical order, as a vital starting point to this futures thinking.

### **Comprehensive review of governance approaches, interventions, and concepts**

The proliferation of decentralised systems of water supply infrastructure in Nigeria is closely connected to development and governance interventions over the years. Developing a comprehensive program to review what approaches work across the water infrastructure governance landscape is crucial. A dedicated program to systematically review the literature is a preferred starting point, to

reduce trial and error, and guide political decisions and policy choices of future interventions. This approach is common in health and medical fields and increasingly contributes to the broader power, governance and socio-ecological literature (Brisbois & de Loë, 2016). This review must account for the lack of French literature in English-dominated water governance analysis in Nigeria. Considering that Nigeria is surrounded by four French-speaking nation-states (Chad, Niger, Cameroon, and Benin Republic) and 23 percent of Nigeria's water comes from transboundary flow, the review should include French language contributions from theses, reports, archival records and other grey literature.

## Political research on water infrastructure governance

Increased calls for water justice, water rights, and human rights to water require a comprehensive understanding of the politics of water infrastructure governance in Nigeria. An in-depth political research program must reconcile with the need to open Pandora's box of critical politics to benefit from the growing number of studies on the politics of policymaking and social and technical governance. On the other hand, it must focus on what Douglas et al. (2021, p. 1) call "the bright side of politics". For example, considering the power dynamics between researchers, politicians and policymakers, how can critical scholars *frame* issues of political corruption and historically unjust policies in an acceptable and conciliatory tone and language to politicians and powerful actors that are often ideologically enveloped in a particular mode of thinking and acting? It is vital to address the role of power and political relations and see it as a critically urgent research agenda for finding contextually relevant and politically responsive solutions to infrastructure failure, deterioration and decay.

Dealing with the theoretical and conceptual deficits in water infrastructure research in Nigeria and West and Central Africa is vital. Future research should ensure that the formulation of concepts succinctly captures peculiar spatial, contextual and conceptual differences in the country, some of which I have highlighted in this thesis (e.g., decentralised water access systems, behaviours and functioning of social and political systems). Further theoretical work to unpack dominant theories like the hydraulic mission, the Nigerian State, and national development is necessary.

Boundary objects (Star & Griesemer, 2016; White et al., 2019) as boundary marking concepts hold significant promise for future power analysis and practical authority because they sit at the centre of political negotiations and power relations. Previous studies have used boundary objects to represent maps, models, and scenarios, and connect knowledge production with decision-making (Lang et al., 2012; White et al., 2019). Using water infrastructure as a boundary marking object to demarcate territories (real and imaginary) will increase the concept's usefulness for conflict analysis and management; specifically, analyses that focus on violence, order, and authority to dominate the objects. Insights from this approach could facilitate new methodological, theoretical and conceptual pathways and sharpen empirical data collection and analysis in multiple ways. Since the concept of *unregulated*

*or uninstitutionalised spaces* immediately suggests an absence of authority, further theoretical and empirical work in this area could explore power relations over control of specific infrastructure (water in this case) rather than land as the central stake of social and political struggles.

## **Denaturalising colonial concepts and legacies**

This thesis showed that it is not enough to parachute theories, concepts or policies when intervening, examining, or critiquing a nation-state like Nigeria, as had been the case since the creation of the Nigerian State. As with other normative knowledge regimes, water infrastructure and its governance are no exception to the prolonged effects of historically (un)just and (un)intentional political and institutional practices. Viewing water infrastructure as an embodiment of these practices can help explain how the intersubjective relations between humans and these technological artefacts unfold. Research into the affective relations of material and incorporeal power is essential to explore the historical effects of inequities on human bodies, especially their attachment to specific infrastructure formations. Some vital questions to pursue include: How does inequitable water access affect individuals, groups, and communities that have been historically subjected to a lack of water? How do these groups or individuals respond to new sources of water interventions? Future research along these lines will explore how a prolonged lack of water access contributes to conflict situations and dynamics of power and authority in those marginalised places.

Developing future power research and theory based on observed practices in *Ìgànná* offers potential insights into how to access and analyse hidden spaces of power using less information. Since conflicts arising from power relations are essentially a clash of ontologies (worldviews), we can understand which worldviews become dominant and unpack the process by identifying the *spaces of ontological interactions* where intentional actions are produced. Analysing this abstract space where the attributes of human practices are established, inscribed, and made durable provides new pathways for power analysis. Political-ecology scholars are starting to advocate for such analyses in climate, conservation and other water-related areas (Bormpoudakis, 2019; Goldman et al., 2018; Yates et al., 2017). However, research on water infrastructure governance needs additional work. The transdisciplinary academic labour can bring together anthropology, sociology, policy, and political sciences scholars to develop new methodologies or a combination of methodologies. As Pierre Bourdieu has methodically shown in his book, *The Political Ontology of Martin Heidegger* (Bourdieu, 1991), rigid ontological and epistemological positions must be rejected because power relations do not obey these inflexible philosophical positions.

## **Concluding remarks**

This thesis analysed water infrastructure and governance in Nigeria through the range of rationales, knowledge, and techniques of power, and other tangibles like legislation and policies. Steeped in colonial history, I underscored the history and legacies of these power relations, particularly their application to dams and standpipes, and their contribution to water infrastructure failure. One of the key arguments is that ideas, ideologies, knowledge, and practices that produced the current state of water access and water infrastructure governance in Nigeria are inherently inequitable, contextual, conditional, and appear unintentional. Unsurprisingly, decision-makers, researchers, and everyday water users have embodied some of these complex ideas. I have demonstrated that to inform the future, reforming the present condition of water infrastructure governance in Nigeria will involve a comprehensive review of the critical aspects of past development. The leading example in this thesis is the infrastructure renovation and failure cycle, a repetitive system of political and policy practice.

Contributions from the systematic review showed how water infrastructure research in Nigeria lags relative to recent developments in theory and praxis. Specifically, the lack of power and political analyses, the unequal representation of rural and urban research, and in practice, the low-level functionality and sustainability of water infrastructures. These limitations persist despite the significant intellectual, financial and policy (knowledge) investments in sustainability research and infrastructure renovation over time. This knowledge gap helps maintain and reinforce existing power disparities between the global North and African countries like Nigeria. Many of these countries have to leapfrog the technological and managerial options presented as apolitical with little regard for sociopolitical histories. Three potential pathways gleaned from this thesis suggest that Nigeria will need to revisit and change key national-level practices. Firstly, politically, an amendment of the constitutional provision that entrusts the federal, state, and local governments with concurrent responsibility for water supply to be changed to state governments (Chapter 5). Such changes will help redirect responsibilities to state governments and free up political and administrative powers at the federal level for use at regional and global levels. Secondly, at the policy level, a careful reconsideration of the continued use of the public standpipe as a water supply infrastructure strategy in favour of alternative options; for example, perfecting centralised distribution systems. Finally, investments in water infrastructure research should take a historical and political approach to develop context-specific concepts for analysis and practice. Such concepts should cross-cut the economic, social, and ecological aspects of water infrastructure governance in Nigeria.

The proposed diagnostic conceptual framework for power and politics in Nigeria can be extended beyond Nigeria and used illustratively to account for contextual and cultural differences, and power and politics, within a changing historical frame. Similarly, the power analyses presents an opportunity to analyse power within the broader sociological debate on structure and agency. The conceptual analysis of power presented in this thesis offers an expanded vision of power analytics beyond political rule

organised by the state. Instead, it considers the dialectical relationship between individual-relational aspects of power and its implication for change within varied structures. By thinking about a hierarchy of stakes of social and political struggles and the historical frame that produced the stakes, I show that analysis of structural and systemic changes cannot fully explain political rule and the acquisition of authority. Individual-relational power relations have implications for changes to society, political practice, and water infrastructure governance. The infrastructure failure model opens a new research path for studying the effects of repeated malfunctioning of water infrastructure on infrastructure financing for both government and non-government institutions.

On a final note, my thesis clarified how individual intentionality and unintentionality operates before developing a water infrastructure and during its use. In its symbolic form, intentional actions use discursive techniques and political practices to transmit development ideas and create new governance spaces and platforms. Similarly, unintentionality in individual power relations relies on dominant cultural practices and effects to acquire authority before entering and engaging new spaces of struggles. In both instances, there is evidence that the restraining effects of higher-level (societal rules, global political, economic, and ideological order) and lower-level (smaller water user groups) structures on the individual are substantial. Furthermore, this thesis shows that once a strategy of power is broken up into smaller parts (e.g., a bucket or policy into their constituting units), the traditional boundaries common in academic disciplines become unsuitable for analysis, because strategies of power are not fixed onto any ontological (worldviews) or epistemological (knowledge) pillars.

Looking into the future, this study calls for a robust intellectual investment in the analysis of power relations in Nigeria's water infrastructure governance, to ensure equitable spatial distribution, sustainable access, and reduced infrastructure failure and decay. Specifically, transformative historical research should be recentred to expose problematic concepts and strategies of power that have endured over time. As shown in this thesis, the concepts and strategies that make up the solutions designed to address infrastructure failure and decay in Nigeria—presented as nonpolitical, ahistorical, and technical—are shaped and held together by specific ideologies, ideas, and daily individual, institutional and non-institutional practices. These ideas are rooted in Nigeria's history and entrenched in the worldviews of the individuals that plan, design and administer the solutions to infrastructure failure and decay in Nigeria.



## References

- Abba, A. A., & Onyemachi, N. D. (2020). Weeping in the Face of Fortune: Eco-Alienation in the Niger-Delta Ecopoetics. *Humanities*, 9(3), 1–16. <https://doi.org/10.3390/h9030054>
- Abdullaev, I., & Mollinga, P. P. (2010). The Socio-Technical Aspects of Water Management: Emerging Trends at Grass Roots Level in Uzbekistan. *Water*, 2(1), 85–100. <https://doi.org/10.3390/w2010085>
- Abdullahi, S. I. (2017, November 22). Towards a renewed partnership with Africa. Organized by the European Parliament. In *Speech at the High-Level conference on Africa*. Brussels, Belgium.
- Abers, R., & Keck, M. E. (2013). *Practical Authority: Agency and Institutional Change in Brazilian Water Politics*. Oxford: Oxford University Press.
- Abrams, P. (1988). Notes on the Difficulty of Studying the State (1977). *Journal of Historical Sociology*, 1(1), 58–89. <https://doi.org/10.1111/J.1467-6443.1988.TB00004.X>
- Abubakar, I. R. (2016). Quality dimensions of public water services in Abuja, Nigeria. *Utilities Policy*, 38(1), 43–51. <https://doi.org/10.1016/j.jup.2015.12.003>
- Abubakar, I. R. (2017). Access to sanitation facilities among Nigerian households: Determinants and sustainability implications. *Sustainability (Switzerland)*, 9(4), 1–17. <https://doi.org/10.3390/su9040547>
- Abubakar, I. R. (2019). Factors influencing household access to drinking water in Nigeria. *Utilities Policy*, 58, 40–51. <https://doi.org/10.1016/J.JUP.2019.03.005>
- Abubakar, I. U., & Yamusa, M. A. (2013). Recurrence of Drought in Nigeria: Causes, Effects and Mitigation. *International Journal of Agriculture and Food Science Technology*, 4(3), 169–180.
- Academic. (2017). *Email interview*.
- Acey, C. (2007). Space vs Race: A Historical Exploration of Spatial Injustice and Unequal Access to Water in Lagos, Nigeria. *City Planning*, 23(Summer), 49–69.
- Acey, C. (2012). Forbidden waters: colonial intervention and the evolution of water supply in Benin City, Nigeria. *Water History*, 4(3), 215–229. <https://doi.org/10.1007/s12685-012-0061-z>
- Adagunodo, T. A., Sunmonu, L. A., Ojoawo, A., Oladejo, O. P., & Olafisoye, E. R. (2013). The Hydro Geophysical Investigation of Oyo State Industrial Estate Ogbomosho, Southwestern Nigeria Using Vertical Electrical Soundings. *Research Journal of Applied Sciences, Engineering and Technology*, 5(5), 1816–1829. <https://doi.org/10.19026/rjaset.5.4944>
- Adams, E. A., Sambu, D., & Smiley, S. L. (2019). Urban water supply in Sub-Saharan Africa: historical and emerging policies and institutional arrangements. *International Journal of Water Resources Development*, 35(2), 240–263. <https://doi.org/10.1080/07900627.2017.1423282>
- Adams, E. A., Zulu, L., & Ouellette-Kray, Q. (2020). Community water governance for urban water

- security in the Global South: Status, lessons, and prospects. *WIREs Water*, 7(5), 1–21. <https://doi.org/10.1002/wat2.1466>
- Adams, W. M. (1985). River basin planning in Nigeria. *Applied Geography*, 5(4), 297–308. [https://doi.org/10.1016/0143-6228\(85\)90009-8](https://doi.org/10.1016/0143-6228(85)90009-8)
- Adams, W. M. (1992). *Wasting the rain: rivers, people and planning in Africa*. London: Earthscan.
- Adams, W. M. (1993). Development's deaf ear: Downstream users and water releases from the Bakolori Dam, Nigeria. *World Development*, 21(9), 1405–1416. [https://doi.org/10.1016/0305-750X\(93\)90121-O](https://doi.org/10.1016/0305-750X(93)90121-O)
- Adams, W. M. A. (2014). *Wasting the Rains: Rivers, People and Planning in Africa* (1st ed.). London: Taylor & Francis.
- Adamu, S. H. (2016). Immediate and Long Term Strategies for the Water Sector (2016 - 2030). Retrieved from <https://theeagleonline.com.ng/tag/immediate-and-long-term-strategies-for-water-sector-2016-2030/>
- Adedeji, A. A., & Ako, R. T. (2009). Towards achieving the United Nations' Millennium Development Goals: The imperative of reforming water pollution control and waste management laws in Nigeria. *Desalination*, 248(1–3), 642–649. <https://doi.org/10.1016/j.desal.2008.05.114>
- Adekitan, O., Oyerinde, A. O., & Musa, A. I. (2010). Community participation in urban water supply management in Abeokuta-Lessons for sustainable water supply in urban communities. *Journal of Environmental Sciences*, 2(September), 95–108.
- Adekola, O. A. A. (2012). *The roles of institutions and networks in the management of the Niger Delta wetlands in Nigeria*. Unpublished PhD thesis, Leeds.
- Adeniran, A. B., & Daniell, K. A. (2020). Transaqua: power, political change and the transnational politics of a water megaproject. *International Journal of Water Resources Development*, 1–23. <https://doi.org/10.1080/07900627.2020.1747408>
- Adeniran, A., & Daniell, K. A. (2017). The attempt to replenish Lake Chad's water may fail again. Here's why. Retrieved January 29, 2018, from The Conversation website: <https://theconversation.com/the-attempt-to-replenish-lake-chads-water-may-fail-again-heres-why-84653>
- Adeniran, A., Daniell, K. A., & Pittock, J. (2021). Water Infrastructure Development in Nigeria: Trend, Size, and Purpose. *Water*, 13(2416), 1–23. <https://doi.org/10.3390/W13172416>
- Adeoti, A. I. (2008). Determinants of households' participation in the collective Maintenance of publicly provided water infrastructure in Oyo State, Nigeria. *Journal of Rural Economics and Development*, 17(1), 1–12. <https://doi.org/http://doi.org/10.22004/ag.econ.147639>
- Adeoti, O. (2010). Development of River Basin Organizations in Nigeria. *Research Journal of Soil and Water Management*, 1(3), 91–100. <https://doi.org/10.3923/rjswm.2010.91.100>

- Adetola, B. (2016). FG to commence construction of 370 new dams. Retrieved June 5, 2019, from Tribune Online website: <https://tribuneonlineng.com/16633/>
- Adetoye, D. (2016). The Nigerian Elite and State Creation: The Creation of False Ethnic Dichotomies for Self Aggradizement. *Global Journal of Human-Social Science*, 16(1), 36–41.
- AfDB. (2018). *Infrastructure and Urban Development Department: Annual Report*. Abidjan, Cote'd Voire: African Development Bank Group.
- AfDB. (2019). Procurement Notices: Topic and sector: Energy and Power - African Development Bank. Retrieved May 7, 2019, from Procurement notices website: <https://www.afdb.org/en/documents/project-related-procurement/procurement-notices/#c>
- Africa Water Facility. (2014). Boosting Inclusive Water Management in Northern Nigeria: Preparation of Strategic Action Plan for Water Resources Development in the Komadugu-Yobe Basin. In *Project appraisal report*. Tunis, Tunisia: African Development Bank.
- African Union. (2013). *Progress on Implementing Water and Sanitation Goals in Africa: The 2011 Country Performance Report* (Vol. 1). Addis Ababa, Ethiopia: The African Union Commission.
- African Union. (2015a). About Agenda 2063. Retrieved March 8, 2019, from Agenda 2063 website: <https://au.int/en/agenda2063/about>
- African Union. (2015b). *Agenda 2063: The Africa We Want*. Addis Ababa, Ethiopia: African Union Commission.
- African Union. (2019). Regional Economic Communities (RECs). Retrieved March 3, 2019, from Website website: <https://au.int/en/organs/recs>
- AFROSAL. (2015). *Joint Environmental Audit on the Drying up of Lake Chad*. Yaounde, Cameroun: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.
- Agbese, P. O. (1992). With Fingers on the Trigger: The Military as Custodian of Democracy in Nigeria. *Journal of Third World Studies*, 9(2), 220–253.
- Aghoghovwia, P. (2015). The Poetics and Politics of Transnational Petro-Environmentalism in Nnimmo Bassey's *We Thought It Was Oil but It Was Blood*. *English in Africa*, 41(2), 59. <https://doi.org/10.4314/eia.v41i2.3>
- Agoro, I. O. (1966). The Establishment of the Chad Basin Commission. *British Institute of International and Comparative Law*, 15(2), 542–550.
- Ahlborg, H., & Nightingale, A. J. (2018). Theorizing power in political ecology: The where of power in resource governance projects. *Journal of Political Ecology*, 25(1), 381–401. <https://doi.org/10.2458/v25i1.22804>
- Ahlers, R. (2010). Fixing and nixing: The politics of water privatization. *Review of Radical Political Economics*, 42(2), 213–230. <https://doi.org/10.1177/0486613410368497>

- Ahlers, R., & Merme, V. (2016). Financialization, water governance, and uneven development. *Wiley Interdisciplinary Reviews: Water*, 3(6), 766–774. <https://doi.org/10.1002/wat2.1166>
- Aileman, T. (2019). Nigeria's Farmer-Herder Conflict: Buhari suspends Ruga settlement plans. Retrieved July 20, 2020, from Business Day website: <https://businessday.ng/agriculture/article/nigerias-farmer-herder-conflict-buhari-suspends-ruga-settlement-plans/>
- Ait-Kadi, M. (2016). Water for Development and Development for Water: Realizing the Sustainable Development Goals (SDGs) Vision. *Aquatic Procedia*, 6, 106–110. <https://doi.org/10.1016/j.aqpro.2016.06.013>
- Ajayi, J. F. A. (1975). Higher Education in Nigeria. *African Affairs*, 74(297), 420–426. <https://doi.org/10.1093/oxfordjournals.afraf.a096639>
- Ajisehiri, B. (2016). *Partnership for Expanded Water Supply, Sanitation and Hygiene (PEWASH): Programme Strategy 2016 - 2030*. Abuja, Nigeria: Federal Ministry of Water Resources.
- Akanmu, J. O., Remi-John, O., & Ekpo, I. E. (2011). Overview of Dam Development in Nigeria. *Geotechnical and Geological Engineering*, 29(6), 953–960. <https://doi.org/10.1007/s10706-010-9370-0>
- Ake, C. (1979). *Social Science as Imperialism: The theory of political development* (First). Ibadan: Ibadan University Press.
- Ake, C. (1981). The congruence of political economies and ideologies in Africa. In *The Political economy of contemporary Africa* (Sixth, pp. 198–211). London: SAGE Publications.
- Akhionbare, W. N., Akhionbare, S. M. O., Ikhile, & Ubuoh, E. A. (2012). Institutional Challenges in Water Supply Development and Sustainability in Nigeria - A Case of a Government-Owned Water Agency. *International Journal of Multidisciplinary Sciences and Engineering*, 3(1), 20–25.
- Akindele, S. T., & Adebo, A. (2004). The Political Economy of River Basin and Rural Development Authority in Nigeria: A Retrospective Case Study of Owena-River Basin and Rural Development Authority (ORBRDA). *Journal of Human Ecology*, 16(1), 55–62. <https://doi.org/10.1080/09709274.2004.11905716>
- Akpabio, E. M. (2007). Assessing integrated water resources management in Nigeria: insights and lessons from irrigation projects in the Cross River Basin. *Water Policy*, 9(2), 149–168. <https://doi.org/10.2166/wp.2007.007>
- Akpabio, E. M., & Ansa, I. E. (2013). Water for Cities in Nigeria: The Governance Dimension. *Mediterranean Journal of Social Sciences*, 4(4), 297–310. <https://doi.org/10.5901/mjss.2013.v4n4p297>
- Akpabio, E. M., & Rowan, J. S. (2021). The political economy of coordinating water, sanitation and hygiene management policies and programmes for Nigeria. *Water International*, 46(3), 365–382.

<https://doi.org/10.1080/02508060.2020.1867454>

- Akpabio, E. M., & Udom, E. S. (2018). 'Borehole Race' and the Dilemma of Governing the 'Ungoverned': Understanding the Urban Political Ecology of Groundwater Exploitation in Nigeria. *Society and Natural Resources*, 31(9), 1030–1044. <https://doi.org/10.1080/08941920.2018.1475586>
- Akpabio, E. M., Watson, N. M., Ite, U. E., & Ukpong, I. E. (2007). Integrated water resources management in the Cross River Basin, Nigeria. *International Journal of Water Resources Development*, 23(4), 691–708. <https://doi.org/10.1080/07900620701488612>
- Akpan, P. O., & Eteng, F. O. (2019). Administrative Challenges and Public Water Supply in Cross River State, Nigeria. *International Journal of Integrative Humanism*, 11(2), 1–17.
- Alasuutari, P., & Qadir, A. (2014). Epistemic governance an approach to the politics of policy making. *European Journal of Cultural and Political Sociology*, 1(1), 67–84. <https://doi.org/10.1080/23254823.2014.887986>
- Alba, R., Kooy, M., & Bruns, A. (2020). Conflicts, cooperation and experimentation: Analysing the politics of urban water through Accra's heterogeneous water supply infrastructure. *Environment and Planning E: Nature and Space*, 0(0), 1–22. <https://doi.org/10.1177/2514848620975342>
- Alhassan, B., Saddik, A. I., Tijjani, N., Abaka, J. U., & Gumel, A. H. (2019). Small Earth Dams in Nigeria: Prospects and Challenges. *Journal of Energy Technologies and Policy*, 9(5), 14–17. <https://doi.org/10.7176/JETP/9-5-02>
- Allan, T., Keulertz, M., & Woertz, E. (2015). The water–food–energy nexus: an introduction to nexus concepts and some conceptual and operational problems. *International Journal of Water Resources Development*, 31(3), 301–311. <https://doi.org/10.1080/07900627.2015.1029118>
- Allen, C. (1981). A bibliographic guide to the study of the political economy of Africa. In Peter. C.W. Gutkind & I. Wallerstein (Eds.), *The Political economy of contemporary Africa* (Sixth, pp. 291–301). London: SAGE Publications.
- Allen, J. (2004). The whereabouts of power: politics, government and space. *Geografiska Annaler: Series B, Human Geography*, 86(1), 19–32. <https://doi.org/10.1111/j.0435-3684.2004.00151.x>
- Allen, J. (2016a). Conclusion: Power on the quiet. In J. Allen (Ed.), *Topologies of Power* (1st ed., pp. 149–160). London: Routledge. <https://doi.org/10.4324/9780203101926-16>
- Allen, J. (2016b). *Topologies of Power: Beyond Territory and Networks* (J. Allen, Ed.). London: Taylor & Francis Group.
- Allen, J. (2020). Power's quiet reach and why it should exercise us. *Space and Polity*, 24(3), 408–413. <https://doi.org/10.1080/13562576.2020.1759412>
- Allott, A. N. (1978). Nigeria: Land Use Decree, 1978. *Journal of African Law*, 22(2), 136–160.
- Alozie, B. (2020). Space and Colonial Alterity: Interrogating British Residential Segregation in Nigeria.

- Ufahamu: A Journal of African Studies*, 41(2), 1–26.
- Amanambu, A. C., Li, L., Egbinola, C. N., Obarein, O. A., Mupenzi, C., & Chen, D. (2019). Spatio-temporal variation in rainfall-runoff erosivity due to climate change in the Lower Niger Basin, West Africa. *Catena*, 172, 324–334. <https://doi.org/10.1016/j.catena.2018.09.003>
- American Historical Association. (2021). Nigeria: Four Regions at the Time of Independence. Retrieved October 24, 2022, from Nigeria website: <https://www.historians.org/teaching-and-learning/teaching-resources-for-historians/teaching-and-learning-in-the-digital-age/through-the-lens-of-history-biafra-nigeria-the-west-and-the-world/the-republic-of-biafra/nigeria-four-regions-at-the-time-of-indepe>
- Anand, N. (2011). Pressure: The politechnics of water supply in Mumbai. *Cultural Anthropology*, 26(4), 542–564. <https://doi.org/10.1111/j.1548-1360.2011.01111.x>
- Anand, N. (2012). Municipal disconnect: On abject water and its urban infrastructures. *Ethnography*, 13(4), 487–509. <https://doi.org/10.1177/1466138111435743>
- Anand, N. (2015a). Accretion. Retrieved January 28, 2020, from Fieldsights website: <https://culanth.org/fieldsights/accretion>
- Anand, N. (2015b). Leaky states: Water audits, ignorance, and the politics of infrastructure. *Public Culture*, 27(2), 305–330. <https://doi.org/10.1215/08992363-2841880>
- Anand, N. (2016). On pressure and the politics of water infrastructure. In P. Harvey, C. B. Jensen, & M. Atsuro (Eds.), *Infrastructures and Social Complexity: A Companion* (pp. 109–119). London: Routledge. <https://doi.org/10.4324/9781315622880-18>
- Anand, N., Gupta, A., & Appel, H. (2018). *The promise of infrastructure*. Durham: Duke University Press.
- Anand, P. B. (2004). The political economy of water scarcity and issues of inequality, entitlements and identities: A tale of two cases from southern India. *International Journal of Technology Management and Sustainable Development*, 3(2), 115–132. <https://doi.org/10.1386/ijtm.3.2.115/0>
- Anderson, Ken. (2009). Imperial Clash on the Congo Resource Front. Retrieved June 29, 2018, from Global Policy Forum website: <https://archive.globalpolicy.org/the-dark-side-of-natural-resources-st/water-in-conflict/40133.html>
- Anderson, M. W., Teisl, M. F., & Noblet, C. L. (2016). Whose values count: is a theory of social choice for sustainability science possible? *Sustainability Science*, 11(3), 373–383. <https://doi.org/10.1007/s11625-015-0345-1>
- Andres, L., Chellaraj, G., Das Gupta, B., Grabinsky, J., & Joseph, G. (2018). *Why Are So Many Water Points in Nigeria Non-Functional? An Empirical Analysis of Contributing Factors* (No. 8388). Washington DC: World Bank, Washington, DC. <https://doi.org/10.1596/1813-9450-8388>
- Andres, L., Chellaraj, G., Gupta, B. Das, Grabinsky, J., & Joseph, G. (2018). *An Evaluation of the*

- Contributing Factors of Water Scheme Failures in Nigeria* (No. 8371). Washington DC: The World Bank. <https://doi.org/10.1596/1813-9450-8371>
- Angel, J., & Loftus, A. (2019). With-against-and-beyond the human right to water. *Geoforum*, 98(January), 206–213. <https://doi.org/10.1016/j.geoforum.2017.05.002>
- Anyadike, R. N. C. (1993). Seasonal and annual rainfall variations over Nigeria. *International Journal of Climatology*, 13(5), 567–580. <https://doi.org/10.1002/joc.3370130507>
- Araral, E., & Wang, Y. (2013). Water Governance 2.0: A Review and Second Generation Research Agenda. *Water Resources Management*, 27(11), 3945–3957. <https://doi.org/10.1007/s11269-013-0389-x>
- Areola, O. (1991). Ecology of natural resources in Nigeria. In *Ecology of natural resources in Nigeria*. Aldershot: Avebury.
- Arimah, B. (2017). Infrastructure as a Catalyst for the Prosperity of African Cities. *Procedia Engineering*, 198(9), 245–266. <https://doi.org/10.1016/j.proeng.2017.07.159>
- Arnett, E. J. (1933). The census of Nigeria, 1931. *African Affairs*, 32(129), 398–404. <https://doi.org/10.1093/oxfordjournals.afraf.a100815>
- Asah, S. T. (2015). Transboundary hydro-politics and climate change rhetoric: an emerging hydro-security complex in the lake chad basin. *WIREs Water*, 2(1), 37–45. <https://doi.org/10.1002/wat2.1057>
- Asiwaju, A. I. (1972). Ashby Revisited: A Review of Nigeria's Educational Growth, 1961-1971. *African Studies Review*, 15(1), 1. <https://doi.org/10.2307/523532>
- Atkinson, W. (2019). Time for Bourdieu: Insights and oversights. *Time and Society*, 28(3), 951–970. <https://doi.org/10.1177/0961463X17752280>
- Awolowo, O. (1947). *Path to Nigerian Freedom*. London: Faber & Faber.
- Ayeni, A. O. (2016). Increasing population, urbanization and climatic factors in Lagos State, Nigeria: The nexus and implications on water demand and supply. *Journal of Global Initiatives: Policy, Pedagogy, Perspectives*, 11(2), 69–87.
- Ayeni, A., Soneye, A., & Akintuyi, A. (2013). Contributions by Stakeholders to Water Supply in the Rural-Urban Communities of Ondo State, Nigeria. *Lagos Journal of Geo-Information Sciences*, 2(1), 63–72.
- Ayoade, J. (1984). Time in Yoruba Thought. In R. A. Wright (Ed.), *African philosophy: an introduction* (3rd ed., pp. 93–111). Lanham: University Press of America.
- Ayoade, J. A. A. (1985). Party and Ideology in Nigeria: A Case Study of the Action. *Source: Journal of Black Studies*, 16(2), 169–188.
- Babalola, O. (2016). *History of State Creation in Nigeria* (pp. 1–12). pp. 1–12.

- Babbie, E. R. (2008). *The practice of social research* (10th ed.). Belmont: Thomson/Wadsworth.
- Baghel, R. (2014). Genealogy of the Hydraulic Mission. In *Advances in Asian Human-Environmental Research* (pp. 61–91). Springer International Publishing. [https://doi.org/10.1007/978-3-319-04432-3\\_3](https://doi.org/10.1007/978-3-319-04432-3_3)
- Bakker, K. J. (2003). A Political Ecology of Water Privatization. *Studies in Political Economy*, 70(1), 35–58. <https://doi.org/10.1080/07078552.2003.11827129>
- Bakker, K., Kooy, M., Shofiani, N. E., & Martijn, E.-J. (2008). Governance Failure: Rethinking the Institutional Dimensions of Urban Water Supply to Poor Households. *World Development*, 36(10), 1891–1915. <https://doi.org/10.1016/j.worlddev.2007.09.015>
- Bakker, K. (2010). *Privatizing Water: Governance Failure and the World's Urban Water Crisis*. Ithaca: Cornell University Press.
- Bakker, Karen. (2012). Water Security: Research Challenges and Opportunities. *Science*, 337(6097), 914–915. <https://doi.org/10.1126/science.1226337>
- Balaguer-Coll, M. T. (2016). Budget Analysis. In A. Farazmand (Ed.), *Global Encyclopedia of Public Administration, Public Policy, and Governance* (pp. 1–10). Cham: Springer. [https://doi.org/10.1007/978-3-319-31816-5\\_2260-1](https://doi.org/10.1007/978-3-319-31816-5_2260-1)
- Balyaminu, J. A. (2017). Towards attaining equity and satisfaction in water allocation mechanism for irrigated agriculture in Northern Nigeria. *African Journal of Agricultural Research*, 12(17), 1466–1476. <https://doi.org/10.5897/AJAR2017.12190>
- Bang, L. (2014). Between the Cat and the Principle: an encounter between Foucault's and Bourdieu's conceptualisations of power. *Power and Education*, 6(1), 2014. <https://doi.org/10.2304/power.2014.6.1.18>
- Bangura, Y. (1987). The IMF/World Bank conditionality and Nigeria's structural adjustment programme. In K. J. Havnevik (Ed.), *The IMF and the World Bank in Africa: Conditionality, impact and alternatives Seminar Proceedings from the Scandinavian Institute of African Studies (Sweden)* (pp. 95–116). Uppsalla: Nordiska Afrikainst.
- Bankole, A. (2002). The Nigerian Tourism Sector: Economic Contribution, Constraints, and Opportunities. *Journal of Hospitality Financial Management*, 10(1), 69–89.
- Barth, H. (1853). *Travels and Discoveries in North and Central Africa: Being a journal of an expedition undertaken under the auspices of H.B.M.'s government, in the years 1849-1855* (No. 1; Vol. 1). New York: Drallop.
- Barth, H. (1857a). *Travels and Discoveries in North and Central Africa: Being a journal of an expedition undertaken under the auspices of H.B.M.'s government, in the years 1849-1855* (No. 3; Vol. 3). New York: D. Appleton and Co.
- Barth, H. (1857b). *Travels and Discoveries in North and Central Africa: Being a journal of an*



- expedition undertaken under the auspices of H.B.M.'s government, in the years 1849-1855* (No. 2; Vol. 2). New York: Harper and Brothers.
- Barth, H. (1858). *Travels and Discoveries in North and Central Africa: Being a journal of an expedition undertaken under the auspices of H.B.M.'s government, in the years 1849-1855* (No. 4; Vol. 4). London: Longman, Brown, Green and Roberts.
- Bascom, W. (1955). Urbanization Among the Yoruba. *American Journal of Sociology*, 60(5), 446–454. <https://doi.org/10.1086/221604>
- Batteau, J., Princen, S., & Rigney, A. (2018). Lessons from the past? Cultural memory in Dutch integration policy. *European Journal of Political Research*, 57(3), 740–758. <https://doi.org/10.1111/1475-6765.12249>
- Baumgartne, T., & Pahl-Wostl, C. (2013). UN-Water and its role in global water governance. *Ecology and Society*, 18(3). <https://doi.org/10.5751/ES-05564-180303>
- Bayart, J.-F. (2009). *The state in Africa : the politics of the belly*. Cambridge: Polity Press.
- Bayliss, K. (2013). Financing Water in Africa. In *SOAS Department of Economics Working Paper Series*. London: School of Oriental and African Studies.
- Beach, D. (2017). *Process-Tracing Methods in Social Science* (Vol. 1). Oxford: Oxford University Press. <https://doi.org/10.1093/acrefore/9780190228637.013.176>
- Beach, D., & Pedersen, R. B. (2013). *Process-Tracing Methods: Foundations and Guidelines*. Ann Arbor: University of Michigan Press.
- Bell, S. (2012). The Power of Ideas: The Ideational Shaping of the Structural Power of Business. *International Studies Quarterly*, 56(4), 661–673.
- Bénit-Gbaffou, C., & Oldfield, S. (2011). Accessing the State: Everyday Practices and Politics in Cities of the South. *Journal of Asian and African Studies*, 46(5), 445–452. <https://doi.org/10.1177/0021909611403703>
- Bennett, A., Acto, L., Epstein, G., Gruby, R. L., & Nenadovic, M. (2018). Embracing conceptual diversity to integrate power and institutional analysis: Introducing a relational typology. *International Journal of the Commons*, 12(2), 330–357. <https://doi.org/10.18352/ijc.819>
- Berg, B. L. (1998). *Qualitative research methods for the social sciences* (3rd ed.). California: Allyn and Bacon.
- Berman, S. (2013). Ideational theorizing in the social sciences since “Policy paradigms, social learning, and the state.” *Governance*, 26(2), 217–237. <https://doi.org/10.1111/gove.12008>
- Beveridge, R., & Koch, P. (2017). The post-political trap? Reflections on politics, agency and the city. *Urban Studies*, 54(1), 31–43. <https://doi.org/10.1177/0042098016671477>
- Bhambra, G. K. (2014). Postcolonial and Decolonial Reconstructions. In *Connected Sociologies* (pp.

- 117–140). London: Bloomsbury Academic. <https://doi.org/10.5040/9781472544377.ch-006>
- Bichsel, C. (2016). Water and the (Infra-)Structure of Political Rule: A Synthesis. *Water Alternatives*, 9(2), 356–372.
- Bigon, L. (2016). Bubonic plague, colonial ideologies, and urban planning policies: Dakar, Lagos, and Kumasi. *Planning Perspectives*, 31(2), 205–226. <https://doi.org/10.1080/02665433.2015.1064779>
- Bjornlund, V., Bjornlund, H., & van Rooyen, A. F. (2020). Exploring the factors causing the poor performance of most irrigation schemes in post-independence sub-Saharan Africa. *International Journal of Water Resources Development*, 36(sup1), S54–S101. <https://doi.org/10.1080/07900627.2020.1808448>
- Blatter, J., & Ingram, H. M. (2001). *Reflections on water: new approaches to transboundary conflicts and cooperation*. Massachusetts: MIT Press.
- Blom, U. (2017). Congo will be Africa’s mega-crisis in 2018. Retrieved September 18, 2018, from Thompson Reuters website: <https://news.trust.org/item/20171205141828-kjmht/>
- Blomkvist, P., & Nilsson, D. (2017). On the Need for System Alignment in Large Water Infrastructure: Understanding Infrastructure Dynamics in Nairobi, Kenya. *Water Alternatives*, 10(2), 283–302.
- Blyth, M. M., Goldstein, J., Keohane, R., & Sikink, K. (1997). “Any More Bright Ideas?” The Ideational Turn of Comparative Political Economy. *Comparative Politics*, 29(2), 229. <https://doi.org/10.2307/422082>
- Bocchetto, F. P. (2017). Italy-China Alliance for Transaqua. *Proceedings of the International Schiller Institute Conference on “Fulfilling the Dream of Mankind”, November 25-27, 2017*, 14–21. Bad Soden/ Taunus: Schiller Institute.
- Boelens, R., Hoogesteger, J., Swyngedouw, E., Vos, J., & Wester, P. (2016a). Hydrosocial territories: a political ecology perspective. *Water International*, 41(1), 1–14. <https://doi.org/10.1080/02508060.2016.1134898>
- Boelens, R., Hoogesteger, J., Swyngedouw, E., Vos, J., & Wester, P. (2016b). Hydrosocial territories: a political ecology perspective. *Water International*, 41(1), 1–14. <https://doi.org/10.1080/02508060.2016.1134898>
- Boelens, R., Perreault, T., & Vos, J. (2018). Water justice. In *Water Justice*. Cambridge University Press. <https://doi.org/10.1017/9781316831847>
- Boeuf, B., & Fritsch, O. (2016). Studying the implementation of the Water Framework Directive in Europe: a meta-analysis of 89 journal articles. *Ecology and Society*, 21(2), 1–21. <https://doi.org/10.5751/ES-08411-210219>
- Bofala, F. B. (2017). The attempt to balkanise the Democratic Republic of Congo: Retrieved June 29, 2018, from Mokengeli website: <http://www.mokengeli.com/information-politique/the-attempt-to-balkanize-the-democratic-republic-of-congo-dangerous-for-africa/>

- Böhm, S., & Brei, V. (2008). Marketing the hegemony of development: Of pulp fictions and green deserts. *Marketing Theory*, 8(4), 339–366. <https://doi.org/10.1177/1470593108096540>
- Bond, P. (2019). Class, race, space and the “right to sanitation.” In *Water Politics* (pp. 189–202). Routledge. <https://doi.org/10.4324/9780429453571-14>
- Bonifica Group. (2018). TRANSAQUA: An idea for the Sahel. Retrieved from International Conference on Lake Chad website: <https://drive.google.com/drive/folders/1Qc72gX2xxkwYv1SV1hCNhS7eFPIFUXDI>
- Bormpoudakis, D. (2019). Three implications of political ontology for the political ecology of conservation. *Journal of Political Ecology*, 26(1), 545–566. <https://doi.org/10.2458/V26I1.22014>
- Bouckaert, F. W., Vasconcelos, V. V., Wei, Y., Empinotti, V. L., Daniell, K. A., & Pittock, J. (2020). A diagnostic framework to assess the governance of the São Francisco River Basin Committee, Brazil. *World Water Policy*, 00, 1–30. <https://doi.org/10.1002/wwp2.12022>
- Bourdieu, P. (1977). *Outline of a Theory of Practice*. Cambridge: Cambridge University Press. <https://doi.org/10.1017/CBO9780511812507>
- Bourdieu, P. (1979). Symbolic Power. *Critique of Anthropology*, 4(13–14), 77–85. <https://doi.org/10.1177/0308275X7900401307>
- Bourdieu, P. (1985). The social space and the genesis of groups. *Theory and Society*, 14(6), 723–744. <https://doi.org/10.1007/BF00174048>
- Bourdieu, P. (1986). The Forms of Capital. In J. G. Richardson (Ed.), *Handbook of Theory and Research for the Sociology of Education* (pp. 241–258). New York: Greenwood Press.
- Bourdieu, P. (1989a). *Language and Symbolic Power*. Cambridge, UK: Polity Press.
- Bourdieu, P. (1989b). Social Space and Symbolic Power. *Sociological Theory*, 7(1), 14. <https://doi.org/10.2307/202060>
- Bourdieu, P. (1990). *The Logic of Practice* (Reprint, R). Stanford: Stanford University Press.
- Bourdieu, P. (1991). *The Political Ontology of Martin Heidegger* (English ed). Cambridge: Polity Press.
- Bourdieu, P. (1995). *Physical space, social space and habitus*. Oslo, Norway: Unpublished.
- Bourdieu, P. (1996). *Distinction: A social critique of the judgement of taste* (8th ed.). Cambridge: Harvard University Press.
- Bourdieu, P. (1998). *Practical Reason: On the Theory of Action*. California: Stanford University Press.
- Bourdieu, P. (2000). *Pascalian Meditations*. Stanford: Stanford University Press.
- Bourdieu, P. (2008). *Sketch for a self-analysis* (Reprint). Chicago: University of Chicago Press.
- Bourdieu, P. (2013). *Outline of a Theory of Practice* (28th ed.). Cambridge, UK: Cambridge University Press. <https://doi.org/10.1017/cbo9780511812507>
- Bourdieu, P. (2018). Social Space and the Genesis of Appropriated Physical Space. *International*

- Journal of Urban and Regional Research*, 42(1), 106–114. <https://doi.org/10.1111/1468-2427.12534>
- Bourdieu, P. (2020). The Field of Power and the Division of the Labour of Domination. In Denord F., M. Palme, & B. Réau (Eds.), *Researching Elites and Power. Methodos Series (Methodological Prospects in the Social Sciences)* (pp. 33–44). Cham: Springer International Publishing. [https://doi.org/10.1007/978-3-030-45175-2\\_3](https://doi.org/10.1007/978-3-030-45175-2_3)
- Bourdieu, P., & Wacquant, L. (1992). *An Invitation to Reflexive Sociology, Bourdieu, Wacquant*. Chicago: The University of Chicago Press.
- Bourdillon, B. H. (1944). Colonial Development and Welfare. *International Affairs*, 20(3), 369–380. <https://doi.org/10.2307/3018563>
- Bourdillon, B. H. (1945). *The Future of the Colonial Empire* (First). SCM Press.
- Bourdillon, B., & Palmer, R. (1945). Nigerian Constitutional Proposals. *African Affairs*, 44(176), 120–124. <https://doi.org/10.1093/oxfordjournals.afraf.a093452>
- Bradlow, D. D. (2015). Southern African governments, multilateral development banks, non-state actors, and sustainable infrastructure: Managing changing relationships. *South African Journal of International Affairs*, 22(3), 289–305. <https://doi.org/10.1080/10220461.2015.1087874>
- Bredillet, C. N., Tywoniak, S., & Dwivedula, R. (2015). Reconnecting Theory and Practice in Pluralistic Contexts: Issues and Aristotelian Considerations. *Project Management Journal*, 46(2), 6–20. <https://doi.org/10.1002/pmj.21479>
- Brisbois, M. C., & de Loë, R. C. (2016). Power in Collaborative Approaches to Governance for Water: A Systematic Review. *Society and Natural Resources*, 29(7), 775–790. <https://doi.org/10.1080/08941920.2015.1080339>
- Briscoe, J. (1999a). The changing face of water infrastructure financing in developing countries. *International Journal of Water Resources Development*, 15(3), 301–308. <https://doi.org/10.1080/07900629948826>
- Briscoe, J. (1999b). The Financing of Hydropower, Irrigation and Water Supply Infrastructure in Developing Countries. *International Journal of Water Resources Development*, 15(4), 459–491. <https://doi.org/10.1080/07900629948718>
- Broich, J. (2007). Engineering the Empire: British water supply systems and colonial societies, 1850–1900. *Journal of British Studies*, 46(April), 346–365. <https://doi.org/10.17613/M6GD6W>
- Bryant, R. L., & Bailey, S. (1997). Third World Political Ecology. *Geography*, 5, 237. <https://doi.org/10.2307/216150>
- Budds, J. (2009). Contested H2O: Science, policy and politics in water resources management in Chile. *Geoforum*, 40(3), 418–430. <https://doi.org/10.1016/j.geoforum.2008.12.008>
- Budds, J., Linton, J., & McDonnell, R. (2014). The hydrosocial cycle. *Geoforum*, (57), 167–169.

