Infrastructure as Dignity: Women's Water Labor and Political Exclusion in Lagos Slums

A Long-Durational Feminist Study of Water Infrastructure and Organizing



Cumulative doctoral dissertation by Fabienne Hoelzel
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Dortmund, 2026

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Cumulative doctoral dissertation
for the degree of Doctor of Engineering (Dr.-Ing.)
Dortmund, 2026
Date of oral examination: 23 October 2026

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Cover photograph: Water labor, Lagos, 2026. © Fabienne Hoelzel

Dedication

This dissertation is dedicated to all the women across Lagos, Abuja, Nairobi, Dadaab, Dakar, and the many places I have not yet reached. They navigate everyday life while simultaneously producing the actually existing postcolonial African city—without recognition, and often without recourse. This is an act of solidarity with their labor, and with the dignity it contains.

Acknowledgments

This dissertation would not exist without the 194 participants who shared their lives with me across seven years of fieldwork. I am especially grateful to the women of Otumara, Amukoko-Mosafejo, Mafowoku, Orisunmibare, and Precious Seeds who trusted me with stories of survival, resistance, and collective organizing. I hope this work honors those experiences and contributes, however modestly, to the transformation you have already begun. I also wish to acknowledge the former members of the Oworo Reality Women Group, whose community was destroyed by forced eviction in December 2025: their organizing endures, and this dissertation refuses to let it disappear.

I am deeply grateful to Dr. Wolfgang Scholz and Prof. ir. em. Kees Christiaanse for their sustained support, critical engagement, and encouragement throughout this process. I also thank Prof. Dr. Sophie Schramm for her role on the examination committee. The editors and reviewers involved in the paper publication process provided invaluable guidance in sharpening the arguments.

This research was supported by the German Academic Exchange Service (DAAD), which funded my field research in 2019, and by the Stuttgart State Academy of Art and Design, which granted a research semester that contributed to the writing of this dissertation.

In Lagos, officials and representatives of Lagos State government—particularly from the Lagos Water Corporation (LWC) and the Lagos State Urban Renewal Agency (LASURA)—gave generously of their time for reflective and verifying conversations. I extend this acknowledgment to members of the five local governments whose everyday work on the ground this dissertation attempts to render visible.

My translator Yewande Morris enabled conversations that would otherwise have been impossible. Without her skill, patience, and judgment, the empirical foundation of this work would be far thinner.

Colleagues at Lagos State University provided intellectual community and critical feedback. I am especially grateful to Prof. Dr. Taibat Lawanson and Dr. Adeyemi Oginni.

Ass. Prof. Dr. Zegeye Cherenet of Addis Ababa University has been both a rigorous critical interlocutor and a warm, steadying presence. He was among the first to encourage my engagement with urban Africa, and that encouragement has proven enduring.

Colleagues at the Stuttgart State Academy of Art and Design showed genuine curiosity and intellectual generosity toward this project. I am especially grateful to Prof. Dr. Ole W. Fischer, Prof. Wolfgang Mayer, and Karin Schulte for their engagement with the content and stakes of this research. I also wish to thank my academic associates Saskia Niklas, Ute Vees, Lisa Dautel, and Metadel Sileshi for their commitment, energy, and enthusiasm in helping to establish urban Africa as a field of research and teaching at the chair of urban design.

I extend these thanks to the many African Master exchange students I have been privileged to welcome in Stuttgart since 2017: Alex Otungo Maroko, Bolly Kevin Echessa, Faith Margaret Atieno Mugah, Stephanie Akeyo Nyapela, Mojeed Afolabi, Damisi Akinnubi, Foluke Mofoluwake, Simisola Fabusuyi, Abraham Okello Omoding, Elizabeth Sanyaolu, Salaam Mujibah, Naimah Akinbile, Chienye Ndudim, Francisca Uwakwe, Salem Gulilat, Bethelhem Gebremedhin, Boluwatife Soremi, Chukwudumebi Asem, Adeposi Adeogun, Eden Dereje Shewandagn, Yodahe Taye Dubre, Yishak Teklegiorgis, Bezabh Yeshiwas, Assefa Robel, Kalkidan Debela, and Abdelwehab Mohammed. Coming from Ethiopia, Nigeria, and Kenya, they brought their lived realities as young urban Africans into a very different institutional environment—and did not allow that difference to silence them. I grew alongside them, and this dissertation carries traces of what I learned.

Being a scholar requires sustained engagement with the literature of one's field and its neighbors. Engaging intellectually with postcolonial urban Africa has been the most consequential intellectual adventure of my life—one that has unsettled nearly everything I once assumed about cities, their production, what it means to be a woman, and perhaps about life in its entirety. While my desk, shelves, and hard drive are full of works that matter to this project, a few authors shook my thinking fundamentally and have become, over time, what I can only describe as faithful yet uncomfortable intellectual companions. Rita Laura Segato and Achille Mbembe are foremost among them. If I were not already a feminist when I first read Segato, she would have made me one. Mbembe's Postcolony, for all its silences on gender, grasps the depth and materiality of postcolonial sub-Saharan Africa with a force that is very difficult to match. And AbdouMaliq Simone taught me that how we write about African cities is itself an intervention—that the narrative we choose is inseparable from the transformation we seek, or refuse.

FABULOUS URBAN | NIGERIA FOUNDATION supported and accompanied this work throughout. I am especially grateful to Aro Ismaila, our Lagos Director of Projects, whose local knowledge, critical acuity, and commitment to the communities we work with are present on every page.

The Heinrich Böll Foundation Abuja has been FABULOUS URBAN's closest partner organization and a steadfast ally in the work for a more equal and gender-responsive Lagos, building over more than a decade a forum of exchange and alliance among the CBOs and NGOs advocating for citizen-led and community-based urban planning and governance in the city.

FABULOUS URBAN shares the passion, energy, and labor of making Lagos more equal and gender-responsive with a number of allied organizations. Every conversation we have brings us, I hope, a little closer to that common goal. I am especially grateful to Deji Akinpelu of Rethinking Cities and Olamide Udoma-Ejorh of Ludi.

I would like to thank Valentin Alisch for his advice and support in the area of visual communication.

Finally, my thanks go to my family and friends—and especially to the women in my life who have supported this work, whether silently through their example or actively through their encouragement and belief. I am especially grateful to my mother, Jacqueline Hausammann; my childhood friend Fränzi Zimmerli; my colleague and friend Claudia Meier; my former supervisor Dr. Elisabete França, who invited me in 2009 to join her team at SEHAB in São Paulo and thereby set the course of everything that followed; and Monika Umunna, whose belief in the work and whose friendship have sustained my engagement in Lagos since 2012.

Infrastructure as Dignity: Women's Water Labor and Political Exclusion in Lagos Slums

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Abstract

This dissertation investigates how gendered power relations structure both access to water and control over water infrastructure in Lagos slums. Women function as de facto water infrastructure providers at the household scale—their daily labor procuring, transporting, storing, and rationing water constitutes the actually existing municipal coverage for Lagos's 12–16 million slum residents—while the water supply infrastructure itself is almost exclusively controlled by men through private boreholes, vendor cartels, and male-dominated community governance structures that systematically exclude women from implementation, management, and decision-making. Drawing on fifteen years of practice engagement combined with seven years of formal doctoral research (2018–2025) including 194 interviews across five Lagos slum communities (Otumara, Amukoko-Mosafejo, Mafowoku, Orisunmibare, Precious Seeds), this long-durational feminist study generates epistemological insights unavailable through conventional fieldwork timelines.

The doctoral research addresses three critical gaps: limited technical documentation of informal water infrastructure systems, insufficient multi-scalar analysis of gendered water access and control, and absence of feminist analysis in Lagos water infrastructure scholarship. Employing the cumulative dissertation format, three empirical papers use distinct methodologies—game theory, comparative institutional analysis, and feminist ethnography—while integrating four theoretical strands: postcolonial urbanism (Mbembe 2001; Simone 2004a, 2004b), feminist geography (Massey 1994; McDowell 1999), feminist political ecology of water (Sultana 2011; Truelove 2019a, 2019b), and hybrid governance theory (Jaglin 2014; Monstadt and Schramm 2017)—synthesized through the infrastructure as dignity framework this dissertation develops. The framework draws centrally on Segato's (2003; 2018) theorization of the mandato de masculinidad and her distinction between low-intensity and high-intensity patriarchy, and on the African feminist scholarly tradition (Oyěwùmí 1997; Mama 1995; Tamale 2011) insisting on theorizing from Black African women's material conditions as generative ground.

The dissertation develops “infrastructure as dignity” as theoretical framework extending and transforming Anand's (2017) hydraulic citizenship concept. Where hydraulic citizenship theorizes how residents negotiate belonging through state infrastructure, infrastructure as dignity theorizes what happens when women's labor has already produced the infrastructure the state has not provided—shifting the normative ground from a politics of recognition to an ethics of non-abandonment. The framework constitutes a post-citizenship analysis demonstrating that infrastructure provision in contexts of near-total state absence has already exceeded what citizenship frameworks can account for. A critical analytical distinction structures the dissertation's argument and intervention frameworks: the difference between inclusion feminism (inserting women into existing patriarchal governance structures) and transformation feminism (theorizing governance from women's infrastructure labor as generative ground)—a distinction with implications beyond the water sector.

The cumulative analytical deepening across three papers—from game-theoretical analysis of state-community non-cooperation (Paper 1), through comparative institutional analysis revealing

governance heterogeneity across “free-market” and “solidarity” provision models (Paper 2), to feminist ethnography centering women's embodied experiences of water procurement (Paper 3)—reveals that gender operates not as one inequality among others but as the transversal inequality structuring who occupies which position within the power configurations that class and space delimit. Eight insights and one methodological implication synthesized from multi-scalar analysis inform two complementary intervention pathways: comprehensive policy reforms targeting Lagos Water Corporation (LWC) and Lagos State government (LSG), including technical infrastructure standards specifying compound-level water point distribution at a minimum target of 75 liters per person per day—the threshold at which women's bodily needs cease to be systematically sacrificed to household water scarcity; and experimental multi-scalar frameworks operable regardless of state receptivity, centering cross-community women's water networks, hybrid financing models, and protective mechanisms addressing gender-based violence risks. These recommendations carry differentiated evidence status: empirically grounded findings from documented infrastructure configurations and demonstrated women's organizing capacity; theoretically derived proposals designed for empirical testing through the planned 2026 LWC implementation project; and normative commitments generated by the framework's ethics of non-abandonment regardless of implementation outcomes.