- Budget Office of the Federation. (2017). *Economic Recovery and Growth Plan (ERGP) 2017-2020*. Abuja, Nigeria: Ministry of Budget & National Planning.
- Buhari, M. (2018). President Buhari's speech at the launch of the National Action Plan for Revitalizing the Water Supply, Sanitation and Hygiene (WASH) sector. Retrieved May 19, 2021, from [https://statehouse.gov.ng/daily/thur-8-11-18/?doing\\_wp\\_cron=1621396474.2227859497070312500000](https://statehouse.gov.ng/daily/thur-8-11-18/?doing_wp_cron=1621396474.2227859497070312500000)
- Burnham, J. F. (2006). Scopus database: a review. *Biomedical Digital Libraries*, 3, 1. <https://doi.org/10.1186/1742-5581-3-1>
- Burns, A. C. (1919a). *The Nigerian Handbook 1919*. Lagos, Nigeria: Government Printer.
- Burns, A. C. (1919b). *The Nigerian Handbook 1919 Containing Statistical and General Information respecting the Colony and Protectorate*. Lagos.
- Cai, P. (2017). *Understanding China's Belt and Road Initiative*. Sydney, Australia: Lowy Institute.
- Callewaert, S. (2006). Bourdieu, Critic of Foucault. *Theory, Culture & Society*, 23(6), 73–98. <https://doi.org/10.1177/02632764060609776>
- Cameron, D. (1934). *The principles of native administration and their application*. (p. 47p.). p. 47p. Lagos: Govt. Printer.
- Campbell, H. G. (2018a). Saving Lake Chad: A pan-African project. Retrieved March 26, 2018, from Pambazuka News website: <https://www.pambazuka.org/human-security/saving-lake-chad-pan-african-project>
- Campbell, H. G. (2018b). Saving Lake Chad and the Rejuvenation of Africa: Beyond the imaginary. *Imaged or Imagined Africa: Issues in Security, Governance and Sustainable Development*, 25-27 June 2018, Abuja, Nigeria, 1–38. Abuja, Nigeria: Unpublished.
- Campbell, M., Katikireddi, S. V., Sowden, A., McKenzie, J. E., & Thomson, H. (2018). Improving Conduct and Reporting of Narrative Synthesis of Quantitative Data (ICONS-Quant): protocol for a mixed methods study to develop a reporting guideline. *BMJ Open*, 8(2), 1–5. <https://doi.org/10.1136/BMJOPEN-2017-020064>
- Canguilhem, G. (1998). *The Normal and the Pathological* (4th ed.). New York: Zone Books.
- Carmel, E. (2019). *Governance Analysis*. Cheltenham: Edward Elgar Publishing.
- Carstensen, M. B. (2011). Ideas are not as stable as political scientists want them to be: A theory of incremental ideational change. *Political Studies*, 59(3), 596–615. <https://doi.org/10.1111/j.1467-9248.2010.00868.x>
- Carstensen, M. B. (2015). Bringing Ideational Power into the Paradigm Approach: Critical Perspectives on Policy Paradigms in Theory and Practice. In J. Hogan & Howlett M (Eds.), *Policy Paradigms in Theory and Practice* (pp. 295–318). London: Palgrave Macmillan UK. [https://doi.org/10.1057/9781137434043\\_14](https://doi.org/10.1057/9781137434043_14)

- Carstensen, M. B., & Schmidt, V. A. (2016). Power through, over and in ideas: conceptualizing ideational power in discursive institutionalism. *Journal of European Public Policy*, 23(3), 318–337. <https://doi.org/10.1080/13501763.2015.1115534>
- Casey, C. (2013). Mediating justice: Youth, media, and “affective justice” in the politics of Northern Nigeria. In *Democracy and Prebendalism in Nigeria: Critical Interpretations* (pp. 201–225). Rochester Institute of Technology, Rochester, NY, United States: Palgrave Macmillan. [https://doi.org/10.1057/9781137280770\\_9](https://doi.org/10.1057/9781137280770_9)
- Castells, M. (2011). A network theory of power. *International Journal of Communication*, 5(1), 773–787. <https://doi.org/1932-8036/20110773>
- Central Bank of Nigeria. (2020). Public Finance Statistics. Retrieved May 22, 2020, from Statistical Bulletin website: <https://www.cbn.gov.ng/rates/>
- Chambers, R. (1986a). *Agriculture and Rural Problems: Normal professionalism, new paradigms and development*. Brighton, United Kingdom: Institute of Development Studies.
- Chambers, R. (1986b). *Sustainable Livelihoods: An opportunity for the World commission on Environment and Development*. Brighton, United Kingdom: Institute of Development Studies.
- Chattopadhyay, S. (2015). The false dichotomy in the sanitation debate. Retrieved May 27, 2021, from Industry Agenda website: <https://www.weforum.org/agenda/2015/02/the-false-dichotomy-in-the-sanitation-debate/>
- Chinese Ministry of Foreign Affairs. (2018). Forum on China-Africa Cooperation Beijing Action Plan (2019-2021). Retrieved March 8, 2019, from The Summit website: [https://focacsummit.mfa.gov.cn/eng/hyqk\\_1/t1594297.htm](https://focacsummit.mfa.gov.cn/eng/hyqk_1/t1594297.htm)
- Christie, I., Fernandes, E., Messerli, H., & Twining-Ward, L. (2014). *Tourism in Africa: Harnessing Tourism for Growth and Improved Livelihoods*. Washington DC: World Bank. <https://doi.org/10.1596/978-1-4648-0190-7>
- Chukwu, K. E. (2015). Water Supply Management Policy in Nigeria: Challenges in the wetland area of Niger Delta. *European Scientific Journal*, 11(26), 1857–7881.
- Chukwuma, O. M. (2016). Community participation in the rural water supply sector of Enugu State, Nigeria. *American Journal of Water Resources*, 4(3), 58–67. <https://doi.org/10.12691/ajwr-4-3-2>
- Chukwuma Obeta, M. (2018). Rural water supply in Nigeria: policy gaps and future directions. *Water Policy*, 20(3), 597–616. <https://doi.org/10.2166/wp.2018.129>
- Chung, I., & Helweg, O. (1985). Modeling the California State Water Project. *Journal of Water Resources Planning and Management*, 111(1), 82–97. [https://doi.org/10.1061/\(ASCE\)0733-9496\(1985\)111:1\(82\)](https://doi.org/10.1061/(ASCE)0733-9496(1985)111:1(82))
- CIA. (2011). Country comparison to the world: Waterways. Retrieved June 2, 2019, from CIA Factbook website: [https://www.cia.gov/LIBRARY/publications/the-world-factbook/fields/print\\_2093.html](https://www.cia.gov/LIBRARY/publications/the-world-factbook/fields/print_2093.html)

- CIMA International. (2011). *Feasibility Study of the Water Transfer Project from the Ubangi To Lake Chad Summary document: Main results of the Feasibility Study* (No. LI0093A). Laval, Canada: CIMA International.
- Clarke-Sather, A. (2017). State power and domestic water provision in semi-arid Northwest China: Towards an aleatory political ecology. *Political Geography*, 58, 93–103. <https://doi.org/10.1016/J.POLGEO.2015.12.003>
- Cleaver, F. (2017). *Development Through Bricolage*. London: Routledge. <https://doi.org/10.4324/9781315094915>
- Cleaver, F. D., & De Koning, J. (2015). Furthering critical institutionalism. *International Journal of the Commons*, 9(1), 1–18. <https://doi.org/10.18352/ijc.605>
- Cleaver, F., & Franks, T. (2008). Distilling or Diluting? Negotiating the Water Research-Policy Interface. *Water Alternatives*, 1(1), 157–176.
- Cleaver, F., & Whaley, L. (2018). Understanding process, power, and meaning in adaptive governance: a critical institutional reading. *Ecology and Society*, 23(2), 1–14. <https://doi.org/10.5751/ES-10212-230249>
- Clegg, S. R., & Haugaard, M. (2009). Introduction: Power is the Central Concept of the Social Sciences. In S. R. Clegg & M. Haugaard (Eds.), *The SAGE Handbook of Power* (1st ed., pp. 1–24). London: Sage Publications.
- Coleman, J. S. (1958). *Nigeria: background to nationalism*. Berkeley: University of California Press.
- Collier, P. (2007). The Bottom Billion: Why the Poorest Countries Are Failing and What Can Be Done about It. In *The Bottom Billion: Why the Poorest Countries Are Failing and What Can Be Done About It* (Online). Oxford: Oxford University Press, Incorporated.
- Collier, P., & Cust, J. (2015). Investing in Africa's Infrastructure: Financing and Policy Options. *Annual Review of Resource Economics*, 7(1), 473–493. <https://doi.org/10.1146/annurev-resource-100814-124926>
- Collier, S. J. (2009). Topologies of Power: Foucault's Analysis of Political Government beyond 'Governmentality.' *Theory, Culture & Society*, 26(6), 78–108. <https://doi.org/10.1177/0263276409347694>
- Collignon, B., & Vézina, M. (2000). *Independent water and sanitation providers in African cities: A ten-country study*. Washington DC: The World Bank.
- Collins English Dictionary. (2007). *Collins English Dictionary* (9th Editio). Glasgow: HarperCollins.
- Colonial Office. (1916). *Annual reports on the colonies, Nigeria, 1915*. London: H.M. Stationery Office.
- Conca, K. (2006). *Governing water: contentious transnational politics and global institution building*. Cambridge, Massachussets: MIT Press.

- Conker, A., & Hussein, H. (2019). Hydraulic Mission at Home, Hydraulic Mission abroad? Examining Turkey's Regional 'Pax-Aquarum' and Its Limits. *Sustainability*, *11*(1), 1–20. <https://doi.org/10.3390/SU11010228>
- Constantine, S. (1984). *The Making of British Colonial Development Policy 1914-1940* (1st ed.). London: Frank Cass and Company Limited.
- Cornwall, A. (2007). Buzzwords and fuzzwords: deconstructing development discourse. *Development in Practice*, *17*(4–5), 471–484. <https://doi.org/10.1080/09614520701469302>
- Cornwall, A., & Brock, K. (2005). What do buzzwords do for development policy? a critical look at 'participation', 'empowerment' and 'poverty reduction.' *Third World Quarterly*, *26*(7), 1043–1060. <https://doi.org/10.1080/01436590500235603>
- Cosgrove, W. J., & Loucks, D. P. (2015). Water management: Current and future challenges and research directions. *Water Resources Research*, *51*(6), 4823–4839. <https://doi.org/10.1002/2014WR016869>
- Cronin, C. (1996). Bourdieu and Foucault on power and modernity. *Philosophy & Social Criticism*, *22*(6), 55–85. <https://doi.org/10.1177/019145379602200603>
- Cronk, R., & Bartram, J. (2017). Factors Influencing Water System Functionality in Nigeria and Tanzania: A Regression and Bayesian Network Analysis. *Environmental Science & Technology*, *51*(19), 11336–11345. <https://doi.org/10.1021/acs.est.7b03287>
- Crow-Miller, B. (2015a). Discourses of Deflection: The Politics of Framing China's South - North Water Transfer Project. *Water Alternatives*, *8*(2), 173–192.
- Crow-Miller, B. (2015b). Discourses of Deflection: The Politics of Framing China's South-North Water Transfer Project. *Water Alternatives*, *8*(2), 173–192.
- Crow-Miller, B. ., Webber, M., & Molle, F. (2017). The (Re)turn to Infrastructure for Water Management? *Water Alternatives*, *10*(2), 195–207.
- Crow-Miller, B., Webber, M., & Rogers, S. (2017). The Techno-Politics of Big Infrastructure and the Chinese Water Machine. *Water Alternatives*, *10*(2), 233–249.
- Crowder, M. (1964). Indirect Rule - French and British Style. *Africa: Journal of the International African Institute*, *34*(3), 197–205. <https://doi.org/10.1017/S000197200001500X>
- Crowder, Micheal. (1968). *West Africa under colonial rule* (1st ed.). Evanston (Illinois): Northwestern University Press.
- Cui, R. Y., Calvin, K., Clarke, L., Hejazi, M., Kim, S., Kyle, P., ... Wise, M. (2018). Regional responses to future, demand-driven water scarcity. *Environmental Research Letters*, *13*(9), 1–8. <https://doi.org/10.1088/1748-9326/aad8f7>
- D'Arcy, S. (2004). The Essential Foucault: Selections from Essential Works of Foucault, 1954-1984. *Foucault Studies*, *1*(December), 116–118. <https://doi.org/10.22439/fs.v0i1.573>



- D'Silva, B. C., & Raza, M. R. (1980). Integrated rural development in Nigeria: The Funtua project. *Food Policy*, 5(4), 282–297. [https://doi.org/10.1016/0306-9192\(80\)90057-3](https://doi.org/10.1016/0306-9192(80)90057-3)
- Dafinone, D. (1980). *The rationale behind the decision of the senate on revenue allocation*. Lagos: Federal Government of Nigeria.
- Dakyaga, F., Ahmed, A., & Sillim, M. L. (2021). Governing Ourselves for Sustainability: Everyday Ingenuities in the Governance of Water Infrastructure in the Informal Settlements of Dar es Salaam. *Urban Forum*, 32(1), 111–129. <https://doi.org/10.1007/s12132-020-09412-6>
- Danert, K., Adekile, D., & Canuto, J. G. (2020). Striving for Borehole Drilling Professionalism in Africa: A Review of a 16-Year Initiative through the Rural Water Supply Network from 2004 to 2020. *Water*, 12(12), 1–34. <https://doi.org/10.3390/w12123305>
- Daniell, K. A. (2012). *Co-Engineering and Participatory Water Management: Organisational Challenges for Water Governance*. Cambridge, UK: Cambridge University Press.
- Daniell, K. A. (2013). Practical responses to water and climate policy implementation challenges. *Australasian Journal of Water Resources*, 17(2), 111–125. <https://doi.org/10.7158/W13-WC01.2013.17.2>
- Daniell, K. A., & Barreteau, O. (2014). Water governance across competing scales: Coupling land and water management. *Journal of Hydrology*, 519, 2367–2380. <https://doi.org/10.1016/j.jhydrol.2014.10.055>
- Daniell, K. A., & Kay, A. (2017). *Multi-level governance: conceptual challenges and case studies from Australia*. Canberra, Australia: ANU Press.
- Daniell, K. A., & Mercer, T. (2017). What Remains Unwritten? Developing a Critical Evaluation of Multi-level Governance and its Futures in Australian Public Policy and Politics. In K. A. Daniell & A. Kay (Eds.), *Multi-level governance: conceptual challenges and case studies from Australia* (pp. 443–457). Canberra, Australia: ANU Press.
- Daniell, K. A., Milner, H., & Squires, V. (2014). Uniting Perspectives: People and Place in River Basin Management. In V. R. Squires, H. M. Milner, & K. A. Daniell (Eds.), *River Basin Management in the Twenty-First century: Understanding People and Place* (pp. 467–483). Boca Raton: CRC Press, Taylor & Francis Group.
- Dare, M. L., & Daniell, K. A. (2017). Australian water governance in the global context: understanding the benefits of localism. *Policy Studies*, 38(5), 462–481. <https://doi.org/10.1080/01442872.2016.1188908>
- Dargie, G. C., Lawson, I. T., Rayden, T. J., Miles, L., Mitchard, E. T. A., Page, S. E., ... Lewis, S. L. (2018). Congo Basin peatlands: threats and conservation priorities. *Mitigation and Adaptation Strategies for Global Change*, 24(1), 669–686. <https://doi.org/10.1007/s11027-017-9774-8>
- De Stefano, L., Svendsen, M., Giordano, M., Steel, B. S., Brown, B., Wolf, A. T., & Walsh, E. A. (2014).

- Water governance benchmarking: concepts and approach framework as applied to Middle East and North Africa countries. *Water Policy*, 16, 1121–1139. <https://doi.org/10.2166/wp.2014.305>
- Deleuze, G., & Guattari, F. (2000). *Capitalism and Schizophrenia* (Tenth). Minneapolis: University of Minnesota Press.
- Demarest, L., Langer, A., & Ukiwo, U. (2020). Nigeria's Federal Character Commission (FCC): a critical appraisal. *Oxford Development Studies*, 48(4), 315–328. <https://doi.org/10.1080/13600818.2020.1727427>
- Demart, S., & Bodeux, L. (2013). Postcolonial stakes of congolese (DRC) Political Space: 50 Years after independence. *African Diaspora*, 6(1), 72–96. <https://doi.org/10.1163/18725457-12341242>
- Deshpande, A., Miller-Petrie, M. K., Lindstedt, P. A., Baumann, M. M., Johnson, K. B., Blacker, B. F., ... Reiner, R. C. (2020). Mapping geographical inequalities in access to drinking water and sanitation facilities in low-income and middle-income countries, 2000–17. *The Lancet Global Health*, 8(9), e1162–e1185. [https://doi.org/10.1016/S2214-109X\(20\)30278-3](https://doi.org/10.1016/S2214-109X(20)30278-3)
- Dicicco, J. M., & Levy, J. S. (1999). Power Shifts and Problem Shifts: The Evolution of the Power Transition Research. *Source: The Journal of Conflict Resolution*, 43(6), 675–704.
- Dillet, B. (2017). What is Poststructuralism? *Political Studies Review*, 15(4), 516–527. <https://doi.org/10.1177/1478929917712931>
- Dixey, F. (1946). Rural Water Supplies in Africa. *South African Geographical Journal*, 28(1), 1–29. <https://doi.org/10.1080/03736245.1946.10559245>
- Dixey, F. (1950). *A Practical Handbook of Water Supply* (Second). London: Thomas Murby & Co.
- Dogara, B. (2018). Presentation of Reports of the Plenary Sessions. *International Conference on Lake Chad, February 26-28, 2018*. Abuja: Lake Chad Basin Commission.
- Dominic, C. M. U., Ezeabasili, A. C. C., & Okoro, B. U. (2014). Community-government partnership and sustainability of rural water programmes in Anambra State, Nigeria. *J. Environ. Earth Sci.*, 4(13), 1–13.
- Doron, R. S. (2011). *Forging a Nation while losing a Country: Igbo Nationalism , Ethnicity and Propaganda in the Nigerian Civil War 1968-1970*. University of Texas at Austin, Austin.
- Douglas, S., Schillemans, T., 't Hart, P., Ansell, C., Bøgh Andersen, L., Flinders, M., ... Torfing, J. (2021). *Rising to Ostrom's Challenge: An invitation to walk on the bright side of politics, governance and public service*. <https://doi.org/10.13140/RG.2.2.27680.30721>
- Douven, I. (2017). Abduction. In Edward N. Zalta (Ed.), *Stanford encyclopedia of philosophy*. (Summer). Stanford: Stanford University.
- Downey, G. (2014). "Habitus in extremis": From embodied culture to bio-cultural development. *Body and Society*, 20(2), 113–117. <https://doi.org/10.1177/1357034X14524603>

- Dreyfus, H. L., & Rabinow, P. (2014). *Michel Foucault: Beyond structuralism and hermeneutics*. New York: Taylor and Francis. <https://doi.org/10.4324/9781315835259>
- Duckworth, E. H. (1952). The future of Badagry. *Nigeria: A Quarterly Magazine of General Interest*, 178.
- Duffield, I. (1971). John Eldred Taylor and West African Opposition to Indirect Rule in Nigeria. *African Affairs*, 70(280), 252–268. <https://doi.org/10.2307/720553>
- Dulles, F. R., & Ridinger, G. E. (1955). The Anti-Colonial Policies of Franklin D. Roosevelt. *Political Science Quarterly*, 70(1), 1–18. <https://doi.org/10.2307/2145412>
- Dunham, K. (1983). Frank Dixey: 7 April 1892-1 November 1982. *Biographical Memoirs of Fellows of the Royal Society*, 29(11), 158–176. <https://doi.org/http://www.jstor.org/stable/769799>
- Dworkin, G. (2020). Paternalism. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy* (Fall 2020, pp. 1–16). Stanford: Metaphysics Research Lab.
- Dye, B. (2016). The return of ‘high modernism’? Exploring the changing development paradigm through a Rwandan case study of dam construction. *Journal of Eastern African Studies*, 10(2), 303–324. <https://doi.org/10.1080/17531055.2016.1181411>
- Eberhard, R. (2019). *Access to Water and Sanitation in Sub-Saharan Africa: Part I – Synthesis Report* (No. 1; Vol. 1). Berlin, Germany: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.
- Edigheji, O. (2005). *A Democratic Developmental State in Africa?* (No. 105). Johannesburg: Centre for Policy Studies.
- Eduvie, O. M., Iliyas, M., & Yakubu, N. (2011). Approach to sustainable rural water supply and sanitation in Africa: Ganji Gebi, NW-Nigeria Case Study. *35th WEDC International Conference, Loughborough, UK, 2011 The Future of Water, Sanitation and Hygiene: Innovation, Adaptation and Engagement in a Changing World*. Coordinator Rural Water Supply and Sanitation Centre, National Water Resources Institute, Mando Road, PIVIB, 2309 Kaduna, Nigeria: WEDC, Loughborough University.
- Edwardes, H. S. W. (1919). Lake Formation and Desiccation in Africa. *The Geographical Journal*, 53(3), 206. <https://doi.org/10.2307/1779279>
- EIR. (2014). *The New Silk Road Becomes the World Land-Bridge* (Vol. 1). Virginia: EIR News Service, Inc.
- Ekeh, P. P. (1975). Colonialism and the Two Publics in Africa: A Theoretical Statement. *Comparative Studies in Society and History*, 17(1), 91–112. <https://doi.org/10.1017/S0010417500007659>
- Elden, S. (2016). *Foucault's last decade*. Cambridge, Massachusetts: Polity Press.
- Elkins, S. M. (1987). *Slavery: A Problem in American Institutional and Intellectual Life* (3rd ed.). Chicago: University of Chicago Press.

- Emirbayer, M., & Mische, A. (1998). What Is Agency? *Source: American Journal of Sociology*, 103(4), 962–1023. <https://doi.org/10.1086/231294>
- Emmanuel, T., & Bamidele, M. (2013). Sustainability of Borehole Water Schemes Through Community Participation in Ejigbo, Osun State. *Journal of Innovative Systems Design and Engineering*, 4(9), 79–84.
- Emmett, C. (2015). “I am a father now”: Colonial paternalism and oedipal typicality in Shaun Johnson’s The Native Commissioner: *The Journal of Commonwealth Literature*, 52(2), 248–262. <https://doi.org/10.1177/0021989415608903>
- Engida, G. (2018). Address by Mr Getachew Engida, Deputy Director-General of UNESCO on the occasion of International Conference on Lake Chad. Retrieved from International Conference on Lake Chad, February 26-28, 2018 website: <https://drive.google.com/drive/folders/1Qc72gX2xxkwYv1SV1hCNhS7eFPIFUXDI>
- England, M. I., & Haines, D. (2021). Topography and the hydraulic mission: water management, river control and state power in Nepal. *International Journal of Water Resources Development*, 37(3), 508–530. <https://doi.org/10.1080/07900627.2018.1515066>
- Enserink, B., Patel, M., Kranz, N., & Maestu, J. (2007). Cultural Factors as Co-Determinants of Participation in River Basin Management. *Ecology and Society*, 12(2), 1–13.
- Enweremadu, D. U. (2013). Nigeria’s Quest to Recover Looted Assets: The Abacha Affair. *Africa Spectrum*, 48(2), 51–70. <https://doi.org/10.1177/000203971304800203>
- Ertsen, M. W. (2008). Controlling the farmer: colonial and post- colonial irrigation interventions in Africa. *The Journal for Transdisciplinary Research in Southern Africa*, 4(1), 209–236. <https://doi.org/10.4102/td.v4i1.167>
- Escobar, A. (1984). Discourse and power in development: Michel foucault and the relevance of his work to the third world. *Alternatives: Global, Local, Political*, 10(3), 377–400. <https://doi.org/10.1177/030437548401000304>
- Escobar, A. (1988). Power and Visibility: Development and the Invention and Management of the Third World. *Cultural Anthropology*, 3(4), 428–443. <https://doi.org/10.1525/can.1988.3.4.02a00060>
- Escobar, A. (1992). Imagining a Post-Development Era? Critical Thought, Development and Social Movements. *Social Text*, 1(31/32), 20–56. <https://doi.org/10.2307/466217>
- Escobar, A. (2007). Worlds and Knowledges otherwise. *Cultural Studies*, 21(2–3), 179–210. <https://doi.org/10.1080/09502380601162506>
- Escobar, A. (2012). Power and Visibility: Tales of Peasants, Women, and the Environment. In *Encountering Development* (pp. 154–211). Princeton: Princeton University Press. <https://doi.org/10.1515/9781400839926-005>
- Escobar, A. (2014). *Encountering Development* (1st ed.). Princeton: Princeton University Press.

- Escobar, A. (2015, July 24). Degrowth, postdevelopment, and transitions: a preliminary conversation. *Sustainability Science*, Vol. 10, pp. 451–462. Springer Tokyo. <https://doi.org/10.1007/s11625-015-0297-5>
- Escobar, A. (2018). *Designs for the Pluriverse* (1st ed.). Durham: Duke University Press.
- European Commission. (2010). *Evaluation of the Commission's support to Nigeria - Summary* (No. 1276). Brussels, Belgium: European Commission.
- European Parliament. (2013). Written question - Transaqua project for the Sahel - P-008774/2013. Retrieved September 4, 2019, from Parliamentary questions website: <http://www.europarl.europa.eu/sides/getDoc.do?type=WQ&reference=P-2013-008774&language=FR>
- European Parliament. (2014). Official Journal of the European Union: Information and Notices. *Official Journal of the European Union*, 57(C 218), 173–174.
- Evans, D. (2002). Systematic reviews of interpretive research: interpretive data synthesis of processed data. *The Australian Journal of Advanced Nursing*, 20(2), 22–26. <https://doi.org/10.3316/IELAPA.405497388325103>
- Eyben, R., Harris, C., & Pettit, J. (2006). Introduction: Exploring Power for Change. *IDS Bulletin*, 37(6), 1–10. <https://doi.org/10.1111/idsb.2006.37.issue-6>
- Ezema, B., & Ogujiuba, K. K. (2012). The Developmental State Debate: Where Is Nigeria? *Journal of Sustainable Development*, 5(1), 100–113. <https://doi.org/10.5539/jsd.v5n1p100>
- Fabinyi, M., Evans, L., & Foale, S. J. (2014). Social-ecological systems, social diversity, and power: insights from anthropology and political ecology. *Ecology and Society*, 19(4), art28. <https://doi.org/10.5751/ES-07029-190428>
- Fairclough, N. (2013). *Critical discourse analysis: the critical study of language* (2nd ed.). London: Routledge.
- Falana, F. (2020). Illegality of the National Water Resource Bill 2020. Retrieved May 20, 2021, from This Day Live website: <https://www.thisdaylive.com/index.php/2020/09/09/illegality-of-the-national-water-resource-bill-2020/>
- Falola, T., & Heaton, M. M. (2018). Colonial Rule. In Carl Levan & Patrick Ukata (Eds.), *The Oxford Handbook of Nigerian Politics* (Online, pp. 75–88). London: Oxford University Press. <https://doi.org/10.1093/OXFORDHB/9780198804307.013.4>
- Faluyi, O. T., Khan, S., & Akinola, A. O. (2019). Nigeria and the Resource Question: Theoretical Understanding. In O. T. Faluyi, S. Khan, & A. O. Akinola (Eds.), *Boko Haram's Terrorism and the Nigerian State: Advances in African Economic, Social and Political Development* (1st ed., pp. 45–56). Cham: Springer Nature. [https://doi.org/10.1007/978-3-030-05737-4\\_4](https://doi.org/10.1007/978-3-030-05737-4_4)
- Familugba, O. J., & Ojo, O. O. (2013). Nigeria – Cameroon Border Relations: An Analysis of the

- Conflict and Cooperation (1970-2004). *International Journal of Humanities and Social Science*, 3(11), 181–190.
- Fanon, F. (1967). *Black Skin, White Masks*. London: Grove Press, Inc.
- Fanon, F. (1968). *The wretched of the earth*. New York: Grove Press, Inc.
- FAO. (1997). *Treaties concerning the non-navigational uses of international watercourses, Africa*. Rome: Food and Agriculture Organization of the United Nations.
- FAO. (2003). *Ministerial meeting on Water for Food and Agriculture*. Kyoto: Food and Agriculture Organization.
- FAO. (2019). Land use. Retrieved March 10, 2020, from FAOSTAT website: <http://www.fao.org/faostat/en/#data/RL>
- Faseke, B. (2019). Nigeria and the Organization of Islamic Cooperation: A Discourse in Identity, Faith and Development, 1969–2016. *Religions*, 10(156), 1–12. <https://doi.org/10.3390/rel10030156>
- Federal Government of Nigeria. (1970). *Second national development plan, 1970-74: programme of post-war reconstruction and development*. Lagos: Government Printer.
- Federal Government of Nigeria. *River Basins Development Authorities Act.* , (1987). Lagos: Nigerian National Assembly.
- Federal Government of Nigeria. (2014). White Paper on the Report of the Presidential Committee on Restructuring and Rationalization of Federal Government Parastatals, Commissions and Agencies. In *Government White Paper*. Abuja, Nigeria: The Federal Government Printer.
- Federal Government of Nigeria. (2015). *Report of the pilot corruption risk assessment in selected MDG-related MDAs of water resources, health and education sectors* (No. 2; Vol. 2). Abuja, Nigeria: Federal Government of Nigeria.
- Federal Military Government of Nigeria. (1966). The Unification Decree: No 34 of 1966. Retrieved August 31, 2018, from Dawodu.com website: <https://dawodu.com/decreed34.htm>
- Federal Military Government of Nigeria. *River Basin Development Authorities Decree 1979.* , (1979). Lagos, Nigeria: Federal Military Government of Nigeria.
- Federal Ministry of Agriculture and Rural Development. (2016). *The agriculture promotion policy (2016 – 2020) Building on the Successes of the ATA, Closing Key Gaps*. Abuja, Nigeria: Federal Ministry of Agriculture and Rural Development. [https://doi.org/http://fmard.gov.ng/wp-content/uploads/2016/03/2016-Nigeria-Agric-Sector-Policy-Roadmap\\_June-15-2016\\_Final.pdf](https://doi.org/http://fmard.gov.ng/wp-content/uploads/2016/03/2016-Nigeria-Agric-Sector-Policy-Roadmap_June-15-2016_Final.pdf)
- Federal Ministry of Economic Development. (1962). *Nigeria National development plan, 1962-68*. Lagos: Federal Ministry of Economic Development.
- Federal Ministry of Water Resources. (2004). *National Water Policy*. Abuja, Nigeria: Federal Government of Nigeria. <https://doi.org/10.1093/chemse/bjt099>

- Federal Ministry of Water Resources. (2016a). *National Water Resources Policy*. Abuja, Nigeria: Federal Government of Nigeria.
- Federal Ministry of Water Resources. (2016b). *Partnership for Expanded Water Supply, Sanitation & Hygiene (PEWASH) Programmed Strategy (2016-2030)*. Abuja, Nigeria: Federal Government of Nigeria.
- Federal Ministry of Water Resources. (2017). *Transforming Irrigation Management in Nigeria (TRIMING) Project Environmental and Social Impact Assessment Draft Final Report*. Abuja, Nigeria: Federal Ministry of Water Resources.
- Federal Ministry of Water Resources. (2021). Overview - Federal Ministry of Water Resources. Retrieved September 6, 2021, from <https://www.waterresources.gov.ng/overview/>
- Federal Ministry Of Water Resources. (2020). *27th Regular Meeting of the National Council on Water Resources*. Nigeria: Facebook.
- Federal Ministry of Water Resources, & JICA. (2014a). *National Water Resources Master Plan 2013* (No. 4; Vol. 4). Abuja, Nigeria: Japan International Cooperation Agency (JICA) and Federal Republic of Nigeria.
- Federal Ministry of Water Resources, & JICA. (2014b). *National Water Resources Masterplan 2013* (No. 3; Vol. 3). Abuja, Nigeria: Japan International Cooperation Agency (JICA) and Federal Republic of Nigeria.
- Federal Ministry of Water Resources, & JICA. (2014c). *Supporting Report 6-8: Water Resources Management Plan* (No. SR7; Vol. 5). Abuja, Nigeria: Japan International Cooperation Agency (JICA) and Federal Republic of Nigeria.
- Federal Republic of Nigeria. (1974). *Guidelines for the third national development plan: 1975-1980*. Lagos: The central planning office of the federal ministry of economic development and reconstruction.
- Federal Republic of Nigeria. (1975). *Third national development plan 1975-80*. Lagos: Government Printer.
- Federal Republic of Nigeria. (1979). *Constitution of the Federal Republic of Nigeria 1979*. Lagos, Nigeria: Federal Government Press.
- Federal Republic of Nigeria. (1980a). *Guidelines for the fourth National Development Plan, 1981-85*. Lagos: Federal Ministry of Planning.
- Federal Republic of Nigeria. (1980b). *Report of the presidential commission on revenue allocation: Main Report* (Vol. 1). Lagos, Nigeria: Federal Government Press.
- Federal Republic of Nigeria. (1980c). *Report of the presidential commission on revenue allocation: Minutes of meeting with the government, states houses of assembly and local government councils*. Apapa, Nigeria: Federal Government Press.

- Federal Republic of Nigeria. (1981). *Outline of the fourth national development plan, 1981-85*. Lagos: Federal Ministry of Planning.
- Federal Republic of Nigeria. (1987). *Report of the Political Bureau*. Lagos, Nigeria: Federal Government Press.
- Federal Republic of Nigeria. (1999). Constitution of the Federal Republic of Nigeria. Retrieved November 23, 2018, from <http://www.nigeria-law.org/ConstitutionOfTheFederalRepublicOfNigeria.htm>
- Federal Republic of Nigeria. (2020). *2020 Appropriated Bill*. Abuja, Nigeria: National Assembly of Nigeria.
- Federation of Nigeria. (1962). *National development plan 1962-1968*. Lagos, Nigeria: The Federal Ministry of Economic Development.
- Felix, O., May, T.-M., Giles, M., Giuseppina, S., & Frauke, U. (2017). Hope, Politics and Risk: The Case of Chinese Dam in Nigeria. *Energy and Environment Research*, 7(2), 1–13. <https://doi.org/10.5539/eer.v7n2p1>
- Filani, M. O. (1993). Transport and rural development in Nigeria. *Journal of Transport Geography*, 1(4), 248–254. [https://doi.org/10.1016/0966-6923\(93\)90049-6](https://doi.org/10.1016/0966-6923(93)90049-6)
- Finkler, S., Smith, D., & Calabrese, T. (2018). *Financial Management for Public, Health, and Not-for-Profit Organizations* (6th ed.). Sydney, Australia: SAGE Publications Australia.
- Fischhendler, I., Cohen-Blankshtain, G., Shuali, Y., & Boykoff, M. (2015). Communicating mega-projects in the face of uncertainties: Israeli mass media treatment of the Dead Sea Water Canal. *Public Understanding of Science*, 24(7), 794–810. <https://doi.org/10.1177/0963662513512440>
- Fischman, G. E., & McLaren, P. (2005). Rethinking Critical Pedagogy and the Gramscian and Freirean Legacies: From Organic to Committed Intellectuals or Critical Pedagogy, Commitment, and Praxis. *Critical Methodologies*, 5(4), 425–447. <https://doi.org/10.1177/1532708605279701>
- Flyvbjerg, B. (2006). From Nobel Prize to Project Management: Getting Risks Right. *Project Management Journal*, 37(3), 5–15. <https://doi.org/10.1177/875697280603700302>
- Flyvbjerg, B. (2014). What You Should Know about Megaprojects and Why: An Overview. *Project Management Journal*, 45(2), 6–19. <https://doi.org/10.1002/pmj.21409>
- FMWR, NBS, & UNICEF. (2020). *Water, Sanitation, Hygiene: National Outcome Routine Mapping (WASH NORM) 2019: A Report of Findings*. Abuja, Nigeria: Federal Ministry of Water Resources/UNICEF.
- Foster, T., Willetts, J., Lane, M., Thomson, P., Katuva, J., & Hope, R. (2018). Risk factors associated with rural water supply failure: A 30-year retrospective study of handpumps on the south coast of Kenya. *Science of the Total Environment*, 626, 156–164.
- Foster, V., Butterfield, W., Chen, C., & Pushak, N. (2010). Building Bridges: China's Growing Role As



- Infrastructure Financier for sub-Saharan Africa. In V. Foster, W. Butterfield, C. Chen, & N. Pushak (Eds.), *Trends and policy options* (Vol. 5). Washington: The World Bank. <https://doi.org/10.1111/j.1365-313X.2011.04497.x>
- Foucault, M. (1972a). *The archaeology of knowledge and the discourse on language* (Translated). New York: Tavistock Publications.
- Foucault, M. (1972b). *The Archaeology of Knowledge and the discourse on language* (First; P. Rabinow, Ed.). New York: Pantheon Books.
- Foucault, M. (1979). Truth and Power: an interview with Michel Foucault. *Critique of Anthropology*, 4(13–14), 131–137. <https://doi.org/10.1177/0308275X7900401311>
- Foucault, M. (1980). *Power/Knowledge: Selected Interviews and Other Writings 1972-1977* (3rd ed.; C. Gordon, Ed.). New York: Pantheon Books.
- Foucault, M. (1982). The Subject and Power. *Critical Inquiry*, 8(4), 777–795. <https://doi.org/10.1086/448181>
- Foucault, M. (1984). *The Foucault Reader* (1st ed., Vol. 1; P. Rabinow, Ed.). New York: Pantheon Books.
- Foucault, M. (1988). Technologies of the Self. In P. H. H. Luther H. Martin, Huck Gutman (Ed.), *Lecture at University of Vermont* (1st ed.). Massachusetts: Univ. of Massachusetts Press.
- Foucault, M. (1991). Governmentality. In G. Burchell, C. Gordon, & P. Miller (Eds.), *The Foucault Effect: Studies in Governmentality. With Two Lectures By and an Interview with Michel Foucault*. Chicago: University of Chicago Press. <https://doi.org/10.1146/annurev-micro-090110-102957>
- Foucault, M. (1995). *Discipline and Punish The Birth of the Prison* (2nd ed.). New York: Vintage Books.
- Foucault, M. (2001). *Ethics, Subjectivity and Truth: Essential Works of Michel Foucault 1954-1984* (Reprint). London: Penguin.
- Fowler, B. (1997). *Pierre Bourdieu and Cultural Theory* (1st ed.). London: SAGE Publications Ltd.
- Fowler, B. (2020). Pierre Bourdieu on social transformation, with particular reference to political and symbolic revolutions. *Theory and Society*, 49(3), 439–463. <https://doi.org/10.1007/s11186-019-09375-z>
- Fox, N. J. (2011). Boundary Objects, Social Meanings and the Success of New Technologies: *Sociology*, 45(1), 70–85. <https://doi.org/10.1177/0038038510387196>
- Fox, S., Bloch, R., & Monroy, J. (2018). Understanding the dynamics of Nigeria’s urban transition: A refutation of the “stalled urbanization” hypothesis. *Urban Studies*, 55(5), 947–964. <https://doi.org/10.1177/0042098017712688>
- Franks, T. (2006). Water Governance: A Solution to all Problems. *Water Governance – Challenging the Consensus*, 1–8. Bradford, UK: University of Bradford, Department for International

Development.