Theoretical contributions include establishing infrastructure as dignity as framework revealing what postcolonial urban theory structurally cannot see—women's infrastructure labor as city-producing work—through a synthesis of Mbembe's analysis of male political impotence in the postcolony with Segato's theorization of the gendered relational forms that fill the vacuum male power produces; demonstrating the inseparability of technical infrastructure parameters and governance decisions; developing long-durational practice-research as distinct epistemology; and positioning eviction as gendered constitutive violence targeting women's infrastructure organizing. The forced evictions of Orisunmibare (February 2024) and Precious Seeds (December 2025)—despite vastly different internal conditions—empirically validate that community-scale organizing, however successful, operates at insufficient scale to challenge state violence, necessitating cross-community networks resilient to individual settlement erasure.

The planned 2026 LWC implementation project operationalizes findings through cross-community women's water network formation, borehole-to-standpipe distribution systems under women's committee governance, and state partnership advocacy—proceeding experimentally regardless of institutional receptivity. This doctoral research demonstrates that addressing Lagos's water crisis requires recognizing infrastructure as socio-technical terrain where governance arrangements and engineering specifications are inseparable: those whose labor produces infrastructure deserve corresponding governance rights, and the technical standards through which infrastructure operates must be configured for equitable compound-level coverage rather than vendor profit maximization.

Keywords: water infrastructure, feminist political ecology, postcolonial urbanism, African feminist theory, Lagos, informal settlements, gender inequality, hybrid governance, infrastructure labor, eviction, scholar-activism, infrastructure as dignity, dignity, feminist geography, mandato de masculinidad

Infrastruktur als Würde: Wasserarbeit von Frauen und politische Exklusion in den Slums von Lagos

Wasserinfrastruktur und Organisierung. Eine feministische Langzeitstudie

Zusammenfassung

Die vorliegende Dissertation untersucht, wie geschlechtsspezifische Machtverhältnisse sowohl den Zugang zu Wasser als auch die Kontrolle über Wasserinfrastruktur in den Slums von Lagos strukturieren. Frauen fungieren auf Haushaltsebene als faktische Bereitstellerinnen von Wasserinfrastruktur. Ihre tägliche Arbeit des Beschaffens, Transportierens, Speicherns und Rationierens von Wasser bildet die real existierende kommunale Versorgung für die 12–16 Millionen Slumbewohner:innen von Lagos, während die Wasserversorgungsinfrastruktur selbst nahezu ausschließlich von Männern kontrolliert wird – durch private Bohrlöcher, Händlerkartelle und männlich dominierte kommunale Governance-Strukturen, die Frauen systematisch von Umsetzung, Management und Entscheidungsfindung ausschließen. Auf der Grundlage von fünfzehn Jahren praktischer Tätigkeit in Verbindung mit sieben Jahren formaler Promotionsforschung (2018–2025), darunter 194 Interviews in fünf Slumgemeinschaften in Lagos (Otumara, Amukoko-Mosafejo, Mafowoku, Orisunmibare, Precious Seeds), generiert diese feministische Langzeitstudie erkenntnistheoretische Einsichten, die durch konventionelle Feldforschungszeiträume nicht zugänglich sind.

Die Promotion adressiert drei zentrale Forschungslücken: die begrenzte technische Dokumentation informeller Wasserinfrastruktursysteme, die unzureichende mehrskalige Analyse geschlechtsspezifischen Wasserzugangs und entsprechender Kontrollverhältnisse sowie das Fehlen feministischer Analysen in der Forschung zur Wasserinfrastruktur in Lagos. Im Format einer kumulativen Dissertation verwenden drei empirische Studien unterschiedliche Methoden – Spieltheorie, vergleichende Institutionenanalyse und feministische Ethnographie – und integrieren dabei vier theoretische Stränge: postkolonialen Urbanismus (Mbembe 2001; Simone 2004a, 2004b), feministische Geographie (Massey 1994; McDowell 1999), feministische politische Ökologie des Wassers (Sultana 2011; Truelove 2019a, Truelove, 2019b) sowie Theorien hybrider Governance (Jaglin 2014; Monstadt und Schramm 2017) – zusammengeführt durch das in dieser Dissertation entwickelte Framework *Infrastruktur als Würde*. Das Framework stützt sich zentral auf Segatos (2003; 2018) Theoretisierung des *mandato de masculinidad* sowie ihre Unterscheidung zwischen niedrigintensivem und hochintensivem Patriarchat, und auf die afrikanisch-feministische Forschungstradition (Oyěwùmí 1997; Mama 1995; Tamale 2011), die darauf besteht, von den materiellen Bedingungen Schwarzer afrikanischer Frauen als generativem Boden aus zu theoretisieren.

Die Dissertation entwickelt »Infrastruktur als Würde« als theoretisches Framework, das Anands (2017) Konzept der *hydraulic citizenship* erweitert und transformiert. Wo hydraulische Staatsbürgerschaft theoretisiert, wie Bewohner:innen Zugehörigkeit über staatliche Infrastruktur aushandeln, theoretisiert Infrastruktur als Würde, was geschieht, wenn die Arbeit von Frauen jene Infrastruktur bereits hervorgebracht hat, die der Staat nicht bereitgestellt hat – wodurch sich der normative Bezugsrahmen von einer Politik der Anerkennung hin zu einer Ethik der Nicht-Verlassenheit verschiebt. Der Rahmen stellt eine Post-Citizenship-Analyse dar, die zeigt, dass die Infrastrukturbereitstellung in Kontexten nahezu vollständiger staatlicher Abwesenheit bereits

über das hinausgeht, was Staatsbürgerschaftsrahmen erfassen können. Eine kritische analytische Unterscheidung strukturiert das Argument der Dissertation und ihre Interventionsrahmen: die Differenz zwischen Inklusionsfeminismus (das Einfügen von Frauen in bestehende patriarchale Governance-Strukturen) und Transformationsfeminismus (die Theoretisierung von Governance ausgehend von der Infrastrukturarbeit von Frauen als generativem Boden) – eine Unterscheidung mit Implikationen weit über den Wassersektor hinaus.

Die kumulative analytische Vertiefung über die drei Fachaufsätze hinweg – von einer spieltheoretischen Analyse der Nicht-Kooperation zwischen Staat und Gemeinschaft (Aufsatz 1), über eine vergleichende Institutionenanalyse, die Governance-Heterogenität zwischen »marktförmigen« und »solidarischen« Versorgungsmodellen offenlegt (Aufsatz 2), bis hin zu einer feministischen Ethnographie, die die verkörperten Erfahrungen von Frauen bei der Wasserbeschaffung ins Zentrum rückt (Aufsatz 3) – zeigt, dass Geschlecht nicht als eine Ungleichheit unter anderen, sondern als die transversale Ungleichheit operiert, welche strukturiert, wer innerhalb der durch Klasse und Raum umrissenen Machtkonfigurationen welche Position einnimmt. Acht aus der mehrskaligen Analyse synthetisierte Erkenntnisse sowie eine methodologische Implikation informieren zwei komplementäre Interventionspfade: zum einen umfassende politische Reformen, die auf die Lagos Water Corporation (LWC) und die Regierung des Bundesstaates Lagos (LSG) abzielen, einschließlich technischer Infrastrukturstandards, die eine Verteilung von Wasserentnahmestellen auf Compound-Ebene mit einem Mindestziel von 75 Litern pro Person und Tag vorsehen – der Schwelle, an der die körperlichen Bedürfnisse von Frauen nicht länger systematisch der Wasserknappheit auf Haushaltsebene geopfert werden; zum anderen experimentelle mehrskalige Handlungsrahmen, die unabhängig von staatlicher Empfänglichkeit funktionsfähig sind und gemeinschaftsübergreifende Frauen-Wassernetzwerke, hybride Finanzierungsmodelle sowie Schutzmechanismen gegen geschlechtsbasierte Gewaltrisiken ins Zentrum stellen. Diese Empfehlungen tragen einen differenzierten Evidenzstatus: empirisch fundierte Befunde aus dokumentierten Infrastrukturkonfigurationen und nachgewiesener Organisationsfähigkeit von Frauen; theoretisch abgeleitete Vorschläge, die für die empirische Überprüfung im Rahmen des für 2026 geplanten LWC-Implementierungsprojekts konzipiert sind; und normative Verpflichtungen, die sich aus der Ethik der Nicht-Verlassenheit des Rahmens unabhängig von Umsetzungsergebnissen ergeben.

Zu den theoretischen Beiträgen zählen: die Etablierung von Infrastruktur als Würde als Framework, das sichtbar macht, was die postkoloniale Stadttheorie strukturell nicht sehen kann – die Infrastrukturarbeit von Frauen als stadtproduzierende Arbeit – durch eine Synthese von Mbembes Analyse männlicher politischer Impotenz in der Postkolonie mit Segatos Theoretisierung jener vergeschlechtlichten relationalen Formen, die das von männlicher Macht erzeugte Vakuum füllen; der Nachweis der Untrennbarkeit technischer Infrastrukturparameter und Governance-Entscheidungen; die Entwicklung langzeitlicher Praxisforschung als eigenständige Epistemologie; und die Positionierung von Zwangsräumung als vergeschlechtlichter konstitutiver Gewalt, die sich gegen die Infrastrukturorganisierung von Frauen richtet. Die gewaltsamen Räumungen von Orisunmibare (Februar 2024) und Precious Seeds (Dezember 2025) – trotz erheblich unterschiedlicher interner Bedingungen – bestätigen empirisch, dass Organisierung auf Gemeinschaftsebene, so erfolgreich sie auch sein mag, auf einem Maßstab operiert, der unzureichend ist, um staatlicher Gewalt zu begegnen, und macht somit gemeinschaftsübergreifende Netzwerke notwendig, die gegenüber der Auslöschung einzelner Siedlungen resilient sind.