- Franks, T. R., & Cleaver, F. D. (2007). Water governance and poverty: a framework for analysis. *Progress in Development Studies*, 7(4), 291–306.
- Fredrickson, G. (1971). *The Black image in the White mind: The debate on Afro-American character and destiny, 1817-1914* (First). New York: Harper & Row, Publishers.
- Freeman, L. (2014). Lake Chad, Transaqua Basis for New Africa. Retrieved January 28, 2018, from Executive Intelligence Review website: [http://www.larouchepub.com/eiw/public/2014/eirv41n48-20141205/33-35\\_4148.pdf](http://www.larouchepub.com/eiw/public/2014/eirv41n48-20141205/33-35_4148.pdf)
- Fuchs, A. (2001). Autonomy, Slavery, and Mill's Critique of Paternalism. *Ethical Theory and Moral Practice*, 4(3), 231–251. <https://doi.org/10.1023/A:1011891622148>
- Furlong, K. (2011). Small technologies, big change: Rethinking infrastructure through STS and geography. *Progress in Human Geography*, 35(4), 460–482. <https://doi.org/10.1177/0309132510380488>
- Furlong, K. (2014). STS beyond the “modern infrastructure ideal”: Extending theory by engaging with infrastructure challenges in the South. *Technology in Society*, 38, 139–147. <https://doi.org/10.1016/j.techsoc.2014.04.001>
- Galeazzi, G., Medinilla, A., Ebiede, T. M., & Desmidt, S. (2017). *Understanding the Lake Chad Basin Commission (LCBC) Water and security at inter-regional cross-roads*. Maastricht: ECDPM.
- Gana, B. A., Abdulkadir, I. F., Musa, H., & Garba, T. (2019). A Conceptual Framework for Organisation of River Basin Development and Management in Nigeria. *European Journal of Engineering Research and Science*, 4(6), 34–40. <https://doi.org/10.24018/ejers.2019.4.6.1308>
- Gandy, M. (2006). Planning, Anti-planning and the Infrastructure Crisis Facing Metropolitan Lagos. *Urban Studies*, 43(2), 371–396. <https://doi.org/10.1080/00420980500406751>
- Gao, H., Bohn, T. J., Podest, E., McDonald, K. C., & Lettenmaier, D. P. (2011). On the causes of the shrinking of Lake Chad. *Environmental Research Letters*, 6(3), 1–7. <https://doi.org/10.1088/1748-9326/6/3/034021>
- García López, G. A., Velicu, I., & D'Alisa, G. (2017). Performing Counter-Hegemonic Common(s) Senses: Rearticulating Democracy, Community and Forests in Puerto Rico. *Capitalism, Nature, Socialism*, 28(3), 88–107. <https://doi.org/10.1080/10455752.2017.1321026>
- Garland, D. (2014). What is a “history of the present”? On Foucault's genealogies and their critical preconditions. *Punishment & Society*, 16(4), 365–384. <https://doi.org/10.1177/1462474514541711>
- Gaventa, John, & Cornwall, A. (2006). Challenging the Boundaries of the Possible: Participation, Knowledge and Power. *IDS Bulletin*, 37(6), 122–128. <https://doi.org/10.1111/j.1759-5436.2006.tb00329.x>

- Gaventa, John, & Cornwall, A. (2014). Power and Knowledge. In P. Reason & H. Bradbury (Eds.), *The SAGE Handbook of Action Research* (pp. 172–189). London: SAGE Publications Ltd. <https://doi.org/10.4135/9781848607934.n17>
- Gaventa, Jonathan. (2003). *Power after Lukes: An overview of theories of power since Lukes and their application to development* (p. 18). p. 18.
- Gbadegesin, A. S., & Olorunfemi, F. B. (2011). Sustainable technological policy options for rural water supply management in selected rural areas of Oyo State, Nigeria. *Management of Environmental Quality: An International Journal*, 22(4), 486–501. <https://doi.org/10.1108/14777831111136081>
- Gbadegesin, N., & Olorunfemi, F. (2007). *Assessment of rural water supply management in selected rural areas of Oyo State, Nigeria*. Kenya: ATPS.
- Gbahabo, P. T. (2015). *The sustainability of community-managed water supply. A case study of Ilala community-managed water supply, Kwara State, Nigeria*. Unpublished Masters thesis. Monash University, Monash.
- Gbajabiamila, F. (2017). *Lead Debate Of The Executive Bill On The National Water Resources, Surface and Ground Water Resources*. Abuja, Nigeria: National Assembly of the Federal Republic of Nigeria.
- George, A. L., & Bennett, A. (2005). *Case studies and theory development in the social sciences*. Massachusetts: MIT Press.
- Gerlach, E., & Franceys, R. (2009). ‘Standpipes and beyond’-a universal water service dynamic. *Journal of International Development*, 22(4), 455–469. <https://doi.org/10.1002/jid.1567>
- Ghassemi, F., & White, I. (2007). *Inter-Basin Water Transfer*. Cambridge: Cambridge University Press. <https://doi.org/10.1017/CBO9780511535697>
- Giddens, A. (1979). *Central Problems in Social Theory*. London: Macmillan Education UK. <https://doi.org/10.1007/978-1-349-16161-4>
- Giddens, A. (1996). *The Consequences of Modernity* (Sixth). Cambridge, UK: Polity Press.
- Girvan, N. (2007). *Power Imbalances and Development Knowledge* (Reprint). Ottawa: North-South Institute.
- Goldman, M. J., Turner, M. D., & Daly, M. (2018). A critical political ecology of human dimensions of climate change: Epistemology, ontology, and ethics. *Wiley Interdisciplinary Reviews: Climate Change*, 9(4), 1–15. <https://doi.org/10.1002/WCC.526>
- Goodwin, G. (2018). Water, Infrastructure and Power: Contention and Resistance in Post-colonial Cities of the South. *Development and Change*, 49(6), 1616–1630. <https://doi.org/10.1111/dech.12458>
- Gorski, P. S. (2013). Introduction. In *Bourdieu and Historical Analysis* (pp. 1–16). Duke University Press. <https://doi.org/10.2307/j.ctv1168cx9.4>

- Gowon, Y. (1968). *Four steps to National stability*. Lagos, Nigeria: Federal Government Press.
- Gowon, Y. (1973). *Nigeria on the threshold of socio-economic revolution: Message to the Nation on the occasion of the 13th independence anniversary celebration on the 1st October, 1973*. Lagos, Nigeria: Federal Government Press.
- Graf, W. D. (1985). The Nigerian new year's coup of December 31, 1983: A class analysis. *Journal of Black Studies*, 16(1), 21–45. [https://doi.org/10.1177/002193478501600102/ASSET/002193478501600102.FP.PNG\\_V03](https://doi.org/10.1177/002193478501600102/ASSET/002193478501600102.FP.PNG_V03)
- Graf, W. D. (1986). Nigerian 'Grassroots' Politics: Local Government, Traditional Rule and Class Domination. *The Journal of Commonwealth & Comparative Politics*, 24(2), 99–130. <https://doi.org/10.1080/14662048608447490>
- Grafton, Q., Wyrwoll, P., White, C., & Allendes, D. (2014). *Global Water: Issues and Insights* (2014th ed.). Canberra: ANU Press.
- Graham, H. (2020). Hysteresis and the sociological perspective in a time of crisis. *Acta Sociologica (United Kingdom)*, 63(4), 450–452. <https://doi.org/10.1177/0001699320961814>
- Gramsci, A. (1971). *Selections from the prison notebooks of Antonion Gramsci* (First; Quintin Hoare and Geoffrey Nowell Smith, Ed.). New York: International Publishers.
- Greenfield, J. L. (2018). *Water Marginalised: Findings in International, British Colonial, and PostColonial Health Discourses c. 1925-1975*. University of York, York.
- Grigg, N. S. (2019). Global water infrastructure: state of the art review. *International Journal of Water Resources Development*, 35(2), 181–205. <https://doi.org/10.1080/07900627.2017.1401919>
- Guerrero, T. A. (2018). Water infrastructure: A terrain for studying nonhuman agency, power relations, and socioeconomic change. *Wiley Interdisciplinary Reviews: Water*, 5(5), 1–7. <https://doi.org/10.1002/wat2.1298>
- Gupta, J., & van der Zaag, P. (2008). Interbasin water transfers and integrated water resources management: Where engineering, science and politics interlock. *Physics and Chemistry of the Earth, Parts A/B/C*, 33(1–2), 28–40. <https://doi.org/10.1016/j.pce.2007.04.003>
- Gupta, Joyeeta, & Pahl-Wostl, C. (2013). Global water governance in the context of global and multilevel governance: Its need, form, and challenges. *Ecology and Society*, 18(4). <https://doi.org/10.5751/ES-05952-180453>
- GWP-N. (2014). *The post-2015 development agenda Nigeria stakeholder perspectives on a water goal and its implementation*. Stockholm, Sweden: Global Water Partnership (GWP).
- H. M. Government. (1929). Colonial Development Act 1929. Retrieved September 23, 2022, from <https://www.legislation.gov.uk/ukpga/Geo5/20-21/5/enacted>
- H. M. Stationery Office. (1921). *Nigeria. Annual General Report for the year 1920*. London.

- H. M. Stationery Office. (1938). *Colonial Reports - Nigeria: Annual Report on the Social and Economic Progress of the People of Nigeria for 1936*. London: His Majesty's Stationery Office.
- Hackett, R. I. J. (2011). Nigeria's religious leaders in an age of radicalism and neoliberalism. In *Between Terror and Tolerance: Religious Leaders, Conflict, and Peacemaking* (pp. 123–144). Knoxville: Georgetown University Press.
- Haddaway, N. R. (2015). A call for better reporting of conservation research data for use in meta-analyses. *Conservation Biology*, 29(4), 1242–1245. <https://doi.org/10.1111/cobi.12449>
- Hall, K., Cleaver, F., Franks, T., & Maganga, F. (2014). Capturing critical institutionalism: A synthesis of key themes and debates. *European Journal of Development Research*, 26(1), 71–86. <https://doi.org/10.1057/ejdr.2013.48>
- Hannus, S., & Simola, H. (2010). The Effects of Power Mechanisms in Education: bringing Foucault and Bourdieu together. *Power and Education*, 2(1), 1–17. <https://doi.org/10.2304/power.2010.2.1.1>
- Harrington, C. (2017). The political ontology of collaborative water governance. *Water International*, 42(3), 254–270. <https://doi.org/10.1080/02508060.2017.1309507>
- Harris, D., Kooy, M., & Jones, L. (2011). *Analysing the governance and political economy of water and sanitation service delivery Results of ODI research presented in preliminary form for discussion and critical comment advancing knowledge, shaping policy, inspiring practice* (No. 334). London: Overseas Development Institute.
- Harris, L. (2012). State as Socionatural Effect: Variable and Emergent Geographies of the State in Southeastern Turkey. *Comparative Studies of South Asia, Africa and the Middle East*, 32(1), 25–39.
- Harris, L. M. (2017). Political ecologies of the state: Recent interventions and questions going forward. *Political Geography*, 58, 90–92. <https://doi.org/10.1016/j.polgeo.2017.03.006>
- Harris, L. M. (2020). Assessing states: Water service delivery and evolving state–society relations in Accra, Ghana and Cape Town, South Africa. *Environment and Planning C: Politics and Space*, 38(2), 290–311. <https://doi.org/10.1177/2399654419859365>
- Harris, P. (2014). Problems with Power-Transition Theory: Beyond the Vanishing Disparities Thesis. *Asian Security*, 10(3), 241–259. <https://doi.org/10.1080/14799855.2014.983634>
- Harrison, H., Birks, M., Franklin, R., & Mills, J. (2017). Case Study Research: Foundations and Methodological Orientations. *Forum: Qualitative Social Research*, 18(1), 1–17.
- Hartley, J. (2014). Case Study Research. In P. Leavy (Ed.), *The Oxford Handbook of Qualitative Research* (pp. 454–470). Oxford: Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199811755.013.005>
- Harvey, D. (2010). Between Space and Time: Reflections on the Geographical Imagination. *Annals of*

- the Association of American Geographers*, 80(3), 418–434. <https://doi.org/10.1111/J.1467-8306.1990.TB00305.X>
- Harvey, P. A., & Reed, R. A. (2007). Community-managed water supplies in Africa: sustainable or dispensable? *Community Development Journal*, 42(3), 365–378.
- Haugaard, M., & Clegg, S. (2009). Introduction: Why power is the central concept of the social sciences. In M Haugaard & S. Clegg (Eds.), *The SAGE Handbook of Power* (1st ed., pp. 1–24). London: Sage Publications.
- Haugaard, Mark. (2009). Power and Hegemony. In S. R. Clegg & M. Haugaard (Eds.), *The SAGE Handbook of Power* (pp. 348–367). London: Sage Publications.
- Hausner, E., Guddat, C., Hermanns, T., Lampert, U., & Waffenschmidt, S. (2015). Development of search strategies for systematic reviews: validation showed the noninferiority of the objective approach. *Journal of Clinical Epidemiology*, 68(2), 191–199. <https://doi.org/https://doi.org/10.1016/j.jclinepi.2014.09.016>
- Hay, C. (2002). *Political analysis*. London: Palgrave.
- Hay, C. S. (2014). Neither real nor fictitious but ‘as if real’: A political ontology of the state. *British Journal of Sociology*, 65(3), 459–480. <https://doi.org/10.1111/1468-4446.12082>
- Hay, Colin. (2017). The Interdependence of Intra- and Inter-Subjectivity in Constructivist Institutionalism. *Critical Review*, 29(2), 235–247. <https://doi.org/10.1080/08913811.2017.1366667>
- Hazell, R. (2004). British hydrogeologists in West Africa — an historical evaluation of their role and contribution. *Geological Society, London, Special Publications*, 225(1), 229–237. <https://doi.org/10.1144/GSL.SP.2004.225.01.16>
- Heiskala, R. (2001). Theorizing power: Weber, Parsons, Foucault and neostructuralism. *Social Science Information*, 40(2), 241–264. <https://doi.org/10.1177/053901801040002003>
- Heiskala, R. (2014). Evidence and interest in social theory. *Acta Sociologica*, 57(4), 279–292. <https://doi.org/10.1177/0001699314543568>
- Hinderer, A. (1877). *Seventeen Years in the Yoruba Country: Memorials of Anna Hinderer*. London: The Religious Tract Society.
- Ho, A. T.-K. (2018). From Performance Budgeting to Performance Budget Management: Theory and Practice. *Public Administration Review*, 78(5), 748–758. <https://doi.org/10.1111/PUAR.12915>
- Hoffmann, L. K. (2014). *Who Speaks for the North? Politics and Influence in Northern Nigeria*. London, United Kingdom: Chatham House.
- Hondius, D. (2017). *Blackness in Western Europe: racial patterns of paternalism and exclusion* (2nd ed.). Oxfordshire: Routledge.

- Hope, R. (2015). Is community water management the community's choice? Implications for water and development policy in Africa. *Water Policy*, 17(4), 664–678. <https://doi.org/10.2166/wp.2014.170>
- Hope, R., Thomson, P., Koehler, J., & Foster, T. (2020). Rethinking the economics of rural water in Africa. *Oxford Review of Economic Policy*, 36(1), 171–190. <https://doi.org/10.1093/oxrep/grz036>
- House, R. J., Shane, S. A., & Herold, D. M. (1996). Rumors of the Death of Dispositional Research are Vastly Exaggerated. *The Academy of Management Review*, 21(1), 203. <https://doi.org/10.2307/258634>
- Hove, J., D'Ambruso, L., Mabetha, D., Van Der Merwe, M., Byass, P., Kahn, K., ... Twine, R. (2019). "Water is life": Developing community participation for clean water in rural South Africa. *BMJ Global Health*, 4(3), 1–13. <https://doi.org/10.1136/bmjgh-2018-001377>
- Howard-Wagner, D. (2017). Governance of indigenous policy in the neo-liberal age: indigenous disadvantage and the intersecting of paternalism and neo-liberalism as a racial project. *Ethnic and Racial Studies*, 41(7), 1332–1351. <https://doi.org/10.1080/01419870.2017.1287415>
- Hoy, D. C. (2004). *Critical Resistance: From Poststructuralism to Post-Critique*. Cambridge: The MIT Press.
- Hudson, D., & Marquette, H. (2015). Mind the Gaps: What's Missing in Political Economy Analysis and Why It Matters. *A Governance Practitioner's Notebook: Alternative Ideas and Approaches*, 67–82.
- Hungerford, H., & Smiley, S. L. (2016). Comparing colonial water provision in British and French Africa. *Journal of Historical Geography*, 52(April), 74–83. <https://doi.org/10.1016/J.JHG.2015.12.001>
- Hussein, H. (2018). Lifting the veil: Unpacking the discourse of water scarcity in Jordan. *Environmental Science & Policy*, 89(Sep), 385–392. <https://doi.org/10.1016/j.envsci.2018.09.007>
- Hussey, K., & Pittock, J. (2012). The Energy–Water Nexus: Managing the Links between Energy and Water for a Sustainable Future. *Ecology and Society*, 17(1), 1–9. <https://doi.org/10.5751/ES-04641-170131>
- Hutton, G., & Varughese, M. (2016). *The Costs of Meeting the 2030 Sustainable Development Goal Targets on Drinking Water, Sanitation, and Hygiene*. Washington, DC: World Bank. <https://doi.org/10.1596/K8543>
- Hyden, G. (2008). *Institutions, Power and Policy Outcomes in Africa*. London: GSDRC.
- IBRD-IDA. (1965). *Economic growth of Nigeria: Problems and prospects - Water supply and sewerage* (No. AF-34c). Washington D.C, USA: IBRD-IDA.
- IBRD-IDA. (1972). *The Current Economic Position and Long Term Prospects of Nigeria* (No. AW35; Vol. 4). Lagos, Nigeria: IBRD-IDA.
- ICLC. (2018). Roadmap on Saving the Lake Chad. In *International Conference on Lake Chad*. Abuja,

- Nigeria: Lake Chad Basin Commission.
- ICOLD. (2011). Definition of a Large Dam. Retrieved December 26, 2019, from ICOLD website: [https://www.icold-cigb.org/GB/dams/definition\\_of\\_a\\_large\\_dam.asp](https://www.icold-cigb.org/GB/dams/definition_of_a_large_dam.asp)
- IEG. (2012). Agricultural Development Projects in Nigeria. Retrieved August 17, 2018, from IEG Newsletter website: <http://lnweb90.worldbank.org/oed/oeddoclib.nsf/DocUNIDViewForJavaSearch/FE7BA13642E3E0D7852567F5005D85CF>
- Ifabiyi, I. P. (2013). Recharging the Lake Chad: the Hydropolitics of National Security and Regional Integration in Africa. *An International Multidisciplinary Journal, Ethiopia*, 7(3), 196–216. <https://doi.org/10.4314/afrrrev.v7i3.15>
- Igbinedion, O. G. H. (2016). *Urgent Need to Investigate the Mismanagement, Executive Lawlessness and Financial Misappropriation in the Lake Chad Basin Commission (LCBC)*: Abuja: House of Representatives, Federal Republic of Nigeria.
- Ige, B. (1994). *People, Politics and Politicians of Nigeria (1940-1979)*. Ibadan: Heinemann Educational Books.
- Ikime, O. (1968). Reconsidering Indirect Rule: The Nigerian Example. *Source: Journal of the Historical Society of Nigeria*, 4(3), 421–438.
- Ikpe, E. (2018). The Enduring Relevance of the Developmental State Paradigm Across Space and Time: Lessons for Africa on Structural Transformation and Agriculture in Oil-Rich Contexts. *Journal of Asian and African Studies*, 53(5), 764–781. <https://doi.org/10.1177/0021909617722375>
- Ikpe, E. (2021). Bringing the ‘International’ into Discourses on Developmental Statehood in Ethiopia. In R. J. Geröcs T. (Ed.), *The Post-Crisis Developmental State* (1st ed., pp. 179–196). Cham.: Palgrave Macmillan. [https://doi.org/10.1007/978-3-030-71987-6\\_9](https://doi.org/10.1007/978-3-030-71987-6_9)
- IMF. (2020). *Nigeria: Technical Assistance Report-Additional Spending Toward Sustainable Development Goals* (No. 2020/177). Washington DC: International Monetary Fund.
- Ingram, H. (2011). Beyond universal remedies for good water governance: a political and contextual approach. In A. Garrido & H. Ingram (Eds.), *Water for Food in a Changing World* (1st editio, pp. 259–279). London: Routledge. <https://doi.org/10.4324/9780203828410-23>
- Ingram, H. (2013). No universal remedies: design for contexts. *Water International*, 38(1), 6–11. <https://doi.org/10.1080/02508060.2012.739076>
- Inguscio, A. (2017). Historical path dependencies and energy governance in post-Apartheid South Africa. In L. M. Pereira, C. A. McElroy, A. Littaye, & A. M. Girard (Eds.), *Food, Energy and Water Sustainability* (pp. 53–66). London: Routledge. [https://doi.org/10.9774/gleaf.9781315696522\\_5](https://doi.org/10.9774/gleaf.9781315696522_5)
- International Environmental Law Research Centre. (1993). Nigeria: Water Resources Decree 1993.



<https://doi.org/10.1017/CBO9781107415324.004>

- International Hydropower Association. (2018). *2018 Hydropower Status Report: sector trends and insights*. London, United Kingdom: International Hydropower Association Ltd.
- International Lake Environment Committee Foundation. (1988). International training course for Lake/watershed management in China. *Newsletter*, p. 8. Kunming, China.
- International Monetary Fund. (2019). *World Economic Outlook: Global Manufacturing Downturn, Rising Trade Barriers*. Washington, DC, USA.
- Ioris, A. A. R. (2014). *The Political Ecology of the State The basis and the evolution of environmental statehood* (1st ed.). New York: Routledge Taylor & Francis Group.
- Ioris, A. A. R. (2012). Applying the Strategic-Relational Approach to Urban Political Ecology: *Antipode*, 44(1), 122–150. <https://doi.org/10.1111/j.1467-8330.2011.00848.x>
- Islar, M., & Boda, C. (2014). Political ecology of inter-basin water transfers in Turkish water governance. *Ecology and Society*, 19(4), 1–8. <https://doi.org/10.5751/ES-06885-190415>
- Iyeh, P. (2014). Reconsidering Place of Traditional Institutions under the Nigerian Constitution: A Comparative Analysis. *Journal of Law, Policy and Globalization*, 31(Online), 135–148.
- Jabareen, Y. (2009). Building a Conceptual Framework: Philosophy, Definitions, and Procedure. *International Journal of Qualitative Methods*, 8(4), 49–62. <https://doi.org/10.1177/160940690900800406>
- Jakande, L. K. (1985). *The Action Years*. Lagos: John West Publications.
- James, E. E., & Udo Essien, A. (2019). Infrastructure and Sustainable Tourism Development in Nigeria. *Journal Of Humanities And Social Science*, 24(1), 72–80. <https://doi.org/10.9790/0837-2401067280>
- Jasanoff, S., & Kim, S.-H. (2015). *Dreamscapes of Modernity: Sociotechnical Imaginaries and the Fabrication of Power*. Chicago: University of Chicago Press.
- Jedwab, R., Kerby, E., & Moradi, A. (2014). *History, Path Dependence and Development: Evidence from Colonial Railroads, Settlers and Cities in Kenya* (No. 2). Washington DC: Institute for International Economic Policy.
- Jensen, M. L. (2014). *Structure, Agency and Power: A Comparison of Bourdieu and Foucault* (pp. 1–18). pp. 1–18.
- Jepson, W., Wutich, A., & Harris, L. M. (2019). Water-security capabilities and the human right to water. In *Water Politics* (pp. 84–98). London: Routledge. <https://doi.org/10.4324/9780429453571-7>
- Jessop, B. (2005). Critical realism and the strategic-relational approach. *New Formations: A Journal of Culture, Theory and Politics*, 56(1), 40–53.

- Jessop, B. (2007). *State power: a strategic-relational approach*. Cambridge, UK: Polity.
- Jessop, B. (2008). Dialogue of the Deaf: Some Reflections on the Poulantzas-Miliband Debate. In P. Wetherly, C. W. Barrow, & P. Burnham (Eds.), *Class, Power and the State in Capitalist Society* (pp. 132–157). London: Palgrave Macmillan UK. [https://doi.org/10.1057/9780230592704\\_7](https://doi.org/10.1057/9780230592704_7)
- Jessop, B. (2013). *State Power* (2nd ed.). London: Wiley.
- Jessop, B. (2014). Towards a political ontology of state power: a comment on Colin Hay's article. *The British Journal of Sociology*, 65(3), 481–486. <https://doi.org/10.1111/1468-4446.12087>
- Jessop, B. (2017a). From micro-powers to governmentality: Foucault's work on statehood, state formation, statecraft and state power. In D. Owen (Ed.), *Michel Foucault* (1st ed., pp. 347–353). London: Routledge. <https://doi.org/10.4324/9781315249032-18>
- Jessop, B. (2017b). Nicos Poulantzas on political economy, political ecology, and democratic socialism. *Journal of Political Ecology*, 24(1), 186–199. <https://doi.org/10.2458/v24i1.20794>
- JICA, & FMWRRD. (1995a). *The study of the 1995 national water resources masterplan Dam Inventory* (No. 4; Vol. 4). Abuja, Nigeria: Japan International Cooperation Agency (JICA) and Federal Government of Nigeria.
- JICA, & FMWRRD. (1995b). *The study on the National Water resources masterplan (NWRMP) Summary and Main text* (No. 1; Vol. 1). Abuja, Nigeria: Japan International Cooperation Agency (JICA).
- Johnson, S. (1921). *The History of The Yorubas: From the Earliest Times to the Beginning of the British Protectorate*. London: Lowe and Brydone.
- Jones, C. (2017). 9 international agreements signed by President Buhari. Retrieved January 29, 2018, from Naij.com website: <https://www.naija.ng/1122095-9-international-agreements-signed-by-president-buhari-list.html#1122095>
- Jones, S. D. (2015). Bridging political economy analysis and critical institutionalism: An approach to help analyse institutional change for rural water services. *International Journal of the Commons*, 9(1), 65–86. <https://doi.org/10.18352/ijc.520>
- Joy, K. J., Kulkarni, S., Roth, D., & Zwarteveen, M. (2014). Re-politicising water governance: exploring water re-allocations in terms of justice. *Local Environment*, 19(9), 954–973. <https://doi.org/10.1080/13549839.2013.870542>
- Kabeer, N. (1994). *Reversed realities: gender hierarchies in development thought*. London: Verso.
- Käkönen, M. (2020). *Fixing the fluid: Making Resources and ordering hydrosocial relations in the Mekong Region*. Helsinki: University of Helsinki.
- Kanayo, K. O., & Ehigiamusoe, K. (2014). Capital Budget Implementation in Nigeria: Evidence from the 2012 Capital Budget. *Contemporary Economics*, 8(3), 299–314. <https://doi.org/10.5709/CE.1897-9254.147>

- Kashwan, P., MacLean, L. M., & García-López, G. A. (2019). Rethinking power and institutions in the shadows of neoliberalism: (An introduction to a special issue of World Development). *World Development*, *120*, 133–146. <https://doi.org/10.1016/j.worlddev.2018.05.026>
- Kayizzi-Mugerwa, S., & Lufumpa, C. L. (2020). *Developmental State of Africa in Practice: Looking East with Focus on* (1st ed.; C. L. L. Steve Kayizzi-Mugerwa, Ed.). Routledge.
- Keener, S., Luengo, M., & Banerjee, S. (2010). *Provision of Water to the Poor in Africa Experience with Water Standposts and the Informal Water Sector* (No. 5387). Washington D.C: The World Bank.
- Keikelame, M. J., & Swartz, L. (2019). Decolonising research methodologies: lessons from a qualitative research project, Cape Town, South Africa. *Global Health Action*, *12*(1), 1–7. <https://doi.org/10.1080/16549716.2018.1561175>
- Kelly, D. (1999). The Strategic-Relational View of the State. *Politics*, *19*(2), 109–115. <https://doi.org/10.1111/1467-9256.00093>
- Kergna, A., Deressa, T. T., Pugliese, J. E., Kimenyi, M., Adibe, J., Djiré, M., ... Westbury, A. (2014). *The Impact of Conflict and Political Instability on Agricultural Investments in Mali and Nigeria* (No. 17). Washington DC: Brookings Institution Press.
- Kerkvliet, B. J. (1990). *Everyday politics in the Philippines: class and status relations in a Central Luzon village*. University of California Press.
- Kerkvliet, B. J. (2009). Everyday politics in peasant societies (and ours). *The Journal of Peasant Studies*, *36*(1), 227–243. <https://doi.org/10.1080/03066150902820487>
- Kindler, J., Warshall, P., Eric, A. J., Charles, F. H., & Robert, V. (1989). *The Lake Chad Conventional Basin: A Diagnostic Study of Environmental Degradation*. Arizona: United Nations Env.
- Kinsella, D. T. (2013). Power Transition Theory and the Global Arms Trade: Exploring Constructs from Social Network Analysis. *Fifth Power Transition Conference*, 32. California: . Political Science Faculty Publications and Presentations.
- Kirk-Greene, A. H. M. . (1971). *Crisis and conflict in Nigeria: a documentary sourcebook*. London: Oxford University Press.
- Kirsch, S. (2018). *Engaged anthropology: politics beyond the text* (1st ed.). Berkeley: University of California Press.
- Kithiia, J., & Majambo, G. (2020). Motion but no speed: Colonial to post-colonial status of water and sanitation service provision in Mombasa city. *Cities*, *107*(December), 1–12. <https://doi.org/10.1016/j.cities.2020.102867>
- Klug, T., Cronk, R., Shields, K. F., & Bartram, J. (2018). A categorization of water system breakdowns: Evidence from Liberia, Nigeria, Tanzania, and Uganda. *Science of The Total Environment*, *619–620*(April), 1126–1132. <https://doi.org/10.1016/j.scitotenv.2017.11.183>

- Knieper, C., & Pahl-Wostl, C. (2016). A Comparative Analysis of Water Governance, Water Management, and Environmental Performance in River Basins. *Water Resources Management*, 30(7), 2161–2177. <https://doi.org/10.1007/s11269-016-1276-z>
- Koehn, P. (1989). Local government involvement in national development planning; guidelines for project selection based upon Nigeria's Fourth Plan experience. *Public Administration and Development*, 9(4), 417–436. <https://doi.org/10.1002/pad.4230090408>
- Komakech, H. C., Kwezi, L., & Ali, M. (2020). Why prepaid technologies are not a panacea for inclusive and sustainable rural water services in Tanzania? *Water Policy*, 22(5), 925–942. <https://doi.org/10.2166/wp.2020.070>
- Koot, S. (2020). Articulations of inferiority: From pre-colonial to post-colonial paternalism in tourism and development among the indigenous Bushmen of Southern Africa. *History and Anthropology*, 31(October), 1–20. <https://doi.org/10.1080/02757206.2020.1830387>
- Kooy, M., & Bakker, K. (2008a). Splintered networks: The colonial and contemporary waters of Jakarta. *Geoforum*, 39(6), 1843–1858. <https://doi.org/10.1016/j.geoforum.2008.07.012>
- Kooy, M., & Bakker, K. (2008b). Technologies of government: Constituting subjectivities, spaces, and infrastructures in colonial and contemporary Jakarta. *International Journal of Urban and Regional Research*, 32(2), 375–391. <https://doi.org/10.1111/j.1468-2427.2008.00791.x>
- Kraxberger, B. (2004). Geo-historical trajectories of democratic transition: The case of Nigeria. *GeoJournal*, 60(1), 81–92.
- Kugler, J., & Organski, A. F. K. (1989). The Power Transition: A Retrospective and Prospective Evaluation. *Handbook of War Studies*, 1, 171–194.
- Kumpel, E., Albert, J., Peletz, R., De Waal, D., Hirn, M., Danilenko, A., ... Khush, R. (2016). Urban water services in Fragile States: An analysis of drinking water sources and quality in port Harcourt, Nigeria, and Monrovia, Liberia. *American Journal of Tropical Medicine and Hygiene*, 95(1), 229–238. <https://doi.org/10.4269/ajtmh.15-0766>
- Kusch, M. (1991). *Foucault's Strata and Fields: Foucault's strata and fields an investigation into archaeological and genealogical science studies*. Dordrecht: Springer Netherlands. <https://doi.org/10.1007/978-94-011-3540-5>
- Kwon, Y., Lemieux, M., McTavish, J., & Wathen, N. (2015). Identifying and removing duplicate records from systematic review searches. *Journal of the Medical Library Association*, 103(4), 184–188. <https://doi.org/10.3163/1536-5050.103.4.004>
- Lake Chad Basin Commission. (2018). Lake Chad Basin Commission: Engineer Sanusi Imran Abdullahi hands over to Ambassador Mamman Nuhu | The Lake Chad Basin Commission. Retrieved July 6, 2018, from Lake Chad Basin Commission News website: <http://www.cbtl.org/fr/actualites/commission-du-bassin-du-lac-tchad-ingenieur-sanusi-imran>

abdullahi-passe-le-relais

- Lane, J. (2012). Barriers and Opportunities for Sanitation and Water for All, as Envisaged by the New Delhi Statement. *IDS Bulletin*, 43(2), 13–20. <https://doi.org/10.1111/j.1759-5436.2012.00302.x>
- Lang, D. J., Wiek, A., Bergmann, M., Stauffacher, M., Martens, P., Moll, P., ... Thomas, C. J. (2012). Transdisciplinary research in sustainability science: practice, principles, and challenges. *Sustainability Science*, 7(1), 25–43. <https://doi.org/10.1007/S11625-011-0149-X>
- Larkin, B. (2013). The Politics and Poetics of Infrastructure. *Annual Review of Anthropology*, 42, 327–343. <https://doi.org/10.1146/ANNUREV-ANTHRO-092412-155522>
- LaRouchePAC. (2020). LaRouchePAC Home. Retrieved March 12, 2020, from <https://www.larouchepac.com/>
- Larsson, O. (2018). Advancing Post-Structural Institutionalism: Discourses, Subjects, Power Asymmetries, and Institutional Change. *Critical Review*, 30(3–4), 325–346. <https://doi.org/10.1080/08913811.2018.1567982>
- Lavers, T., & Dye, B. (2019). *Theorising the political economy of dams: towards a research agenda. FutureDAMS Working Paper 001*. Manchester: The University of Manchester.
- LCBC. (2010). *Head of State and Government summits directory: Vol 1: 1964-2010*. N'djamena, Chad: Lake Chad Basin Commission.
- LCBC. (2011). *Water Charter of the Lake Chad Basin*. Ndjamena: Lake Chad Basin Commission.
- LCBC. (2016). Inter Basin Water Transfer Project: Signing of a memorandum of Understanding between LCBC and PowerChina International Group Limited. Retrieved January 29, 2018, from <http://www.cbilt.org/en/news/inter-basin-water-transfer-project-signing-memorandum-understanding-between-lcbc-and-PowerChina>
- LCBC. (2017). *Report on the State of the Lake Chad Basin Ecosystem*. N'djamena, Chad: Lake Chad Basin Commission.
- LCBC. (2018a). *Abuja Declaration: Roadmap on Saving the Lake Chad to revitalise the Basin Ecosystem for sustainable livelihood, security and development*. Abuja, Nigeria: Lake Chad Basin Commission.
- LCBC. (2018b). Signing of MoU between LCBC and Italy. Retrieved March 7, 2019, from Press Release website: <http://www.cbilt.org/en/news/signing-mou-between-lcbc-and-italy>
- Leach, M., Scoones, I., & Stirling, A. (2007). *Pathways to Sustainability: an overview of the STEPS Centre approach, STEPS Approach Paper (First)*. Brighton: STEPS Centre.
- Leach, Melissa, Raworth, K., & Rockström, J. (2013). Between social and planetary boundaries: Navigating pathways in the safe and just space for humanity. In *World Social Science Report 2013 (First)*, pp. 84–89). Paris: OECD Publishing. <https://doi.org/10.1787/9789264203419-10-en>

- Lebow, R. N., & Valentino, B. (2009). Lost in Transition: A Critical Analysis of Power Transition Theory. *International Relations*, 23(3), 389–410. <https://doi.org/10.1177/0047117809340481>
- Lele, U., Klousia-Marquis, M., & Goswami, S. (2013). Good Governance for Food, Water and Energy Security. *Aquatic Procedia*, 1(1), 44–63. <https://doi.org/10.1016/j.aqpro.2013.07.005>
- Lemke, D. (1997). The Continuation of History: Power Transition Theory and the End of the of the Cold War. *Journal of Peace Research*, 34(1), 23–36.
- Leong, C., & Mukhtarov, F. (2018). Global IWRM Ideas and Local Context: Studying Narratives in Rural Cambodia. *Water*, 10(11), 1643–1660. <https://doi.org/10.3390/w10111643>
- Levan, C., & Ukata, P. (2018). The Oxford Handbook of Nigerian Politics. In C. Levan & P. Ukata (Eds.), *The Oxford Handbook of Nigerian Politics* (Online). Oxford: Oxford University Press. <https://doi.org/10.1093/OXFORDHB/9780198804307.001.0001>
- Lewis, A. O. (1977). Nigeria's Third National Development Plan, 1975-80: An appraisal of objectives and policy frame. *The Developing Economies*, 15(1), 60–79. <https://doi.org/10.1111/j.1746-1049.1977.tb00370.x>
- Lewis, P. (1996). From Prebendalism to Predation: the Political Economy of Decline in Nigeria. *The Journal of Modern African Studies*, 34(1), 79–103. <https://doi.org/10.1017/s0022278x0005521x>
- Ley, L. (2018). On the margins of the hydrosocial: Quasi-events along a stagnant river. *Geoforum*, 131(May), 234–242. <https://doi.org/10.1016/j.geoforum.2018.03.010>
- Library of Congress. (1962). Nigeria, administrative divisions. Retrieved October 24, 2022, from Library of Congress, Washington, D.C. 20540 USA website: <https://www.loc.gov/item/94686058/>
- Lilyea, B. V., Cooper, R., Rice, J., DuPraw, M., & Allsop, S. R. (2016). Conducting a Systematic Literature Review on Water-related Attitudes, Behaviors, and Stakeholder Engagement Approaches in Florid: Strategies and Tools. *The International Journal of Interdisciplinary Social Sciences: Annual Review*, 11(1), 87–102. <https://doi.org/10.18848/1833-1882/CGP/v11i01/87-102>
- Liu, C., & Zheng, H. (2002). South-to-north Water Transfer Schemes for China. *International Journal of Water Resources Development*, 18(3), 453–471. <https://doi.org/10.1080/0790062022000006934>
- Lloyd, P. C. (1974). *Power and independence: urban Africans' perception of social inequality* (1st ed.). London: Routledge & K. Paul.
- Lockwood, M. (2014). Fossil Fuel Subsidy Reform, Rent Management and Political Fragmentation in Developing Countries. *New Political Economy*, 20(4), 475–494. <https://doi.org/10.1080/13563467.2014.923826>
- Loftus, A. (2020). Political ecology II: Whither the state? *Progress in Human Geography*, 44(1), 139–149. <https://doi.org/10.1177/0309132518803421>

- Loftus, A., & Nash, F. (2016). Water Infrastructure and the Making of Financial Subjects in the South East of England. *Water Alternatives*, 9(2), 319–335.
- Long, N., & Ploeg, J. D. Van Der. (1989). Demythologizing Planned Intervention: An actor perspective. *Sociologia Ruralis*, 29(3–4), 226–249. <https://doi.org/10.1111/j.1467-9523.1989.tb00368.x>
- Longe, E. O., Omotoso, O. B., & Sodamade, G. A. (2009). Appraisal of water supply facilities in Rural Riverine Coastal Areas of Lagos State. *Journal of Sustainable Development in Africa*, 11(1), 268–279.
- Lopez, J. R., Tielbörger, K., Claus, C., Fröhlich, C., Gramberger, M., Scheffran, J., ... Scheffran, J. (2019). A Transdisciplinary Approach to Identifying Transboundary Tipping Points in a Contentious Area: Experiences from across the Jordan River Region. *Sustainability*, 11(4), 1184. <https://doi.org/10.3390/su11041184>
- Loyal, S. (2017). The State and the Field of Power. In *Bourdieu's Theory of the State* (pp. 83–94). New York: Palgrave Macmillan US. [https://doi.org/10.1057/978-1-137-58350-5\\_5](https://doi.org/10.1057/978-1-137-58350-5_5)
- Lugard, F. D. (1912). *Annual Colonial Report - Northern Nigeria* (No. 785). London: Fisher Unwin.
- Lugard, F. J. D. (1922). *The dual mandate in British tropical Africa Baron, 1858-1945*. Edinburgh and London: William Blackwood and Sons.
- Lukes, S. (2005). *Power: A Radical View* (Second). Hampshire: Palgrave Macmillan.
- Lund, C. (2006). Twilight institutions: Public authority and local politics in Africa. *Development and Change*, 37(4), 685–705. <https://doi.org/10.1111/j.1467-7660.2006.00497.x>
- Lund, C. (2014). Of What is This a Case?: Analytical Movements in Qualitative Social Science Research. *Human Organization*, 73(3), 224–234. <https://doi.org/10.17730/humo.73.3.e35q482014x03314>
- Lynn, M. (2006). The Nigerian self-government crisis of 1953 and the colonial office. *Journal of Imperial and Commonwealth History*, 34(2), 245–261. <https://doi.org/10.1080/03086530600633462>
- Mabogunje, A. L. (1968). *Urbanisation in Nigeria* (1st ed.). London: University of London.
- Mabogunje, A. L. (1992). New initiatives in urban planning and management in Nigeria. *Habitat International*, 16(2), 73–88. [https://doi.org/10.1016/0197-3975\(92\)90038-Z](https://doi.org/10.1016/0197-3975(92)90038-Z)
- MacDonald, C. M. (1891). Exploration of the Benue and Its Northern Tributary the Kebbi. *Proceedings of the Royal Geographical Society and Monthly Record of Geography*, 13(8), 449–477. <https://doi.org/10.2307/1801201>
- Macheve, B., Danilenko, A., Abdullah, R., Bove, A., & Moffitt, L. J. (2015). *State Water Agencies in Nigeria: A Performance Assessment*. *Directions in Development*. Washington DC, United States: World Bank. <https://doi.org/10.1596/978-1-4648-0657-5>.

- Magrath, P. (2010). Beyond Governmentality: Building Theory for Weak and Fragile States. *Anthropology Matters*, 12(2), 1–18. <https://doi.org/10.22582/am.v12i2.208>
- Magrin, G. (2016). The disappearance of Lake Chad: history of a myth. *Journal of Political Ecology*, 23(1), 204–222. <https://doi.org/10.2458/v23i1.20191>
- Majuru, B., Suhrcke, M., & Hunter, P. (2016). How Do Households Respond to Unreliable Water Supplies? A Systematic Review. *International Journal of Environmental Research and Public Health*, 13(12), 1–20. <https://doi.org/10.3390/ijerph13121222>
- Maldonado-Torres, N. (2013). On the Coloniality of Being: Contributions to the development of a concept. In D. M. And & A. Escobar (Eds.), *Globalisation and the decolonial option* (Paperback, pp. 94–124). New York: Routledge Taylor & Francis Group.
- Marques, R. C., Pinto, F. S., & Miranda, J. (2016). Redrafting Water Governance: Guiding the way to improve the status quo. *Utilities Policy*, 12(Part A), 1–3. <https://doi.org/10.1016/j.jup.2016.11.002>
- Mather, J. D. (2004). 200 years of British hydrogeology — an introduction and overview. *Geological Society Special Publications*, 225(1), 1–13. <https://doi.org/10.1144/GSL.SP.2004.225.01.02>
- Mathevet, R., Peluso, N. L., Couespel, A., & Robbins, P. (2015). Using historical political ecology to understand the present: Water, reeds, and biodiversity in the camargue biosphere reserve, southern france. *Ecology and Society*, 20(4), 1–13. <https://doi.org/10.5751/ES-07787-200417>
- Maxwell, J. A. (2005). Conceptual framework: What do you think is going on? In J. A. Maxwell (Ed.), *Qualitative research design: An interactive approach* (2nd ed., pp. 33–64). Thousand Oaks, California: Sage Publications.
- Mayer, A. (2016). Notes. In A. Mayer (Ed.), *Naija Marxisms* (pp. 83–101). London: Pluto Press. <https://doi.org/10.2307/j.ctt1ddr6f8.12>
- Mayhew, R. J. (2009). Historical geography 2007–2008: Foucault’s avatars - Still in (the) Driver’s seat. *Progress in Human Geography*, 33(3), 387–397. <https://doi.org/10.1177/0309132508096354>
- McFarlane, C. (2008). Governing the Contaminated City: Infrastructure and Sanitation in Colonial and Post-Colonial Bombay. *International Journal of Urban and Regional Research*, 32(2), 415–435. <https://doi.org/10.1111/j.1468-2427.2008.00793.x>
- McFarlane, C., & Rutherford, J. (2008). Political Infrastructures: Governing and Experiencing the Fabric of the City. *International Journal of Urban and Regional Research*, 32(2), 363–374. <https://doi.org/10.1111/j.1468-2427.2008.00792.x>
- McFarlane, C., & Silver, J. (2017). Navigating the city: dialectics of everyday urbanism. *Transactions of the Institute of British Geographers*, 42(3), 458–471. <https://doi.org/10.1111/tran.12175>
- McGinnis, M. D. (2016). Polycentric Governance in Theory and Practice: Dimensions of Aspiration and Practical Limitations. In *Polycentricity Workshop, Ostrom Workshop, IU Bloomington*,. Bloomington: Unpublished.



- McGinnis, M. D., & Ostrom, E. (2014). Social-ecological system framework: Initial changes and continuing challenges. *Ecology and Society*, 19(2), 1–12. <https://doi.org/10.5751/ES-06387-190230>
- McGinnis, M. D., & Walker, J. M. (2010). Foundations of the Ostrom workshop: Institutional analysis, polycentricity, and self-governance of the commons. *Public Choice*, 143(3), 293–301. <https://doi.org/10.1007/s11127-010-9626-5>
- McGinnis, S. M., McKeon, T., Desai, R., Ejelonu, A., Laskowski, S., & Murphy, H. M. (2017). A systematic review: Costing and financing of water, sanitation, and hygiene (WASH) in schools. *International Journal of Environmental Research and Public Health*, 14(4), 1–28. <https://doi.org/10.3390/ijerph14040442>
- McKinsey & Company. (2017). Dance of the lions and dragons How are Africa and China engaging, and how will the partnership evolve? Retrieved from [www.mckinsey.com/africa-china](http://www.mckinsey.com/africa-china).
- Meehan, K. (2019). Making space for practical authority: Policy formalization and the right to water in Mexico. In S. Farhana & A. Loftus (Eds.), *Water Politics: Governance, Justice and the Right to Water* (1st ed., pp. 28–41). London: Routledge. <https://doi.org/10.4324/9780429453571-3>
- Meehan, K. M. (2014). Tool-power: Water infrastructure as wellsprings of state power. *Geoforum*, 57(November), 215–224. <https://doi.org/10.1016/j.geoforum.2013.08.005>
- Meehan, K. M., & Molden, O. C. (2015). Political Ecologies of the State. In J. Agnew, V. Mamadouh, A. J. Secor, & J. Sharp (Eds.), *The Wiley Blackwell Companion to Political Geography* (1st ed., pp. 438–450). Chichester, UK: John Wiley & Sons, Ltd. <https://doi.org/10.1002/9781118725771.ch32>
- Mehta, L., Alba, R., Bolding, A., Denby, K., Derman, B., Hove, T., ... van Koppen, B. (2014). The politics of IWRM in Southern Africa. *International Journal of Water Resources Development*, 30(3), 528–542. <https://doi.org/10.1080/07900627.2014.916200>
- Meinzen-Dick, R., & Bakker, M. (2001). Water Rights and Multiple Water Uses – Framework and Application to Kirindi Oya Irrigation System Sri Lanka. *Irrigation and Drainage Systems*, 15(2), 129–148. <https://doi.org/10.1023/A:1012903127115>
- Meinzer, O. E. (1934). The history and development of ground-water hydrology. *Journal of the Washington Academy of Sciences*, 24(1), 6–32.
- Meissner, R. (2016). Paradigms and theories in water governance: the case of South Africa’s National Water Resource Strategy, Second Edition. *Water SA*, 42(1), 1–10. <https://doi.org/10.4314/wsa.v42i1.01>
- Menga, F. (2015). Building a nation through a dam: the case of Rogun in Tajikistan. *Nationalities Papers*, 43(3), 479–494. <https://doi.org/10.1080/00905992.2014.924489>
- Menga, F. (2017). Hydropolis: Reinterpreting the polis in water politics. *Political Geography*, 60, 100–

109. <https://doi.org/10.1016/j.polgeo.2017.05.002>
- Menga, F. (2018). Bigger is Better or how Governments Learned to Stop Worrying and Love Megaprojects. *Studies of Transition States and Societies*, 10(1), 3–14.
- Menga, F., & Swyngedouw, E. (2018). *Water, technology and the nation-state*. London: Routledge.
- Merenlender, A. M., & Matella, M. K. (2013). Maintaining and restoring hydrologic habitat connectivity in mediterranean streams: an integrated modeling framework. *Hydrobiologia*, 719(1), 509–525. <https://doi.org/10.1007/s10750-013-1468-y>
- Mgbolu, C. C., Obiadi, I. I., Obiadi, C. M., Okolo, C. M., & Irumhe, P. E. (2019). Integrated groundwater potentials studies, aquifer hydraulic characterisation and vulnerability investigations of parts of Ndokwa, Niger Delta Basin, Nigeria. *Solid Earth Sciences*, 4(3), 102–112. <https://doi.org/10.1016/j.sesci.2019.06.002>
- Midgal, S. J. (2004). *State in society: studying how states and societies transform and constitute one another*. Cambridge: Cambridge University Press.
- Mignolo, W. D. (2007a). Delinking. *Cultural Studies*, 21(2–3), 449–514. <https://doi.org/10.1080/09502380601162647>
- Mignolo, W. D. (2007b). Introduction: Coloniality of power and de-colonial thinking. *Cultural Studies*, 21(2–3), 155–167. <https://doi.org/10.1080/09502380601162498>
- Mignolo, W. D. (2013). Delinking. In W. D. Mignolo & A. Escobar (Eds.), *On the Coloniality of Being: Contributions to the development of a concept* (Paperback, pp. 303–354). New York: Routledge Taylor & Francis Group.
- Mignolo, W. D. (2017). Coloniality is far from over, and so must be decoloniality. *Afterall*, 43(4), 38–45. <https://doi.org/10.1086/692552>
- Mignolo, W. D. (2020). The geopolitics of knowledge and the colonial difference. *Revista Lusofona de Educacao*, 48(48), 187–224. <https://doi.org/10.24140/issn.1645-7250.rle48.12>
- Mignolo, W. D., & Escobar, A. (2013). *Globalisation and the decolonial option* (2nd ed.). London: Routledge Taylor & Francis Group.
- Mill, J. S. (1859). *On liberty*. London: J.W. Parker and son.
- Ministry of External Affairs Government of India. (2019). Brief on India-Nigeria bilateral relations. Retrieved May 20, 2021, from <https://mea.gov.in/>
- Miranda, B. L., Hordijk, M., & Molina, R. K. T. (2011). *Water Governance Key Approaches: An Analytical Framework*. Unpublished.
- Mirumachi, N. (2007). The politics of water transfer between South Africa and Lesotho: Bilateral cooperation in the Lesotho Highlands water project. *Water International*, 32(4), 558–570. <https://doi.org/10.1080/02508060.2007.9709688>

- Mirumachi, N. (2015). *Transboundary Water Politics in the Developing World*. New York: Routledge.  
<https://doi.org/10.4324/9780203068380>
- Misser, F. (2018). Kinshasa Vetoes Water Transfer Project To Replenish Lake Chad. Retrieved March 10, 2019, from Southworld website: <https://www.southworld.net/kinshasa-vetoes-water-transfer-project-to-replenish-lake-chad/>
- Mitchell, H. (2019). *Economics Honors Projects*. Macalester College, Macalester.
- Mitchell, T. (1991). The Limits of the State: Beyond Statist Approaches and Their Critics. *The American Political Science Review*, 85(1), 77–91. <https://doi.org/10.2307/1962879>
- Mitchell, T. (2006). Society, Economy, and the State Effect. In A. Sharma & A. Gupta (Eds.), *The Anthropology of the State: A Reader* (First, pp. 169–186). Oxford: Blackwell Publishing Ltd.
- Moe, C. L., & Rheingans, R. D. (2006). Global challenges in water, sanitation and health. *Journal of Water and Health*, 4(SUPPL. 1), 41–58. <https://doi.org/10.2166/wh.2005.039>
- Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & The PRISMA Group. (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *PLOS Medicine*, 6(7), 1–6. <https://doi.org/10.1371/JOURNAL.PMED.1000097>
- Molle, F. (2009). Water, politics and river basin governance: Repoliticizing approaches to river basin management. *Water International*, 34(1), 62–70. <https://doi.org/10.1080/02508060802677846>
- Molle, F., Mollinga, P. P., & Meinzen-Dick, R. (2008). Water, politics and development: Introducing water alternatives. *Water Alternatives*, 1(1), 1–6.
- Molle, F., Mollinga, P. P., & Wester, P. (2009). Hydraulic Bureaucracies and the Hydraulic Mission: Flows of Water, Flows of Power. *Water Alternatives*, 2(3), 328–349.
- Mollinga, P. P. (2008). Water, politics and development: Framing a political sociology of water resources management. *Water Alternatives*, 1(1), 7–23.
- Mollinga, P. P. (2019). Cultural Political Economy and Critical Water Studies: An Introduction to the Special Themed Section. *Water Alternatives*, 12(3), 788–801.
- Mollinga, P. P. (2020). Knowledge, context and problemsheds: a critical realist method for interdisciplinary water studies. *Water International*, 1–28. <https://doi.org/10.1080/02508060.2020.1787617>
- Mollinga, P. P., Meinzen-Dick, R. S., & Merrey, D. J. (2007). Politics, plurality and problemsheds: A strategic approach for reform of agricultural water resources management. *Development Policy Review*, 25(6), 699–719. <https://doi.org/10.1111/j.1467-7679.2007.00393.x>
- Moore, M. L., von der Porten, S., Plummer, R., Brandes, O., & Baird, J. (2014). Water policy reform and innovation: A systematic review. *Environmental Science and Policy*, 38(April), 263–271. <https://doi.org/10.1016/j.envsci.2014.01.007>

- Moore, S. (2018). China's domestic hydropolitics: an assessment and implications for international transboundary dynamics. *International Journal of Water Resources Development*, 34(5), 732–746. <https://doi.org/10.1080/07900627.2017.1313157>
- Moran, E. F., Lopez, M. C., Moore, N., Müller, N., & Hyndman, D. W. (2018). Sustainable hydropower in the 21st century. *Proceedings of the National Academy of Sciences*, 115(47), 11891–11898. <https://doi.org/10.1073/PNAS.1809426115>
- Moseley, W. (2009). Response to Watts - 2. *Macalester International*, 24(1).
- Moss, T. (2014). Socio-technical Change and the Politics of Urban Infrastructure: Managing Energy in Berlin between Dictatorship and Democracy. *Urban Studies*, 51(7), 1432–1448. <https://doi.org/10.1177/0042098013500086>
- Moss, T., & Newig, J. (2010). Multilevel Water Governance and Problems of Scale: Setting the Stage for a Broader Debate. *Environmental Management*, 46(1), 1–6. <https://doi.org/10.1007/s00267-010-9531-1>
- Mouzelis, N. (2007). Habitus and Reflexivity: Restructuring Bourdieu's Theory of Practice. *Sociological Research Online*, 12(6), 1–6. <https://doi.org/10.5153/sro.1449>
- Mpofu, W. (2018). Decoloniality as a Combative Ontology in African Development. In *The Palgrave Handbook of African Politics, Governance and Development* (pp. 83–102). New York: Palgrave Macmillan US. [https://doi.org/10.1057/978-1-349-95232-8\\_5](https://doi.org/10.1057/978-1-349-95232-8_5)
- Mugagga, F., & Nabaasa, B. B. (2016). The centrality of water resources to the realization of Sustainable Development Goals (SDG). A review of potentials and constraints on the African continent. *International Soil and Water Conservation Research*, 4(3), 215–223. <https://doi.org/10.1016/j.iswcr.2016.05.004>
- Mukhtarov, F., & Cherp, A. (2014). The hegemony of Integrated Water Resources Management as a global resource. In V. R. Squires, H. M. Milner, & K. A. Daniell (Eds.), *River Basin Management in the 21st Century Understanding People and Place* (1st ed.). Boca Raton: CRC Press. <https://doi.org/10.1201/b17168>
- Mukhtarov, F., & Daniell, K. A. (2017). Transfer, Diffusion, Adaptation, and Translation of Water Policy Models. In K. Conca & E. Weintal (Eds.), *The Oxford Handbook of Water Politics and Policy* (Vol. 1, pp. 594–616). Oxford: Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199335084.013.30>
- Mukhtarov, F. G. (2009). The Hegemony of Integrated Water Resources Management: a Study of Policy Translation in England, Turkey and Kazakhstan.
- Muller, M., Biswas, A., Martin-Hurtado, R., & Tortajada, C. (2015). Built infrastructure is essential. *Science*, 349(6248), 585–586. <https://doi.org/10.1126/science.aac7606>
- Musa, I. K., Bila, M., Mana, B., & Mahaman, C. (2008). Lake Chad Basin Commission. *Proceedings*

- of Sirte Roundtable, Libya, 17th December 2008*, 1–23. Sirte, Libya: Lake Chad Basin Commission. [https://doi.org/10.1057/9780230271357\\_72](https://doi.org/10.1057/9780230271357_72)
- Musavuli, B., & Garrison, A. (2018). Divide and Rule: Balkanizing the Democratic Republic of Congo | Global Research - Centre for Research on Globalization. In *Global Research*.
- Nabavi, E. (2017). (Ground)Water Governance and Legal Development in Iran, 1906-2016. *Middle East Law and Governance*, 9(1), 43–70. <https://doi.org/10.1163/18763375-00901005>
- National Assembly. (2015). Call for Investigation of the \$5 Million Granted to Lake Chad Basin Commission by the Chief Olusegun Obasanjo Administration for Feasibility Studies on how to Divert Rivers to Lake Chad. In *Nigerian Institute of International Affairs Act (Amendment) Bill*. Abuja, Nigeria: Nigerian National Assembly.
- National Assembly. (2018). *House of Representatives Federal Republic of Nigeria Votes and Proceedings*. Abuja.
- National Assembly of Nigeria. (2015). *2015 Appropriation Act Zonal Intervention*. Abuja, Nigeria: National Assembly of the Federal Republic of Nigeria.
- National Assembly of Nigeria. (2016). *National water resources Bill, 2016*. Abuja: National Assembly of the Federal Republic of Nigeria.
- National Assembly of Nigeria. (2020). *National Water Resources Bill, 2020*. Abuja: National Assembly of the Federal Republic of Nigeria.
- National Bureau of Statistics. (2017). *Annual Abstract of Statistics* (Vol. 1). Abuja, Nigeria: Federal Government of Nigeria.
- National Bureau of Statistics. (2018). *National Nutrition and Health Survey (NNHS) 2018: Report on the nutrition and health situation of Nigeria*. Abuja, Nigeria: Federal Republic of Nigeria.
- National Universities Commission. (2021). Federal Universities | National Universities Commission. Retrieved May 28, 2021, from List of Universities website: <https://www.nuc.edu.ng/nigerian-universities/federal-universities/>
- Ndlovu-Gatsheni, S. J. (2013). *Coloniality of Power in Postcolonial Africa: Myths of Decolonization* (1st ed.). CODESRIA.
- Nduduba, O. I. (2014). Inventory Of Existing Rural Water Supply Sources Using Model Nigerian Communities Vis a Vis Household Access to Improved Water. *IOSR Journal of Mechanical and Civil Engineering*, 11(4), 16–23.
- Ndukong, K. H. (2017). Chinese, Italian firms reach deal to refill fast-shrinking Lake Chad. Retrieved January 29, 2018, from People’s Daily Online website: <http://en.people.cn/n3/2017/0821/c90000-9258249.html>
- Nechifor, V., Winning, M., Nechifor, V., & Winning, M. (2018). Global Economic and Food Security Impacts of Demand-Driven Water Scarcity—Alternative Water Management Options for a Thirsty

- World. *Water*, 10(10), 1442–1462. <https://doi.org/10.3390/w10101442>
- Neocosmos, M. (2010). Analysing Political Subjectivities: Naming the Post-developmental State in Africa Today. *Journal of Asian and African Studies*, 45(5), 534–553. <https://doi.org/10.1177/0021909610373895>
- NEPAD. (2018). Progress on the African Integrated High Speed Railway Network. Retrieved October 14, 2019, from Press Releases website: <https://www.nepad.org/news/progress-african-integrated-high-speed-railway-network>
- Neves Alves, S. (2021). Everyday states and water infrastructure: Insights from a small secondary city in Africa, Bafatá in Guinea-Bissau. *Environment and Planning C: Politics and Space*, 39(2), 247–264. <https://doi.org/10.1177/2399654419875748>
- Neveu, E. (2018). Bourdieu's Capital(s). In T. Medvetz & J. J. Sallaz (Eds.), *The Oxford Handbook of Pierre Bourdieu* (Vol. 1). Oxford: Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199357192.013.15>
- Ngene, B. U., Nwafor, C. O., Bamigboye, G. O., Ogbiye, A. S., Ogundare, J. O., & Akpan, V. E. (2021). Assessment of water resources development and exploitation in Nigeria: A review of integrated water resources management approach. *Heliyon*, 7(1), 1–10. <https://doi.org/10.1016/j.heliyon.2021.e05955>
- Nghipangwa, S. T. (2017). *Water infrastructure finance in Namibia: Analysing the participation of State and non-State actors*. Unpublished Masters thesis, University of Cape Town, Cape Town.
- Ngoa, S. N. (2011). A Review & Analytical Narrative of Propaganda Activities: A Nigerian perspective. *International Journal of Humanities and Social Science*, 1(16), 237–248.
- Nicholson, I. F. (1969). *The Administration of Nigeria*. Oxford: Clarendon Press.
- Nigeria. (1933). *Colonial Annual Report on The Social and Economic progress of the People of Nigeria, 1933* (No. 58; Vol. 1668). Lagos, Nigeria: His Majesty's Stationery Office.
- Nigeria Legislative Council. (1946). *A ten-year plan of development and welfare for Nigeria, 1946*. Lagos: Government Printer.
- Nilsen, A. G. (2016). Power, Resistance and Development in the Global South: Notes Towards a Critical Research Agenda. *International Journal of Politics, Culture and Society*, 29(3), 269–287. <https://doi.org/10.1007/s10767-016-9224-8>
- Nilson, H. (1998). Technologies of the Self. In H. Nilson (Ed.), *Michel Foucault and the Games of Truth* (pp. 97–102). London: Palgrave Macmillan UK. [https://doi.org/10.1007/978-1-349-26624-1\\_7](https://doi.org/10.1007/978-1-349-26624-1_7)
- Nilsson, D., & Nyanchaga, E. N. (2008). Pipes and politics: A century of change and continuity in Kenyan urban water supply. *The Journal of Modern African Studies*, 46(1), 133–158. <https://doi.org/10.1017/S0022278X07003102>
- Nixdorff, H. (2020). *Identifying Factors that Influence the Sustainability of a Gravity-Fed Water System*

- in Rural Haiti*. University of Alberta.
- Njeuma, M. Z., & Malaquais, D. (2004). Coopération internationale et transformation du Bassin du Lac Tchad. *Politique Africaine*, 94(2), 23–41. <https://doi.org/10.3917/polaf.094.0023>
- Njoh, A. J., & Akiwumi, F. A. (2011). The impact of colonization on access to improved water and sanitation facilities in African cities. *Cities*, 28(5), 452–460. <https://doi.org/10.1016/j.cities.2011.04.005>
- NPC, & ICF. (2014). *Nigeria Demographic and Health Survey, 2013*. Abuja, Nigeria, and Rockville, Maryland, USA, Nigeria: Federal Republic of Nigeria.
- NPC, & ICF. (2018). *Nigeria Demographic Health Survey, 2018*. Abuja, Nigeria: Federal Government of Nigeria.
- NPC, & ICF. (2019). *Nigeria Demographic and Health Survey 2018*. Abuja and Rockville, Nigeria and USA: National Population Commission.
- Nustad, K. G., & Swanson, H. (2021). Political ecology and the Foucault effect: A need to diversify disciplinary approaches to ecological management? *Environment and Planning E: Nature and Space*, 0(0), 1–23. <https://doi.org/10.1177/25148486211015044>
- Nweze, N. (2016). Failure of Public Infrastructure Projects in Nigeria: Causes, Effects and Solutions. *Texila International Journal of Management*, 2(2), 33–43. <https://doi.org/10.21522/TIJMG.2015.02.02.Art004>
- Nwosu, H. I. (2018). Nigerias Third National Development Plan, 1975-80: Major Problems to Implementation. *Africa Today*, 24(4), 23–38.
- Nwosu, N. I. A. (1990). The State and Rural Development in Nigeria. *Ufahamu: A Journal of African Studies*, 18(3), 52–65. <https://doi.org/10.5070/F7183016815>
- O'Toole, L. J. (2004). The Theory-Practice Issue in Policy Implementation Research. *Public Administration*, 82(2), 309–329. <https://doi.org/10.1111/j.0033-3298.2004.00396.x>
- Obertreis, J., Moss, T., Mollinga, P. P., & Bichsel, C. (2016). Water , Infrastructure and Political Rule: Introduction to the Special Issue. *Water Alternatives*, 9(2), 168–181.
- Obeta, M. C. (2018). Rural water supply in Nigeria: Policy gaps and future directions. *Water Policy*, 20(3), 597–616. <https://doi.org/10.2166/wp.2018.129>
- Obikili, N. (2016). The trans-Atlantic slave trade and local political fragmentation in Africa. *The Economic History Review*, 69(4), 1157–1177. <https://doi.org/10.1111/EHR.12328>
- Obomanu, E. F. (2020). Political Marginalization and Implications for Nigerian Federation. *SJI-Journal of Social Science and Humanities*, 2(5), 40–48.
- OCHA. (2018). Lake Chad Basin: Crisis Overview. Retrieved March 3, 2019, from Humanitarian Response website: <https://www.humanitarianresponse.info/en/operations/west-and-central->

africa/lake-chad-basin-crisis-overview

- ODI. (1964). *Colonial Development - British Aid* (No. 5; Vol. 5). London, UK: The Overseas Development Institute Ltd.
- Odueze, S. A. (1990). *An Historical Review of Higher Education in Nigeria*. University of North Texas, Denton.
- OECD/UNCDF. (2020). *Blended Finance in the Least Developed Countries 2020: Supporting a Resilient COVID-19 Recovery*. Paris, France: OECD Publishing. <https://doi.org/10.1787/57620d04-en>.
- OECD. (2004). *Unanswered questions Companies, conflict and the Democratic Republic of Congo The Work of the UN Panel of Experts on the Illegal Exploitation of Natural Resources and Other Forms of Wealth of the Democratic Republic of the Congo and The OECD Guidelines fo*.
- OECD. (2011). *Water Governance in OECD Countries*. Brussels: OECD Publishing. <https://doi.org/10.1787/9789264119284-en>
- Offen, K. (2012). Historical geography I. *Progress in Human Geography*, 36(4), 527–540. <https://doi.org/10.1177/0309132511417964>
- Offen, K. . H. (2004). Historical Political Ecology: An Introduction Historical Political Ecology. *Historical Geography*, 32(0), 19–42.
- Office of the Auditor-General for the Federation. (2019). *Auditor-General's Annual Report on the Account of the Federation of Nigeria 2017*. Abuja, Nigeria: Federal Government of Nigeria.
- Oginni, F. A., & Fadipe, O. O. (2016). Domestic water supply sources and distribution issues in Ilesha West Local council, Osun State, Nigeria. *International Journal of Civil Engineering and Technology*, 7(3), 407–418.
- Ogunnaike, J. (2020). Gov Abiodun declares “state of emergency” in Water sector. Retrieved May 19, 2021, from Vanguard Nigeria website: <https://www.vanguardngr.com/2020/10/gov-abiodun-declares-state-of-emergency-in-water-sector/>
- OIC. (2019). Final Communique of the 14th Islamic summit conference. *The 14th Islamic Summit Conference, 31 May 2019*, 1–19. Makkah, Saudi Arabia: Organisation of Islamic Cooperation.
- Ojewale, C. (2017). The private sector is key to Nigeria’s \$22.5 billion food import bill. Retrieved November 29, 2017, from Business Day website: <https://www.businessdayonline.com/private-sector-key-nigerias-22-5-billion-food-import-bill/>
- Ojiako, G. U. (1985). Nigerian Water Resources and Their Management. *Water International*, 10(2), 64–72. <https://doi.org/10.1080/02508068508686310>
- Ojo, O. (2007). “Èmú” (Àmúyá): The Yoruba institution of panyarring or seizure for debt. *African Economic History*, 35(2), 31–58. <https://doi.org/10.2307/25427033>



- Okeke, I. C., & Oyebande, L. (2009). Water resources challenges in Nigeria: Pathways to water security and sustainability. *Symposium JS.3 at the Joint Convention of the International Association of Hydrological Sciences, IAHS, and the International Association of Hydrogeologists, IAH, September 6 - 12, 2009, 330*, 113–116. Lagos, Nigeria: IAHS.
- Okigbo, P. N. C. (1989). *National development planning in Nigeria 1900-92*. London: Currey.
- Okoroafo, S. C., & Kotabe, M. (1993). The IMF's Structural Adjustment Program and Its Impact on Firm Performance: A Case of Foreign and Domestic Firms in Nigeria. *Management International Review*, 33(2), 139–156.
- Olagunju, A., Thondhlana, G., Chilima, J. S., Sène-Harper, A., Compaoré, W. R. N., & Ohiozebau, E. (2019). Water governance research in Africa: progress, challenges and an agenda for research and action. *Water International*, 44(4), 382–407. <https://doi.org/10.1080/02508060.2019.1594576>
- Olajuyigbe, A. E. (2016). Community Participation and Sustainability Issue: An Evaluation of a Donor-Driven Water Sector in Ikaram Millennium Village Project, Nigeria. *Open Journal of Social Sciences*, 4(6), 90–103. <https://doi.org/10.4236/jss.2016.46010>
- Olasupo, O., Oladeji, I. O., & Ijeoma, E. O. C. (2017a). Nationalism and Nationalist Agitation in Africa: the Nigerian Trajectory. *Review of Black Political Economy*, 44(3–4), 261–283. <https://doi.org/10.1007/s12114-017-9257-x>
- Olasupo, O., Oladeji, I. O., & Ijeoma, E. O. C. (2017b). Nationalism and Nationalist Agitation in Africa: the Nigerian Trajectory. *Review of Black Political Economy*, 44(3–4), 261–283. <https://doi.org/10.1007/s12114-017-9257-x>
- Oloke, D., & Olugboye, D. (2014). An Overview of Management Issues in Developing a Sustainable Water Supply, Sanitation and Hygiene (WASH) Service Delivery in Nigeria. In C. A. Booth & S. M. Charlesworth (Eds.), *Water Resources in the Built Environment: Management Issues and Solutions* (1st ed., pp. 371–388). London: John Wiley & Sons, Ltd. <https://doi.org/10.1002/9781118809167.ch27>
- Olorode, O. (2016). *Neo-liberal siege against Nigeria: In memory of Festus Iyayi* (1st ed.). Ibadan: Darosat Global Business Ltd.
- Oloruntade, A. J., Konyeha, S., & Alao, F. (2014). Assessing the Sustainability of Borehole as an Alternative to Pipe-borne Water Supply in Some Selected Communities in Akoko Area of Ondo State, Nigeria. *Ethiopian Journal of Environmental Studies and Management*, 7(2), 881–889. <https://doi.org/10.4314/ejesm.v7i2.8S>
- Oloruntoba, S. O., & Falola, T. (2020a). The Palgrave Handbook of African Political Economy. In S. O. Oloruntoba & T. Falola (Eds.), *The Palgrave Handbook of African Political Economy*. Cham: Springer International Publishing. <https://doi.org/10.1007/978-3-030-38922-2>
- Oloruntoba, S. O., & Falola, T. (2020b). The Political Economy of Africa: Connecting the Past to the

- Present and Future of Development in Africa. In S. O. Oloruntoba & T. Falola (Eds.), *The Palgrave Handbook of African Political Economy* (pp. 1–28). Cham: Springer International Publishing. [https://doi.org/10.1007/978-3-030-38922-2\\_1](https://doi.org/10.1007/978-3-030-38922-2_1)
- Olowu, D. (1986). A Decade of Local Government Reform in Nigeria: 1976-1986. *International Review of Administrative Sciences*, 52(3), 287–299. <https://doi.org/10.1177/002085238605200302>
- Olukoju, A. (2003). Water supply in the nineteenth and twentieth centuries. In *Infrastructure Development and Urban Facilities in Lagos, 1861-2000* (pp. 47–79). Ibadan: IFRA-Nigeria. <https://doi.org/10.4000/books.ifra.830>
- Olukoshi, A. (2004). Changing Patterns of Politics in Africa. *Cadernos de Estudos Africanos*, 5/6(Online), 15–38. <https://doi.org/10.4000/cea.1045>
- Olukoshi, A. O., & Aremu, I. (1988). Structural Adjustment and Labour Subordination in Nigeria: The Dissolution of the Nigeria Labour Congress Re-visited. *Review of African Political Economy*, (43), 99–111.
- Olukotun, G. A. (2008). Achieving project sustainability through community participation. *Journal of Social Sciences*, 17(1), 21–29. <https://doi.org/10.1080/09718923.2008.11892630>
- Oluwasanya, G., Smith, J., & Carter, R. (2011). Self supply systems: Urban dug wells in Abeokuta, Nigeria. *Water Supply*, 11(2), 172–178. <https://doi.org/10.2166/ws.2011.026>
- Olúwolé, S. B. (1998). The Labyrinth Conception of Time as Basis of Yoruba View of Development. In Souleymane Bachir Diagne & H. Kimmerle (Eds.), *Time and Development in the Thought of Sub-Saharan Africa / Time and Development in the Thought of Sub-Saharan Africa* (Vol. 8, pp. 139–150). Leiden: Brill. [https://doi.org/10.1163/9789004458048\\_015](https://doi.org/10.1163/9789004458048_015)
- Olúwolé, Sophie. Bósèdé. (2015). *Socrates and Òrúnmilà: Two Patron Saints of Classical Philosophy* (Revised). Lagos: Ark Publishers.
- Omobowale, A. O. (2018). The roots of division, activism, and civil society in Nigeria. *International Sociology*, 33(5), 558–567. <https://doi.org/10.1177/0268580918791968>
- Onokerhoraye, A. G. (1978). The Urban System and National Integration in Nigeria. *Journal of Black Studies*, 9(2), 169–180.
- Onolememen, M. O. (2020). *Infrastructure development in Nigeria: a political and economic history* (1st ed.). London: Routledge.
- Onyiah, I. A., Ezeamama, N. C., Ugwu, J. N., & Mgbodile, C. C. (2016). Nigerian Budget Implementation and Control Reforms: Tool for Macro Economic Growth. *Journal of Economics, Management and Trade*, 11(2), 1–13. <https://doi.org/10.9734/BJEMT/2016/19556>
- Ordinioha, B. (2011). A Survey of the Community Water Supply of some rural Riverine Communities in the Niger Delta region, Nigeria: Health implications and literature search for suitable interventions. *Nigerian Medical Journal : Journal of the Nigeria Medical Association*, 52(1), 13–

18.

- Organski, A. F. K. (1959). World Politics. *American Political Science Review*, 53(2), 587–587. <https://doi.org/10.1017/S000305540023325X>
- Orimogunje, O. O. (2015). Legislative Constituency Projects in Nigeria: A Matter of Constitutionality or Political Expediency? *Journal of Law, Policy and Globalization*, 41(6), 2224–3240. <https://doi.org/https://doi.org/10.7176/JLPG>
- Ososanya, T. (2019). Adeboye opposes Ruga settlement scheme anywhere in Nigeria. Retrieved July 20, 2020, from MSN Africa website: <https://www.msn.com/en-xl/africa/nigeria/adeboye-opposes-ruga-settlement-scheme-anywhere-in-nigeria/ar-AAGGPSy?li=BBJGzsi&ocid=mailsignout&fbclid=IwAR1r5-ZXobESiXxPNw8Bx7PZtmu1DIcTHS12itdnbMI1SMF-Oc6qhjbDeJU>
- OSSAP-SDGs. (2020). *Nigeria: Integration of the SDGs into National Development Planning: Second Voluntary National Review*. Abuja, Nigeria: OSSAP-SDGs.
- Ostrom, E. (2009). A General Framework for Analyzing Sustainability of Social-Ecological Systems. *Science*, 325(5939), 419–422. <https://doi.org/10.1126/science.1172133>
- Ostrom, E. (2015). Governing the Commons. In *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge: Cambridge University Press. <https://doi.org/10.1017/CBO9781316423936>
- Otero, I., Kallis, G., Aguilar, R., & Ruiz, V. (2011). Water scarcity, social power and the production of an elite suburb. The political ecology of water in Matadepera, Catalonia. *Ecological Economics*, 70(7), 1297–1308. <https://doi.org/10.1016/j.ecolecon.2009.09.011>
- Otti, V. I., Ezenwaji, E. E., Aginam, H. C. & Nwafor, A. U. (2014). Effective Community Participation In Reconstruction Of Greater Aguata Water Scheme, Enhances Sustainability. *IOSR Journal of Engineering*, 14(2), 60–66. <https://doi.org/10.9790/3021-04351924>
- Otun, I. A., Oke, I. A. A., & Oguntuase, A. M. (2011). Issues and challenges of decaying urban water infrastructure in Nigeria. *The Future of Water, Sanitation and Hygiene: Innovation, Adaptation and Engagement in a Changing World*, 1–5. Loughborough: WEDC, Loughborough University.
- Oyebande, L. (2001). Water problems in Africa—how can the sciences help? *Hydrological Sciences Journal*, 46(6), 947–962. <https://doi.org/10.1080/02626660109492888>
- Oyediran, O. (1988). *Essays on local government and administration in Nigeria* (1st ed.). Lagos: Estorise Nigeria Ltd.
- Oyeniya, S. O., & Oloyede, J. O. (2016). A Comparative Analysis of Safe Water and Sanitation in Selected Urban and Rural Areas of Osun State, Nigeria. *Donnish Journal of Research in Environmental Studies*, 3(2), 8–16.
- Òyó State Government. (2011). *Òyó State Water Resources and Sanitation Policy*. Ibadan, Nigeria: Oyo

State Government.