Das für 2026 geplante LWC-Implementierungsprojekt operationalisiert die Befunde durch die Bildung gemeinschaftsübergreifender Frauen-Wassernetzwerke, durch Bohrloch-zu-Standrohr-Verteilungssysteme unter der Governance von Frauenkomitees sowie durch Advocacy für staatliche Partnerschaften – und verfährt experimentell unabhängig von institutioneller Empfänglichkeit. Diese Dissertation zeigt, dass die Bewältigung der Wasserkrise von Lagos erfordert, Infrastruktur als sozio-technisches Terrain anzuerkennen, in dem Governance-Arrangements und ingenieurtechnische Spezifikationen untrennbar sind: jene, deren Arbeit Infrastruktur hervorbringt, verdienen entsprechende Governance-Rechte, und die technischen Standards, durch die Infrastruktur funktioniert, müssen auf eine gleichberechtigte Versorgung auf Compound-Ebene hin konfiguriert sein und nicht auf die Profitmaximierung von Händler:innen.

Schlüsselwörter: Wasserinfrastruktur, feministische politische Ökologie, postkolonialer Urbanismus, afrikanische feministische Theorie, Lagos, informelle Siedlungen, Geschlechterungleichheit, hybride Governance, Infrastrukturarbeit, Zwangsräumung, Scholar-Activism, Infrastruktur als Würde, Würde, feministische Geographie, *mandato de masculinidad*

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List of Abbreviations

APC	All Progressives Congress (Nigerian political party)
CBO	Community Based Organization
CDA	Community Development Association
GBV	Gender-Based Violence
IDP	Internally Displaced Person
IPV	Intimate-Partner Violence
LASG	Lagos State Government (abbreviation used in Chapter 4)
LASURA	Lagos State Urban Renewal Agency
LCDA	Local Council Development Area
LGA	Local Government Area
LSG	Lagos State Government (abbreviation used in Chapters 5–8)
LWC	Lagos Water Corporation
MDDT	Mobile Dry Diversion Toilet
NGO	Non-Governmental Organization
PDP	Peoples Democratic Party (Nigerian political party)
UN	United Nations
WASH	Water, Sanitation, and Hygiene

Note on Formatting and Lagos Terminology

This dissertation follows American English spelling conventions and employs Harvard (author-date) citation style throughout all chapters. Published papers appearing as Chapters 4, 5, and 6 have been adapted from their original publication formats for consistency with these conventions. The substantive content, including empirical findings, analyses, and arguments, remains unchanged from the published versions. Figure and table numbering has been updated to reflect chapter numbering (e.g., Figure 4.1, Table 5.2). Abbreviations are defined on first use in each chapter and are compiled in the List of Abbreviations in the front matter.

One terminological note:

Lagos State government appears as "LASG" in Chapter 4 (reflecting the original 2022 publication) and as "LSG" in Chapters 5–8 (reflecting terminology adopted in subsequent publications). Both abbreviations refer to the same government entity.

Lagos is both a state and a city. Lagos State comprises 20 local government areas, of which 16 constitute the city of Lagos. The relevant political and administrative entity for water provision is the state: Lagos Water Corporation (LWC) operates at state level, and Lagos State government (LSG) determines infrastructure policy. This dissertation uses "state" rather than "municipal" to reflect this administrative reality.

Chapter 1: Becoming a Feminist Urbanist: Practice, Positionality, and the Making of This Research

1.1 From Practice to Feminist Inquiry: Why Water, Why Slums, Why Now

This chapter advances an epistemological argument: that sustained practitioner engagement in postcolonial urban contexts does not merely precede research but fundamentally constitutes the conditions under which certain knowledge becomes possible. The trajectory documented here—from gender-blind infrastructure practitioner to feminist urbanist—is not offered as autobiographical prelude but as evidence for how positionality, disciplinary formation, and material context shape what researchers recognize as analytically significant. Feminist methodologists have long argued that knowledge production is situated (Haraway 1988; Harding 1991), yet situated knowledge claims often function as performative acknowledgments rather than substantive analytical commitments. This chapter operationalizes situatedness: it traces how specific practice failures—a biogas cooperative captured by patriarchal leadership, sanitation technologies denied to women by male household members—generated the analytical questions that technical infrastructure frameworks could not answer, compelling the feminist theoretical reorientation structuring this dissertation. The chapter further examines how whiteness, European nationality, gender, and class privilege simultaneously enabled and constrained knowledge production across fifteen years of practice engagement, thirteen of them with Lagos's informal water systems, establishing the reflexive-methodological foundation upon which all subsequent chapters depend.

My engagement with slums—termed favelas in Brazil, slums in Nigeria, and bidonvilles in Francophone Africa—began in early 2010 when I joined Dr. Elisabete França's team at São Paulo's Secretariat of Housing (SEHAB) to implement the city's slum-upgrading program. Leaving my research position at ETH Zurich's Institute for Urban Design under Prof. ir. Kees Christiaanse in late 2009, I assumed an executive role upgrading settlements classified as favelas under Brazil's official definition. In 2010, favelas housed 20% of São Paulo's population, declining to 15% by 2024 (IBGE 2024), reflecting government interventions producing heterogeneous outcomes including improved but poorly defined water access (UN-HABITAT 2010).

My three years at SEHAB (01/2010–12/2012) revealed persistent gaps between technical provision and social equity. Although half of SEHAB's staff were social workers, slum-upgrading remained primarily technical-infrastructural—a framing I initially accepted uncritically, focused on infrastructure delivery rather than interrogating who benefited from interventions or how household-level power relations mediated access. I left in late December 2012 following government change with questions about slum-upgrading's actual aim—improving life within favelas or eliminating them to create equal urban resource access—but these questions remained primarily at the scale of state–community relations, not yet examining intra-household or gendered dimensions.

My trajectory from São Paulo to Lagos began with a 2012 invitation from Nigerian NGOs to speak about Brazilian slum-upgrading as Makoko—Lagos's iconic waterfront settlement—faced imminent eviction. That encounter revealed a city defying my São Paulo experience: 60 to 80% of Lagos's population (approximately 12–16 million people) resides in slums per UN-HABITAT criteria, where government's "global city of the South" aspiration manifests through evictions rather than service provision. What began as one speaking engagement became sustained involvement from 2013 onward, driven by deep fascination with African cities and Lagos specifically, whose demographic reality—where slums house the majority—demands different analytical frameworks. Returning to Switzerland, I resumed part-time at ETH Zurich with Prof. ir. Christiaanse while founding FABULOUS URBAN | NIGERIA FOUNDATION in 2013—a Swiss-Nigerian NGO combining urban design practice, infrastructure implementation, and advocacy. In 2016, my appointment as Professor of Urban Design at Stuttgart State Academy (Staatliche Akademie der Bildenden Künste Stuttgart, ABK Stuttgart) provided the institutional base for developing research-informed infrastructure interventions, creating feedback loops between research, teaching, and implementation.

The move from São Paulo to Lagos was not merely geographical but epistemological. Lagos's near-total absence of household water connections made visible gendered dimensions that São Paulo's partial piped service had obscured. Where São Paulo favelas receive intermittent municipal supply—however inadequate—Lagos's slum population operates almost entirely through informal provision systems controlled by male vendors and intermediaries. This disparity creates what I term "infrastructural exposure": women's daily labor procuring water becomes impossible to overlook when no household has reliable access, when every drop requires negotiation with vendors or hours queuing at communal taps. The extremity of Lagos's water crisis, while producing immense hardship, paradoxically enabled recognition of patterns that remained analytically invisible in contexts with greater state provision. My failure to center gender in São Paulo work reflected not only my practitioner framing at that time but also how partial infrastructure provision can mask the gendered labor sustaining urban life—a recognition that emerged only through confronting Lagos's more radical infrastructural abandonment. This epistemological dimension of the practice-to-research trajectory—the insight that what researchers see depends not only on who they are but on what material conditions make visible—informs the methodological strategies detailed in Section 1.2.

The mechanism by which practice failure generates theoretical knowledge requires explicit theorization rather than mere narration. Reflexive accounts of researcher positionality—now standard in feminist and postcolonial methodology—typically position practice as context for research: the researcher arrives, encounters complexity, adjusts. What the trajectory documented here reveals is a different relationship between practice and knowledge production. Implementation failures did not simply prompt new research questions; they produced empirical evidence that theoretical frameworks alone could not have generated. The biogas cooperative's capture by male leadership was not an illustration of patriarchal exclusion I could have deduced from reading Oyěwùmí or Mama—it was an event whose specific dynamics (the pragmatic deferral, the consolidation, the irreversibility) constituted knowledge about how patriarchal structures operate through infrastructure governance that no amount of prior feminist theorizing would have predicted. Schön's (1983) concept of reflection-in-action captures part of this: practitioners generate knowledge through confronting situations that resist technical framing. But Schön's framework lacks the political dimension essential here. Nagar's (2014) theorization of collaborative praxis comes closer—knowledge emerges through sustained engagement with

communities whose material conditions challenge the researcher's inherited frameworks. What my trajectory adds to both is the role of failure as epistemic event: it is not engagement as such that transforms analytical frameworks but the specific experience of watching "best practice" interventions reproduce the very exclusions they purport to address. That experience—repeated across biogas, MDDT, and initial water governance work—generated an embodied understanding of how patriarchal infrastructure operates that reading alone could not produce and that short-term fieldwork could not replicate.