- Òyó State Government. (2017). List Of Dams Constructed In Oke-Ogun/Ibarapa Area. Retrieved March 23, 2018, from <https://oyostate.gov.ng/list-of-dams-constructed-in-oke-ogunibarapa-area/>
- Òyó State of Nigeria. *The Local Government Edict 1976: Extraordinary Gazette No. 27, Vol. 1, 4th October, 1976.* , Pub. L. No. 5, 69 (1976). Ibadan, Nigeria: Òyó State of Nigeria.
- Òyó State of Nigeria. *The Water Corporation of Òyó State Edict 1977: Gazette No. 53.* , Pub. L. No. 24, 30 (1977). Ibadan, Nigeria: Òyó State of Nigeria.
- Òyó State of Nigeria. *Oyo State Agricultural Development Project Edict, 1989.* , (1989). Ibadan, Nigeria: Oyo State Government.
- OYSADEP. (1989). *OYSADEP Documents*. Ibadan, Nigeria: Òyó State Government.
- OYSADEP. (1990). *Annual Report*. Ibadan: Òyó State Government.
- OYSADEP. (1994). *Annual Report*. Ibadan: Òyó State Government.
- OYSADEP. (1996). *Annual Report*. Ibadan, Nigeria: Òyó State Government.
- OYSADEP. (2011). *Annual Report*. Ibadan: Òyó State Government.
- Özerol, G., Vinke-de Kruijf, J., Brisbois, M. C., Casiano Flores, C., Deekshit, P., Girard, C., ... Schröter, B. (2018). Comparative studies of water governance: a systematic review. *Ecology and Society*, 23(4), 1–28. <https://doi.org/10.5751/ES-10548-230443>
- Pacheco-Vega, R. (2019). (Re)theorizing the politics of bottled water: Water insecurity in the context of weak regulatory regimes. *Water (Switzerland)*, 11(4), 1–16. <https://doi.org/10.3390/w11040658>
- Paddon, E., & Lacaille, G. (2011). *Stabilising the Congo* (No. 8). Oxford: University of Oxford.
- Paerregaard, K. (2018). Power in/of/as water: Revisiting the hydrologic cycle in the Peruvian Andes. *Wiley Interdisciplinary Reviews: Water*, 5(2), e1270. <https://doi.org/10.1002/wat2.1270>
- Pahl-Wostl, C. (2009). A conceptual framework for analysing adaptive capacity and multi-level learning processes in resource governance regimes. *Global Environmental Change*, 19(3), 354–365. <https://doi.org/10.1016/j.gloenvcha.2009.06.001>
- Pahl-Wostl, C. (2015a). A Theory on Water Governance Dynamics. In C. Pahl-Wostl (Ed.), *Water Governance in the Face of Global Change From Understanding to Transformation* (pp. 159–180). Cham: Springer International Publishing. [https://doi.org/10.1007/978-3-319-21855-7\\_8](https://doi.org/10.1007/978-3-319-21855-7_8)
- Pahl-Wostl, C. (2015b). Conceptual and Analytical Framework. In C. Pahl-Wostl (Ed.), *Water Governance in the Face of Global Change From Understanding to Transformation* (pp. 25–50). Cham: Springer International Publishing. [https://doi.org/10.1007/978-3-319-21855-7\\_3](https://doi.org/10.1007/978-3-319-21855-7_3)
- Pahl-Wostl, C. (2015c). The Challenge of Water Governance. In C. Pahl-Wostl (Ed.), *Water Governance in the Face of Global Change From Understanding to Transformation* (pp. 1–10). Cham: Springer International Publishing. [https://doi.org/10.1007/978-3-319-21855-7\\_1](https://doi.org/10.1007/978-3-319-21855-7_1)

- Pahl-Wostl, C. (2015d). *Water governance in the face of global change: From understanding to transformation*. Cham: Springer International Publishing.
- Pahl-Wostl, C. (2015e). *Water Governance in the Face of Global Change*. Cham: Springer International Publishing. <https://doi.org/10.1007/978-3-319-21855-7>
- Pahl-Wostl, C., Lebel, L., Knieper, C., & Nikitina, E. (2012). From applying panaceas to mastering complexity: Toward adaptive water governance in river basins. *Environmental Science and Policy*, 23(November), 24–34. <https://doi.org/10.1016/j.envsci.2012.07.014>
- Painter, J. (2006). Prosaic geographies of stateness. *Political Geography*, 25(7), 752–774. <https://doi.org/10.1016/j.polgeo.2006.07.004>
- Painter, J. (2015). Power. In J. A. Agnew, V. Mamadouh, Anna Secor, & J. Sharp (Eds.), *The Wiley Blackwell Companion to Political Geography* (First, pp. 141–151). New York: Wiley. <https://doi.org/10.1002/9781118725771.ch12>
- Papaioannou, K. J., & Dalrymple-Smith, A. E. (2015). Political instability and discontinuity in Nigeria: The pre-colonial past and public goods provision under colonial and post-colonial political orders. *The Economics of Peace and Security Journal*, 10(1), 40–53. <https://doi.org/10.15355/epsj.10.1.40>
- Pedregal, B., Cabello, V., Hernández-Mora, N., Limones, N., & Moral, L. Del. (2015). Information and Knowledge for Water Governance in the Networked Society. *Water Alternatives*, 8(2), 1–19.
- Peet, R., & Watts, M. (2004). *Liberation Ecologies* (Second; R. Peet & M. Watts, Eds.). New York: Routledge. <https://doi.org/10.4324/9780203235096>
- Perham, M. (1933). The Census of Nigeria, 1931. *Africa*, 6(4), 415–430. <https://doi.org/10.2307/1155557>
- Perreault, T. (2014). What kind of governance for what kind of equity? Towards a theorization of justice in water governance. *Water International*, 39(2), 233–245. <https://doi.org/10.1080/02508060.2014.886843>
- Peters, B. G. (2012). Governance As Political Theory. In D. Levi-Faur (Ed.), *Oxford Handbook Online* (pp. 1–17). Oxford: Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199560530.013.0002>
- Petticrew, M., & Roberts, H. (2006). *Systematic Reviews in the Social Sciences*. Oxford, UK: Blackwell Publishing Ltd. <https://doi.org/10.1002/9780470754887>
- PIDA. (2019a). Palambo Multi-purpose Dam. Retrieved November 3, 2019, from Virtual PIDA information centre website: <https://www.au-pida.org/view-project/1012/>
- PIDA. (2019b). PIDA Projects Dashboard. Retrieved March 3, 2019, from Virtual PIDA information centretual PIDA information centre website: <http://www.au-pida.org/pida-projects/>
- Pierre Bourdieu. (1985). A Free Thinker: “Do not ask me who I am.” *Paragraph*, 5(1), 80–87. <https://doi.org/10.3366/para.1985.0005>

- Popay, J., Roberts, H., Sowden, A., Petticrew, M., Arai, L., Rodgers, M., & Britten, N. (2006). *Guidance on the conduct of narrative synthesis in systematic Reviews. A Product from the ESRC Methods Programme*. (1st ed.). Lancaster: Lancaster University.
- Porter, P. W. (1985). Michael Watts, Silent Violence: Food, Famine & Peasantry in Northern Nigeria. *Journal of Historical Geography*, *11*(1), 106–107. [https://doi.org/10.1016/S0305-7488\(85\)80050-5](https://doi.org/10.1016/S0305-7488(85)80050-5)
- Poulantzas, N. A. (1978). *State, Power, Socialism* (Original). London: Verso.
- Presidential Committee on the North East Initiative. (2016). *Rebuilding the North East: The Buhari Plan*. Abuja, Nigeria: Presidential Committee on the North-East Initiative (PCNI).
- Priemus, H. (2010). Decision-making on Mega-projects: Drifting on Political Discontinuity and Market Dynamics. *EJTIR Issue*, *10*(1), 19–29.
- Prins, G. (1990). Politics and the Environment. *Royal Institute of International Affairs*, *64*(3), 449–464.
- Prodi, R. (2014). Foundation for the Collaboration among Peoples Commission of the Basin of Lake Tchad. *Donor Conference for the Revitalization of Lake Tchad, Bologna – Rimini, Italy April 4-5, 2014*. Rimini, Italy: Foundation for world wide coporation.
- Pullan, R. L., Freeman, M. C., Gething, P. W., & Brooker, S. J. (2014). Geographical Inequalities in Use of Improved Drinking Water Supply and Sanitation across Sub-Saharan Africa: Mapping and Spatial Analysis of Cross-sectional Survey Data. *PLoS Medicine*, *11*(4), 1–17. <https://doi.org/10.1371/journal.pmed.1001626>
- Quijano, A. (2000). Coloniality of power and Eurocentrism in Latin America. *International Sociology*, *15*(2), 215–232. <https://doi.org/10.1177/0268580900015002005>
- Quijano, A. (2007). Coloniality and modernity/rationality. *Cultural Studies*, *21*(2–3), 168–178. <https://doi.org/10.1080/09502380601164353>
- Quijano, A., & Wallerstein, I. (1992). ‘Americanity as a ‘Concept, or the Americas in the Modern World. *International Social Science Journal*, *44*(4), 549–557.
- Rae, A. (2014). Trend Analysis. In A. C. Michalos (Ed.), *Encyclopedia of Quality of Life and Well-Being Research* (pp. 288–311). Dordrecht: Springer Netherlands. [https://doi.org/10.1007/978-94-007-0753-5\\_3062](https://doi.org/10.1007/978-94-007-0753-5_3062)
- Ramakrishnan, K., O’Reilly, K., & Budds, J. (2020). The temporal fragility of infrastructure: Theorizing decay, maintenance, and repair. *Environment and Planning E: Nature and Space*, *25*1484862097971. <https://doi.org/10.1177/2514848620979712>
- Ranganathan, M. (2018). Rule by difference: Empire, liberalism, and the legacies of urban “improvement.” *Environment and Planning A: Economy and Space*, *50*(7), 1386–1406. <https://doi.org/10.1177/0308518X18781851>
- Rasul, I., & Rogger, D. (2018). Management of Bureaucrats and Public Service Delivery: Evidence from

- the Nigerian Civil Service. *The Economic Journal*, 128(608), 413–446.  
<https://doi.org/10.1111/eoj.12418>
- Rathore, L. S. (1986). Political Sociology: Its Meaning, Evolution and Scope. *The Indian Journal of Political Science*, 47(1), 119–140.
- Read, J. S. (1979). The New Constitution of Nigeria, 1979: “The Washington Model”? *Journal of African Law*, 23(2), 131–174. <https://doi.org/DOI: 10.1017/S0021855300010810>
- Reed, I. A. (2013). Power. *Sociological Theory*, 31(3), 193–218.  
<https://doi.org/10.1177/0735275113501792>
- Reed, W. (2000). A Unified Statistical Model of Conflict Onset and Escalation. *American Journal of Political Science*, 44(1), 84–93. <https://doi.org/10.2307/2669294>
- Reed, W. C. (1982). *The role of traditional rulers in elective politics in Nigeria*. Bloomington.: African Studies Program, Indiana University.
- Rhodes, B. A. (1973). *The Genesis of the 1959 Ashby Commission Report on Education in Nigeria*. University of Southern California.
- Richards, D. (2008). Handsearching still a valuable element of the systematic review: Does handsearching identify more randomised controlled trials than electronic searching? *Evidence-Based Dentistry*, 9(3), 85. <https://doi.org/10.1038/SJ.EBD.6400602>
- Rinaudo, J.-D., & Barraqué, B. (2015). Inter-basin transfers as a supply option: the end of an era? In R. Q. Grafton, K. A. Daniell, C. Nauges, J.-D. Rinaudo, & N. Wai Wah Chan (Eds.), *Understanding and managing urban water in transition* (pp. 175–200). Dordrecht: Springer.  
<https://doi.org/10.1007/978-94-017-9801>
- Robbins, P. (2019). *Political Ecology: A Critical Introduction* (3rd ed.). London: Wiley-Blackwell.
- Rodney, W. (1973). *How Europe Underdeveloped Africa* (6th ed.). Dar-Es-Salaam: Bogle-L'Ouverture Publications.
- Rodríguez-de-Francisco, J. C., & Boelens, R. (2016). PES hydrosocial territories: de-territorialization and re-patterning of water control arenas in the Andean highlands. *Water International*, 41(1), 140–156. <https://doi.org/10.1080/02508060.2016.1129686>
- Rogger, D. (2014). The Causes and Consequences of Political Interference in Bureaucratic Decision Making: Evidence from Nigeria. Retrieved from <http://www.danrogger.com/papers.html>
- Rolfe, S. (2018). Governance and Governmentality in Community Participation: The Shifting Sands of Power, Responsibility and Risk. *Social Policy and Society*, 17(4), 579–598.  
<https://doi.org/10.1017/S1474746417000410>
- Roman, P. (2017). The São Francisco Interbasin Water Transfer in Brazil: Tribulations of a Megaproject through Constraints and Controversy. *Water Alternatives*, 10(2), 395–419.

- Rondinelli, D. A. (1994). Local government in the third world: The experience of decentralization in tropical africa. *Public Administration and Development*, 14(5), 510–511. <https://doi.org/10.1002/pad.4230140508>
- Roosevelt, E. (1946). *As He Saw It* (2nd ed.). New York: The Conde Nast Publications Inc.
- Rose, N., & Miller, P. (2010). Political power beyond the State: Problematics of government. *British Journal of Sociology*, 61(SUPPL. 1), 271–303. <https://doi.org/10.1111/j.1468-4446.2009.01247.x>
- Ross, M. L. (1999). The Political Economy of the Resource Curse. *World Politics*, 51(2), 297–322. <https://doi.org/10.1017/S0043887100008200>
- Roth, D., Zwartveen, M., Joy, K. J., & Kulkarni, S. (2018). Water Governance as a Question of Justice. In J. Vos, R. Boelens, & T. Perreault (Eds.), *Water Justice* (pp. 43–58). Cambridge: Cambridge University Press. <https://doi.org/DOI: 10.1017/9781316831847.003>
- Ruiters, C. (2013). Funding models for financing water infrastructure in South Africa: Framework and critical analysis of alternatives. *Water SA*, 39(2), 313–326. <https://doi.org/10.4314/wsa.v39i2.16>
- Ruiters, C., & Matji, M. P. (2016). Water institutions and governance models for the funding, financing and management of water infrastructure in South Africa. *Water SA*, 41(5), 660–676. <https://doi.org/10.4314/wsa.v41i5.09>
- Rusca, M., Santos, T. dos, Menga, F., Mirumachi, N., Schwartz, K., & Hordijk, M. (2018). Space, state-building and the hydraulic mission: Crafting the Mozambican state: *EPC: Politics and Space C*, 37(5), 868–888. <https://doi.org/10.1177/0263774X18812171>
- Rwanda Ministry of Lands. (2005). *The United Nations Framework Convention on Climate Change*. Kigali: Republic of Rwanda.
- Sachs, J., Schmidt-Traub, G., Kroll, C., Lafortune, G., Fuller, G., & Woelm, F. (2020). *The Sustainable Development Goals and COVID-19. Sustainable Development Report 2020*. Cambridge, United Kingdom: Cambridge University Press.
- Saleth, R. M., & Dinar, A. (2004). *The Institutional Economics of Water: A Cross-Country Analysis of Institutions and Performance*. Washington, DC and Cheltenham, UK: Edward Elgar Publishing Ltd and World Bank. <https://doi.org/10.1596/0-8213-5656-9>
- Schiller Institute. (2018). *The new silk road becomes the world land-bridge: A shared future for humanity* (No. 2). New York: Schiller Institute.
- Schiltz, M. (1980). *Rural-Urban Migration in Iganna: A study of the changing relations of production in an agricultural community in northwestern Yorubaland*. Unpublished PhD thesis, London.
- Schlosser, J. A. (2012). Bourdieu and Foucault: A Conceptual Integration Toward an Empirical Sociology of Prisons. *Critical Criminology*, 21(1), 31–46. <https://doi.org/10.1007/s10612-012-9164-1>
- Schmidt, V. A. (2008). Discursive Institutionalism: The Explanatory Power of Ideas and Discourse.



- Annual Review of Political Science*, 11(1), 303–326.  
<https://doi.org/10.1146/annurev.polisci.11.060606.135342>
- Schmidt, V. A. (2010). Taking ideas and discourse seriously: explaining change through discursive institutionalism as the fourth ‘new institutionalism.’ *European Political Science Review*, 2(01), 1.  
<https://doi.org/10.1017/S175577390999021X>
- Schmidt, V. A. (2017). Theorizing Ideas and Discourse in Political Science: Intersubjectivity, Neo-Institutionalisms, and the Power of Ideas. *Critical Review*, 29(2), 248–263.  
<https://doi.org/10.1080/08913811.2017.1366665>
- Schubert, J. (2005). *Political Ecology in Development Research: An Introductory Overview and Annotated Bibliography*. Bern, NCCR North-South.
- Schulz, K. A. (2017). Decolonizing political ecology: Ontology, technology and “critical” enchantment. *Journal of Political Ecology*, 24(1), 125–143. <https://doi.org/10.2458/v24i1.20789>
- Schwartz-Shea, P., & Yanow, D. (2012). *Interpretive research design: concepts and processes*. London: Routledge.
- Scoones, I. (2016). The Politics of Sustainability and Development. *The Annual Review of Environment and Resources*, 41, 293–319. <https://doi.org/10.1146/annurev-environ-110615-090039>
- Scoones, I., & Stirling, A. (2020). Uncertainty and the politics of transformation. In I. Scoones & A. Stirling (Eds.), *The Politics of Uncertainty* (First, pp. 1–30). London: Routledge.  
<https://doi.org/10.4324/9781003023845-1>
- Scott, J. C. (1989). Everyday Forms of Resistance. *The Copenhagen Journal of Asian Studies*, 4(May), 33. <https://doi.org/10.22439/cjas.v4i1.1765>
- Scott, J. C. (1999). *Seeing like a State, Seeing like a City: How Certain Schemes to Improve the Human Condition have Failed*. Yale: Yale University Press.
- Scott, J. C. (2008). *Weapons of the weak: Everyday forms of peasant resistance*. New Haven: Yale University Press.
- SERAP Nigeria. (2021). *Nigeria: Anti-corruption Performance Assessment Survey*. Abuja, Nigeria: SERAP Nigeria.
- Shagari, S. U. A. (1981). *The challenge of change: collected speeches of President Shehu Shagari*. [Book]. Lagos: Department of Information.
- Shankar, S. (2018). Precolonial Christianity and Missionary Legacies. In C. Levan & P. Ukata (Eds.), *The Oxford Handbook of Nigerian Politics* (pp. 46–59). London: Oxford University Press.  
<https://doi.org/10.1093/oxfordhb/9780198804307.013.3>
- Sharma, A., & Gupta, A. (2006). *The Anthropology of the State: A Reader* (1st ed.). Oxford: Blackwell Publishing Ltd.

- Shettima, K. A. (1995). Engendering Nigeria's Third Republic. *African Studies Review*, 38(3), 61–98. <https://doi.org/10.2307/524793>
- Shim, J. K., Siegel, J. G., & Shim, A. I. (2012). Glossary of Budgeting and Planning Terms. In J. K. Shim, J. G. Siegel, & A. I. Shim (Eds.), *Budgeting Basics and Beyond* (pp. 513–529). London: John Wiley & Sons, Ltd. <https://doi.org/10.1002/9781118387023.GLOSS>
- Shiru, M. S., Shahid, S., Dewan, A., Chung, E. S., Alias, N., Ahmed, K., & Hassan, Q. K. (2020). Projection of meteorological droughts in Nigeria during growing seasons under climate change scenarios. *Scientific Reports*, 10(1), 10107. <https://doi.org/10.1038/s41598-020-67146-8>
- Shumilova, O., Tockner, K., Thieme, M., Koska, A., & Zarfl, C. (2018). Global Water Transfer Megaprojects: A Potential Solution for the Water-Food-Energy Nexus? *Frontiers in Environmental Science*, 6(150), 1–11. <https://doi.org/10.3389/fenvs.2018.00150>
- Siala, T. F., & Stoner, J. R. (2006). The Great Man-Made River Project. In A. Atala & A. Tremblay (Eds.), *Pipelines 2006* (pp. 1–8). Reston, VA, United States: American Society of Civil Engineers. [https://doi.org/10.1061/40854\(211\)32](https://doi.org/10.1061/40854(211)32)
- Sikor, T. (2008). *Public and Private in Natural Resource Governance: A False Dichotomy?* (1st ed.). London: Routledge.
- Sikor, T., & Lund, C. (2009). Access and Property: A Question of Power and Authority. *Development and Change*, 40(1), 1–22. <https://doi.org/10.1111/j.1467-7660.2009.01503.x>
- Silverman, D. (1993). *Interpreting qualitative data: methods for analysing talk, text, and interaction*. California: SAGE Publications.
- Smit, W. (2018). Urban Governance in Africa: An Overview. *Revue Internationale de Politique de Développement*, 10(10), 55–77. <https://doi.org/10.4000/poldev.2637>
- Smith, B. C. (2013). *Understanding third world politics: theories of political change and development* (4th ed.). Hampshire: Palgrave Macmillan.
- Smyth, R. (2004). The Roots of Community Development in Colonial Office Policy and Practice in Africa. *Social Policy and Administration*, 38(4), 418–436.
- Sneddon, C. (2012). The “sinew of development”: Cold War geopolitics, technical expertise, and water resource development in Southeast Asia, 1954-1975. *Social Studies of Science*, 42(4), 564–590. <https://doi.org/10.1177/0306312712445835>
- Sokoh, G. C. (2018). An Historical Analysis of the Changing Role of Traditional Rulers In Governance In Nigeria. *IOSR Journal Of Humanities And Social Science*, 23(1), 51–62. <https://doi.org/10.9790/0837-2301025162>
- Soyland, A. J., & Kendall, G. P. (1997). Abusing Foucault: Methodology, critique and subversion. *History and Philosophy of Psychology Section Newsletter*, 25(Autumn), 9–17.
- Stacey, P., & Lund, C. (2016). In a state of slum: governance in an informal urban settlement in Ghana.

- The Journal of Modern African Studies*, 54(4), 591–615.  
<https://doi.org/10.1017/S0022278X16000586>
- Star, S. L. (1999). The Ethnography of Infrastructure. *American Behavioral Scientist*, 43(3), 377–391.  
<https://doi.org/10.1177/00027649921955326>
- Star, S. L., & Griesemer, J. R. (2016). Institutional Ecology, ‘Translations’ and Boundary Objects: Amateurs and Professionals in Berkeley’s Museum of Vertebrate Zoology, 1907–39. *Social Studies of Science*, 19(3), 387–420. <https://doi.org/10.1177/030631289019003001>
- State House. (2013). *Presidential Summit on Water held at the State House, Abuja, Nigeria, 18-19 February 2013 - Communique*. Abuja, Nigeria: State House.
- Stirling, A., & Mitchell, C. (2018). Evaluate power and bias in synthesizing evidence for policy. *Nature*, 561(7721), 33–33. <https://doi.org/10.1038/d41586-018-06128-3>
- Stone, D. (2001). The ‘Policy Research’ Knowledge Elite and Global Policy Processes. In D. Josselin & W. Wallace (Eds.), *Non-state Actors in World Politics* (1st ed., pp. 113–132). London: Palgrave Macmillan UK. [https://doi.org/10.1057/9781403900906\\_7](https://doi.org/10.1057/9781403900906_7)
- Sukraroeck, W. W. (2013). *Integration, participation and the politics of water resources management in the Sesan river basin*. University of Sydney, Sydney.
- Suleiman, A. H. (2015). *Federal Ministry of Water Resources: Account of Stewardship by Honourable Minister of Water Resources*. Abuja, Nigeria: Unpublished.
- Sultana, F. (2018). Water justice: why it matters and how to achieve it. *Water International*, 43(4), 483–493. <https://doi.org/10.1080/02508060.2018.1458272>
- Sultana, F. (2020). Political ecology 1: From margins to center. *Progress in Human Geography*, 20(10), 1–10. <https://doi.org/10.1177/0309132520936751>
- Sultana, F., & Loftus, A. (2015). The Human Right to Water: Critiques and Condition of Possibility. *WIREs Water*, 2(2), 97–105. <https://doi.org/10.1002/wat2.1067>
- Sultana, F., & Loftus, A. (2019). The right to water in a global context. In F. Sultana & A. Loftus (Eds.), *Water Politics* (1st ed., pp. 1–14). London: Routledge. <https://doi.org/10.4324/9780429453571-1>
- Svarstad, H., Benjaminsen, T. A., & Overå, R. (2018). Power theories in political ecology. *Journal of Political Ecology*, 25(1), 350–363. <https://doi.org/10.2458/v25i1.23044>
- Swartz, D. L. (1998). *Culture and Power: The Sociology of Pierre Bourdieu*, Swartz. Chicago: University of Chicago Press.
- Swatuk, L. A. (2008). A political economy of water in Southern Africa. *Water Alternatives*, 1(1), 24–47.
- Swyngedouw, E. (2004). “Spain’s Hydraulic Mission: Conflict, Power, and the Mastering of Water.” *Water Resources Management: Risks and Challenges for the 21st Century*, *European Water*

*Resources Association.*

- Swyngedouw, Erik. (1999). Modernity and Hibridity: Nature, Regeneracionismo, and the Production of the Spanish Waterscape, 1890–1930. *Annals of the Association of American Geographers*, 89(3), 443–465. <https://doi.org/10.1111/0004-5608.00157>
- Swyngedouw, Erik. (2000). Authoritarian governance, power, and the politics of rescaling. *Environment and Planning D: Society and Space*, 18(1), 63–76. <https://doi.org/10.1068/d9s>
- Swyngedouw, Erik. (2007). Technonatural revolutions: The scalar politics of Franco’s hydro-social dream for Spain, 1939-1975. *Transactions of the Institute of British Geographers*, 32(1), 9–28. <https://doi.org/10.1111/j.1475-5661.2007.00233.x>
- Swyngedouw, Erik. (2009). The Political Economy and Political Ecology of the Hydro-Social Cycle. *Journal of Contemporary Water Research & Education*, 142(1), 56–60. <https://doi.org/10.1111/j.1936-704X.2009.00054.x>
- Swyngedouw, Erik. (2014). “Not a drop of water...”: State, modernity and the production of nature in Spain, 1898-2010. *Environment and History*, 20(1), 67–92. <https://doi.org/10.3197/096734014X13851121443445>
- Szokolczai, A. (1993). The Foucault Effect: Studies in Governmentality, with Two Lectures by and an Interview with Michel Foucault by Graham Burchell, Colin Gordon, Peter Miller. *Contemporary Sociology*, 22(2), 279–281. <https://doi.org/10.2307/2075812>
- Tammen, R. L., Kugler, J., & Lemke, D. (2011). *Power Transition Theory*.
- Tasi’u, Y. R. (2018). Evaluation of the status of water resources and infrastructure for community development in Warwade, Dutse, Jigawa state, Nigeria. *FUDMA Journal of Sciences*, 2(4), 8–14.
- Tavakoli-Nabavi, S. E. (2017). *More Than human, More Than Water: A Transdisciplinary Sociology of Water Conflict in Central Iran*. Unpublished PhD thesis Australian National University, Canberra.
- Taylor-Powell, E., & Renner, M. (2003). Analyzing Qualitative Data. Retrieved March 24, 2018, from University of Wisconsin-Extension, Program Development and Evaluation website: [https://deltastate.edu/docs/irp/Analyzing Qualitative Data.pdf](https://deltastate.edu/docs/irp/Analyzing%20Qualitative%20Data.pdf)
- Taylor, A. J. (2016). Thoughts on the nature and consequences of ungoverned spaces. *SAIS Review of International Affairs*, 36(1), 5–15. <https://doi.org/10.1353/sais.2016.0002>
- Teale, E. (1945). The contribution of colonial geological survey to the development of the mineral and other resources of east and West Africa . *Journal of the Royal Society of Arts*, 93(4689), 245–256.
- Tempelhoff, J. W. N. (2018). *South Africa’s water governance: hydraulic mission (1912–2008) in a WEF nexus context*. Durbanville: AOSIS. <https://doi.org/10.4102/aosis.2018.BK75>
- Temple, C. L. (1918). *Native Races and their Rulers*. Cape Town: Argus Printing and Publishing Ltd.
- Tetra Tech, & USAID. (2015). *Sector Assessment Summary: Nigeria USAID WASH Sector Status and*

*Trends in Water and Development Strategy Priority Countries*. Washington DC, United States: USAID.

Thapar, R. (1970). Political Fragmentation? *Economic and Political Weekly*, 3(5), 75–78.

The Economist Intelligence Unit. (2014). Main opposition party promises to fight corruption. Retrieved September 6, 2021, from The Economist website: [http://country.eiu.com/article.aspx?articleid=1621611946&Country=Nigeria&topic=Politics&subtopic=\\_8](http://country.eiu.com/article.aspx?articleid=1621611946&Country=Nigeria&topic=Politics&subtopic=_8)

The Economist Intelligence Unit. (2019). *The critical role of infrastructure for the Sustainable Development Goals*. London: The Economist.

The Nation. (2019). Nigeria formally joins China's belt, road initiative. Retrieved March 8, 2019, from The Nation website: <http://thenationonline.net/nigeria-formally-joins-chinas-belt-road-initiative/>

The World Bank. (1974). *Appraisal of Funtua Agricultural Development Project, Nigeria* (No. 345; Vol. 1). Washington DC: The World Bank.

The World Bank. (1980). *Loan Agreement: Òyó North Agricultural Development Project* (No. 1838). The World Bank.

The World Bank. (1982). *Project performance audit report Nigeria, Gusua, Funtua and Gombe agricultural development projects* (No. 3975). Washington DC: The World Bank.

The World Bank. (1990). *Japanese Grant Agreement (National Water Rehabilitation Fund Project) between Federal Republic of Nigeria and International Bank for Reconstruction and Development*. Unpublished. <https://doi.org/10.1596/978-1-4648-0675-9>

The World Bank. (1992a). *First multistate water supply project* (No. P-5625-UNI). Unpublished.

The World Bank. (1992b). *Memorandum and recommendation Of the President of the International development association To the Executive directors On a Proposed credit in the amount equivalent to sdr 74.7 million To the Federal Republic of Nigeria for a First multistate water supply* (No. P-5625-UNI). Washington DC: The World Bank.

The World Bank. (1992c). *Project Completion Report: Oyo North Agricultural Development Project* (No. 10238). Washington DC: The World Bank.

The World Bank. (1993). *Performance audit report on Nigeria* (No. 12016). Washington, DC, U.S.A: The World Bank.

The World Bank. (1994). *Nigeria - Structural adjustment program: policies, implementation, and impact*. Abuja, Nigeria: The World Bank.

The World Bank. (1995). *Implementation completion report: Nigeria - second multi-State Agricultural Development Project* (No. 15249). Washington DC: The World Bank.

- The World Bank. (1997). *Implementation completion report Nigeria third multi-state agricultural development project* (No. 16767). Washington DC: The World Bank.
- The World Bank. (1998). *First Multistate Agricultural Development Project, Second Multistate Agricultural Development Project, and Third Multistate Agricultural Development Project*. Washington DC: The World Bank.
- The World Bank. (2001a). *Implementation Completion Report for the National Water Rehabilitation Project* (No. 23363). Abuja, Nigeria: The World Bank.
- The World Bank. (2001b). *World Development Report 2002* (No. 22825; Vol. 1). New York: The World Bank. <https://doi.org/10.1596/0-1952-1606-7>
- The World Bank. (2006a). *Nigeria - National Water Rehabilitation, First Multi-State Water Supply, and Small Towns Water Supply and Sanitation Projects* (No. 36443; Vol. 1). Washington DC: The World Bank.
- The World Bank. (2006b). *Utilization of repatriated Abacha loot: Results of the field monitoring exercise* (Vol. 1). Abuja, Nigeria: The World Bank.
- The World Bank. (2017a). *A Wake Up Call Nigeria Water Supply, Sanitation, and Hygiene Poverty Diagnostic*. Washington DC: The World Bank.
- The World Bank. (2017b). *Sustainability Assessment of Rural Water Service Delivery Models Findings of a Multi-Country Review*. Washington DC: The World Bank.
- The World Bank. (2018). Population growth (annual %). Retrieved March 14, 2019, from Data website: <https://data.worldbank.org/indicator/SP.POP.GROW?locations=ZG-ZF>
- The World Bank. (2019). Nigeria. Retrieved December 28, 2019, from Databank website: <https://data.worldbank.org/country/nigeria>
- This Day. (2021). Adamu: I'll Push Until the Water Bill is Passed. Retrieved September 6, 2021, from This Day Live website: <https://www.thisdaylive.com/index.php/2021/09/04/adamu-ill-push-until-the-water-bill-is-passed/>
- Thompson, A. B. (1935). The Water Problems of Abyssinia and Bordering Countries. *International Affairs (Royal Institute of International Affairs 1931-1939)*, 14(6), 769–779.
- Threadgold, S. (2020). Bourdieu and Affect: Towards a Theory of Affective Affinities. In *Bourdieu and Affect*. Policy Press. <https://doi.org/10.1332/POLICYPRESS/9781529206616.001.0001>
- Thurston, A. (1995). *Records of the Colonial Office, Dominions Office, Commonwealth Relations Office and Commonwealth Office*. London: The Stationary Office.
- Tockner, K., Bernhardt, E. S., Koska, A., & Zarfl, C. (2016). A Global View on Future Major Water Engineering Projects. In R. F. Hüttl, O. Bens, C. Bismuth, & S. Hoehstetter (Eds.), *Society - Water - Technology: A Critical Appraisal of Major Water Engineering Projects* (pp. 47–64). Cham: Springer International Publishing. [https://doi.org/10.1007/978-3-319-18971-0\\_4](https://doi.org/10.1007/978-3-319-18971-0_4)

- Todorov, T. (1993). *On Human Diversity: Nationalism, Racism, and Exoticism in French Thought*. Massachusetts: Harvard University Press.
- Tonwe, B. O. (1972). The Lake Chad Basin Commission. *Journal of African Law*, 16(3), 343–345.
- Tortajada, C. (2006). Water Governance with Equity: Is Decentralisation the Answer? Decentralisation of the Water Sector in Mexico and Intercomparison with Practices from Turkey and Brazil. In *Human Development Occasional Papers (1992-2007)* (No. 2006–15). New York: United Nations Development Programme.
- Tortajada, C. (2010). Water governance: Some critical issues. *International Journal of Water Resources Development*, 26(2), 297–307. <https://doi.org/10.1080/07900621003683298>
- Towett, E. K., Drake, L. B., Acquah, G. E., Haefele, S. M., McGrath, S. P., & Shepherd, K. D. (2020). Comprehensive nutrient analysis in agricultural organic amendments through non-destructive assays using machine learning. *PLoS ONE*, 15(12), 1–17. <https://doi.org/10.1371/journal.pone.0242821>
- Townsend, M. (1903). *Asia and Europe: studies presenting the conclusions formed by the author in a long life devoted to the subject of the relations between Asia and Europe* (Second). London: Archibald Constable & Co Ltd.
- Tracka. (2017). *2016 Federal Constituency Projects: Lessons and Findings from Focus States*. Lagos, Nigeria: BudgIT.
- Truelove, Y. (2020). Who is the state? Infrastructural power and everyday water governance in Delhi. *Environment and Planning C: Politics and Space*, 39(2), 1–18. <https://doi.org/10.1177/2399654419897922>
- Tshibwabwa, S. (2017). After plundering minerals, soon the plundering of the Congo freshwater, the blue gold of this century. Retrieved January 28, 2018, from Wondo website: <http://desc-wondo.org/en/after-plundering-minerals-soon-the-plundering-of-the-congo-freshwater-the-blue-gold-of-this-century-sinaseli-tshibwabwa/>
- Tucker, K. (2018). Unraveling coloniality in international relations: Knowledge, relationality, and strategies for engagement. *International Political Sociology*, 12(3), 215–232. <https://doi.org/10.1093/ips/oly005>
- Turner, M. D. (2017). Political ecology III: The commons and commoning. *Progress in Human Geography*, 41(6), 795–802. <https://doi.org/10.1177/0309132516664433>
- Turton, A., & Henwood, R. (2002). *Hydropolitics in the Developing World: A Southern African Perspective* (1st ed.). Pretoria: African Water Issues Research Unit, Centre for International Political Studies, University of Pretoria.
- Uchechi, O., Ubi, P., & Lionel, E. (2014). Corruption and Infrastructural Decay: Perceptible Evidence from Nigeria. *Journal of Economics and Sustainable Development*, 5(10), 20–28.

- Udefuna, P. N., Jumare, F., & Adebayo, F. O. (2010). Legislative Constituency Project in Nigeria: Implication for National Development. *Mediterranean Journal of Social Sciences*, 4(6), 647–653.
- UN-Water. (2014). *Post-2015 global goal for water: Synthesis of key findings and recommendations from UN-Water* (Vol. 37). Geneva, Switzerland: UN-Water.
- UN-Water. (2018). *Sustainable Development Goal 6 Synthesis Report on Water and Sanitation 2018*. New York: United Nations.
- UN Security Council. (2003). Final report of the Panel of Experts on the Illegal Exploitation of Natural Resources and Other Forms of Wealth of DR Congo (S/2003/1027). Retrieved June 29, 2018, from UN Document website: <https://reliefweb.int/report/democratic-republic-congo/final-report-panel-experts-illegal-exploitation-natural-resources>
- UNDESA. (2019). *World population prospects: Volume I: Comprehensive Tables* (No. ST/ESA/SER.A/426). New York: United Nations.
- UNDP. (2006). *Human Development Report 2006: Beyond Scarcity: Power, Poverty, and the Global Water Crisis*. New York: Palgrave Macmillan.
- UNDP. (2015). *United Nations Development Goals*. New York: United Nations Development Program.
- UNDP. (2018). *Human Development Report 2018: Achieving Human Development in North East Nigeria*. Abuja, Nigeria: United Nations Development Program.
- UNDP, & UNICEF. (2015). *Accountability in WASH: Explaining the Concept*. Stockholm, Sweden: Stockholm International Water Institute (SIWI) and UNICEF.
- UNECA. (2015). *Conflicts in the Democratic Republic of Congo: Causes, impacts and implications for the Great Lakes region*. Addis Ababa, Ethiopia: United Nations Economic Commission for Africa.
- UNESCO. (1987). *Nigeria: Establishment of a National Water Resources Institute, Project Findings and Recommendations*. Paris: UNESCO.
- UNESCO. (2012). *Decisions adopted by the World Heritage Committee at its 36th Session* (No. WHC-12/36.COM/19). Saint-Petersburg, Russia: UNESCO.
- UNESCO. (2017). BIOPALT in a few figures. Retrieved March 15, 2019, from UNESCO Documents website: <https://en.unesco.org/sites/default/files/biopalt-en.pdf>
- UNESCO. (2018a). BIOPALT project strengthens transboundary collaboration in the Lake Chad region. Retrieved March 15, 2019, from World Heritage Centre News and events website: <https://whc.unesco.org/en/news/1833>
- UNESCO. (2018b). Biosphere and Heritage of Lake Chad (BIOPALT) project. Retrieved March 15, 2019, from BIOPALT Project website: <https://en.unesco.org/biopalt>
- UNESCO. (2019). UNESCO World Heritage Centre - UNESCO-Africa-China Forum on World Heritage Capacity Building and Cooperation. Retrieved March 15, 2019, from News and events



website: <https://whc.unesco.org/en/events/1472/>

UNESCO. (2021). *Valuing water - The United Nations World Water Development Report 2021*. Paris: UNESCO.

UNFCCC. (2018). UNFCCC - COP24: Official opening ceremony of COP24 CMP14 CMA1.3 and high-level segment. Retrieved November 17, 2019, from Plenary Session website: <https://unfccc-cop24.streamworld.de/webcast/official-opening-ceremony-of-cop24-cmp14-cma13-and>

UNGA. (1980). *Proclamation of the International Drinking Water Supply and Sanitation Decade*. (No. UNA(01)/R3; Vol. 1). New York: United Nations.

United Nations. (2018). List of least developed countries. Retrieved March 16, 2019, from [https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/ldc\\_list.pdf](https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/ldc_list.pdf)

United Nations. (2019a). *Financing for Sustainable Development Report 2019: Inter-agency Task Force on Financing for Development*. New York: United Nations.

United Nations. (2019b). Human Development Index and its components. Retrieved May 24, 2019, from <http://hdr.undp.org/en/composite/HDI>

United Nations. (2019c). World Urbanization Prospects. Retrieved May 16, 2019, from <https://population.un.org/wup/Country-Profiles/>

United Nations. (2021a). *Financing strategy*. New York: United Nations.

United Nations. (2021b). Integrated National Financing Framework: Nigeria. Retrieved September 4, 2021, from <https://inff.org/country/nigeria>

UNOCHA. (2019). Nigeria: 2019-2021 Humanitarian Response Strategy (January 2019 - December 2021). Retrieved November 14, 2019, from <https://m.reliefweb.int/report/2968214>

UNSC. (2002). *Final report of the Panel of Experts on the Illegal Exploitation of Natural Resources and Other Forms of Wealth of the Democratic Republic of the Congo* (No. S/2002/1146). Washington DC: UNSC.

UNSC. (2018). *UN documents: Security Council meeting records 8212th meeting* (No. S/PV.8212). New York: United Nations Security Council.

Utietiang, B. (2015). Historicizing Development: Nigeria's 1945 Colonial Plan. *The Journal of Pan African Studies*, 8(9), 5–25.

Van Den Berg, C., & Danilenko, A. (2017). *Performance of Water Utilities in Africa*. Washington DC: The World Bank.

van der Wijngaart, R., Helming, J., Jacobs, C., Andrés Garzón Delvaux, P., Hoek, S., & Gomez Paloma, S. (2019). *Irrigation and irrigated agriculture potential in the Sahel: The case of the Niger River basin*. Paloma, Spain: Publications Office of the European Union. <https://doi.org/10.2760/725906>

Venkataramanan, V., Crocker, J., Karon, A., & Bartram, J. (2018). Community-Led Total Sanitation: A

- Mixed-Methods Systematic Review of Evidence and Its Quality. *Environmental Health Perspectives*, 126(2), 1–17. <https://doi.org/10.1289/EHP1965>
- Verhoeven, H. (2015). *Water, Civilisation and Power in Sudan: The Political Economy of Military-Islamist State Building*. New York: Cambridge University Press. <https://doi.org/10.1017/CBO9781107447769>
- Vichi, M. (2014). Transaqua Development for Africa. Retrieved January 28, 2018, from EIR website: <http://archive.larouchepac.com/node/18782>
- Vink, M. J., Dewulf, A., & Termeer, C. (2013). The role of knowledge and power in climate change adaptation governance: a systematic literature review. *Ecology and Society*, 18(4), art46. <https://doi.org/10.5751/ES-05897-180446>
- Vos, J., & Boelens, R. (2018). Neoliberal water governmentalities, virtual water trade, and contestations. In *Water Justice* (pp. 283–301). Cambridge University Press. <https://doi.org/10.1017/9781316831847.019>
- Wacquant, L. (2004). Following Pierre Bourdieu into the field. *Ethnography*, 5(4), 387–414. <https://doi.org/10.1177/1466138104052259>
- Wacquant, L. (2013). Symbolic power and group-making: On Pierre Bourdieu's reframing of class. *Journal of Classical Sociology*, 13(2), 274–291. <https://doi.org/10.1177/1468795X12468737>
- Wacquant, L. (2014). Putting habitus in its place: Rejoinder to the symposium. *Body and Society*, 20(2), 118–139. <https://doi.org/10.1177/1357034X14530845>
- Wacquant, L. (2016). A Concise Genealogy and Anatomy of Habitus. *The Sociological Review*, 64(1), 64–72. <https://doi.org/10.1111/1467-954X.12356>
- Wacquant, L. (2018a). Bourdieu Comes to Town: Pertinence, Principles, Applications. *International Journal of Urban and Regional Research*, 42(1), 90–105. <https://doi.org/10.1111/1468-2427.12535>
- Wacquant, L. (2018b). Four transversal principles for putting Bourdieu to work. *Anthropological Theory*, 18(1), 3–17. <https://doi.org/10.1177/1463499617746254>
- Wagner, E. G., & Lanoix, J. N. (1959). *Water supply for rural areas and small communities* (Vol. 42). Geneva, Switzerland: World Health Organisation.
- Wakili, I. (2016). FEC ratifies Lake Chad Basin Water Charter. Retrieved January 29, 2018, from Daily Trust website: <https://www.dailytrust.com.ng/news/general/story/170895.html>
- Wallbank, T. W. (1934). The Principles and Organization of British Native Rule in Tropical Africa. *Source: Pacific Historical Review*, 3(2), 142–155.
- Wallerstein, I. (1981). The three stages of African involvement in the world-economy. In Peter Claus Wolfgang Gutkind & I. Wallerstein (Eds.), *The political economy of contemporary Africa* (Sixth, pp. 30–57). London: SAGE Publications.