This claim—that practice failure constitutes a distinct mode of knowledge production—carries methodological implications for how the dissertation's progressive analytical deepening should be read. The shift from game theory (Paper 1) through comparative institutional analysis (Paper 2) to feminist ethnography (Paper 3) is not a correction of earlier errors but a cumulative epistemic process in which each method's limitations became visible only through its practice. Game theory captured strategic interactions but could not explain why mutual gains went unrealized when gendered power asymmetries structured the game's payoff matrix. Comparative analysis revealed institutional diversity but could not account for why women's exclusion remained constant across governance models that differed in every other respect. These were not failures of method but productive encounters with each method's horizon—encounters that cumulatively directed the analysis toward gender as the analytically generative lens capable of explaining what earlier approaches had documented but could not make legible. The feminist reorientation structuring Paper 3 and the infrastructure as dignity framework did not arrive through a single recognition but through the convergence of multiple forces—practice failures, accumulated testimony, theoretical encounter, and the researcher's own confrontation with internalized epistemological hierarchies—whose interaction the cumulative structure of the following section and Chapter 2 traces in full.

My Lagos work since 2013 centered on supposedly sound community-based interventions: biogas-powered community centers (the Makoko biogas center, destroyed entirely during Makoko's January 2026 eviction), Mobile Dry Diversion Toilets (MDDT), and shelter for women displaced by evictions and, in Abuja, by Boko Haram. Yet these "best practice" projects failed in ways that exposed not only analytical blind spots but strategic compromises I made knowingly. The biogas center—implemented in 2014, extended to biogas production in 2017—collapsed through operational and management failures rooted in my pragmatic decision to register the cooperative with male traditional leaders only, assuming women could be integrated after implementation. Men blocked subsequent attempts to include women despite their role as primary waste collectors, and the facility proved unsustainable without their participation. The MDDT—initiated at my Chair, developed through my organization—faced identical barriers: men denied female household members toilet access. What I had framed as "community participation" systematically reproduced male-dominated power structures I failed to interrogate and, in the biogas case, structures I pragmatically accommodated with the intention of transforming later—a strategy that proved fundamentally flawed. My practitioner training had taught me to engage "community leadership"—which meant engaging men—without questioning why leadership was exclusively male or how this exclusion related to project failures.

These implementation and operational failures revealed a pattern I had not anticipated: women's systematic exclusion from infrastructure decision-making and control traced directly to their invisibilized water procurement labor. Water emerged as the convergence point connecting biogas management failures, MDDT access denial, and the broader dynamics of patriarchal household structures, male-dominated slum governance, and government policies refusing to acknowledge

slum existence. In Lagos slums, women spend two hours or more daily procuring water—time extracted from income, education, childcare, rest—making water not merely service deficit but mechanism producing multiple inequalities. Hauling jerrycans, navigating vendor pricing, managing scarcity—these practices position women as de facto infrastructure providers yet systematically excluded from infrastructure decisions.

Confronting these failures—and the accumulated evidence of fifteen years across Lagos and Nairobi slums, Abuja IDP camps, and Dadaab refugee settlements—revealed a pattern that standard intersectionality frameworks, while indispensable, do not adequately theorize. Intersectionality rightly insists that gender, class, race, ethnicity, and spatial marginalization are co-constitutive: a female slum-dwelling tenant in Lagos experiences exploitation qualitatively different from that of an upper-class Nigerian woman whose domestic servants perform water procurement labor on her behalf, or who can afford commercial water delivery. Class, ethnicity, and geography determine which group one belongs to and how severely subordination manifests. But what this research documents across every context I have encountered—every community, every displacement camp, every institutional setting—is that within any group sharing the same class position, the same ethnicity, the same spatial marginalization, gender consistently operates as the axis along which domination reproduces itself. Hold every other variable constant, and women are still subordinated: they perform the unpaid labor, they are excluded from decisions, they experience violence from men within their own group who share their poverty, their ethnicity, their precarity. This pattern is not unique to Lagos. It repeated itself in Abuja's IDP camps where displaced Hausa women performed both reproductive and income-generating labor—procuring water, managing households, trading to sustain families—while displaced Hausa men retained control over resource distribution and decision-making within the same conditions of displacement. It repeated in Dadaab where Somali refugee women sustained households through reproductive and economic labor—water procurement, food preparation, small-scale trade—while Somali refugee men dominated camp governance structures and controlled resource allocation, reproducing patriarchal authority within conditions of shared displacement and shared precarity. It repeated in my own professional experience: presenting my research—seven years of fieldwork, 194 interviews, three peer-reviewed publications—alongside my Nigerian male colleague, audiences consistently addressed him as the authority despite his own insistence on my primacy. Gender subordination is not one inequality among many that intersects with others in context-specific configurations. It is the transversal inequality—the one that operates within every other social category, that no shared identity or shared marginalization eliminates, and that therefore constitutes the analytically indispensable lens for understanding how power reproduces itself at the scale where infrastructure meets bodies: the household, the queue, the point of sale. Race, class, and geography set the terms; gender extracts the cost. This is an empirical finding with theoretical force, not a metaphysical claim about what matters most. It means that analytical frameworks attending to class or spatial marginalization without centering gender will consistently misdiagnose why technically sound interventions fail—because they cannot see the intra-group domination that captures every intervention’s benefits for men while extracting its costs from women. Reading feminist geographers (Massey, McDowell), postcolonial urbanists (Simone, Mbembe), feminist political ecologists on water (Sultana, Harris, Mehta), and African feminist scholars (Oyěwùmí, Mama, Tamale, Dangarembga) provided the theoretical vocabulary to articulate what practice had made visible.

In 2016, compelled by questions practice could not answer, I began my cumulative doctoral thesis—initially titled “Effective, affordable, community-based approaches in urban slum

settlements in Lagos, Nigeria." This title reflected my practitioner framing: technical interventions, affordability constraints, community engagement as implementation and operational challenge. Only through research did the central question transform, eventually becoming "Infrastructure as Dignity: Women's Water Labor and Political Exclusion in Lagos Slums: A Long-Durational Feminist Study of Water Infrastructure and Organizing." This title evolution reflects the journey this dissertation documents: from technical infrastructure focus toward recognizing that water systems operate not merely as service delivery but as sites where dignity, recognition, and political belonging are contested. Women function as essential infrastructure providers through their daily labor procuring, transporting, storing, and rationing water, yet this essential work generates no corresponding political recognition, decision-making authority, or infrastructure governance rights. The "infrastructure as dignity" framework—building on and departing from Anand's (2017) concept of hydraulic citizenship—reveals how gender operates not as isolated variable but as constitutive inequality intersecting with class and spatial marginalization to structure who performs infrastructure labor, who controls infrastructure systems, and whose work sustains cities while remaining systematically devalued and politically excluded. This framework enacts African feminist scholarship's methodological commitment to theorizing from Black African women's material conditions rather than adapting frameworks developed elsewhere (Oyěwùmí 1997; Mama 1995; Tamale 2011)—a commitment detailed in Sections 2.4.3 and 8.6.1.

The dissertation's cumulative structure reflects epistemological transformation from inclusion feminism to transformation feminism—the distinction between bringing women into existing water governance and building governance from women's infrastructure labor as its generative ground (developed in Section 2.4.3). But this transformation was neither linear nor self-generated. Papers 1–2 operated within inclusion feminist logic, recommending partnerships with CDAs and traditional leaders, asking how women might be better served by existing systems. The shift toward Paper 3's transformation feminist framework was overdetermined: practice failures demonstrated empirically that deferring gender confrontation allowed patriarchal structures to consolidate, making subsequent inclusion impossible; accumulated fieldwork across 194 interviews produced a weight of testimony that my inherited analytical categories could no longer contain; sustained reading of African feminist scholarship—Oyěwùmí, Mama, Tamale—provided the theoretical vocabulary for what I was observing; and my own internalized assumption that "gender-neutral" systems analysis must precede feminist analysis delayed the reorientation even when the evidence demanded it. This last force deserves emphasis because it reveals how deeply the epistemological hierarchies this dissertation critiques can operate within the researcher herself: I believed, following disciplinary convention, that centering women's experience required first establishing the "objective" infrastructure baseline—not recognizing that this sequencing treated feminist knowledge as supplementary rather than foundational. The convergence of these forces matters epistemologically. Had any single one operated in isolation—had I read the feminist theory without the practice failures, or experienced the failures without the accumulated testimony pushing against my inherited categories—the transformation might not have occurred, or might have produced a different, less adequate analytical framework. The inclusion/transformation distinction emerged not from a moment of recognition but from the slow, sometimes uncomfortable accumulation of evidence, embodied experience, and intellectual honesty about what my earlier work had failed to theorize. This recognition structures both the three-paper progression and the infrastructure as dignity framework developed in Chapter 2.

Doctoral research—begun in 2016, delayed by my professorial responsibilities at Stuttgart State Academy and continued Lagos advocacy—offered what practice could not: methodological rigor for comparative community analysis, theoretical tools situating Lagos within Global South patterns, and sustained time for 194 in-depth interviews.

The urgency—"why now"—lies in accelerating state violence against slum settlements amid intensifying water crisis. During this doctoral research's completion, three evictions underscore these stakes with brutal clarity: Orisunmibare in February 2024, destroying one of this study's case communities characterized by extreme vendor exploitation; Precious Seeds in December 2025, demolishing four years of community work—including the Oworo Reality Women Group and its multiple projects spanning shelter, advocacy, and women-centered water organizing documented in this research; and Makoko in January 2026 (Searcey 2026), erasing the biogas center and settlement where my Lagos engagement began in 2012. These evictions demonstrate that neither vendor-dominated systems nor successful women's organizing protect against state violence when land becomes valuable for elite development—validating this dissertation's core argument that community-scale interventions, while necessary, remain insufficient without simultaneous transformation of patriarchal structures and state-level institutional change. Addressing water inequity without reproducing gender hierarchies requires first understanding how hierarchies structure access. This dissertation builds that understanding from fifteen years of practice, 194 Lagos slum voices, and feminist commitment to centering whose labor makes cities function yet remains systematically devalued.