- Wallerstein, I. (1992). The Concept of National Development, 1917-1989 Elegy and Requiem. *American Behavioral Scientist*, 35(4), 517–529.
- Walther, O., Leuprecht, C., & Skillicorn, D. B. (2017). Political Fragmentation and Alliances among Armed Non-state Actors in North and Western Africa (1997–2014). *Terrorism and Political Violence*, 32(1), 167–186. <https://doi.org/10.1080/09546553.2017.1364635>
- Warner, J., Mirumachi, N., Farnum, R. L., Grandi, M., Menga, F., & Zeitoun, M. (2017). Transboundary ‘hydro-hegemony’: 10 years later. *Wiley Interdisciplinary Reviews: Water*, 4(6), 1–13. <https://doi.org/10.1002/wat2.1242>
- Warren, M. E. (1999). What is political? *Journal of Theoretical Politics*, 11(2), 207–231. <https://doi.org/10.1177/0951692899011002004>
- Watts, M. (1983). *Silent Violence: Food, famine, and peasantry in Northern Nigeria* (1st ed.). Berkeley: University of California Press.
- Watts, M. (2000). Political Ecology. In E. Barnes, T., Sheppard (Ed.), *A Companion To Economic Geography* (pp. 257–275). Oxford: Blackwell.
- Watts, M. (2004). Resource curse? governmentality, oil and power in the Niger Delta, Nigeria. *Geopolitics*, 9(1), 50–80. <https://doi.org/10.1080/14650040412331307832>
- Watts, M. (2012). A Tale of Two Gulfs: Life, Death, and Dispossession along Two Oil Frontiers. *American Quarterly*, 64(3), 437–467. <https://doi.org/10.1353/aq.2012.0039>
- Watts, M. (2018). Resource Curse? Governmentality, Oil and Power in the Niger Delta, Nigeria. In Kay Anderson & B. Braun (Eds.), *Environment* (1st ed., pp. 503–533). London: Routledge. <https://doi.org/10.4324/9781315256351-22>
- Watts, M. J. (2017). Frontiers: Authority, Precarity and Insurgency at the Edge of the State. *L’Espace Politique*, 32(2), 1–24. <https://doi.org/10.4000/espacepolitique.4336>
- Watts, M. J. (2018). Ecologies of Rule: Politics, Political Economy, and Governing the Environment in Nigeria. In U. P. Levan Carl (Ed.), *The Oxford Handbook of Nigerian Politics* (Online, pp. 132–168). London: Oxford University Press. <https://doi.org/10.1093/OXFORDHB/9780198804307.013.9>
- Watts, R., Walton, D., & Yeung, T. (2019). *Equal to the task: financing for a state of emergency in Nigeria’s water, sanitation and hygiene sector*. Abuja, Nigeria: WaterAid Nigeria.
- Wax, J. (1971). Power Theory and Institutional Change. *Social Service Review*, 45(3), 274–288.
- Waziri, I. M. (1989). *Political economy of development: Discussion and analysis of the Nigerian Federal Government development policies on agriculture over the period: 1975-1985*. ETD Collection for AUC Robert W. Woodruff Library, Atlanta.
- Weiss, G., & Wodak, R. (2003). Introduction: Theory, Interdisciplinarity and Critical Discourse Analysis. In G. Weiss & R. Wodak (Eds.), *Critical Discourse Analysis: Theory and*

- Interdisciplinarity* (1st ed., pp. 1–33). London: Palgrave Macmillan.  
[https://doi.org/10.1057/9780230288423\\_1](https://doi.org/10.1057/9780230288423_1)
- Werth, S., White, D., & Bliss, D. W. (2017). GRACE Detected Rise of Groundwater in the Sahelian Niger River Basin. *Journal of Geophysical Research: Solid Earth*, 122(12), 10459–10477.  
<https://doi.org/10.1002/2017JB014845>
- Wester, P. (2008). *Shedding the waters: institutional change and water control in the Lerma-Chapala Basin, Mexico*. Wageningen University, Wageningen.
- Western State of Nigeria. (1974). *An introduction to the new local council system in the Western State of Nigeria*. Ibadan: Government Printer.
- Whaley, L. (2018). The critical institutional analysis and development (CIAD) framework. *International Journal of the Commons*, 12(2), 137–161. <https://doi.org/10.18352/ijc.848>
- Whaley, L., & Cleaver, F. (2017). Can ‘functionality’ save the community management model of rural water supply? *Water Resources and Rural Development*, 9(1), 56–66.  
<https://doi.org/10.1016/j.wrr.2017.04.001>
- Whaley, L., MacAllister, D. J., Bonsor, H., Mwachunga, E., Banda, S., Katusiime, F., ... MacDonald, A. (2019). Evidence, ideology, and the policy of community management in Africa. *Environmental Research Letters*, 14(8), 1–11. <https://doi.org/10.1088/1748-9326/ab35be>
- Wheida, E., & Verhoeven, R. (2007). An alternative solution of the water shortage problem in Libya. *Water Resources Management*, 21(6), 961–982. <https://doi.org/10.1007/s11269-006-9067-6>
- White, D. D., Lawless, K. L., Vivoni, E. R., Mascaro, G., Pahle, R., Kumar, I., ... Asfora, M. (2019). Co-Producing Interdisciplinary Knowledge and Action for Sustainable Water Governance: Lessons from the Development of a Water Resources Decision Support System in Pernambuco, Brazil. *Global Challenges*, 3(4), 1–14. <https://doi.org/10.1002/gch2.201800012>
- Whittington, D., Davis, J., & McClelland, E. (1998). Implementing a Demand-Driven Approach to Community Water Supply Planning: A Case Study of Lugazi, Uganda. *Water International*, 23(3), 134–145. <https://doi.org/10.1080/02508069808686760>
- WHO. (2017). *Financing Universal Water, Sanitation and Hygiene under the Sustainable Development Goals GLAAS 2017 Report: UN-Water Global Analysis and Assessment of Sanitation and Drinking Water*. Geneva: World Health Organisation.
- WHO. (2019). WHO | Country profiles of environmental burden of disease. Retrieved November 14, 2019, from WHO website:  
[https://www.who.int/quantifying\\_ehimpacts/national/countryprofile/en/](https://www.who.int/quantifying_ehimpacts/national/countryprofile/en/)
- WHO. (2020). *National systems to support drinking-water, sanitation and hygiene: global status report 2019*. Geneva: World Health Organization.
- WHO & UNICEF. (2019). *Progress on household drinking water, sanitation and hygiene 2000-2017:*

- New York: World Health Organization.
- WHO, & UNICEF. (2017). *Progress on Drinking Water, Sanitation and Hygiene*. New York: World Health Organisation. <https://doi.org/10.1111/tmi.12329>
- WHO, & UNICEF. (2018). *JMP methodology 2017 update & SDG baselines*. Washington: UNICEF.
- Wicker, E. R. (1958). Colonial Development and Welfare, 1929-1957: The Evolution of a Policy. *Social and Economic Studies*, 7(4), 170–192.
- Wijeyewardene, G. (1973). Hydraulic society in contemporary Thailand. In R. Ho & E. C. Chapman (Eds.), *Studies of contemporary Thailand*. Canberra: ANU Press.
- Williams, C. (2011). Research Methods. *Journal of Business & Economics Research*, 5(3), 65–72. <https://doi.org/10.19030/jber.v5i3.2532>
- Williams, G. (1988). The World Bank in Rural Nigeria, Revisited: A Review of the World Bank's Nigeria: Agricultural Sector Review 1987. *Review of African Political Economy*, 15(43), 42–67. <https://doi.org/10.1080/03056248808703790>
- Williams, J., Williams, & M., J. (2018). Stagnant Rivers: Transboundary Water Security in South and Southeast Asia. *Water*, 10(12), 1–23. <https://doi.org/10.3390/w10121819>
- Williamson, K. (2018). Ethnographic research. In K. Williamson & G. Johanson (Eds.), *Research Methods* (2nd ed., pp. 311–335). New York: Elsevier. <https://doi.org/10.1016/B978-0-08-102220-7.00013-3>
- Wilson, N. J., Harris, L. M., Nelson, J., & Shah, S. H. (2019). Re-Theorizing Politics in Water Governance. *Water*, 11(7), 1–13. <https://doi.org/10.3390/w11071470>
- Wittfogel, K. A. (1957). *Oriental despotism: a comparative study of total power*. New Haven: Yale University Press.
- Wong, S. (2007). South-North Water Transfer Project. Retrieved from International Rivers website: <https://archive.internationalrivers.org/campaigns/south-north-water-transfer-project>
- Woodhouse, P., & Muller, M. (2017). Water Governance—An Historical Perspective on Current Debates. *World Development*, 92(2), 225–241. <https://doi.org/10.1016/j.worlddev.2016.11.014>
- World Bank. (2016). *Poverty and Shared Prosperity 2016 Taking on Inequality*. Washington.
- World Bank. (2017). *20 Reasons Sustainable Tourism Counts for Development Knowledge*. Washington DC: The World Bank.
- World Bank. (2019). *Moving toward a middle-class society, Nigeria on the move: a journey to inclusive growth*. Washington DC: World Bank.
- World Water Council. (2016). *Water infrastructure and investment: A framing note for the High Level panel on water*. Marseille, France: World Water Council.
- Worster, D. (1985). *Rivers of empire: water, aridity, and the growth of the American West*. New York:

Pantheon Books.

- Wright, D. (1995). "That Hell-hole Of Yours." *American Heritage*.
- WTTC. (2019). *Country Reports: Nigeria*. London, United Kingdom: WTTC.
- Yagboyaju, D. A., & Akinola, A. O. (2019). Nigerian State and the Crisis of Governance: A Critical Exposition. *SAGE Open*, 9(3), 1–10. <https://doi.org/10.1177/2158244019865810>
- Yanow, D. (2007). Qualitative-Interpretive Methods in Policy Research. In F. Fischer & G. J. Miller (Eds.), *Handbook of public policy analysis: Theory, politics, and methods* (1st ed., pp. 405–415). London: Routledge. <https://doi.org/10.4324/9781315093192>
- Yates, J. S., Harris, L. M., & Wilson, N. J. (2017). Multiple ontologies of water: Politics, conflict and implications for governance: *Environment and Planning D: Society and Space*, 35(5), 797–815. <https://doi.org/10.1177/0263775817700395>
- Yildiz, D. (2015). New threats to transboundary waters require a new conceptual approach. Retrieved from Global Water Forum website: <https://globalwaterforum.org/2015/08/10/new-threats-on-transboundary-waters-require-a-new-conceptual-approach/?pdf=12434>
- Yin, R. K. (2014). *Case Study Research*. Thousand Oaks: SAGE Publications.
- Young, O. R. . (1968). Political Discontinuities in the International System. *World Politics*, 20(3), 369–392. <https://doi.org/10.2307/2009773>
- Young, R. (2009). John Stuart Mill, Ronald Dworkin, and paternalism. In C. L. Ten (Ed.), *Mill's On Liberty: A critical guide* (pp. 209–227). Cambridge: Cambridge University Press. <https://doi.org/10.1017/CBO9780511575181.011>
- Zeitoun, M., & Mirumachi, N. (2008). Transboundary water interaction I: Reconsidering conflict and cooperation. *International Environmental Agreements: Politics, Law and Economics*, 8(4), 297–316. <https://doi.org/10.1007/s10784-008-9083-5>
- Zeitoun, M., & Warner, J. (2006). Hydro-hegemony – a framework for analysis of trans-boundary water conflicts. *Water Policy*, 8(5), 435–460. <https://doi.org/10.2166/wp.2006.054>
- Zhang, L., Li, S., Loáiciga, H. A., Zhuang, Y., & Du, Y. (2015). Opportunities and challenges of interbasin water transfers: a literature review with bibliometric analysis. *Scientometrics*, 105(1), 279–294. <https://doi.org/10.1007/s11192-015-1656-9>
- Zhu, J., & Liu, W. (2020). A tale of two databases: the use of Web of Science and Scopus in academic papers. *Scientometrics*, 123(1), 321–335. <https://doi.org/10.1007/S11192-020-03387-8>
- Zhuang, W. (2016). Eco-environmental impact of inter-basin water transfer projects: a review. *Environmental Science and Pollution Research*, 23(13), 12867–12879. <https://doi.org/10.1007/s11356-016-6854-3>
- Zwarteveen, M., Kemerink-Seyoum, J. S., Kooy, M., Evers, J., Guerrero, T. A., Batubara, B., ...

Wesselink, A. (2017). Engaging with the politics of water governance. *Wiley Interdisciplinary Reviews: Water*, 4(6), 1–9. <https://doi.org/10.1002/wat2.1245>

## Appendix A: Search terms used in systematic review of water infrastructure governance in Nigeria 1990–2019

1. "water infrastructure" OR standpipes AND "governance" OR management AND "Nigeria"
2. "water infrastructure" OR well AND "governance" OR management AND "Nigeria"
3. "water infrastructure" OR dams AND "governance" OR management AND "Nigeria"
4. "water infrastructure" OR boreholes AND "governance" OR management AND "Nigeria"
5. "water infrastructure", govern\*, research or study, and "Nigeria"
6. "borehole management" AND Nigeria well OR standpipes
7. "borehole management" AND Nigeria well OR standpipes
8. dam management AND Nigeria well OR standpipes
9. community management AND Nigeria AND "borehole"
10. community water management AND Nigeria AND "borehole"
11. community water management AND Nigeria AND "wells"
12. community water management AND Nigeria AND "standpipes"
13. community water management AND Nigeria AND "dams"
14. community water governance AND Nigeria AND "dams"
15. "community water governance" AND Nigeria AND "wells"
16. "water governance" AND Nigeria AND "standpipes"
17. "water governance" AND Nigeria AND "dams"
18. "water resources management in Nigeria" AND "dams"
19. "water resources management in Nigeria" AND "boreholes"
20. "water resources management in Nigeria" AND "wells"

### Boolean search from Scopus

( TITLE-ABS-KEY ( "Water projects" ) OR TITLE-ABS-KEY ( wells ) OR TITLE-ABS-KEY ( standpipes ) OR TITLE-ABS-KEY ( dams ) OR TITLE-ABS-KEY ( boreholes ) AND TITLE-ABS-KEY ( "governance" ) OR TITLE-ABS-KEY ( management ) AND TITLE-ABS-KEY ( "Nigeria" ) ) AND PUBYEAR > 1990 AND PUBYEAR < 2019



## Appendix B: Current challenges in water resource management

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- i. Unevenly distributed water resources and demand necessitating the creation of dams and transportation of water to the areas of need.
  - ii. Inadequate access to usable water resources to meet the rapidly increasing domestic and industrial (economic growth) water demand. These are manifested by poor access to clean and potable water in urban, small towns and rural areas, low levels of irrigation agriculture, poor utilisation of hydropower potentials and limited inland fishery.
  - iii. Degrading watershed and water courses as a result of widespread pollution, including the indiscriminate disposal of hazardous wastes due to poor pollution and mining control leading to deteriorating water quality.
  - iv. Fragmented and uncoordinated water resources development as a result of inadequate catchment management.
  - v. Unclear roles and responsibilities among the various levels of government, different ministries, departments and agencies at the federal and state levels.
  - vi. Poor coordination (including international donor coordination), mobilisation and application of funds for water supply development. This often leads to duplication of efforts, wastages, and inefficiency in the development and management of water infrastructure throughout the country
  - vii. Inadequate water resources data collection and management. This leads to poor planning and project designs.
  - viii. Limited groundwater availability in the areas underlain by crystalline rocks which covers substantial parts of the country, while for the more productive sedimentary areas of the country, detailed study and documentation is still premature.
  - ix. Poor or lack of monitoring and control of groundwater resources.
  - x. Escalating costs of water production and distribution for domestic and industrial water supply, irrigation, husbandry, horticulture and other uses against dwindling financial resources.
  - xi. Inefficient government subsidies on the provision water services.
  - xii. Extreme weather conditions due to climate change resulting in prolonged droughts, increased flooding, widespread erosion, and communal conflicts.
  - xiii. Vicious cycle of unreliable projects that provide services that do not meet consumer needs and for which the consumers are unwilling to pay.
  - xiv. Poor or inefficient management of water resources infrastructures like dams, reservoirs, waterworks with their related distribution networks, irrigation structures, and navigable waterways leading to financial losses and unreliable service delivery.
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## Appendix C: Nigeria's transboundary organisations

Transboundary Organisations	Some Rivers and Lakes Systems	Infrastructures	Approach	Countries	Convention Signed	Aim
Niger Basin Authority	Niger; Bani; Benue; Kaduna; Lake Faguibine; Senegal	Kandaji dam; Mambilla	Multilateral	Benin, Nigeria, Burkina Faso, Cameroon, Côte d'Ivoire, Guinea, Mali, Niger, and Chad	26 October 1963	To promote the co-operation among the Member States and to ensure integrated development of the Niger Basin in all fields, by developing its resources particularly in the fields of energy, water resources, agriculture, animal husbandry, fishing and fisheries, forestry exploitation transport, communications, and industry.
Lake Chad Basin Commission	Lake Chad; Chari-Logone; Komadugu-Yobe	Maga Dam	Multilateral	Nigeria, Chad, Niger, Cameroon	22 May 1964	To intensify Member States' cooperative efforts in the economic development of the Lake Chad Basin, a specific area defined as the conventional Basin with particular attention to surface water utilisation but also extending widely to agriculture, livestock, minerals, industry, transportation, and telecommunications.
Niger-Nigeria Joint Commission	Niger	Kainji	Bilateral	Niger and Nigeria	3 March 1971	To have the general and exclusive jurisdiction to identify the several ways and means of coordinating and harmonising the economies of the two countries in all fields to achieve increased and more effective cooperation between them.
Cameroon-Nigeria mixed Commission	Benue; Lake Nyos; Katsina-Ala	Lagdo dam	Bilateral	Nigeria and Cameroon	15 November 2002	To facilitate the implementation of the 10 October 2002 judgment of the International Court of Justice (ICJ) on the Cameroon-Nigeria boundary dispute.

## Appendix D: Federal government capital expenditure for water and agriculture in the national development plans

Plan	Years	Projected Resources (N million)	Water (Other than Irrigation) (%)	Agriculture (%)
10-Year plan	1945–1955	NA	NA	NA
Development programs	1955–1961	NA	NA	NA
First	1962–1968	2434	3.6	13.6
Second	1970–1974	9051	5.8	n/a
Third	1975–1980	43,783	2.8	5.0
Fourth	1981–1985	96,968	0.4	11.1
Fifth	1988–1992	n/a	n/a	n/a

**Source:** Author

## Appendix E: The World Bank Agricultural Development Programs

	Program Name	Loan Amount (US\$ million)	Loan Approval (Year)	Loan Closed (Year)	Completed (Year)	Water Supply Component				Project Evaluation Ratings	
						Planned		Completed		Sustainability	Overall Assessment
						Dams	Others	Dams	Others		
First generation: Enclave ADPs	Funtua ADP	29	1974	1982	1982	85	0	45	0	Likely	Satisfactory
	Gusau ADP	19	1974	1982	1982	85	0	47	0	Likely	Satisfactory
	Gombe ADP	21	1974	1982	1982	85	0	40	0	Likely	Satisfactory
	Lafia ADP	27	1977	1984	1985	0	400	0	259	Unlikely	Unsatisfactory
	Ayangba ADP	35	1977	1985	1985	0	0	0	24	Unlikely	Unsatisfactory
	Bida ADP	23	1979	1987	1990	0	0	0	0	Unlikely	Satisfactory
	Ilorin ADP	27	1979	1988	1992	0	0	0	0	Uncertain	Unsatisfactory
	Òyó North ADP	28	1980	1988	1989	40	300	12	1391	Uncertain	Unsatisfactory
Ekiti-Akoko ADP	32.5	1980	1986	1986	35	0	0	0	Uncertain	Unsatisfactory	
<b>Total</b>		<b>241.5</b>				<b>330</b>	<b>700</b>	<b>144</b>	<b>1674</b>		
Second generation: State-wide ADPs	Bauchi state ADP	132	1981	1989	1989	25	1300	0	1480	Uncertain	Satisfactory
	Kano state ADP	142	1981	1989	1990	0	1000	0	1659	Uncertain	Satisfactory
	Sokoto state ADP	147	1982	1990	1990	0	1200	32	3500	Uncertain	Unsatisfactory
	Kaduna/Katsina ADP	122	1984	1994	1995	48	1420	9	1302	Uncertain	Satisfactory
	South Borno ADP	25	1986	1994	1994	0	910	0	437	Likely	Satisfactory
<b>Total</b>		<b>568</b>				<b>73</b>	<b>5830</b>	<b>41</b>	<b>8378</b>		
Third generation: Multistate ADP	First Multistate ADP	162	1986	1995	1995	0	2574	0	1684	Likely	Satisfactory
	Second Multistate ADP	85.2	1989	1995	1995	0	975	0	443	Likely	Satisfactory
	Third Multistate ADP	100.9	1989	1996	1997	37	970	5	472	Uncertain	Satisfactory
<b>Total</b>		<b>348.1</b>				<b>37</b>	<b>4519</b>	<b>5</b>	<b>2599</b>		
<b>Grand Total</b>		<b>1157.6</b>				<b>440</b>	<b>11,049</b>	<b>190</b>	<b>12,651</b>		

Source: Author

## Appendix F: Number of newly drilled boreholes to meet water demand of 2030

State	Urban/Semi-Urban/Small Town			Rural			Overall Total	
	Motorised Pump			Motorised Pump				Hand Pump
	200 m	50 m	Total	200 m	50 m	Total		
Abia	108	215	323	78	63	140	1217	2144
Adamawa	29	546	575	50	295	345	3116	4956
Akwa Ibom	133	45	178	215	34	249	2242	3096
Anambra	71	76	147	189	54	243	2266	3046
Bauchi	141	333	474	234	270	504	4661	6617
Bayelsa	208	0	208	56	0	56	542	1070
Benue	16	218	234	23	326	349	3066	4232
Borno	353	303	656	311	106	418	3910	6057
Cross River	18	161	179	40	145	185	1595	2323
Delta	208	0	208	178	0	178	1612	2384
Ebonyi	0	0	0	4	203	206	1867	2280
Edo	145	234	379	139	95	234	2078	3304
Ekiti	0	101	101	0	88	88	792	1170
Enugu	95	1180	1275	79	165	244	2087	5125
Gombe	33	525	558	53	169	221	2011	3570
Imo	212	243	455	226	98	324	3014	4572
Jigawa	317	210	527	176	49	225	2044	3548
Kaduna	2	168	170	1	246	248	2298	3133
Kano	26	542	568	115	596	711	6804	9362
Katsina	335	975	1310	143	325	468	4328	7884
Kebbi	228	278	506	161	109	270	2317	3869
Kogi	95	374	469	79	154	233	2085	3489
Kwara	19	200	219	13	73	85	759	1368
Lagos	0	0	0	33	0	33	286	352
Nasarawa	22	110	132	29	90	119	937	1439
Niger	179	184	363	129	134	263	2272	3524
Ogun	0	0	0	154	73	226	1925	2378
Ondo	20	185	205	54	153	206	1869	2692
Osun	0	146	146	0	140	140	1200	1772
Òyó	2	89	91	6	251	258	2386	3083
Plateau	12	347	359	25	299	324	2926	4292
Rivers	322	0	322	309	0	309	2956	4218
Sokoto	246	539	785	150	45	195	1580	3540
Taraba	15	430	445	33	238	270	2470	3901
Yobe	183	99	282	183	20	203	1808	2778
Zamfara	39	337	376	64	194	258	2408	3676
FCT Abuja	25	1397	1422	10	74	84	804	3816
<b>Total</b>	<b>3857</b>	<b>10,790</b>	<b>14,647</b>	<b>3736</b>	<b>5369</b>	<b>9105</b>	<b>82,538</b>	<b>130,042</b>

**Source:** (Federal Ministry of Water Resources & JICA, 2014c)

## Appendix G: Post-independence political changes and water resources development in Nigeria 1960-2021

Timeline	Republics	Presidents / Heads of State	Political system	Nature of change	Political structure	States/ Regions	Local government councils	National development plans	Water-related enactments	Revenue sharing / allocation
October 1, 1960 – 1963	First Republic	Abubakar Tafawa Balewa	Democratic	Democratic	Regional	3		First plan 1962-1968	1963 constitution	Raismann Commission
1963 – January 15, 1966			Democratic	Democratic	Regional	4				
15 January 1966 – July 28th 1966		Gen Aguiyi Ironsi	Military	Coup d'état	Unitary	0				Binns Commission
July 28th 1966 – July 29th 1975		Gen Yakubu Gowon	Military	Coup d'état		12		Second plan 1970–1974		Dina Commission
July 29th 1975 – 13 February 1976		Murtala Muhammed	Military	Coup d'état	Federal	19 + FCT		Third plan 1975–1980	Decree 25 of 1976–RBDAs	Aboyade Commission
13 February 1976 – 30 September 1979		Olusegun Obasanjo	Military	Coup d'état	Federal				Decree 6 of 1978–Land use	
October 1 1979 – December 31 1983	Second Republic	Shehu Shagari	Democratic	Democratic	Federal		449	Fourth plan 1980–1985	Decree 87 of 1979; 1979 constitution	Okigbo Commission
December 31 1983 – August 28 1985		Muhammadu Buhari	Military	Coup d'état	Federal					
August 29 1985 – November 17 1993	Third Republic	Ibrahim Babangida	Military/ Democratic	Coup d'état	Federal	21 in 1989, 24 in 1991, 30 + FCT	774	Fifth plan 1985–1990	1989 and 1992 constitution	Cookey Commission
17 November 1993 - May 29th 1999		Sani Abacha	Military	Coup d'état	Federal	36 + FCT in 1995			Decree 101 of 1993–water resources	
May 29th 1999 – May 29 2007	Fourth Republic	Olusegun Obasanjo	Democratic	Democratic	Federal	36 + FCT in 1995	776	Millennium Development Goals (MDGs)	1999 constitution	
May 29th 2007- May 5th 2010	Fourth Republic	Umaru Musa Yar'Adua	Democratic	Democratic	Federal	36 + FCT in 1995	776			
May 5th 2010 – May 29th 2015	Fourth Republic	Goodluck Jonathan	Democratic	Democratic	Federal	36 + FCT in 1995	776			
May 29th 2015 – present	Fourth Republic	Muhammadu Buhari	Democratic	Democratic	Federal	36 + FCT in 1995	776	Sustainable Development Goals (SDGs)		

## Appendix H List of RBDAs

<b>RBDA</b>	<b>Area of Operation</b>	<b>Office</b>
Anambra-Imo River Basin Development Authority (AIRBDA)	Abia, Anambra, Ebonyi, Enugu and Imo States	Owerri
Benin Owena River Basin Development Authority (BORBDA)	The regions of the River Benin and Owena and the senatorial district in Delta State	Benin-City
Chad Basin Development Authority (CBDA)	Borno, Yobe State and northern part of Adamawa State	Maiduguri
Cross River Basin Development Authority (CRBDA)	Akwa Ibom and Cross River States	Calabar
Hadejia Jama' Are River Basin Development Authority (HJABDA)	Kano, Jigawa States and north and central parts of Bauchi State	Kano
Lower Benue River Basin Development Authority (LBRBDA)	The catchment states of Benue, Plateau, Nasarawa States and Kogi State East of the River Niger	Makurdi
Lower Niger River Basin Development Authority (LNRBDA)	Entire geographical boundaries of Kwara State and a part of Kogi State, west of the River Niger	Ilorin
Niger Delta Basin Development Authority (NDBDA)	Delta and Bayelsa States	Port Harcourt
Ogun-Osun River Basin Development Authority (OORBDA)	Lagos, Ogun, Oyo and Osun States	Abeokuta
Sokoto-Rima River Basin Development Authority (SRRBDA)	Katsina, Zamfara, Sokoto and Kebbi	Sokoto
Upper Benue River Basin Development Authority (UBRBDA)	Gombe, Taraba, two senatorial districts of Adamawa State and one senatorial district of Bauchi State	Yola
Upper Niger River Basin Development Authority (UNRBDA)	Niger, Kaduna States and the FCT	Minna

**Source:** (Federal Ministry of Water Resources & JICA, 2014a)

# Appendix I: Additional literature review

## *1.1. Disciplinary orientations in power analysis*

### **1.1.1. Political science and power**

Over the last decade, the application of ideational power has expanded into power analysis in dams (Lavers & Dye, 2019), water governance (Harrington, 2017; Warner et al., 2017; Williams et al., 2018), water infrastructure development (Adeniran & Daniell, 2020), climate change adaptation (Vink et al., 2013), policy studies (Berman, 2013), cultural studies (Batteau et al., 2018), business (Bell, 2012), and across different disciplinary backgrounds; for example, political economy (Blyth et al., 1997), political science (Hay, 2002; Schmidt, 2017), and political ecology (Schulz, 2017). Vivien Schmidt and Martin Carstensen have done much work in theorising and improving the analytical efficacy of ideas and ideational power in discursive and constructivist institutionalism (Carstensen, 2011; Carstensen & Schmidt, 2016; Schmidt, 2010). However, their work is largely confined to political science literature. With this ideational turn in political research and the essential role ideational power plays in the formation of structures (Bell, 2012; Carstensen, 2015; Carstensen & Schmidt, 2016; Schmidt, 2017), recent calls for addressing ecological governance as ideational constructs have been made (Harrington, 2017). These theorists draw their definitions of ideas from constructivist philosophers such as John Searle and Peter Berger. However, many approaches that generally fit under the discursive institutionalist umbrella do not theorise power but instead simply state that ideas have power (Larsson, 2018).

Discussions about the role of ideational structures, resources, elements, and factors often do not account for what constitutes this structure. One of the central distinctions between Larsson's poststructural institutionalism and Hay and Schmidt's constructive/discursive institutionalism goes back to one of the central debates in the structure-agency debate: that is, in analysing institutional change, what level of agency should be given to individuals or actors in that process? (Larsson, 2018). Larsson is also concerned about neo-institutionalism's tendency toward methodological individualism due to voluntarism, which encourages researchers to take things unseen for granted (Bourdieu, 2000). It is similar to Colin Hay's intersubjective description of the constitution of actors (Hay, 2017). Methodological voluntarism is the attempt by structuralist scholars to decentre individuals and groups from the relations of power and to place the burden of change on them. I suggest that Larsson's fear could be managed by following Bourdieu's suggestions on methodological polytheism (Bourdieu & Wacquant, 1992). Methodological polytheism offers a way to confront the "conventional opposition between established techniques of inquiry of quantitative studies and qualitative investigations" (Wacquant, 2018a, p. 92).



Attempts by institutionalists to integrate agential tendencies into power analysis have focused mainly on ideational power and the role of ideas in socioecological governance. Often, the field is dominated by institutionalist analyses of the governance of the commons with their rational choice theories (McGinnis & Walker, 2010; Ostrom, 2015). More recently, critical institutionalist researchers such as Luke Whaley and Frances Cleaver have provided vital insights into water governance analyses that emphasise place, culture, power and knowledge in decision-making processes (Cleaver & Whaley, 2018). Institutional literature generally conceptualises power and institutional authority as operating from a *power centre* (Harvey, 2010). Bennett et al. (2018) attempt to bridge the theoretical gap between political ecology and institutional approaches by developing a typology of interactions between power and institutions in environmental governance. This typology draws on the notion of *power constructs* to define poststructuralist political ecology, which differs from *power structures* used in political economy approaches, commonly referred to as neo-Marxist approaches. Discourses and identities are "more contingent, ephemeral, and empirically specific concepts" examples of power constructs that influence institutions and vice versa (Bennett et al., 2018, p. 337).

### **1.1.2. Political ecology and power**

Political ecology has offered the most sophisticated integration of power analysis in socioecological governance, mainly due to its integration of more-than-human thinking (Latour, 1995; Jassanoff, 2015). Political ecology has advanced power research the most, with an increasing focus on the poststructuralist, neo-Marxist application of Michel Foucault's ideas or its combination with other theorists of power (Heiskala, 2001; Reed, 2013). Svarstad et al. (2018) proposed a synopsis of power perspectives in political ecology literature and identified three strands of power analysis. First, actor-oriented perspectives emphasise how actors exercise power, taking power as relational, intentional, and causal. This approach indicates that power is *held* by particular actors that may be sedentary or nomadic, occupying different spaces at different times (Svarstad et al., 2018). Second, neo-Marxist approaches highlight the substantial and enduring influence of structures as a predetermining factor for individual agency and actions, hence the construction of inequalities and injustices. Third, the poststructuralist account shows the disproportionate application of Foucaultian *governmentality* (Soyland & Kendall, 1997), disciplinary and discursive power, and the scant use of biopower and constitutive nature of power in socioecological analyses (Ahlborg & Nightingale, 2018).

In a political ecology analysis, Ahlborg & Nightingale (2018) combine a poststructuralist account of power with an actor-centred approach by linking human agency with sociotechnical studies. Their interpretation and understanding of power "as relational and productive" (2018, p. 390) helps show the constitutive form of power and the mediation between intentional action and

technology. They highlighted four *locations* where power interplay emerges in access to electricity in rural Tanzania. The over-concentration of Foucaultian interpretation of power relations poses a significant risk, especially for African countries. Many of these analyses use the Foucaultian governmentality lens that analyses discursive devices much more than nondiscursive mechanisms of power. This *Foucault effect* has dominated social theory and the analysis of power, specifically its application in socioecological research (Nustad & Swanson, 2021; Szokolczai, 1993).

This challenge suggests that more must be done to capture, explore, and describe the symbolic or abstract spaces (Bourdieu, 1989b), where nondiscursive devices inform human practices and act as the primary organising principles of intentional practices. Realising the effect of nondiscursive devices on disciplinary techniques informed Foucault's decision to almost dump the idea of the episteme wholly and reimagine the *dispositif* (apparatus) (Dreyfus & Rabinow, 2014; Foucault, 1980). Soyland & Kendall (1997) documented scholars' misuse of Foucaultian concepts in discourse analysis. They argue that scholars' application of Foucaultian discourse analysis neglects a fundamental aspect of Foucault's method, the *condition of possibility*, under which a specific discursive formation emerges to produce a regime of truth. Methodologically, this neglect of Foucault's method ignores the role of history and genealogies in examining the rule of formation of any discursive device. A second limitation of Foucault's work and its application is the lack of attention to the individual's ontological condition or position in a space Foucault described as the "field of strategic possibilities" (Foucault, 1972b, p. 39), a system of dispersed choices where individual labour on the self is restricted to that system. The third is the situated nature of governmentality, which owes its emergence to the analysis of governmental relations of power in the West. Such conceptualisation suffers when extrapolating the concept to other regions of the world, particularly African countries where multiple *sovereignties* exist at different levels (Magrath, 2010), and its use in community water governance (Rolfe, 2018; Rose & Miller, 2010).

A significant observation is that the empirical literature on power overwhelmingly demonstrates the excessive focus on *power over*, mainly highlighting how individuals and governments exercise power, resources, and means through different political technologies. Two crucial questions arise from these theorisations of power as *exercised*, thereby *held*, at the same time, constitutive and relational as it links different objective entities. First is the emphasis on the *where* of power, indicating that power exists in a particular topological space (Allen, 2016a). The second point links into the first, the *exercise* of power, suggesting the existence of space, a location, an arena within a social space that is both physical and abstract (Bourdieu, 1989b). The belaboured question of *where* requires we revisit the congruence of *what*, *how* and *where* of power relations from a relational perspective.

## ***1.2. Political change***

Power transition (Organski, 1959) research in political science is traditionally focused on macropolitical changes among modern nation-states. It is applied extensively in international politics, conflicts, and institutional changes (Kinsella, 2013; Lemke, 1997; Wax, 1971). Therefore, hierarchy, power and satisfaction are central components of this theory (Tammen et al., 2011). The structural and dynamic attributes of power transition theories are helpful in representing structural actors (states) linked together by power. Critics of the power transition theory (Dicicco & Levy, 1999; Harris, 2014; Lebow & Valentino, 2009) have raised important questions about some of its central assumptions. Harris (2014) delivered a blistering critique of the theory and captured these problems as threefold: the theoretical challenge; empirical challenge, and practical challenges. Harris questioned the central assumption of a predetermined condition as a major theoretical limitation of traditional power transitional theory. He believed that these three problems are rooted in what he termed the vanishing disparities in power as an explanatory factor:

The main theoretical problem is that a vanishing disparity in national power is characterised as an independent variable—something that causes particular outcomes in the context of shifting power—while at the same time being, by necessity, a scope condition to the argument—an essential, defining feature of all power-transitions. In other words, the theory's explanatory variable does not vary; one value (the imminence of a power-transitional moment) always is observed, while the other conceptually possible value (the preservation of a disparity in power) never is observed. (Harris, 2014, p. 252)

Such criticisms and reviews have pushed proponents of the theory to adjust the connotation of power from purely economic-relational terms (economic parameters such as GDP; wealth became a determinant of power) to more immaterial or rather subjective elements such as satisfaction and trust (Kugler & Organski, 1989; Tammen et al., 2011). However, these elements are still presented as a gamut of statistical parameters (Reed, 2000) to determine what constitutes, say, dissatisfaction (Lebow & Valentino, 2009). Regardless of these challenges, power transition theory still is a useful theoretical tool for analysing the structural evolution of states within a world system. Two main difficulties in scaling this theory to domestic/local level political governance analysis exist. First, the concept of the preceding conditions of change, where power transition theory suggests a violent transition between governments, does not adequately explain intranational conditions of transitions in political systems (Harris, 2014). This objection can be a tenable position for some states that emerged and evolved from brutal conflicts. However, states like Nigeria, with a mixture of violent (military) and smooth (democratic) transitional processes, are an aberration under this condition. The second challenge is the state-centric approach to power transition. Power transition theory solely engages with a study of state forms, its institutions and

dominance over other political entities, neglecting the fragmented nature of contemporary governance systems.

Conceptualising political change poses a critical challenge in political analysis due to the complexity of the actors, their interests, and power relationships (Hay, 2002). Central to this analysis is the state, its (re)imagining and (re)creation, the power relations amongst its organs and rules, and how these power relations shape the trajectories of water infrastructure development. Migdal's state-in-society approach conceptualises the state as a "field of power marked by the use and threat of violence and shaped by the image of a coherent, controlling organisation in a territory, which is a representation of the people bounded by that territory, and the actual practices of its multiple parts" (Midgal, 2004, p. 16). State power is reinforced or diminished by projecting a state's image and its actors' calculative and performative practices on society (Sharma & Gupta, 2006).

The pervasive effect of state power on every facet of society is noteworthy because it becomes objectified and observable months or decades after the moments of change. Poulantzas refers to these moments as "political and ideological" (Poulantzas, 1978, p. 43), and which Jessop argued "opened up the theoretical space for thinking about the economic, political, and ideological moments of other sets of social relations, such as state apparatus and the exercise of power" (Jessop, 2017b, p. 191). Revolutionary and sometimes reactionary changes that occur from political struggles and contestations may result from internal dissent within the military hierarchy or the political class, sometimes because no agitation from large sections of society motivated the successive coup d'états and countercoups. Thus, the routine and flagrant contravention of the 'rules of the game' within the military, sometimes with unimaginable ferocity, cannot be explained. Thus, it challenges the theory of state orderliness and the image of a unified entity. The state, through its institutions and apparatus, not only builds or reinforces images of itself in the eyes of the people through their performance, but also repeatedly attempts to (re)create and (re)produce an image for subordinate levels of power using narratives that frame those entities in its intended objective.

Drawing on Gramscian interpretation of power (Gramsci, 1971), Poulantzas sees ideological moments as "subjectivities" concerned with the micro- and intra-relations within labour processes and their effect on contextual and geographical experiences. In comparison, political moments relate to the production and exercise of authority "around labour processes and relations" (Poulantzas, 1978, p. 43). Midgal's position considers these moments as "moments of original sin" where the researcher's task is to "search for the event or condition or crossroads that one can read back to from the present to see how the current state of affairs came to be" (Midgal, 2004, p. 24). Beyond labour relations and processes, the task here is to extend the analysis of political and ideological moments by interrogating how and what ideas and practices connect structural

changes in political governance to water supply infrastructure production and distribution in Nigeria. Water infrastructure is a crucial aspect of these social relations because of the multiple entities and histories that define their production, and the centrality of power and knowledge relations within the production process.

## Appendix J: Power and development research and practice

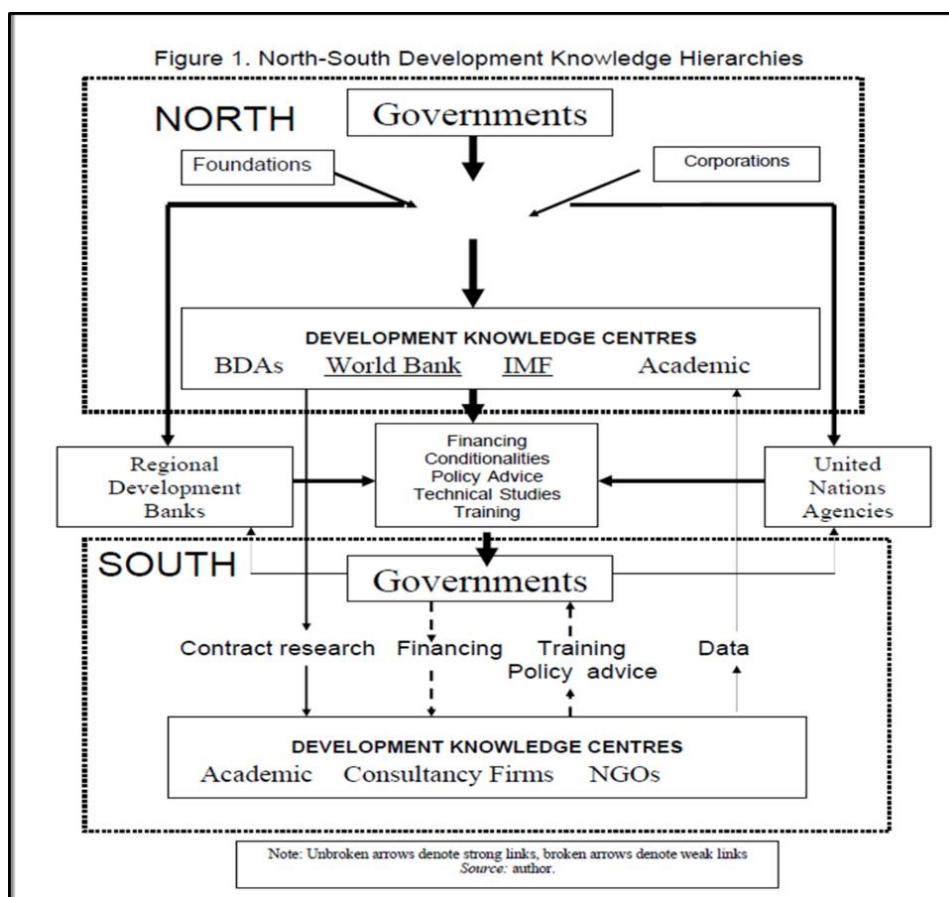
### ***J.1. Power and knowledge in the world systems***

In practice, knowledge production and distribution through discourses form a central part of the exercise of power, and development discourse itself is one form of hegemonic control over 'underdeveloped' countries (Escobar, 1984). Professionalisation through formal training and knowledge transfer schemes, and institutionalisation through the establishment of institutions and organisations through which specific forms of development interventions occur, this discourse calls into question the agents used in the process (Escobar, 1988). Hence, my conception of power relations in development proceeds from a definition of development as:

an apparatus (dispositif) that links forms of knowledge about the Third World with the deployment of forms of power and intervention, resulting in the mapping and production of Third World societies. In other words, development is what constructs the contemporary Third World, silently, without our noticing it. By means of this discourse, individuals, governments and communities are seen as "underdeveloped" (or placed under conditions in which they tend to see themselves as such), and are treated accordingly. (Escobar, 1992, p. 23)

Within the gradient of reality of the development process, specific paradigms are set in place that seek to transplant different regimes of *normal* or *acceptable* practices, say in health and nutrition, and education (standards, type, pedagogy, content). These knowledge regimes uphold a certain kind of order, a hegemonic order that occurs within a world system between the global North and the global South (Figure J-1). In this sense, what is often referred to as hegemony, the unity of multiple discursive practices and strategies that internally cohere in the domination of specific groups of people (Gramsci, 1971), is that reality. It can thus be used to reproduce discourses and to articulate systemic forms of domination, a kind of power held by development practitioners (Escobar, 2012). This power is often synonymous with the idea of *power over* or *power to*; that is, power over specific peoples and power to transform their lives and livelihoods according to the powerful individuals' (or groups') worldviews. This is one aspect where power and development research and practice intersect, which requires interrogating how new forms of societal conditions and agents transform less powerful societies and communities globally. The positions and maneuvers used to negotiate, and bargain (towards a particular objective), and the underlying contextual specificities of the development marketer cum interventionist and the receiver, are essential elements in a hegemonic relationship that determines whose values are invaluable (Anderson et al., 2016). The effect of hegemonic order transcends the global structures.

It affects individuals as much through a process of subjectification (Foucault, 1982), whereby individuals participate in this relationship by imbibing the prescribed ways of knowing and seeing the world. Such epistemic adjustments to hegemonic prescriptions are a subject of research in development scholarship (Maldonado-Torres, 2013).



**Figure J-1: North-South development knowledge hierarchies. (Girvan, 2007)**

The epistemic hegemony that underpins development itself has a structuring effect on the custodians of hegemony itself. It enacts a *custodian effect* whereby the idea of relinquishing or imagining a post-development or new form of development in itself is ontologically impossible. Claude Ake argues that this hegemony occurs through the social science disciplines, particularly political science, economics and sociology which he labelled *academic imperialism* (Ake, 1979). He argues that Western social science on the Third World is an imperialism “that produces some attitudes of mind which it inculcates” (Ake, 1979, p. Intro). In this sense, epistemic hegemony is an ontological relationship of power tied to specific cultural inclinations.

What is often referred to as cultural hegemony in development research (Fischman & McLaren, 2005; Swartz, 1998) is marketed by specific entrepreneurs of whom intellectuals and practitioners are central (Böhm & Brei, 2008). Cultural or epistemic hegemony itself is a form of

knowledge of self and environment that needs deconstruction (Deleuze & Guattari, 2000; Dillet, 2017). In this regard, development practitioners must be mindful of themselves as a vehicle for projecting their already embodied hegemonic discourses onto individuals and groups (Deleuze & Guattari, 2000). For example, the community management model developed in the late 1950s and early 1960s by the World Bank, re-formulated and re-designed in the 1970s and 1980s by academics and practitioners, is now facing an existential crisis (see Whaley and Cleaver (2017). This crisis is partly due to its development in the West and its project approach as a development framework (Harvey & Reed, 2007). Similarly, the disparity between the global North and South in political ecology research, whose primary focus is on power relations, requires a change in knowledge generation and production systems. Schubert (2005, p. 28) considers this the power of "who holds interpretive dominance", despite the emergence of political ecology from an analysis of development issues in the global South. This knowledge discrepancy raises another challenge with the epistemic and ontological nature of power relations and the production of the subject (individuals and groups).

The historical reality is that all the faculties of development discourse are still domiciled in the global North. This spatial reality demands that the responsibility of change and transformation is incumbent upon the custodians of these faculties due to their legitimacy, the power they hold and their proximities to the citadels of knowledge production, distribution, and validation. Achieving this will require shifting away from what John Allen considers the "spatial trappings" of power (Allen, 2004, p. 19). It is to simply not talk and think about power "as centralised or distributed, concentrated or diffuse, deterritorialised or dispersed even," but to have "a more spatially-curious dialogue of power... as a topological arrangement – as a relational effect of social interaction" (Allen, 2004, p. 19). The key concern is to understand how "the practices that fall under the benign heading of *power to* make things happen, to facilitate progressive outcomes, yet often end up constraining more possibilities than they enable" (Allen, 2016, p. 149). This would mean that we account for the primary role of language in deconstructing development discourse, particularly in participation and knowledge (Cornwall, 2007; Cornwall & Brock, 2005).

A second challenge is the state-centric notion of power. Joe Painter describes the role played by political geographers in the formulations, definitions, and analyses of power where "state, power, and territory formed a kind of Holy Trinity" (Painter, 2015, p. 141). Despite the significant breakdown of this hegemonic view of power (at least in the academic – theoretical and empirical – space), translating that knowledge into praxis remains a crucial challenge (Whaley, 2018). Development practice has historically been the purview of nation-states, with most relations occurring on a bilateral or multilateral basis (Bradlow, 2015; Bryant & Bailey, 1997; Williams, 1988). The acknowledgement of inequality within the development architecture by the World



Bank as a result of power imbalances (World Bank, 2016) signaled a step in centering power more actively at the global level of authority. One problem is that the World Bank isolated this inequality from the broader organisation of states and institutions, markets, and economic structures (Kashwan et al. 2019). Historically, these relations of power and the institutions underpin their attempt at social change and transformation and their mode of engagement with developing countries (World Bank, 2001; García López et al. 2017).

When examining structural power relations (i.e. those within and between actors as they navigate and construct patterned social arrangements in their society, such as family, religion, and organisations), the Three Faces of Power (Lukes, 2005) were and still are influential within development research and practice. However, it is a fairly simplistic theoretical view of power as it does not go far enough to elaborate on the mechanisms and strategies through which the effects of power over another can be exhaustively examined, nor does it explain how people are exercised by power or participate in their domination (Allen, 2004). Lukes' focus on the interests of the agents raises a key concern because individual interests are always preceded and defined by the stake of social or political struggles (Bourdieu, 2018). People do not *decide* or defend their interests in isolation from others. Nearly two decades ago, Jonathan Gaventa suggested that new approaches and tools for analysing power in development should be multimodal, able to simultaneously acknowledge discourses, contextual situations, and strategic abilities of actors' including how they deploy them (Gaventa, 2003). Three specific areas are considered essential to development practitioners as individuals within their own rights and as individuals inextricably linked to their specific institutional orders and regimes. First, how can development practitioners identify and critique strategies and tactics of power they use and are used by their collaborators, competitors, and recipients of their projects? Second, how should development practitioners operate within their institutional set up, especially in estimating the extent to which the rules and expectations of their organisations shape praxis? Third, how do they evaluate power, privilege, and bias (Stirling & Mitchell, 2018)?

These questions require three practical but critical views of development. First, the difficulty of predicting the future, whatever shape of form development takes, requires adopting a pluriversal view of power and development practice (Escobar, 2014, 2015, 2018). It can also imitate one that imagines multiple pathways to achieving multiple-defined overarching development objectives for human livelihoods (Leach et al., 2007, 2013) in an uncertain future (Scoones & Stirling, 2020). Fundamentally, pursuing this pluriversal approach must jettison the colonial roots of development logic and practice (Mignolo, 2007a; Schulz, 2017). The second point relates to the first in that the individuals and groups (development practitioners) who hold custody of the rationales, modalities, and strategies (ensemble of power) of development discourse will need to enrol themselves in the social and political reengineering of self in order to

accomplish the desired transformations. Essentially, it requires paying attention to intentional designs grounded in reflexivity and aspires to objectives that are fair, balanced, and just as they navigate the realms of things and human needs and desires (Svarstad et al., 2018). Through this theorising, we can empirically advance the study of *power within* (Gaventa & Cornwall, 2006; Gaventa, 2003; Kabeer, 1994) and the internal processes that generate *power over* (which has dominated our understanding of power) in societal interactions. This direction would guide us away from disciplinary orientations that are accustomed to rigid epistemological and ontological thinking and praxis and explore analytical and methodological approaches to power necessary for this intellectual exercise.

## ***J.2. View on power and development***

From these theoretical and methodological conceptions of power developed by Bourdieu and Foucault, I explore power in this thesis. The scope of my engagement with their work is limited to the conceptual insights they offer on the problematics of power and development that I highlighted in the literature review. It caters to what Ciara Cronin highlights as one of the limitations of applying Foucault, its inability to account "for the inner, reflective dimension of personal identity and thus seems to reduce the subject to a collection of acquired behavioural reflexes" (Cronin, 1996, p. 73). I deploy Bourdieu to plug this lack of attention to the cognitive processes of power relations and the specific role played by language, strategies, and action in that arena. Power relations are viewed as "an action upon an action, on existing actions or on those which may arise in the present or the future" (Foucault, 1982, p. 789). I acknowledge the symbolic power as a *power to* "make groups," a subordinate power, that is a transformed – misrecognizable, transfigured, and legitimated – form of the other forms of power (Bourdieu, 1989b, p. 23).

These actions are analysed as an "antagonism of strategies" (Foucault, 1982, p. 780), a process of social and political struggles that contains the logic, properties, and practices of resistance. Using specific strategies, we/they are recurrently presenting a rational representation of 'truth' by exercising our/their power of worldmaking (Bourdieu, 1989). Social and political struggles do not by themselves exist without a particular stake of struggle because it is to this stake that people deploy their strategies for negotiation, resistance, acquiescence and detachment/disinterest. Thus, the third leg of the trifecta of a conceptual and empirical analysis of power will register the stake of social and political struggles.

Development practice today presents many challenges in relation to power largely due to the disintegration of homogeneous legitimacy of the groups; for example, state, community, society, and experts. The increasing acceptance of the state's vulnerability as a heterogeneous entity and

the increasing understanding of how intragroup relations of power produce authority constitute the competing modes of concrete power relations. This has made a pragmatic account of power an indispensable feature of the future of power and development practice. This pragmatic account of power concerns itself with the "legitimation of legitimacy" (Haugaard & Clegg, 2009, p. 31) of a group within a social structure and how it allots legitimacy both to the structure and the individual(s) representing and operating within it. Pierre Bourdieu's social theory comes in handy here. By inciting us to see analysis of power beyond the *relations of forces*, or the *effects of the exercise of power*, Bourdieu breaks with the substantialist tradition by declaring that:

A unified science of practices must supersede the choice between energy models which describe social relations as relations of force, and cybernetic models which make them relations of communication, in order to describe the transformational laws which, govern the transmutation of the different forms of capital into symbolic capital. (Bourdieu, 1979, p. 83)

Bourdieu encourages us to distance ourselves from the binaries of force or communication. These forms of absolutism/universalism ignore the fact that wastage and loss are not properties of human practices once we can access the symbolic spaces of power. Thus, he concludes that to understand power:

The crucial process to be studied is the work of dissimulation and transfiguration (in a word, euphemization) which makes it possible to transfigure relations of force by getting the violence they objectively contain misrecognised/recognised, so transforming them into a symbolic power, capable of producing effects without visible expenditure of energy. (Bourdieu, 1979, p. 83)

Beyond this, Bourdieu's work serves as a template for conceptualising change because his major works are centred around the theme of social reproduction and transformation (Gorski, 2013), despite the criticism of its inability to explain or conceptualise structural resistance or change. Nevertheless, how could a theorist/philosopher whose central concern is about history, temporality, and change not bother with societal change and transformation? Fowler (2020) has written a strong repudiation of these claims, elaborating on the different stages of Bourdieu's intellectual development and works that specifically address subjects of social transformation, especially his work on hysteresis (Bourdieu, 1990, 2000; Graham, 2020). Hysteresis allows us to map what exists; that is, what is latent in the spaces of developmental intervention, in order to discover the configurations and forms of power relations effecting the different changes. These categorisations can be observed through practical knowledge of the context and setting where this change takes place and differ in essence from a description of the space, a knowledge that considers what "pre-exists" (Bourdieu, 1990, p. 467) visible representations. The temporality

inherent in this process forces us to investigate the lag between competing statements or interactions.

### **J.2.1. Power as dispositions – Peripheries of power?**

Dispositions form a vital component of the political technology of individuals and carry great analytical usefulness. Power is as ontological and material interactions to produce meaning and action. When it interacts with externalities, human thoughts that result in actions are a product of internal power calculations. This Cartesian understanding of power, however, situated, is tangible as it can be processed in objective material realities; it is also psychical as shown in its dispositional attributes of the subject (individuals) in their daily discursive and symbolic actions. Dispositions of professionals have been shown to influence path-dependent practices in water management institutions (Molle et al., 2009) and among urban centres in the global South (Goodwin, 2018). All of these are generally political responses intended to generate specific responses (Allen, 2020). While the death of dispositional research has been predicted (House et al., 1996), Wacquant (2014, p. 122) believes that : "Dispositional theory of action is capacious enough to account for both regularity and deviation, conformity and innovation, reproduction and change."

Experience, meaning and differentiated practices that inform ideas and social actions are also affective and affected by the immanent nature of power fully represented in Bourdieu's habitus (Mouzelis, 2007). We must begin to anatomise the groups we have held bound from Marxist analytical positions (such as classes) and explore how such groups emerge to have strong structural and cultural influences (structuring and structured structures) with their instruments of domination. From an agent's perspective, we must demonstrate how symbolic power systems operate in their virtual fields (Foucault) of reasoning and meaning. The regulation of human relations and their relations to things within specific spatial demarcations using societal values, rules, and normative instruments (water policies, legislations, institutions) are good examples of the political. The politicised refers to the spaces of meaning, interpretations, thought processes and patterns, and the structures and influences that define and transform these imaginations. Integrating the complexity of agential power in the structure–agency continuum is necessary to understand, explain, and provide new formations and constructions of nature–society relationships. It must also explore different ontological positions that the structuring structures impose in decision-making and action. These distinctions will assist in identifying potential opportunities and much-needed latitude for collaborative negotiations.

## **J.2.2. Power as multi-sited and multi-located – Topological qualities**

Bourdieu's topological conceptualisation has validity beyond spatial configurations and boundaries and extends to the cognitive aspects of power analysis (Wacquant, 2018b). Power relations occur within a social space, a space that exists simultaneously as an abstract and physical space, inscribing itself in both spaces through the actions of agents and the appropriation of things (Bourdieu, 1989b, 2018, p.109). The *social space* is structured and characterised by "distributions" (Foucault, 1995, p. 143) or distinctions (Bourdieu, 1996) and the differentiation and stratification of agents and things.

This relationship between the individual's internal and external experiences and processes is complex and complicated, with power-defined constraints and considerations. All conjectures, assumptions, and considerations preceding an observable outcome within this process are power-defined and occur in a complex web of (un)intentionality, strategy, intuitiveness, and latency. Downey (2014) noted that analytical detangling of the (inter)subjective and material status and conditions of the individual is necessary if the full analytical potential of habitus will be realised. Peripheries of power see the margin as a centre, someone's centre of power or power nucleus, or a group's centre with its 'sovereignty'. It is a heuristic conceptual tool, and it is at once protean, allowing the researcher-practitioner to change or adopt methods and theories, and versatile, allowing the mutability between theory and practice and other knowledge-related dichotomies; for example, intentionality-unintentionality. These peripheries are also capable of being new powers and are in themselves the 'centres' of power. Peripheries of power also force us to investigate the unintentional strategies of power. Denoting its practice is, for example, useful in:

1. Identifying the various considerations and forms in which power structures the iterative process of decision-making, whether it is culture, religion, spirituality, politics or other forms of socially constituted realities;
2. Identifying particular elements that the subject considers unintentional privilege, which can be mapped to differentiate where strategy and intentionality play out;
3. Providing options for engaging more collaboratively when these considerations are disaggregated.

## **J.2.3. Time (history) – An essential component of power analysis and power relations**

Time is an essential attribute of power through which all empirical analyses of its *what, how* and *where* are encountered. For time and its relation to space (and place), the standardisation and uniformity it has attained require deconstructing to reveal the mode and intentions that constitute

it and whose benefit it serves. How time is mobilised and worked (legitimising specific actions or events in mental and physical spaces) opens up new theoretical and empirical research vistas, especially concerning contemporary socio-ecological changes. From the setting of global agenda (e.g., SDG goals by 2030) to the regulation of water abstraction times at a standpipe (e.g., 6 am - 9 am), disaggregating time and space (and things) as discursive formations allows the disaggregation of the extent of metamorphosis (change), sedimentary layering (overlaps), or metastasis (spread) of the time-space-thing continuum; more so, the nature of power relations.

Historical constitution of culture, as another critical organising principle of practice and power relations, allows us to begin power analysis from what power is embodied and therefore deployed at the functional sites and locales. The mobilisation of power is a process, and time or history forms a key part of this process. In the connections between human thought and societal practices, Foucault 1988 highlighted the essential nature of time and that it must constitute a central analytical modality because of the reconfiguration of the self. Philosophy and research methods must therefore seek answers to: "The permanent and ever-changing question, 'What are we today?' And that is, I think, the field of the historical reflection on ourselves" (Foucault, 1988, p. 145). This historical rationality (ibid. p 148) may help capture what is considered reasonable or foolish decisions and choices.

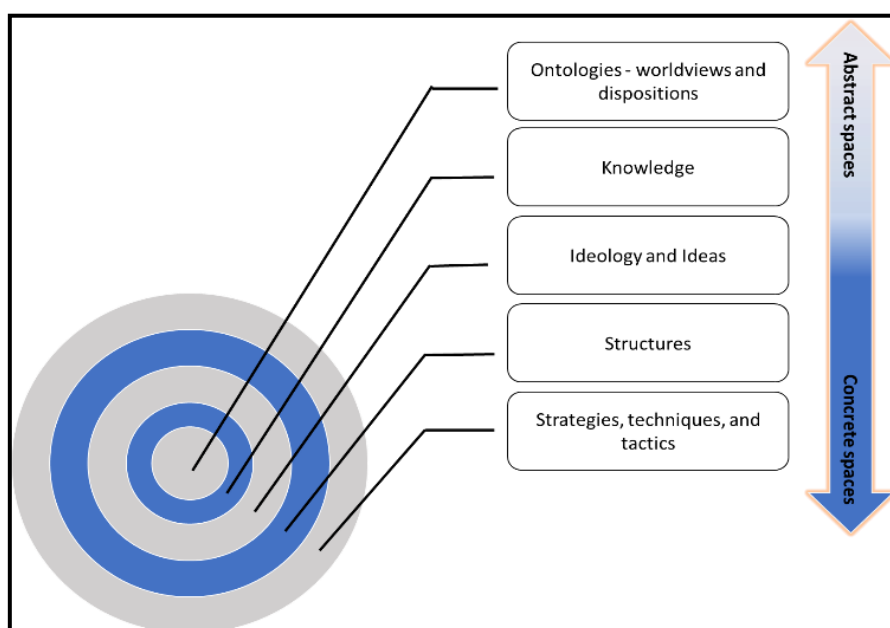
Historical political ecologists have done tremendous work in this regard (Mathevet et al., 2015; Offen, 2004). However, they tend to follow traditional historiographies that do not necessarily disrupt the status quo in profound or radical ways (Offen, 2012). Uncritical perspectives like this may be due to their faithfulness to institutional structures and processes in the analysis of power (Loftus, 2020). Offen (2004) agrees on the similarities between historical geography and historical political ecology. However, Offen declared the distinction as "historical political ecology shares an affinity with environmental history and historical geography, but its explicit attempt to view nature in light of social issues, and the political forces constraining them both, frequently sets it apart" (Offen, 2004, p. 22).

Foucault's genealogical approach and Bourdieu's hysteresis offer valuable insight in this regard (Fowler, 2020). Foucault's genealogy seeks to disrupt existing values that we are used to (Garland, 2014), which have taken an ontological reality for many. A critical realist observation is not only limited to the long search for the genesis of discourses and practices. It also interrogates the temporality that construct, deform, rehabilitate, repair, or destroy objects and other artefacts (infrastructure studies). Bourdieu's hysteresis allows us to probe the organising principle of not just the micro-exercise of power but also the internal and unintentional accumulation and working of power in the symbolic space.

## J.3. The power analysis framework

### J.3.1. Abstract spaces

An integration of Bourdieu and Foucault's theoretical works can be complementary and have broad and lasting implications on power analysis in four ways. First, they provide a theoretical basis for achieving a theory-praxis balance. Second, their understanding of power as relational, constitutive, causal, and generative is vital to situating an empirical analysis of power and human practice as mediating ontological and material spaces. Third is their recognition of history/time as indispensable methodological tools to our understanding of the construction of spaces – abstract and real – and the role of power relations in constructing social problems of inequity and justice. Lastly, the co-constitution of power is rooted in daily social and political struggles that enrol biological and ecological realities as strategies of power. Engaging the ontological aspects of power remains a key empirical and analytical problem in power analysis, concerning practical policy or political analysis (Stone, 2001), more so, across Africa (Whaley et al., 2019). A framework that allows us to engage, however inadequate, with the ontological principles of development actors and agents operating within specific contexts is of immense value in this regard. Without due recognition of ontological positions, it would be difficult to incorporate acquiescence, whereby an individual not only conforms to or resists power, as traditional classical liberal analysis suggests, but can participate in relations of power without engaging in either. Figure J-2 presents a power analysis framework that captures the different spaces where power can be domiciled.



**Figure J-2: Power analysis framework. Source: Author**

### **J.3.2. Power and Ontologies – Worldviews and dispositions**

Our worldviews and the basic assumptions we make interpret what is, how we exercise power and to what degree we are exercised by power. In this struggle between perception and reality, if, as Bourdieu noted that power operates as a dispositional attribute of groups and individuals that produce meaning and action, then, specific questions should be asked of the underlying justifications of judgements and decisions, regardless of the scope, time, and place of the decisions (or any stage in the life cycle of a project). Essentially, specific decisions pushed or made by other actors or floating around within the development space can be questioned for their ontological basis – the logic of the judgement. Answering these questions is critical to how development systems are negotiated and configured to produce measured outcomes. This way, we can "repudiate the universal subjects" (Bourdieu, 1989b, p. 18) and make space for what Schulz (2017) refers to as the *pluriversal view* (Escobar, 2015) that accommodates multiple ontologies in political ecology analyses, for example. This openness facilitates an intentional, potentially fair and balanced relationship of power between development actors and the recipients of development interventions (Ahlborg & Nightingale, 2018) and reduces the constraints imposed by institutional structures and their rules and norms. Establishing what constitutes the dominant dispositions and counter-dispositions is the first step.

### **J.3.3. Power and/or knowledge**

Knowledge as power can be temporary (amenable to change) or fuzzy (incomplete or fully understood by development practitioners, or distorted or misrecognised by the recipient of development intervention). It can also be seen as complementary to and informed by ontological positions (supporting the reification of specific ontologies or discourses). Knowledge can thus be viewed both as complementary to power as in power-knowledge formations, inseparable from power, or as subordinate or secondary to existing power relations. If indeed the relations of power are not necessarily seen as a relation of forces, as Foucault and Bourdieu agree, the existence of social relations without relations of power (hardly so, an example of an exception to the rule) can only be understood by paying attention to the mechanisms and material processes that guarantee their existence. Primarily, this is the process of transfiguration and dissimulation (Allen, 2020; Bourdieu, 1979). Serious ethical issues emerge around the deployment and use of knowledge, such as judgements about what knowledge/information should be divulged in meetings to competing actors with divergent interests, which indicates an aspect of power and privilege often missed.



### **J.3.4. Power, ideology and ideas**

Ideas and ideologies have a profound influence on the exercise of power. Contemporary understanding and interpretation of ideas in relation to power locate it as operating with certain elements. The development practitioner should be concerned with the ideational constructions produced from the workings of an assortment of ideas and ideological elements. Since ideas operate in different realms and spaces of development practice, the finer elements of the idea, especially those resisted by the recipient of such intervention, should trigger interest and encourage critique and resolution. Ideas are not material and concrete but are made such through specific discursive and nondiscursive practices in our relationship with the world. Identifying those ideas with the strongest potential for domination, the perpetuation of inequities, or the re-formulation of such, requires a unique level of reflexivity. Development researchers and practitioners should embrace these processes as a *journey of learning* to encourage reciprocity and critique in our understanding and interpretation of the political and social constructions of those whose well-being we wish to *develop* or *improve*.

### **J.3.5. Concrete spaces – Power and structures**

Social and political institutions are the most concrete effects of power whose extent and boundaries are constantly contested. Bourdieu believes that our practical world has a teleological character on which our historically constructed dispositions are built. This regularity of structure or a "maintained order is provided by an unceasing change in substantial (i.e., non-relational) properties..... built on a temporal order of time" (Bourdieu, 1996, p. 163). What this means is that the breakdown of this inculcated and reinforced order, obeying established order without recourse to the established rules or norms, is possible by walking back or disassembling the "the whole set of gaps, differences, 'differentials', ranks, precedences, priorities, exclusions, distinctions, ordinal properties, and thus of the relations of order which give a social formation its structure" (Bourdieu, 1996, p. 163). In this sense, observable and interpretable structures should be seen and used more for analytical purposes but less as a real 'seat of power'.

### **J.3.6. Power and strategies**

Strategies are the *means* used to attain a particular end, the *manner* in which actions to present or communicate a rational view of the world are undertaken, and the *procedures* used in the conduct of a confrontation or social struggle for domination (Foucault, 1982). Strategies are used to respond to an *urgent need*. Whatever is declared or presented as 'urgent' or 'essential' necessitates us to question why it is considered so. Place-based understanding of power requires that we work to collapse or condense the space-time conundrum because many of our tangible

realities force themselves into our abstract spaces. The ontological nature of symbolic relations of power disregards the ontological rigidities imposed on us by the tangible forms of reality within us and what we observe in our environments. Therefore, a World Bank consultant drafting the most mundane (thought of as having no real material impact on the recipient of development intervention, e.g., remote sensing) report of a study needs a detailed historical (anthropological) insight of the space and locale of intervention. It means simply acknowledging and accommodating the limitations of what is known (and unknown) by investing interest in the history of existing ideas, values, artefacts, and infrastructure in the remotely sensed area.

# Appendix K: A conceptual integration of Bourdieu and Foucault for an empirical power analysis in socioecological governance research

## *K.1. Introduction*

Analyses of power and space in socioecological research have followed traditional different disciplinary orientations (political ecology and political economy) with theoretical and empirical implications (Castells, 2011). Theoretically, the orientations could be rigidly applied or sometimes slow to catch up with advances in contemporary empirical and theoretical challenges or pretermite or obscure old decadent issues. These issues are connected to the ontological and epistemological rigidity that have been critiqued in social theory (Bourdieu & Wacquant, 1992). The inability of these theories to cater to the affective and religious worldviews in empirical analysis is another discretionary problem in sociological research (Castells, 2011). This section contributes to this additional work needed in conceptually coupling power and space in socioecological governance research.

Each discipline coalesces around specific theoretical assumptions; political science, international relations, governance, and economics as an aggregate see power analysis through institutionalism with strong theoretical tradition in neo-Marxist structuralist accounts. Poststructuralist accounts tilts towards individual agency. These distinctions are conceptually important for human practice and power relations in two ways. First, power relations between both traditions affect research output, practice, and policy design differently because different disciplinary positions produce corresponding and different society-nature outcomes. Second, the rigidity to structural analysis or agential determinism interprets power relations as a false dichotomy if power (and the relations it generates and infuses) in its function, topology, and form is conceptualised as relational, constitutive, symbolic, negotiational/ mediational, and causal.

Topological analyses of power have often focused on the materiality of power and space. However, this is starting to change as recent calls from political ecologists have shifted the debate to ontological spaces of practice. These do not go far enough to engage the ontological interactions and formations of space. There is a need to further develop a conceptual system for an empirical analysis of power in socioecological governance research that breaks away from the dominance of geographical spaces over what Bourdieu calls the abstract space, where nondiscursive devices of power operate – spaces of ontological interactions – while maintaining the mediational and relational interpretation of power.

I propose that such analyses should consider the different forms, functions, and locations of power (and its relations) and spatial configurations within specific modalities (Eyben et al., 2006; Gaventa, 2003; Reason et al., 2014). In addition, they must also consider an analysis of agency that is oriented towards an understanding of the effect of the shades of human experiences and the various ways they intersect and interact when self-governing or impacting societal structures. This article fulfils two objectives in empirical power analysis. First, it presents a basis for integrating both theorists. Second, it presents and explains the theoretical integration of Pierre Bourdieu and Michel Foucault's conceptualisation of history, space, agency and power (form, function, and topology).

## ***K.2. Foucault and Bourdieu on power***

Foucault and Bourdieu have had tremendous impact in poststructural and postmodern<sup>111</sup> understanding and analysis of power (Schlosser, 2012). Similar attempts to combine the two writers conceptually have been undertaken in education (Bang, 2014; Hannus & Simola, 2010), anthropology (Jensen, 2014), and criminology (Schlosser, 2012). In my opinion, both theorists have provided highly sophisticated theoretical tools to transcend the macro-micro sociological analysis of power and social relations. This is because power is not just about the distributive or allocative potential (instrumental), but also a manner in which the individual self-governs, in constant interactions with the structures it exists within. I draw on Risto Heiskala's synthetic power conception (Heiskala, 2001, 2014) and Loic Wacquant's four transversal principles on the application of Bourdieu (Wacquant, 2018b) to provide a conceptual foundation for this exercise. Hannus & Simola (2010) synthesised Foucault and Bourdieu's work in theorising power mechanisms in education. Heiskala's work offers huge possibility in conceptualising the concrete representations of power through its acceptance of the complementary nature of the major perspectives on power analysis rather than contradictory or conflicting positions.

One limitation to Heiskala's neostructuralist approach is that it is silent on Bourdieu's theorisations on power or agency. Heiskala's article did not have a single reference to Bourdieu despite the extensive work (theoretical and empirical) that Bourdieu has produced on the subject of symbolic power and cognitive and affective relations of power (Neveu, 2018; Threadgold, 2020). Although Heiskala's synthetic power conception has prompted a reimagination of the possibilities (at a theoretical level) of integrating different conceptions of power, it falls short of resolving the analytical problems associated with dichotomising issues or concepts of structure and agency (Hannus & Simola, 2010) from its "research – strategic suggestions" through to its

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<sup>111</sup> Bourdieu disapproves of this word (Bourdieu, 2008).

inability to collapse analysis of macro-micro power relations (Heiskala, 2001, p. 259). Heiskala's conception is therefore a synthesis of often conflicting approaches (distributive/structuralist theories, and resource theories of Marx Weber and Talcott Parsons) rather than scales. Despite these limitations, Heiskala's conceptualisation still offers a useful perspective on the notion, location, and conceptualisation of power in two ways. First, in the acceptance that all social relations are relations of power and are embedded in power-defined considerations. Second, contrary to the general belief of Foucault's idea of power being *everywhere* (which in ways creates an *agency-less* actor), Foucault's ubiquity of power only extends as far as interrelationships exist, and as Martin Kusch has demonstrated (Kusch, 1991).

Loic Wacquant's<sup>112</sup> four transversal principles address how Bourdieu can be put to analytical use. It sets in clear logic conceptual considerations for operationalising Bourdieu's habitus=structure=practices that allows the integration of the researcher and the subject (Wacquant, 2004, 2018b). Where Foucault has failed to elaborate on the distinctive characteristics of his *dispositif* before his death, Bourdieu has provided an extensive empirically-grounded elaboration through, amongst others, the seven major concepts of his work – capital, habitus, social space, symbolic power, field, doxa, and epistemic reflexivity (Bourdieu & Wacquant, 1992).

### ***K.3. In their own words – Differences and similarities***

Power for Foucault is not macrosocial because of its capillarity, and as a relational concept it is exercised at different *points of resistance* across the *grid of intelligibilities* in societies (Foucault, 1984). It is also not only repressive but productive and emancipatory since power to overturn hegemony can emerge from the bottom or at an unsuspecting point along the web of power relations. One of Bourdieu's theoretical and methodological legacy is setting the stage for approaches that transcend the strict dichotomies present in the analysis of power relations between structure and agency. In his theory of practice (Bourdieu, 2013), what is worthy of analysis, is not the differences in power centers or concentrations, but observing and examining the nature of the

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<sup>112</sup> Bourdieu and Wacquant should be read together for two reasons. First, Wacquant more than any scholar has undertaken extensive dissection of Bourdieu's work, expounding the analytical utility of Bourdieu's main concepts (please see (Wacquant, 2004, 2013, 2016, 2018a, 2018b). Secondly, having served under Bourdieu as a junior research fellow, he has over 30 years of lived experience with Bourdieu, which reflects in his veneration of Bourdieu (e.g., Wacquant describes Bourdieu as the 'Master thinker'), even though Bourdieu disapproves of scholastic obeisance (Bourdieu, 1985, 2008). Whether this scholastic reverence of Bourdieu is worthy is immaterial, but to what extent it taints Wacquant's scholarship on Bourdieu is a judgement I reserve for critiques. My position is that the totality of Bourdieu's work is an intellectual masterpiece that will contribute significantly to the socioecological sciences into the future.

repetitive process of mind, and conditions around which, the iterations of the cognitive processes that lead to decisions are formulated. In this sense, Bourdieu's habitus satisfies the essence of social analysis according to Wacquant (2016). Bourdieu's topological conceptualisation has validity beyond spatial configurations and boundaries and extends to the cognitive aspects of power analysis (Wacquant, 2018b). Callewaert noted: "The most important difference between Bourdieu and Foucault is the difference between the principal domains of their intellectual activity. From Foucault's first book on the history of madness to the last book on the care of the self, Foucault tried to create a new way of doing the history of the human/social sciences and knowledges, with a method that basically was philosophical and historical" (Callewaert, 2006, p. 90). Bourdieu provides a more extensive and insightful explanation for their similarities and differences in his book *Sketch of a Self-analysis*:

I hesitate to undertake to say here – but I cannot avoid doing so, for the sake of the clarity of the analysis and also for the truth that I owe to younger readers, who are liable to be misled, especially abroad, by the apparent resemblances – how I situated myself objectively and subjectively in relation to Michel Foucault. As was brought home to me very clearly, when, after his death, I undertook to write for a foreign journal and evocation of his life and work that would avoid obituary rhetorics, I had almost all the pertinent properties in common with him: a *normalien* and an *agregé de philosophie* a few years before me (I had attended his courses at the Ecole Normale), he held philosophical positions very akin to my own, and in particular, very close to Canguilhem, and the Clermont-Ferrand group (he had been recruited by Vuillemin), with whom I associated myself. (Bourdieu, 2008, p. 79)

Here Bourdieu establishes the philosophical links between him and Foucault in the works of the historian of philosophy and science, Georges Canguilhem. Bourdieu goes on to explain the similarities and differences in their research approach and practice. Writing on the similarities, Bourdieu noted that Foucault:

Never ceased to expand the traditional definition of philosophy to bring into it the world as it is, and consequently all kinds of objects, unknown or excluded – madness, imprisonment, power, etc. – apprehended each time through precise cases, situated and dated, and detailed dossiers. (Bourdieu, 2008, p. 80)

Bourdieu appears to be suggesting here that they both share an ability to dissent and resist established order in research and action by providing a detailed and systematic account of their scientific enquiry, and centring human practice and concerns in their scholarship. Their differences, Bourdieu asserts, is basically of style:

I was separated from Michel Foucault by a whole series of differences of style, visible especially in the areas of politics art and research.....and which seem to flow from profound differences in our dispositions and our respective positions. Whereas in engaging myself resolutely in the field of social science,

initially ethnology, then sociology, I was in fact breaking with the expectations and demands of the philosophical world in order to submit myself to the constraints of a scientific discipline, endowed with its specific capital of problems, theories and methods, Michel Foucault, however great his distance, sanctioned by his remoteness, first of geographic, then social, from the heart of the university institution, always remained present in the philosophical field and attentive to the expectations of the Paris intellectual world. These differences in the objective situations, are quite clearly in a relationship of circular causality with our dispositions: on my side, they pushed me to engage in sociology, and of a kind particularly antithetical to the expectations of the French intellectual field, such as the analysis of artistic practices and the intellectual world, and to invest myself primordially in the collective undertakings of a research group engaged in tasks and preoccupations very remote from the intellectual world, such as ethnographic field work and statistics; on Foucault's side, they inclined him to singular commitments which, as such, better conformed to the expectations of the worlds of art and literature and to scientific practices less different from those of the traditional scholar such as assiduous use of the great libraries (Bourdieu, 2008, pp. 81–82).

Indeed, it was not until the twilight of his years that Foucault began to focus on an analysis of the self – the subject- beginning a new line of investigation into “how a human being turns him or herself into a subject” (Dreyfus & Rabinow, 2014, p. 208). As Rux Martin writes in the introduction of the book *Technologies of the Self: A Seminar with Michel Foucault*, “In many ways, Foucault's project on the self was the logical conclusion to his historical inquiry over twenty-five years into insanity, deviancy, criminality, and sexuality” (Foucault, 1988, p. 3). Throughout his works Foucault had concerned himself largely with the technologies of power and domination, whereby the self has been objectified through scientific inquiry (Foucault, 1988). This shift in Foucault's thinking, and the sharpening of his methodological tools, has not been captured by most analysis underpinned by governmentality (Collier, 2009).

#### ***K.4. The meeting points – Power, agency, knowledge and space***

Philosophically, Bourdieu and Foucault share a constructivist idea of agency and power, and a philosophical link to Canguilhem, the French historian of science and concepts (Canguilhem, 1998). Rationality and knowledge are both socially constructed realities, and knowledge retained both within the agent and externally are historically constructed. This historical understanding of knowledge, power, reality and practice are embedded in discursive formations and symbolic practices – the two distinct ways they see power. The emphasis on time must be a central consideration in the composition and analysis of social relations (Wacquant, 2016). Methodologically, Foucault's historical genealogical analysis of power can only be appropriated to social reality, and not a study of social reality in itself. While this does not invalidate the utility

of his analysis, especially in analysing what is, it does not provide the fundamental organising principles for an analysis of human behaviour. In an attempt to distinguish between concrete and abstract relations of power in practice, Bourdieu suggests that a realist or substantialist analysis of practice (human action) cannot go beyond concrete representations of human actions; therefore, social analysis must transcend these relations (Bourdieu, 1995).

Symbolic power only operates with the *consent* of the subject as they co-construct the different *capitals* and spaces that solidify the power and its effect on them. Capitals are either embodied or material but have a similar mode of transmission that depends on time (Neveu, 2018). The volume of capital held by individuals or groups and their form (social, economic, cultural, symbolic) are two principles of differentiation that construct the social space “as a set of objective power relations that impose themselves on all who enter the field and that are irreducible to the *intentions* of the individual agents or even to the direct interactions among the agents” (Bourdieu, 1985, p. 724). This relational property of social space is made concrete in the interactions between the hierarchy and social positions (locales, including standpipe locations) occupied individually or collectively (and things), their dispositions, and the choices or different positions they take, regardless of their intention.

Capitals are converted through a principle guaranteeing that within a symbolic exchange, accumulated symbolic “profits in one area are paid for by costs in another” (Bourdieu, 1986, p. 253). Symbolic capital as the “symbolic effects of capital” is produced by the functioning of other kinds of capital (Bourdieu, 2000, p. 242), and confers symbolic power on an individual (as in the case of the supervisor). Obtained through social recognition, and conferring on the possessor the power or legitimacy to name or impose distinctions, symbolic capital is the fundamental element of the “power of constitution”, using words to achieve symbolic efficacy (Bourdieu, 1989b, p. 23). This power of constitution is accumulated from symbolic capital gradually over time and an understanding of how realistic and practical the worldview is (Bourdieu, 1989b). Symbolic capital and the corresponding symbolic power it produces is used to dominate by applying symbolic violence, which in this case is a gentle and “unperceived violence” (Bourdieu, 2018, p. 108), produced by (un)intentional actions.

Bourdieu and Foucault agree on the dispersed nature of power, which Foucault refers to as *capillarity* nature of power with its extensive network of relations: “I am thinking rather of its capillary form of existence, the point where power reaches into the very grain of individuals, touches their bodies and inserts itself into their actions and attitudes, their discourses, learning processes and everyday lives” (Foucault, 1980, p. 39). As Bourdieu noted “power is differentiated and dispersed and this is probably what Michel Foucault meant to suggest, when no doubt in opposition to the Marxist vision of the centralized, monolithic apparatus, with his rather vague metaphor of *capillarity*” (Bourdieu, 2000, p. 102). It is from this perspective that they both



developed their styles, theories and concepts. Table K-1 shows a limited classification of some concepts and ideas related to how they both understand power in time, power as resources, power as dispositions and power in space.