Yet this is not merely retrospective but prospective. Research findings inform a 2026 project where my organization approaches Lagos Water Corporation (LWC) to implement recommendations detailed in this thesis (Section 8.2), closing the circle from practice failures through systematic inquiry to evidence-based advocacy seeking institutional transformation. Whether LWC proves receptive to recommendations centering gender equity and slum residents' water rights remains uncertain. But the attempt itself—grounded in rigorous research, informed by practice, accountable to women populating this dissertation—represents scholar-activism aspiring to research that does not merely document inequality but actively works toward transformation. Scholar-activism, as practiced here, means research questions emerge from implementation challenges, systematic inquiry produces theoretical frameworks, and these frameworks inform interventions explicitly addressing the exclusions previous work inadvertently reproduced (detailed methodologically in Section 7.5.2 and operationalized in Section 8.2).

1.2 Positionality: A White Woman Researching Lagos Slums

1.2.1 Acknowledging Privilege and Power

As a white European academic, I navigated asymmetric access patterns throughout this research. Government officials—predominantly male—granted meetings more readily than they might have to Nigerian researchers, typically premised on assumptions that "European/Western knowledge" would address Lagos's water supply "dysfunction" through technical solutions. When I clarified my interest in the sociomateriality of water—the inseparable linkages between infrastructure and people, particularly slum dwellers and women as primary actors in community

water provision—official interest often vanished or devolved into paternalistic responses that refused to recognize slum dwellers as equal citizens or, critically, as water supply producers. This dynamic reflects broader colonial legacies wherein white researchers extract knowledge from African communities for Western intellectual advancement, a critique I remained acutely aware of throughout fieldwork.

However, distinctions matter between agencies' official attitudes and individual officials' commitments. Despite government pursuit of profit-oriented urban development serving only 10% of Lagos's population through household water connections (with merely 5% receiving actual service), individuals within LWC and Lagos State Urban Renewal Agency (LASURA) demonstrated genuine concern for slum communities. My Brazilian slum-upgrading experience arguably served as credential—though likely in combination with racial privilege. A particularly uncomfortable white female privilege in Nigeria's patriarchal society involves being rendered "attractive" simply for being white and female—access granted through objectification rather than professional respect. Age has partially mitigated this dynamic; as a younger white woman I was more object of desire than respected researcher, whereas now professional knowledge supersedes embodiment. This remains painful for two interconnected reasons: it underscores the double racial misogyny Black women face through intersecting patriarchy and colonization (Dangarembga 2022), and it illuminates the compounded discrimination poor Black female slum dwellers experience—lacking both educational credentials attributed to me and wealth prejudicially associated with whiteness.

European nationality and institutional privilege

German/Swiss dual citizenship and affiliation with German state academic institutions conferred substantial privileges: uncomplicated access to multi-year business visas without embassy interviews; DAAD funding for extensive 2019 fieldwork forming this research's foundation; economic resources enabling multiple post-2019 research trips; and a professorial position allowing weeks-long Lagos stays combining research with institutional responsibilities impossible in private sector employment. These privileges provided intellectual and physical resources to engage difficult topics in challenging environments—unserved communities suffering governmental neglect and internal patriarchal violence fueled by resource scarcity. Crucially, I possessed the privilege of leaving while interviewees remained.

1.2.2 Gender as Simultaneously Privilege and Vulnerability

My initial fieldwork design was largely gender-blind, focusing on water infrastructure arrangements, vendor dynamics, and property relations without explicitly centering gender as analytical category. I conducted interviews with male water vendors, male traditional and informal leaders (baales, baloguns, Community Development Association (CDA) representatives), and male community members, alongside women water procurers. This research design reflected my practitioner background where "community-based" approaches implicitly meant engaging existing power structures—which are overwhelmingly male-dominated.

Being a woman facilitated access to women's spaces—emotional, experiential, and spatial—that made gendered patterns visible in ways they might not have been to male researchers. Women expressed appreciation for being heard explicitly as women, with conversations expanding from water procurement to broader experiences of being female slum dwellers.

This access, however, risked false assumptions of sisterhood. My experience of gender in European academia bears little resemblance to that of women in Lagos slums navigating daily water scarcity, patriarchal household structures, and eviction threats. The challenge was validating individual voices and identifying patterns without immediately filtering experiences through existing feminist literature—listening to specific lived realities before applying theoretical frameworks. The intersectionality of my position—simultaneously insider (woman) and outsider (white, foreign, educated, middle-class)—required constant reflexive checking. Gender did not erase racial and class privilege. Yet acknowledging this asymmetry does not invalidate the transversal pattern documented in Section 1.1: that within every group I encountered—whether Lagos slum communities, Abuja displacement camps, or European academic institutions—gender consistently structured who labored and who controlled. What differed across these contexts was not whether gender subordination operated but how severely it manifested and through what mechanisms it extracted its costs. The analytical challenge this dissertation navigates is holding both claims simultaneously: gender is the inequality that no shared condition eliminates, and the experience of gendered subordination varies so profoundly across race and class that assuming shared understanding between researcher and researched would constitute its own form of epistemic violence.

My hesitance to apply feminist analytical lens initially stemmed from two concerns: neo-colonial risks of imposing Western feminism on African women, and fears about causing women greater intimate partner violence after male traditional leaders repeatedly rejected my direct work with women. Years of research revealing incredible violence embedded in everyday water supply ultimately convinced me that feminist analysis was not only appropriate but necessary. This explains why my explicitly feminist paper (Hoelzel 2025) emerged years after foundational 2019 fieldwork, requiring additional interviews focused specifically on women's daily water practices, reviewer encouragement, and intellectual progression from practitioner to feminist urbanist.

The Black-white feminism discourse demands acknowledgment: diaspora African intellectuals rightly expose experiences as women of color in racist Western societies, producing literature more accessible to Western audiences. However, their realities risk being mistaken for Black female realities in postcolonial Black societies—which they are not. White feminism, accused of being about privilege redistribution, contrasts with Black feminism's project of creating fundamentally different societies with leveled playing fields (Dangarembga 2022; Eddo-Lodge 2017). Navigating this terrain as white feminist researcher in Lagos required constant vigilance against imposing Western frameworks while simultaneously recognizing that patriarchal violence transcends cultural specificity. The intellectual grounding for navigating this tension came from African feminist scholarship itself—particularly Oyěwùmí's (1997) insistence that patriarchal structures in Yoruba contexts cannot be understood through Western feminist frameworks but require culturally specific analysis, Segato's (2003; 2018) theorization of how colonialism intensified preexisting patriarchal structures from low to high intensity, Mama's (1995) theorization of African women's agency within compound marginalization, and Tamale's (2011) insistence that frameworks adequate to African women's conditions must be built from their experiences as generative material.

These scholars provided the foundation for theorizing from Lagos women's water labor rather than applying imported feminist frameworks to it—a distinction between application and emergence essential to the infrastructure as dignity framework's development (developed fully in Section 2.4.3).

1.2.3 The Practitioner-Researcher Duality

My long-term Lagos engagement since 2013, building on São Paulo work between early 2010 and late 2012, differentiated this research from "parachute" extractive studies. Rather than establishing networks for academic purposes, I leveraged professional connections from nonprofit infrastructure work, creating both legitimacy and complications. Communities expected continued implementation work. I struggled with extracting knowledge about dramatic water insecurity and gender-based violence while conducting "purely academic" research without immediate solutions. This extractive dilemma—investigating without intervening—I managed by committing to use insights for future interventions once research concluded. This remains imperfect: dissertation writing took years, and implementing recommendations will take longer still.

The broader context of Western knowledge extraction from African communities remained a constant concern. At SEHAB, I watched firsthand as international research institutions—ETH Zurich and Harvard among them—conducted studies in São Paulo's favelas whose findings circulated in Western academic publications but produced no tangible benefit for the communities studied. Dr. Elisabete França, SEHAB's director, argued that knowledge exchange justified these collaborations; the exchange, in practice, flowed in one direction. That experience sharpened my awareness that my own doctoral research risked reproducing the same dynamic—extracting knowledge from Lagos communities for a European academic qualification. My commitment to implementation through the 2026 LWC project represents partial rather than complete resolution of this tension.

However, my practitioner identity also created reciprocity. Through my organization's MDDT provision, Dignity in Shelter (DIS) design, and ongoing advocacy, people understood I was not solely extracting data. Established relationships with male and female community figures, government agencies, and NGO representatives provided trust and access that pure academic positioning might not have enabled. This dual role created expectations requiring careful navigation—responding to legitimate assistance requests during "research" phases while maintaining analytical distance. My practitioner lens potentially created blind spots that pure ethnographers might avoid—the very operational focus on implementation and management challenges that initially prevented me from recognizing how patriarchal structures determined whose participation counted and whose labor remained invisible. Yet as critical practitioner, I welcomed opportunities to investigate issues without immediate practical solution imperatives, allowing deeper structural analysis than implementation timelines typically permit.

The positionality challenges described above became most acute through the forced evictions of two case study communities: Orisunmibare (February 2024) and Precious Seeds (December 2025). My organizational presence in Precious Seeds—where FABULOUS URBAN worked since 2021—did not protect against demolition. The December 2025 eviction destroyed four years of women's organizing built with the Oworo Reality Women Group, demonstrating that researcher and practitioner presence cannot protect communities when state violence serves elite land interests.

These evictions shaped this dissertation's conclusions in ways I did not anticipate. They reveal that community-scale organizing, however successful—and Precious Seeds' women's water

committee was genuinely successful by every metric we established—remains insufficient against state violence operating through land politics. The analytical implications are developed in Chapter 7, Section 7.4.5. What matters here is the positionality dimension: I documented these communities while being unable to protect them, and my documentation ensures their organizing persists in scholarly record despite physical erasure. That asymmetry—researcher protection, community vulnerability—is the clearest expression of the privilege discussed throughout this section.