**Table K-1: Empirics of power and agency**

<b>Power as</b>	<b>Bourdieu</b>	<b>Foucault</b>	<b>Concepts</b>
Topology – position and locations in structure and agency	Differentiated and dispersed	Differentiated, ubiquitous, capillarity	Distinctions
Techniques and Resources	Embodied, instruments of domination	Dividing practices, dispositiffs, political technologies	Conduct of conduct
Temporality	Genealogy	History of the present Genealogical analysis	Genealogy, hysteresis
Dispositions	Structuring structures	Individual political technologies	Habitus, social space, doxa

**Source:** Author

From the above, I identify five key areas where they both complement each other analytically:

1. Both offer a relationalist account of power and agency to examine the topological dimensions of power and its ubiquity- socioecological governance as a relations of power, from the global to the local or what has been referred to as *glocal* (Bakker, 2003, 2012), which emphasises the seamless impact of global governance apparatus on the local economies and vice versa; for example, events in US or China affecting global governance systems, or UN water governance prescriptions on water stewardship (Baumgartne & Pahl-Wostl, 2013) affecting local consumers in Tanzania (Vos & Boelens, 2018). Foucault’s relationalist research is made more explicit in the latter part of his works on biopolitics where he laid bare the different constellations and topologies of power, hence the idea of ubiquitousness of power (Collier, 2009).
2. Non-binary exercise or exercising of power – neither domination nor submission, but also acquiescence; there is a space for the agent’s free will. Power is not a concentration of authority in specific geographical spaces but dispersed and interconnected. This deals with the ubiquity or topological positions of power. The human subject exercises power and is exercised by power, and as such humans themselves constitute a power centre that on one hand is constituted and subject themselves to different forces of power, and at the

same time objectifies reality and self. This duality, Bourdieu believes occurs in a seamless pattern.

3. Knowledge as a central organising principle in power relations – showed in discourse for Foucault. Language as a critical technique for exploring the discursive arena of socioecological governance.
4. Historical constitution of culture as another critical organising principle of practice and power.
5. Objectification and subjectification capabilities of power – immanence and symbolic components.

As governmentality dictates the rationality of governing through the *conduct of conduct*, (Foucault, 1982) it entrenches the disproven assumption of the hegemony of the state, or the state as the ultimate harbinger of social power (Rose & Miller, 2010). If we are to move beyond the operations of institutions and the discursive architecture that propels and supports its techniques, an analysis of power relations that foreground the (re)production of new spaces, institutions, and governance mechanisms is critical. Theoretically, this would help to refocus attention on the conduct and constitution of individuals and groups that design institutions. In this sense, the precondition for such retheorisation of power relations must include the determining role of individual agency, the construction of ideas and the valence of individual subjects. Analyses that use governmentality risk the danger of overanalysing the conduct of groups, rather than the genesis of such groups and the principles that inform such generative practices, falling into the same analytical pit as Marxist scholars.

Bourdieu's concept of agency suggests that agents move between fields and can be disruptive to the existing order of the field/structure. Static agents exist due to the reconfiguration of society. As he observed in his book, *Pascalian Meditations*, Bourdieu explicitly outlines his concept of power as a distinction of Foucault's. Bourdieu's symbolic power sees structures – “different forms of organization of the world” – and knowledge use and production systems – “different modes of cognition” – as symbolic forms which use particular devices to formulate social realities and social action (Bourdieu, 1979, p. 77). These “structuring structures” are “systems of durable, transposable dispositions” that are constituted from particular environments (Bourdieu, 1979, 2013, p. 72). Bourdieu sees these in a relational context whereby language and the social space form a central organising principle of practice (Bourdieu, 1989a, 1989b). Foucault thinks differently about significant structures as he argues:

It is at this point that I reject those analyses which concern the symbolic or the area of significant structures and instead turn to analyses that are undertaken in reference to the geneology of relations of force, strategic developments,

tactics. I think that what we have to use as a point of reference is not the model of language or of the sign but war or battles. (Foucault, 1979, p. 131)

Agency for Bourdieu is also a socially constituted reality and embodies several symbolic elements simultaneously, such that they draw from and inform both individual practice and structure. This conceptualisation offers two usefulnesses. First is that the rapid changes within modern society due to the different forms of communication and changing societal patterns and norms can be understood better. In short, analysis of political and social changes can be made in ways that privilege new modes of symbolic capital and symbolic goods that create or perpetuate them. For Foucault, structure determines individual power and the process of subjectification. Foucault is considered more as a structuralist due to his inability to allocate agency to individuals. This interpretation of agency constitutes one of the difficulties of empirically applying Foucault's theory to ideational power (Gaventa, 2003).

As a second point, this position also speaks to his intellectual evolution, focusing his earlier works on governmental structures and, later, reshaping his methods of inquiry. At the time he wrote *The Subject and Power* (Foucault, 1982), this position had started to change and culminated in his declaration in *The Technology of Self* where he delved more deeply into what he termed the "political technology of individuals" in his later and final part of his research project (Foucault, 1988, p. 146). Secondly, Bourdieu's theory of practice and the specific concept of social space enables the analysis of 'ungoverned spaces,' a condition that besets many developing countries with strict attachment to culture and religion. In this sense, his works focus on the development of the groups, appropriation of space and acquisition of symbolic power in such spaces (Bourdieu, 1985, 1989b, 2018).

### ***K.5. Geneological analysis and power***

Geneological analysis seeks to uncover the constitution of a subject or phenomenon within a historical framework by analysing specific events that mark the descent of a phenomenon and the emergence of another. It is concerned with the search for the processes of *descent* and *emergence*, planes that specify attributes of a "body"<sup>113</sup> and differentiate them accordingly. In analysing the event "the problem is at once to distinguish among events, to differentiate the networks and levels to which they belong, and to reconstitute the lines along which they are connected and engender one another" (Foucault, 1979, p. 131). Genealogy does not seek to

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<sup>113</sup> Body here refers to body politic: "a set of material elements and technique that serve as weapons, relays, communication routes and supports for the power and knowledge relations that invests the body and subjugate them by turning them into objects of knowledge" (Foucault, 1995, p. 28).

establish causal mechanisms but to uncover concepts and attributes that bind together various events against which they were formed (Foucault, 1984, p. 81) and the process through which the apparatus is put to work. Genealogical analysis involves the mapping of the “surface of emergence” where the conceptual genesis of a phenomenon, the medium of communication, is described and how the individual differences are rationalised from the start. It also explains the “authorities of delimitation” where institutions, laws, and other discursive devices/mechanisms are to be described in sufficient details. And lastly, it involves analysing the “grid of specification” to highlight how the categorisations, classification and divisions are undertaken. These planes of specification and differentiation can be analysed as “planes of relations” (Foucault, 1984, p. 81).

Analysing descent means to “identify the accidents, the minute deviations – or conversely, the complete reversals – the errors, the false appraisals, and the faulty calculations that gave birth to those things that continue to exist and have value for us” (Foucault, 1984, p. 81). Emergence reveals where power relations are highlighted in accordance with the purpose of genealogy – establishing the systems of subjugation occasioned by the “hazardous play of domination” (Foucault, 1984, p. 81). Because of these relations and mode of production, analysis must offer an outline of the nature of the repeated interactions, and the different strategies and apparatuses used. In this sense, both externally generated struggles and internal exchanges allow the division of the body and its weakening. Foucault noted that “descent qualifies the strength or weakness of an instinct and its inscription on a body, emergence designates a place of confrontation” (Foucault, 1984, p. 82). Unequal power relations should not be assumed. Rather, the elements that constitute the ensemble should be splintered into recognisable, specifiable, and identifiable discursive and non-discursive devices (strategies) used by each aggregate of power represented materially as the ‘body’. Analysis of power relations in this regard:

consists of taking the forms of resistance against different forms of power as a starting point..... of using this resistance as a chemical catalyst so as to bring to light power relations, locate their position, and find out their point of application and the methods used....., it consists of analyzing power relations through the antagonism of strategies. (Foucault, 1982, p. 780)

Strategies include the ‘means’ used to attain a particular end by presenting a rational representation of ‘truth’, the power of worldmaking (Bourdieu, 1989b). Strategies also consist of the ‘manner’ in which actions to present or communicate this rational view of the world are undertaken. Lastly, strategies are the ‘procedures’ used in the conduct of a confrontation or social struggle for domination (Foucault, 1982). Strategies are in essence the mechanism of power for analysing the *insubordination points* (means of escape from a social struggle) possessed and offered as a strategy by competing bodies during the struggle. Strategies work through the *dispositif* (henceforth, *apparatus*) a “heterogeneous ensemble consisting of discourses,

institutions, architectural forms, regulatory decisions, laws, administrative measures, scientific statements, philosophical, moral and philanthropic propositions” (Foucault, 1980, p. 194), as the main instrument of domination. Dreyfus and Rabinow (2014, p. 121) refer to the apparatus as the “grid of intelligibility,” the ultimate method for constructing “effective history,” one without constants but capable of identifying the discontinuous processes and events that characterise the history of the present.

The nature of the relations within the apparatus is a critical subject of analysis because in the production of a new field of rationality, it explains how particular discourses and non-discursive tools are exercised at different locations within a system, how they are exercised for different purposes, and how they are used to hide, re-interpret, re-invent, or re-utilise one or more practices within the system. Central to the emergence of an apparatus is the necessity of “responding to an *urgent need*” (Foucault, 1980, p. 195). As a collection of discursive and non-discursive elements, the apparatus exists as a system (structure) and has a genesis, an origin. The genesis is defined by two important attributes. First, the presence of a strategic objective (intention to which the apparatus is to be used) with its influences on practices, and secondly, the doubly determined process of “functional overdetermination” and “strategic elaboration” that constitute it and allow for its discontinuity; in short, its perpetuation. Basically, the urgent need is the strategic imperative (to use), creating a strategic objective for which the strategic function (task) of the apparatus is exercised. Functional overdetermination occurs when the strategic outcomes produced by the apparatus reinforce or oppose other elements occupying different positions within the system. It awards the apparatus the evocative power to perpetuate political struggles that define the descent or (re)emergence of a phenomenon. Strategic elaboration is the process of perpetuating a specific apparatus by reinventing it, reconstituting, reforming (reformulating) or simply re-utilising it in a different epoch. This process is central to the history of the present.

Examination of power relations shows the imprints of the apparatus. As such, the connection between the apparatus and knowledge is one of a mutually influencing relationship. Knowledge, as a proxy of power, located at different coordinates within the web of power relations, concurrently emanates from the apparatus and conditions (determines, transforms, or constrains) it. Thus, the apparatus works as: “strategies of relations of forces supporting, and supported by, types of knowledge” (Foucault, 1980, p. 196). I apply this analytical framework to treat a major event in Nigeria’s colonial development history. As it is impossible to provide a detailed account of this political project in one article, I have limited the analyses to an event rather than foisting a chronological demarcation.

That the people are poor and sick is the strategic completion (*remplissement*) (Foucault, 1980, p. 196) of a discursive apparatus that differentiates, existing first as spatial segregation in the late 19<sup>th</sup> century and early 20<sup>th</sup> century, and through the process of *strategic elaboration* reused

as sickness and uncleanness (sanitation and hygiene today) in the first quarter of the 20<sup>th</sup> century<sup>114</sup> (Greenfield, 2018; Ranganathan, 2018). Poverty, poor hygienic conditions, or community or individuated management are fundamentally products of the “logic of opposing strategies” (Foucault, 1980, p. 61).

Foucault noted that the process of normalising domination in an enclosure requires normalising judgement as an instrument of disciplinary power, which allows holders of power to compare, differentiate, hierarchise, homogenise, and exclude (Foucault, 1995, p. 182) dominated groups or individuals through correct training. Once a hierarchy is established, this process seeks to entrench conformity to an idea of what is normal or *the norm*, which is essential for holding on to power. Holders of power exercise this established hierarchy to compare by referring individual behaviour to the group rule by communicating objective ‘truth’. They differentiate by ensuring the individual perceives the rule as an ideal to aspire to or not go below. They provide an opportunity for quantitative measurements and the hierarchy of values it allocates to individuals. Through this value allocation, they homogenise individuals by determining and introducing social constraints they must conform to. They exclude by exploring and defining the differences in relation to other differences within the social space. Normalising the judgement of a dominant group is achieved by the repetitive application of specific strategies and techniques. One must also know what techniques or strategies are applied and the different objective entities they assume. Such techniques may constitute, or be constituted as an ensemble of “instruments, techniques, procedures, targets or levels of application” to be exercised by individuals or institutions (Foucault, 1995, p. 215).

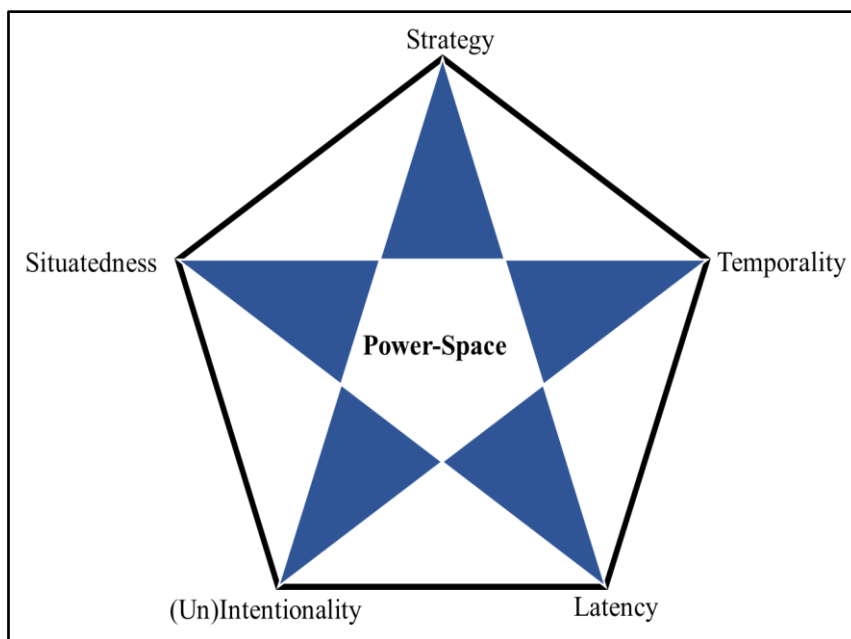
## ***K.6. Analytical modalities of power and space***

To analytically capture the embodied and the objective succinctly when analysing power, five analytical modalities are necessary (Figure K-1). By modality, I take the simple meaning described in the *Collins Dictionary* as “a particular mode in which something exists or is experienced or expressed” and “a form of sensory perceptions” (Collins English Dictionary, 2007). Instead of looking for topologies or locations of power, we should ask the “what?” questions as demanded by the relational, constitutive, negotiational, and mediational nature of power. Thinking about the modalities of power encourages ontological and epistemological flexibility and enhances how we search for the “where” and “what” in the topologies of power.

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<sup>114</sup> Poverty is presented as a material and immaterial condition out of which arose the exercise of the discourse of spatial segregation. Material poverty entails, for example, a lack of clothing to cover the body, the derision for a type of dwelling, a condescension of knowledges (technical and artistic), and projection of uncleanness. Immaterial poverty denotes the denigration of a ‘simple’ lifestyle, e.g., the accumulation of material wealth.

**Latency** – speaks to the questions of what is/was where a critical history of the space and the things within it are explored. It is a question of the history of the object of research, or the phenomenon being explored within the selected space, to excavate the dormant or hidden actions that contributed to the context production. This can be mapped or described to discover the configurations and forms of power relations affecting the different changes observed. Here, a practical knowledge of the context and setting differs from a description of the space. Latency also opens our eyes to the processes and conditions that produce inequality and injustice.



**Figure K-1: Analytical modalities of power. Source: Author**

These pieces of knowledge are embodied and inscribed in both the object and subject of research. We are encouraged to shine our lights on latent actions preceding a decision or the lag inherent between competing statements, actions and interactions. Latency forces us to investigate the idea of temporality. With infrastructure, for example, we can identify the critical moments that define its transformation and its deconstruction and reconstruction, and the physical spaces it is constituted and constituted from – in essence, the material, social, and political relations of power that have produced that critical moment. For example, in the water infrastructure literature, the lifespan or sustainability of standpipes in African countries is estimated to be between 2-5 years after construction (Foster et al., 2018). Investigating latency means that all decisions that have produced the standpipe necessitate an inquiry from design to construction, considering the historicity.

**Situatedness** – relates to place-based, spatial, or topological locations of power. The question about the embodiments and exercise of power in different spaces either symbolically or

discursively is deeply connected to space. For physical structures, our objective impulses make us allocate tangible realities to the contents of social space. Statements like the ‘seat of power’ or the ‘throne’ recognise such realities that structure human thought and practices. Situatedness is also an embodied state where, according to Bourdieu (2018), specific spaces contribute to the accumulation and exchange of power (symbolic) between individuals and the things situated within the space. Situatedness also provides some profits to the agent that occupies the space. Profits of space occur when there are unequal chances of access in the spatial distribution of agents (localised bodies as holders of capital; e.g., supervisors) and the distribution of goods and services (standpipe and honour). In a practical form, profits of space appear as *profits of localisation* (Bourdieu, 2018, p. 110). At an individual level, the profit of occupation works through the occupation of a locale to increase the chance to “aggregate opportunities of appropriation of different materials or cultural goods and services available at a given time” (Bourdieu, 2018, p. 111). This is because the space itself is inscribed and therefore embodies power and its relations. This individual-things-space characterising the relationships of power that emanate from it is a vital component of power analysis. Foucault also supports this as he suggests that “anchorage in a space is an economico-political form which needs to be studied in detail” (Foucault, 1980, p. 150).

***Intentionality/Unintentionality*** – Argument against Foucault’s nonintentionality, the idea of an agency-less actor, is negated by Bourdieu’s habitus. Bourdieu notes that the habitus is not static and changes constantly and unconsciously when it interacts with an event. Habitus is a capsule for a dispositional theory of action. Appropriating a physical space from the social space relies on the *classificatory, mediating, and generative* functions of the habitus.<sup>115</sup> The effect of the interaction between the symbolic representations of capitals (generosity) and the habituses of the agents is the essence of social space because it transforms the social space into a symbolic space. To produce common-sense, the habitus *mediates* the dialectical relationship between the individual habitus (supervisor) and an *objective event* (e.g., butcher movement in town or low water pressure). The habitus inscribes itself in, and it is inscribed in the social space in two ways: It seeks the conjuncture of past and present positions within the social space, and the objective positions and distance (e.g., physical and mental) to produce transformational practices and collective action (Bourdieu, 2013, pp. 82–83). The habitus transforms dispositions to actions and ensures that the time-defined process of domination and naturalisation persist (Bourdieu, 2013).

Habitus can also be compliant or maladjusted. Compliant habitus sets up and perpetuates “durable relations of domination” to maintain order (Bourdieu, 1990, pp. 129–130). Wacquant opines that the agent carries her history inside of her and actively shapes her world through

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<sup>115</sup> “A system of lasting, transposable dispositions” and “a durably installed generative principle of regulated improvisations” (Bourdieu, 2013, pp. 78–81).



socially constructed instruments of construction. Habitus, therefore, may be “adopted, elaborated, and criticised quite independently of Bourdieu’s other concepts” (Wacquant, 2014, p. 124).

**Strategy and intuitiveness** – are either contingent or intentional in terms of their function and form. Both modes of practice speaks to the numerous studies on *power over*. This substantialist position privileges the *power centres* over its margins. Strategy is at once relational and constitutive on two grounds. At the conscious level, the individual can mobilise both resource and distributive elements of power to achieve their specific objective. At the subconscious level, the “socially constituted capacities” of the individual exist as “structuring structures” which select mnemonically specific thoughts and actions for the agent and precede the observed substantial choices and decisions (Bourdieu, 1979, p. 77). This *internal strategy* is worthy of examination even at a basic level of conceptualisation, especially in its role in hysteresis and change (Fowler, 2020).

**Temporality** – Spatially, with shifting topologies comes the temporality that accompanies the changing spaces associated with these topologies. Temporality captures the timing and timelines that produce socioecological transformations and changes at different temporal scales. Timing also enables the examination of patterns and other rhythms of practices. The form that practices take is, for example, radical, abrupt, or incremental, and the forms and functions of power in the production of those forms and changes is of crucial importance to socioecological research and practice. The essence of temporality is to contribute to our understanding of the historicity of what has been co-constructed, and in Giddens’ interpretation of the function of historicity as “the use of knowledge about the past as a means of breaking with it – or, at any rate, only sustaining what can be justified in a principled manner” (Giddens, 1996, p. 50). Bourdieu equally affirms this position: “Knowledge of the social world has to take into account a practical knowledge of this world which pre-exists it and which it must not fail to include in its objects, although, as a first stage, this knowledge has to be constituted against the partial and interested representations provided by practical knowledge” (Bourdieu, 1990, p. 467). Temporality, studied through a genealogical analysis, is not only about the subject of study, but about ourselves as self-constituting subjects. Three crucial domains in this regard are: “First, a historical ontology of ourselves in relation to truth through which we constitute ourselves as subjects of knowledge; second, a historical ontology of ourselves in relation to a field of power through which we constitute ourselves as subjects acting on others; third, a historical ontology in relation to ethics through which we constitute ourselves as moral agents” (Foucault, 2001, p. 261).

# Appendix L: Transaqua and the Lake Chad Basin

## ***L.1. The Water Charter and the Lake Chad Basin Commission***

The Water Charter (LCBC, 2011) is the main instrument guiding the operations of the Lake Chad Basin Commission. Approved in 2012 by the State Parties, Article 3 of the Water Charter highlights the general objectives of the commission and its responsibilities, the obligations and rights of the State Parties, and the principles on which the body would operate. Article 83 provides country-level details for enforcing agreed upon principles that require the State Parties to “make all necessary internal arrangements, in particular judicial, institutional, operational and financial arrangements, to ensure effective enforcement of the present Water Charter” (LCBC, 2011, p. 19). What the Water Charter lacks, however, are the mechanisms for addressing conflicts or disruptions at the intranational level. It relies excessively on the political will of leaders of State Parties, which has historically been inadequate in addressing intranational challenges, especially where the states are weak. The focus on regional and sub-regional dispute settlements, as enshrined in Chapter 15 (articles 85–91), of the charter does not cater for managing national politics within the constituent State Parties. Considering the security and political governance challenges faced by most of the member countries, a question worth asking is: How do State Parties with weak political governance structures enforce Article 83 effectively to deliver the objectives of any inter-basin water transfer project, in this case the Transaqua project?

The Lake Chad Basin Commission (henceforth, LCBC), who has the responsibility to coordinate the activities of its member countries (specifically the riparian countries), appears to give limited attention to national and intranational political issues within the basin. The LCBC was created in 1964 by the Fort Lamy declaration in Ndjamena, Chad, by the four riparian states – Nigeria, Chad, Niger and Cameroon – to pursue the economic development of the conventional Lake Chad basin (Tonwe, 1972). The functions of the LCBC according to article 9 of the statutes are:

- i. To prepare general regulations which shall permit the full application of the principles outlined in the present Convention and its annexed Statute, and to ensure their practical application;
- ii. To collect, evaluate and disseminate information on projects prepared by the Member States and to recommend plans for common projects and joint research programmes in the Lake Chad Basin;
- iii. To keep close contact between the High Contracting Parties to ensure the most efficient utilisation of the waters of the Basin;
- iv. To follow the progress of the execution of surveys and works in the Lake Chad Basin as envisaged in the present Convention, and to keep the Member States

- informed at least once a year thereon, through systematic and periodic reports which each State shall submit to it;
- v. To draw up common rules regarding navigation and transport;
  - vi. To draw up staff regulations and to ensure their application;
  - vii. To examine complaints and to promote the settlement of disputes and the resolution of differences; and
  - viii. To supervise the implementation of the provisions of the present Statute and the Convention to which it is annexed.

The executive secretary of the LCBC is mandated to coordinate the affairs of the LCBC executive secretariat with his duties and executive powers outlined in Article 12 of the Statutes of the Fort Lamy convention (FAO, 1997). Political decisions (Table L-1) made by the heads of states pass onto the council of ministers, then to the executive secretary. The council of ministers engage with the consultative committees, like the politically inclined inter-ministerial committee, and other more apolitical ones such as the technical or stakeholder committees. However, there are informal non-statutory communication exchanges between the leadership of the heads of states, the consultative committees and the executive secretary.

Within the LCBC, Nigeria holds a dominant position, demonstrated by the fact that all ten executive secretaries of the LCBC from inception have been Nigerians. The centralisation of decision-making power of the executive secretary ensures the operationalisation of the political decisions agreed to by the summit of heads of states. However, this centralisation has been identified by Galeazzi et al. (2017, p. 10) as one of the “organisational difficulties” faced by the LCBC due to a lack of performance evaluation between the executive secretary’s office and the LCBC objectives (AFROSAI, 2015). Njeuma & Malaquais (2004) noted that Abubakar Bobboi Jauro<sup>116</sup>, the longest-serving person to hold this position after his re-appointments four times between 1988 and 2000, masterminded the expansion of the decision-making powers of the executive secretary position beyond the statutory prescription.

This challenge raises practical political concerns on the agency of the executive secretary; in particular, following allegations of financial misappropriation and executive recklessness raised on November 9, 2016, in a motion tagged “Urgent need to investigate the mismanagement, executive lawlessness and financial misappropriation in the LCBC” by a member of the Nigerian Federal House of Representatives (Igbinedion, 2016, p. 1). The motion came a year after a previous motion was introduced on December 1, 2015, to investigate how the “US\$5Million spent on the feasibility studies during President Obasanjo's administration” was administered

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<sup>116</sup> Abubakar Bobboi Jauro was the first non-career diplomat to occupy the executive secretary position, a position held traditionally by career diplomats up until 1987.

**Table L-1: Political decisions made at summits of heads of states and government relating to inter-basin water transfer 1964 – 2017**

Summits	Year	Location	Decisions		
			Total number	IBWT related	Notes on decisions
1	July, 1972	Fort-Lamy, Chad	4	0	
2	December, 1973	Yaoundé, Cameroon	4	0	
3	December, 1977	Enugu, Nigeria	6	0	
4	April, 1983	Lagos, Nigeria	6	0	
5	April, 1985	Lagos, Nigeria	2	0	
6	October, 1987	N'djamena, Chad	6	0	
7	February, 1990	Yaoundé, Cameroon	4	0	
8	March, 1994	Abuja, Nigeria	8	2	<ul style="list-style-type: none"> <li>• Approved the master plan completed in 1992 by IUCN;</li> <li>• Officially launched an international campaign to save Lake Chad and organising donors' conference; noted the "possibility" of an inter-basin water transfer was a "necessity" to save Lake Chad drying up;</li> </ul>
9	October, 1996	N'djamena, Chad	7	1	<ul style="list-style-type: none"> <li>• Noted the progress on donors' conference;</li> <li>• Mandated Central African Republic to proceed with feasibility studies and search for funding</li> </ul>
10	July, 2000	N'djamena, Chad	11	3	<ul style="list-style-type: none"> <li>• Gave the Nigerian president a mandate to intercede with donors for financing the project</li> <li>• Focus on the Oubangui water transfer</li> <li>• Preparation of a donors' roundtable conference</li> </ul>
11	June, 2005	Abuja, Nigeria	6	3	<ul style="list-style-type: none"> <li>• Update the master plan and increase donor engagement for the IBWT</li> <li>• Mandate the LCBC states to institute a special tax from oil rents as a financing option for the IBWT</li> </ul>
12	March, 2008	Abuja, Nigeria	4	0	
13	November, 2010	N'djamena, Chad	8	0	
14	April, 2012	N'djamena, Chad	17	3	<ul style="list-style-type: none"> <li>• Water charter adopted</li> <li>• Feasibility study by CIMA adopted</li> <li>• Authorised the engineering design of IBWT from Oubangui to Lake Chad</li> </ul>

Source: (LCBC, 2010)

(National Assembly, 2015, p. 361). While the outcome of both investigations remains unknown, such allegations may affect the interests of donors and other member states. For example, the Nigerian National assembly in February 2018 ordered the Nigerian president to stop the funding of the LCBC pending the outcome of the two investigations (National Assembly, 2018). The above allegations targeted the outgoing executive secretary, Mallam Sanusi Abdullahi, who was replaced by ambassador Maman Nuhu in March 2018 (Lake Chad Basin Commission, 2018). It is also important to note that both national assembly motions were introduced since the inauguration of a new president in Nigeria in May 2015.

## ***L.2. Transaqua, the Congo and multiple national limitations***

As with most inter-basin water transfer projects (e.g. the San Francisco river in Brazil) (Roman, 2017), strong objections are raised by civil society to the Transaqua project despite its purported benefits to the countries (Table L-2). Besides the security challenges in the Democratic Republic of Congo, there is stiff opposition from a range of actors.

**Table L-2: Some stated benefits of the Transaqua project**

<b>Benefits to all countries</b>	<b>Benefits to riparian countries</b>
<ul style="list-style-type: none"> <li>• Lake Chad replenishment and regeneration</li> <li>• Access to freshwater</li> <li>• Revival of agricultural activity: irrigation</li> <li>• Revival of fish farming, livestock production</li> <li>• Navigable infrastructure-trade/transport</li> <li>• Regulation of flows</li> <li>• Dams and electric power production; factories</li> <li>• Rivers and dry ports</li> <li>• Extensive road network</li> <li>• New human settlements</li> </ul>	<ul style="list-style-type: none"> <li>• Intensive integrated development of areas with huge agricultural and zoo technical potential</li> <li>• The canal creation, water retention through artificial reservoirs, will make possible the realization of dams in order to produce electric energy</li> <li>• Regulation of water flow regime in order to make rivers navigable</li> <li>• Redevelopment of Lake Chad economy and access to fresh water</li> <li>• International capital inflows</li> <li>• Creation of projects ensuring work continuity during decades.</li> <li>• Establishment of a large specialized industrial area</li> <li>• Product ability: marketing inside and outside the continent through the established navigation itinerary</li> <li>• Fish culture</li> </ul>

**Source:** (Bonifica Group, 2018)

Poor consultation and a lack of strategic engagement with the relevant actors by the Congolese government in the decision-making process pose a limitation to the Transaqua – notably, the non-inclusion of different groups (academia, citizen groups, opposition political parties) within the society with alternative or opposing views of the project and the Democratic Republic of Congo's involvement. An interviewee from the Democratic Republic of Congo explained these narratives, conflicting actor interests and opposition to the project, noting that:

Until today, neither the government, the parliament nor the Senate has openly pronounced on this project. Only population, civil society and Congolese experts in various associations for the defence of natural resources are firmly opposed to it. The situation in the DRC is similar in the Republic of Congo and CAR (Central African Republic), countries also ruled by dictators.<sup>117</sup>

Part of the argument put forward by the civil society organisations in opposition to the inter-basin water transfer relies on the idea that the Congo River is a national asset of the Congolese people. Therefore, any decision for a large-scale water abstraction from the river must involve collectively agreed-upon solutions; the idea is that *our water* is taken without *our consent*. Such narratives embedded in actors' interests and frames that perceive the Congo River as a national patrimony of the Congolese people, raises a unique political challenge in the Congolese nation. This form of resistance creates major coordination and political governance challenges for a project the size and scope of Transaqua. Inclusive decision-making in the governance process is one way to resolve this challenge. The lack of government engagement with the population and key stakeholders can only erode the government's political authority, undermining the leadership and political governance needed for implementing such a project. It may also create a condition within the political space where the legality of a political decision becomes disputable, as claimed by the interviewee that:

The current rulers of the DRC (Democratic Republic of Congo), all out of legal mandate, have excelled in selling Congo's natural resources, including freshwater resources. President J. Kabila, without respecting the prescriptions of the National Constitution in this matter, had given to the Chadian President, Idriss Déby Itno, and his agreement for this project since 2005.<sup>118</sup>

Even within the purview of LCBC as a transboundary water governance institution, interregional concerns in non-LCBC states are of interest. Ostensibly, the boundaries and overlaps between intranational and international problems are fragile, fluid and rooted deep in history. In this context, concerns about Rwanda's interests and motives in the Transaqua project are also of interest to the interviewee who noted that:

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<sup>117</sup> Interview with Congolese academic, December 2017

<sup>118</sup> Interview with Congolese academic, December 2017

The Transaqua, in addition to taking control of fresh water in the Congo Basin, will: lay hold of the mining squares of strategic minerals in the eastern region of DRC; strengthen the DRC's Balkanization project, the Transaqua canal would constitute an artificial physical boundary, the aim of this balkanization being to grant our lands to Rwanda (ibid).<sup>119</sup>

If it is correct that Rwanda is interested in accessing mining rights and the balkanization of the Congo, there may be a strong argument to support this position. The Congo basin covers approximately thirty-three per cent of Rwanda's land mass in the country's west, and accounts for ten per cent of Rwanda's national freshwater resources (Rwanda Ministry of Lands, 2005). Perhaps this argument has sustained the political and academic discourse around Congo's balkanization for resource access, control and management. As Ken Anderson observed:

the recently intensified conflict in the Democratic Republic of Congo is a proxy war intended to stifle Sino-Congolese economic cooperation and promised "mining reform." Western media remain complicit in the operation by perpetuating the narrative charade of "ethnic tension". (Anderson, 2009, p. 5)

The evidence contained in the United Nations Security Council's final report of the panel of experts on the illegal exploitation of natural resources and other forms of wealth of the Democratic Republic of Congo (UN Security Council, 2002) can sustain this argument. The report noted that: "The Governments of Rwanda and Zimbabwe, as well as powerful individuals in Uganda, have adopted other strategies for maintaining the mechanisms for revenue generation, many of which involve criminal activities, once their troops have departed" (UNSC, 2002, p. 5). The report goes on to identify the extent of Rwanda's involvement in the conflict in Eastern DRC:

The Panel is in possession of a letter, dated 26 May 2000, from Jean-Pierre Ondekane, First Vice-President and Chief of the Military High Command for RCD-Goma, urging all army units to maintain good relations "with our Interahamwe and Mayi-Mayi brothers", and further, "if necessary to let them exploit the sub-soil for their survival". (UNSC, 2002, p. 14)

Other documented reports contained evidence of extensive illegal activities of multinational corporations, some of which have close ties to Rwanda and other western countries such as France and the United States. Such documents include the United Nations panel of experts' report on the illegal exploitation of natural resources and other forms of wealth of the Democratic Republic of the Congo; and the Organization for Economic Co-operation and Development (OECD) guidelines for multinational enterprises (OECD, 2004). The three reports convincingly demonstrate extensive illegal activities of multinational corporations with close ties to Rwanda and other western countries like France

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<sup>119</sup> Interview with Congolese researcher, December 2017

and the United States. Opposition politicians such as Frédéric Boyenga Bofala, the President of an opposition party (Union for the Republic National Movement) in the Congo, currently in exile, argued against this process of balkanization. Bofala accused Rwanda of being “an inexorable and formidable enemy on its (Congo) eastern border, which increasingly frequently, and for a long time now, has been the author of provocations against our country” (Bofala, 2017, p. 3); adding that Rwanda “will never give up until the right time has finally arrived for the balkanization of Congo-Zaire” (ibid). Here it is worth quoting extensively from Bofala’s article that elucidates his clear and well-articulated thought on this matter:

Everyone must have realised that Rwanda was pursuing, with an unyielding logic, the aims it had at the start of the war of the Great Lakes in October 1996. For nobody will believe that Rwanda, in the most decisive struggle of its history, staked human, physical and financial resources, which it certainly does not have in abundance, just in order to receive redress in exchange for the losses it had suffered. Even the entire region of Kivu would not be enough to explain the energy with which Rwanda is conducting its military, diplomatic and business offensive to keep the Congo permanently unstable. The truth is that this is just a part of a huge programme for its future: dismantling Congo-Zaire and breaking it down into a collection of small provincial States, conquering living space for Rwanda: it believes that the necessary space can only be sought inside the Congo's eastern borders. The aim of the Rwandan offensive is clear: Rwanda seeks, certainly, to make the nation more secure but, above all, to expand. In other words, Rwanda has a problem: conquering territory. Rwanda has a way of achieving it: the permanent destabilisation of the Congo. And so long as the conflict pitting Congo-Zaire and Rwanda against each other consists in defence by the Congo against Rwandan aggression, the instability in the Congo will lead inescapably towards its balkanization. (Bofala, 2017, p. 4)

Boniface Musavuli, who spoke on the strategy of the Rwandan government in the balkanization narrative and agenda, strongly supports the exiled Congolese scholar’s view, stating that:

Rwanda’s strategy has always been to use populations of Rwandan origin, or of Rwandan ancestry. By sending Rwandan populations to Congo and massacring native Congolese, Rwanda is trying to create a Rwandan majority in several provinces or territories of Congo. If they become a majority, these populations will be able to demand a referendum of self-determination and obtain the autonomy of the territories under their control. Then, after autonomy, these territories could be annexed to Rwanda. (Musavuli & Garrison, 2018, p. 2)

These and many more questions arise on how the LCBC, the coordinating agency, could be attentive to these ‘boiling points’ and devise mechanisms and processes to accommodate and manage these concerns. With Rwanda’s increasing political and economic power<sup>120</sup>, the opportunity or challenge of integrating the Transaqua as a transregional or pan-African project looms; just another example of the

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<sup>120</sup> On January 28, 2018, the African Union elected President Paul Kagame as the new Chairperson for the African Union.



significant political and institutional challenges facing the LCBC. Internal problems within the DRC and her neighbour, Rwanda, offer additional insights into unacknowledged interregional political issues, and the Congo was projected to experience a mega-crisis in 2018 due to its internal political instability (Blom, 2017). The DRC as the water-donating country faces stiff opposition from a range of civil society actors within the country; notably, academia, citizen groups and opposition political parties with alternative or opposing views to the project. One of the arguments in opposition to the Transaqua is that the Congo River is a national asset of the Congolese people and any large-scale water abstraction will be harmful to them and their environment. This is illustrated by the quote from an email interview with an academic from the DRC:

Until today, neither the government, the parliament nor the Senate has openly pronounced on this project. Only population, civil society and Congolese experts in various associations for the defence of natural resources are firmly opposed to it. The situation in the DRC is similar in the Republic of Congo and CAR, countries also ruled by dictators. The current rulers of the DRC, all out of legal mandate, have excelled in selling Congo's natural resources, including freshwater resources. President J. Kabila, without respecting the prescriptions of the National Constitution in this matter, had given to the Chadian President, Idriss Déby Itno, and his agreement for this project since 2005. (Academic, 2017)

Narratives that present the Congo River as a national heritage of the Congolese people point to key political challenges for the DRC and the Transaqua. These problems question and dispute the legality or legitimacy of political decisions made by political leaders. The internal controversies may have prompted the DRC to veto the decision to proceed with the Transaqua feasibility study in June 2018 (Misser, 2018). The DRC is the only country objecting to the project of all the AU's six regional REC powers. Recognising this peculiar challenge, the former LCBC executive secretary in his speech to the European Union parliament at the high-level conference on Africa in 2017 attempted to address it:

Concerns and issues that are continually being expressed regarding inter-basin water transfers should be appropriately addressed to guide policy and decision makers..... there is a lingering perception that water could be siphoned from Congo basin to support continued growth in Lake Chad basin, resulting in harm to the water resources, the economy, the environment and the people of the source basin. (Abdullahi, 2017, p. 5)

Attention to these tipping points (Lopez et al., 2019) offers the LCBC an opportunity to devise responsive governance mechanisms and processes to manage these concerns.

## Appendix M: Selected historical maps of Nigeria showing the political and administrative boundaries 1914-1997

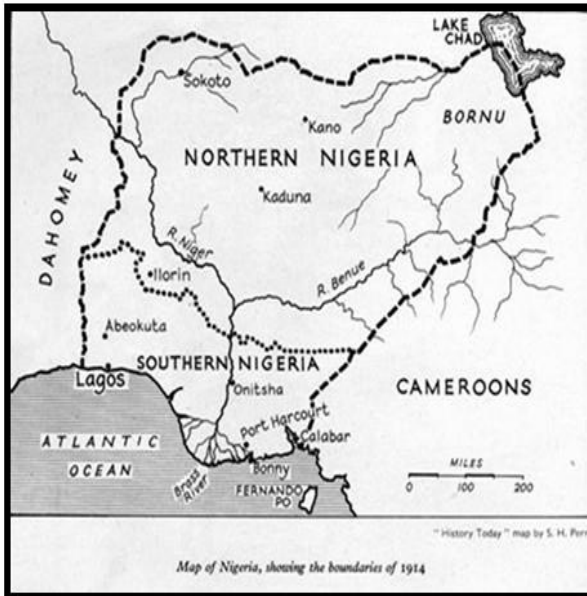


Figure M-1: 1914 boundaries



Figure M-2: 1962 boundaries

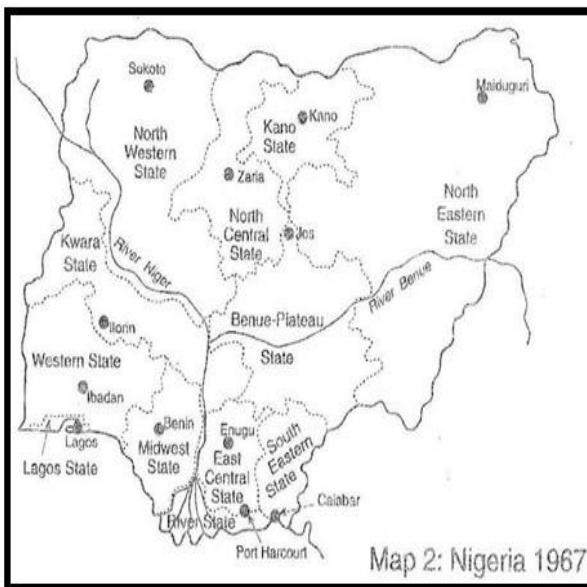


Figure M-3: 1967 boundaries



Figure M-4: 1997 boundaries

Sources: M-1: (Colonial Office, 1916). M-2: (Library of Congress, 1962). M-3 and M-4: (American Historical Association, 2021).