1.2.4 Methodological Strategies for Ethical Research

To mitigate extraction and ensure ethical knowledge production, I employed several strategies. Extensive fieldwork prioritized relationship-building over mere data collection. I conducted 194 interviews across five communities—including male water vendors, traditional and informal leaders, CDA members, male community residents, and women water procurers—with composition evolving as gender analysis sharpened. Initial 2019 fieldwork already interviewed predominantly women water procurers, though my gender-blind analytical lens prevented recognizing the significance of what they revealed about patriarchal power structuring water systems. Subsequent fieldwork (2021–2025) continued centering women's experiences while shifting from documenting "household water procurement" to analyzing gendered infrastructure labor and systematic political exclusion.

Feminist methodology—adopted explicitly in later research phases—centered women's narratives while acknowledging the emotional labor these conversations demanded, including exposing myself to extremely heavy testimonies. Being well-embedded in Lagos with regular return possibilities enabled reflexive practice: continuously interrogating assumptions, discussing findings with participants, conducting follow-up interviews. A young female translator facilitated Yoruba–English interpretation when required, though translation inevitably risks losing cultural nuances.

Lagos's challenging environment—hot humid climate, near-absent infrastructure (the very doctoral research subject), community eviction threats creating unpredictability—shaped fieldwork conditions. Multiple case study communities faced repeated partial evictions or constant eviction threats, representing governmental violence (eviction and neglect) compounding gender-based and intimate partner violence linked to water supply, alongside inter-vendor violence including infrastructure vandalism and physical attacks.

1.2.5 What I Might Have Missed

Honest acknowledgment of limitations strengthens rather than invalidates this research. As white outsider, I may have overlooked invisible community dynamics—hierarchies, unspoken tensions—particularly given the enormous emotional pressure under which all members live in survival struggles. White researchers often do not hear criticisms of academic institutions or NGOs that African researchers would receive directly. This asymmetry is not incidental to my fieldwork but, as Guma (2025) argues, structural to the field itself: urban scholarship on Africa remains disproportionately produced by non-African scholars, with African urbanists more often positioned as data sources than as theorists. My own position—a European academic authoring the knowledge this dissertation produces about Lagos—instantiates that asymmetry rather than standing outside it, and acknowledgment does not dissolve it.

My initial gender-blind analytical frame meant early fieldwork captured water infrastructure ownership structures and property relations but missed gendered dimensions that women were actually articulating—I recorded their accounts of time burdens, economic costs, and physical exhaustion as descriptive facts about "how systems work" rather than recognizing these as evidence of patriarchal exclusion from infrastructure decision-making. While later focused interviews with women addressed this gap, dynamics observable only through sustained gender-centered inquiry from the outset may remain undocumented.

My practitioner lens, focused on implementation and operational challenges, created specific analytical blind spots. Engaging "community leadership" meant engaging men; prioritizing "getting infrastructure built" meant deferring questions about who controlled what was built. These were not merely oversights but systematic orientations shaped by professional training that treats infrastructure as technical rather than political. Recognizing this requires acknowledging that the operational focus I brought from practice—while generating valuable technical knowledge about how informal water systems actually function—delayed recognition of the patriarchal structures determining whose participation counted and whose labor remained invisible.

Romanticizing communities' resilience and innovation risks overlooking persistent structural violence—a tension my academic progression from first to last publication explicitly addresses through increasing attention to violence alongside agency. The evictions of Orisunmibare and Precious Seeds underscore this danger: celebrating women's organizing capacity while failing to theorize the state violence that can erase organizing entirely would constitute profound analytical failure.

Language constitutes another limitation. While English serves as Nigeria's official language, Lagos encompasses Pidgin English (which I understand minimally), Yoruba, Igbo, and Egun among 200 or more indigenous languages. Translation necessarily loses cultural nuances. My fifteen-year engagement partially compensates for these limitations through accumulated contextual knowledge, but gaps remain inevitable.

Analytical Scope and Intersectional Decisions

Beyond limitations of positionality and language, this research reflects deliberate analytical prioritization: centering gender while not fully theorizing other forms of infrastructural labor exploitation. Water pushers—predominantly young male migrants from northern Nigeria or neighboring Niger—perform essential distribution work under precarious conditions, yet their experiences receive empirical documentation (Papers 1–2) without sustained intersectional analysis attending to migration status, ethnicity, age, and labor vulnerability. This decision reflects that gender emerged inductively as the organizing inequality mediating all dynamics documented across communities, whereas water pushers' labor, while exploited, operated through different structural logics than women's unpaid, naturalized procurement responsibility. Comprehensive intersectional analysis would examine how migrant workers' precarity intersects with women's gendered burdens, potentially revealing sites of solidarity or reinforcing ethnic and gender divisions. Future research extending this dissertation's feminist foundation should address this gap, recognizing that infrastructural labor exploitation operates across multiple, compounding inequalities requiring expansive theoretical frameworks.

This chapter has established three foundations upon which the dissertation builds. First, a reflexive-methodological foundation: the practice-to-research trajectory traced in Section 1.1

demonstrates that the analytical questions driving this dissertation—why technically sound interventions reproduce gendered exclusion, why women's infrastructure labor generates no corresponding political recognition—emerged not from theoretical abstraction but from confronting specific implementation failures whose gendered dimensions became visible only through sustained engagement and epistemological reorientation. Second, a positionality foundation: Section 1.2 has made explicit how whiteness, European nationality, gender, class privilege, and practitioner formation simultaneously enabled access, shaped analytical vision, and constrained what this research could know—not as methodological disclaimer but as ongoing analytical practice informing every subsequent chapter's interpretive claims. Third, an intellectual trajectory whose direction matters: the progression from gender-blind infrastructure analysis through inclusion feminism toward transformation feminism is not incidental biography but the epistemological arc structuring this dissertation's cumulative design, its three-paper sequence, and its core theoretical contribution. These foundations necessitate the theoretical architecture developed in Chapter 2—postcolonial urbanism, feminist geography, feminist political ecology, and hybrid governance theory, synthesized through the infrastructure as dignity framework—which provides the analytical vocabulary for the empirical investigations documented in Chapters 4–6 and the synthesis advanced in Chapters 7–8.

Chapter 2: Theoretical Foundations and Research Design

2.1 Introduction: Research Problem and Significance

This doctoral research investigates how gendered power relations structure water infrastructure access and control in Lagos slums, which house 60–80% of the state's population. Only 10% of Lagos's population is connected to the public water mains, and barely half of those, roughly 5%, receive water through them, and then only intermittently, when the Lagos Water Corporation (LWC) delivers at all—a corporation whose supply is so erratic that even connected households cannot depend on it. Effective public provision is negligible; the population relies overwhelmingly on self-organized systems. The research documents a fundamental paradox: women in Lagos's slums function as de facto infrastructure providers—their daily labor procuring, transporting, storing, and rationing water produces community-scale access and, when aggregated, constitutes the actually existing state water coverage for 12–16 million residents—yet they remain systematically excluded from water infrastructure decision-making at household, community, and state levels. Understanding why technically sound water interventions repeatedly fail requires analytical frameworks examining infrastructure as political terrain: postcolonial urbanism, feminist geography, feminist political ecology, and hybrid governance theory, synthesized through the infrastructure as dignity framework this dissertation develops.

Following Harrison's (2006) proposition that African cities are produced at the household level, this doctoral research demonstrates that Lagos's urban water infrastructure exists predominantly through the cumulative effect of women's embodied labor—making visible what conventional water policy frameworks render invisible by focusing exclusively on formal networked systems. However, this informal, profit-oriented water provision operating across Lagos's slums is almost exclusively controlled by men, involving violence, greed, and exploitation, while women's socially prescribed domestic responsibilities require them to provide and pay for household water regardless of household structure (Gandy 2006; Acey 2010; Lawanson 2021; Hoelzel 2025). Section 2.4.5 develops the theoretical framework—"infrastructure as dignity"—through which this dissertation analyzes that paradox. Chapter 3 provides the technical documentation of water infrastructure configurations across all five communities that grounds these theoretical claims empirically.

Drawing on fifteen years of practice engagement (São Paulo 2010–2012, Lagos 2013–present) combined with seven years of formal doctoral research (2018–2025) including 194 interviews across five communities, this long-durational study generates epistemological insights unavailable through conventional fieldwork timelines. The doctoral research proposes multi-scalar intervention frameworks addressing gendered exclusion through women-centered hybrid infrastructure governance models operable across household, community, cross-community, and state scales. These frameworks emerge from confronting the limits of community-scale organizing—validated through the forced evictions of two case study communities (Orisunmibare February 2024, Precious Seeds December 2025) despite vastly different internal conditions—demonstrating that effective transformation requires organizing at scales matching state violence

while centering those whose labor currently sustains urban water systems yet remains systematically devalued.

Understanding this gendered paradox matters for urban theory, policy, and practice across rapidly urbanizing African cities for three interconnected reasons.

Theoretically, this doctoral research challenges dominant infrastructural paradigms that treat "community participation" as gender-neutral and that conceptualize hybrid governance as partnerships between "state" and "community" without interrogating how patriarchal power relations structure both entities. By centering women's embodied experiences of water access, this research demonstrates how infrastructure operates not merely as technical system but as site of gendered political struggle, contributing to postcolonial urban theory's engagement with how power operates through everyday practices (Simone 2004b; Mbembe 2001) while adding feminist analysis often absent from this scholarship.

For policy, Lagos represents a paradigmatic case of African urban futures where slum populations constitute demographic majorities rather than marginal exceptions (detailed in Section 2.2). Policy frameworks addressing urban water crisis must account for contexts where informal provision predominates and where women perform infrastructure labor yet lack decision-making power. This dissertation's findings regarding differentiated hybrid water provision models—and the necessity of women-centered rather than vendor- or CDA-mediated approaches—carry implications for policy debates across dozens of rapidly urbanizing African cities facing similar challenges.

For practice, this doctoral research demonstrates what long-durational practitioner engagement contributes that purely academic analysis cannot: sustained involvement in infrastructure implementation and its failures (Chapter 1) generated the analytical questions this dissertation investigates and produced contextual knowledge—about how patriarchal structures operate through infrastructure governance, about why technically sound interventions reproduce exclusion—unavailable through short-term fieldwork or theoretical deduction alone. The intervention frameworks developed in Chapters 7–8 are grounded not in abstract participation principles but in empirical documentation of how informal water infrastructure actually operates, proposing women-centered models implementable within Lagos's existing socio-technical systems and testable through the planned 2026 Lagos Water Corporation (LWC) implementation project (Section 8.2)—including the technical infrastructure standards for compound-level water point distribution (Section 7.3.5) required to translate governance reform into material change.

This chapter proceeds as follows. Section 2.2 establishes the research site selection and design logic, including the five-community case study evolution and the cumulative dissertation's intellectual progression across three papers. Section 2.3 provides the Lagos context—demographic scale, water infrastructure crisis, government policy, and community governance structures—that grounds the theoretical claims empirically. Section 2.4 develops the theoretical framework: four analytical strands—postcolonial urbanism (2.4.1), feminist geography (2.4.2), feminist political ecology of water (2.4.3), and hybrid governance theory (2.4.4)—are synthesized through infrastructure as dignity (2.4.5), with literature integrated into each framework subsection rather than presented as a separate review. This architectural decision reflects the cumulative dissertation's specific condition: the theoretical framework evolved *with* the three published papers rather than preceding or following them. Postcolonial urbanism and hybrid governance theory informed the analysis from Paper 1 onward; feminist geography and feminist political ecology emerged through the analytical deepening of Papers 2 and 3; infrastructure as dignity—

the synthesizing framework—crystallized only after the cumulative process revealed what no individual paper could articulate on its own. The framework is therefore deliberately ahead of any single empirical chapter because it integrates insights that became visible only through their progressive sequence—a synthesis that is the cumulative format's distinctive intellectual contribution.

2.2 Research Site Selection and Design Logic

This doctoral research draws on engagement with urban informality spanning multiple cities—São Paulo (2010–2012), Nairobi (2024–present), Dadaab refugee camp (2024–present), Dakar (2025–present), Abuja (2025–present), and Lagos (2012–present). Lagos became the primary doctoral research site for three interconnected reasons distinguishing it from these comparative contexts.

First, sustained engagement. Thirteen-year Lagos involvement provided the relational depth and contextual knowledge essential for 194 in-depth interviews across five communities, follow-up conversations, and reflexive ethnographic practice. Long-term presence enabled trust-building with male vendors, traditional leaders, CDA representatives, and—critically—women water procurers whose testimonies form this dissertation's empirical foundation. This temporal dimension matters methodologically: understanding how water infrastructure operates, how gender relations mediate access, and how power circulates through infrastructure requires observation across multiple seasons, policy shifts, and community transitions—insights inaccessible through shorter fieldwork engagements.

Second, analytical visibility. Lagos's near-total absence of household water connections makes visible gendered dimensions that contexts with partial piped service obscure. Where 60–80% of the slum population depends entirely on informal provision systems, women's daily procurement labor becomes impossible to overlook—every drop requires negotiation with vendors or hours queuing at communal taps. This “infrastructural exposure” (Chapter 1, Section 1.1) paradoxically enabled recognition of patterns that remain analytically invisible in cities with greater, if still insufficient, state provision.

Third, majority informality. Lagos represents urban futures where slums house not marginal populations but demographic majorities (Section 2.3 elaborates this significance for Global South urbanization patterns). This scale demands analytical frameworks adequate to contexts where informality is not exception but norm—where “community-based” solutions constitute permanent living and infrastructure modalities rather than temporary interventions pending state formalization. Cities where slums house 15–20% of populations generate different political possibilities and state-community dynamics than those where slums house 60–80%. The latter demands reconceptualizing urban water provision itself, not merely accommodating slums within otherwise formalized systems.

2.2.1 From Four Communities to Five: Research Design Evolution

The case study selection evolved through two phases reflecting both my intellectual trajectory and the doctoral research's progressive deepening. Initially, four communities—Amukoko-

Mosafejo, Mafowoku, Orisunmibare, Otumara—were selected in 2018–2019 to capture morphological diversity and what I hypothesized would be varied external support structures. My research design assumed these communities would receive different forms of institutional intervention (government upgrading, NGO projects, international organization support) while one would remain deliberately self-sustained, enabling comparative analysis of how external support affected water access equity. Fieldwork delivered a foundational insight: none of the four communities received any government water infrastructure support whatsoever, and NGO presence proved minimal (one community had a broken water point from a defunct project). This discovery—that Lagos state abandonment of slums was even more complete than anticipated—fundamentally reframed the research. Rather than comparing communities with versus without external support, I was analyzing variations within comprehensive governmental neglect: "free-market" vendor-dominated systems versus "solidarity" models where CDAs and traditional leaders provided subsidized access; communities with active organizational structures versus those with fragmented governance; settlements facing acute eviction threats versus those with relative tenure security.

2.2.2 Intellectual Progression Across Three Papers

The cumulative dissertation format accommodates this progressive research design and my evolving analytical lens. The first paper (Hoelzel 2022, Chapter 4) examines Otumara's autonomous water provision following its 2010 severance from LWC, employing game theory to analyze how mutual distrust perpetuates non-cooperation despite potential welfare gains. It concludes that the primary division structuring water access lies between landowners (including water vendors controlling boreholes) and tenants, recommending small-scale pilots, third-party mediation, and hybrid co-productive systems.

The second paper (Hoelzel 2024, Chapter 5) comparatively analyzes four communities, revealing "free-market" vendor-dominated systems versus "solidarity" models where CDAs and traditional leaders provide subsidized access. It advocates differentiated hybrid governance: partnering with trustworthy CDAs and baales in solidarity communities, or regulating vendors in free-market contexts to achieve equitable pricing for water-procuring women.

Papers 1 and 2, analyzing these four communities, documented women's water procurement burdens within broader water infrastructure access and control analyses: women appeared as vendors' customers, as CDAs excluded them from leadership, as household members navigating scarcity. Gender was present throughout the doctoral research but not yet centered as primary analytical lens.

Following Paper 2's completion, as my feminist analytical orientation deepened (Sections 1.1–1.2), I added a fifth community—Precious Seeds, a waterfront settlement in Oworonshoki—in 2023. This addition reflected both methodological expansion (adding waterfront dimension and extreme scarcity case where single donor water point serves entire community) and intellectual progression toward foregrounding what earlier papers had documented but not fully theorized: women's roles as primary infrastructure providers systematically excluded from control and decision-making structures. My organization's work in Precious Seeds created sustained longitudinal access, allowing observation of women's daily water practices across months—not just reported experiences but lived realities.

The third paper (Hoelzel 2025, Chapter 6) foregrounds women's lived experiences—allocating one-third of household income to water, rising at 4 AM to queue, accessing water last within households—revealing women as primary stakeholders systematically excluded from male-dominated vendor businesses, CDAs, and traditional leadership. It proposes women-centered access and control over water infrastructure through local female water committees collaborating directly with LWC, rather than channeling through male intermediaries who have historically exploited them.

2.2.3 Making Sense of Seemingly Contradictory Conclusions

This shift from owner and tenant divisions to gender analysis, and from recommending CDA, baale, and vendor partnerships to women-centered decision-making structures, reflects methodological deepening: game-theoretical analysis captured material hierarchies but necessarily reduced complexity; comparative study revealed institutional heterogeneity; sustained ethnographic engagement exposed gender as the transversal inequality—operating within every social group regardless of shared class, ethnicity, or spatial marginalization—that mediates all others—property relations, vendor exploitation, community exclusion, and state neglect all operate through patriarchal structures positioning women as infrastructure providers while denying them decision-making agency. The discussion chapter (Chapter 7) reconciles these conclusions, arguing that effective hybrid water infrastructure supply systems must simultaneously address property relations, community power structures, and gender inequality—with the latter providing the analytical and political leverage for transforming the former.

2.3 Background: Lagos Context

The term “slum” is used throughout this dissertation in a deliberate, non-pejorative sense: following UN-Habitat (2003, p. 12), it designates living conditions that result from structural state abandonment rather than any failing of the residents who produce and sustain these neighborhoods—the sense in which residents' own movements have reclaimed the word. Understanding Lagos's water infrastructure crisis requires establishing the empirical context within which informal provision systems operate—the demographic scale, institutional failures, and governance structures that create conditions this research documents. The following subsections establish Lagos as both paradigmatic case of African urban futures and specific site whose water crisis demands analytical frameworks adequate to contexts where slums house demographic majorities.

2.3.1 Demographic Scale and Urban Growth Trajectories

In Lagos, less than 10% of the population has access to public water (Gandy 2006; ERA 2016; Aliyu and Amadu 2017), with 5% having household connections and 5% accessing legal or illegal standpipes (Expert interview 14; Oyerinde and Jacobs 2022). At least 90% depend on informal or self-sustaining place-based water supply systems (Gandy 2006; ERA 2016; Lawanson 2021; OECD/UN ECA/AfDB 2022). Two out of three people live in urban slums (Lall et al. 2017).

Lagos, West Africa's economic powerhouse (Wilson 2021), exhibits contested demographic figures that themselves signify state capacity limitations and informality's extent. The Nigerian government estimates Lagos State's population at 21 million inhabitants (LSG 2024), significantly different from the UN World Urbanization Prospects' (2025) most recent data, according to which the population is 17.2 million. Regardless of precise figures, Lagos constitutes one of Africa's largest urban agglomerations, with the metropolitan region projected to become the world's largest city by 2100, reaching 80 million residents (Hoornweg and Pope 2017).

The city grows approximately 3% annually, with the vast majority of growth absorbed by slum expansion. Since 1990, Nigerian cities have experienced explosive urban growth primarily through slum formation (Davis 2007; Marx et al. 2013; Büttner et al. 2025), reflecting broader regional urbanization dynamics. This trend aligns with continental patterns, as approximately half of sub-Saharan Africa's urban population resides in slum conditions (Büttner et al. 2025; UN-Habitat 2024). In Lagos specifically, an estimated 60–80% or more of residents inhabit slum settlements—approximately 12–16 million people (Lall et al. 2017; Badmos et al. 2018). The absolute number of slum communities remains contested—Human Rights Watch (2021) identifies 380 such settlements while the Lagos State Urban Renewal Agency (LASURA) recognizes 169 (TNV 2023). A total of 80% of households have less than $1.9 World Bank Purchasing Power of Parity (PPP) available per day (LSG 2016).

These demographic realities position Lagos not as exceptional case but as paradigmatic of African urban futures. With Africa's urban population projected to reach 1.5 billion by 2050 (OECD/SWAC 2020) and water access likely to decrease (UN Water/Africa 2022), dozens of cities will face challenges Lagos currently experiences: rapid growth outpacing infrastructure provision, majority populations residing in slums, and state capacity concentrated in select elite corridors while abandoning vast urban territories. Understanding how Lagos's 12–16 million slum residents navigate water access absent government provision provides insights applicable across rapidly urbanizing African contexts where slums constitute demographic norm rather than marginal exception.

2.3.2 Water Infrastructure Crisis and Informal Provision Systems

The 90% majority without piped water access—at least those intersecting with the 80% of households that have less than $1.9 World Bank PPP available per day—navigates complex assemblages of informal provision including: private boreholes owned by water vendors charging per container; communal taps managed by CDAs or traditional leaders (baales, baloguns) providing free or subsidized access; shallow wells yielding poor-quality water for washing and cleaning; sachet water (“pure water”) purchased for drinking when financially feasible; rainwater collection during wet seasons; and itinerant water pushers—predominantly young northern Nigerian or young foreign migrants from neighboring countries—transporting water by pushcart to households. None of the five case study communities maintains household connections to public networks; all water access points operate through private boreholes or connections to distant private boreholes.

This informal infrastructure landscape exhibits extreme heterogeneity across communities: some operate vendor-dominated “free-market” systems with exploitative pricing (Orisunmibare, Otumara), others feature “solidarity” models where traditional leaders provide subsidized access

(Mafowoku) or mixed/unstable provision (Amukoko-Mosafejo, Precious Seeds), where "solidarity" and "free-market" coexist. Some face in addition extreme scarcity with minimal access points (Orisunmibare, Precious Seeds). Water quality varies dramatically based on location relative to saline intrusion line—communities beyond this threshold require additional treatment for color and odor remediation, substantially increasing production costs vendors pass to consumers (Otumara). Power interruptions necessitate generator usage, further elevating costs ultimately borne by water-procuring women allocating approximately one-third of household income to water (Hoelzel 2025).

Chapter 3 documents these informal water infrastructure systems across all five case study communities (Section 3.4); the access/control analytical distinction essential to interpreting this documentation is defined in Section 2.4.5.

2.3.3 Government Policies: "Megacity" Aspirations and Slum Eviction

Lagos State Government's (LSG) development paradigm produces the conditions this doctoral research documents; the institutional policy framework—including LWC's strategic orientation, funding contradictions, and systematic neglect of gendered water provision—is analyzed in detail in Chapter 3, Section 3.2. What requires emphasis here, as direct context for this research's empirical findings, is the coexistence of state water infrastructure absence across all five case study communities with a development model prioritizing elite corridors and slum demolition over service provision—and the eviction of two case study communities during the research period that demonstrates the most extreme expression of this abandonment.

The spectrum of governmental action regarding slum settlements encompasses four fundamental policy approaches—forced clearance through demolition, settlement upgrading, preventive interventions, and institutional neglect (Harris 2023; Mitlin and Satterthwaite 2013; UN-Habitat 2003). In Lagos, only two prevail: demolition and neglect. LASURA, established in 1991 as the sole governmental institution responsible for slums and subordinate to the Ministry of Physical Planning and Urban Development, has produced upgrading programs marked by donor dependency, fragmented implementation, and the absence of systematic community-based approaches (GFCP 2020a; GFCP 2020b; Udo-Udoma 2014; World Bank 2014). Currently eight settlements have been designated for regeneration, yet the absence of detailed planning information raises questions about implementation transparency (TNV 2023). Meanwhile Lagos sustains coercive slum removal concentrated in waterfront settlements but extending across informal communities—driven by a development agenda whose blueprint is Eko Atlantic City, where international capital flows materialize in elite commercial and residential infrastructure (Adama 2020; AI 2017; John-Phillips 2020; Kazeem 2020; Lawanson and Agunbiade 2018; Olajide and Lawanson, 2022; Sesan 2023; Watson 2020; Wilson 2021).

Government water policy reflects broader megacity priorities: infrastructure investment concentrates in elite corridors and new development zones while slums receive neither service extension nor upgrading support. Lagos Water Corporation (LWC), the state water utility, maintains minimal engagement with slum communities beyond occasional rhetoric about future expansion. This systematic neglect creates the conditions this doctoral research documents: slum residents must provide autonomous water systems that operate through gendered exploitation, wherein women's labor subsidizes state abdication of infrastructure responsibility. The problem

is not primarily LWC intransigence—officials expressing openness to slum provision in expert interviews (Expert interviews 1, 5, 14) are constrained by overarching state policies prioritizing eviction over infrastructure investment and by a position low in the governmental administrative hierarchy. The problem is structural: a state whose development model renders slum water provision politically inconvenient.

Eviction policies compound water insecurity directly. When government demolishes slum settlements, displaced residents lose not only shelter but established water access networks and community support systems—disproportionately affecting women who must reconstitute procurement strategies in unfamiliar locations while navigating trauma and economic devastation. Two of this doctoral research's five case study communities were evicted during the research period: Orisunmibare in February 2024 and Precious Seeds in December 2025. These evictions—occurring despite the communities' vastly different internal conditions—validate this dissertation's central argument that community-scale intervention, however well designed, remains insufficient against state violence operating at a different scale. Their analytical implications are developed in Chapter 7, Section 7.4.5.

2.3.4 Community Governance: CDAs, Traditional Leadership, Water Vendor Networks, and Women's Exclusion

Water governance in Lagos slums operates through complex interactions between formal, traditional, and informal actors whose roles and authority remain fluid and contested.

Community Development Associations (CDAs): Voluntary self-governance organizations that, when communities elect their installation, officially report to local government regarding infrastructure matters including water systems. CDAs vary dramatically in functionality and integrity: some provide effective community representation and manage communal water points equitably (Mafowoku demonstrates relatively functional CDA), while others exhibit corruption, inefficiency, or exist nominally without actual governance capacity (Orisunmibare, Otumara). CDA leadership remains overwhelmingly male despite women being primary water users and procurers. When functioning properly, CDAs possess authority to constrain exploitative water vendors and prevent conflicts, but this depends on having operational borehole-linked water access points—a resource many CDAs lack.

The gendered character of CDA governance is not incidental but historically formed. Communal self-help organizing in Yoruba communities is traceable to precolonial structures—age-grade systems and kinship networks through which communities managed infrastructure, dispute resolution, and collective projects (Akinsorotan and Olujide 2006). Critically, precolonial Yoruba governance maintained parallel female leadership offices—the Ìyálóde, Ìyálọ́jà (market leader), and Erelú—that held substantive authority over economic, social, and governance domains (Awe 1992; Makinde 2004; McIntosh 2009). Colonial indirect rule transformed these arrangements: what Mamdani (1996) terms “decentralised despotism” consolidated governance into male-only customary courts and chief structures, marginalizing women's councils and the institutional forms through which women had exercised political voice (Mamdani 1996; Oyěwùmí 1997). CDAs were formalized under British colonial administration from the 1920s onward and incorporated into Nigerian development planning in the Third National Development Plan (1975–80). The Lagos State Community Development Associations Law of 2008, which provides guidelines for

CDA registration and governance, does not mandate gender balance in CDA leadership—reproducing the colonial-era consolidation of male authority into contemporary institutional form. This trajectory constitutes a Lagos-specific instance of Segato's (2003; 2018) low-to-high-intensity transition theorized in Section 2.4.3: communal governance forms that once included women's parallel authority were consolidated through colonial institutions into exclusively male structures whose postcolonial successors—the CDAs this dissertation documents—inherit that exclusion as institutional norm rather than deliberate policy.

Traditional Leadership (Baales, Baloguns): Traditional leaders derive authority from specific family lineages and receive appointment by the oba (local monarch). Baales and baloguns assume responsibility for community dispute resolution while functioning as "community shepherds." Within this role, they frequently provide free water access at their residences (documented in Amukoko-Mosafejo and Mafowoku), though traditional leaders' boreholes remain non-functional in some communities (Orisunmibare, Otumara) and one community (Precious Seeds) lacks an appointed baale or balogun entirely. Traditional leadership structures are exclusively male, perpetuating women's governance exclusion despite traditional leaders' rhetoric about serving entire communities. The integrity and commitment of individual traditional leaders varies substantially: some genuinely prioritize community welfare while others leverage positions for personal economic gain or political influence.

Water Vendor Networks: In communities where CDAs and traditional leadership are weak, absent, or corrupt, water vendors become de facto governance actors. Vendors—almost exclusively male—control water infrastructure (private boreholes, storage tanks, distribution points) and exercise oligopolistic pricing power, particularly in "free-market" communities like Orisunmibare and Otumara where vendor cartels coordinate to prevent free water provision that would undermine their profits. Vendors face substantial capital investment requirements (borehole drilling, pump installation, generator fuel, maintenance costs) and operate in challenging conditions (frequent power outages, water quality issues beyond the saline intrusion line, aggressive competition including physical violence and infrastructure sabotage). However, vendors' economic pressures do not justify exploitative pricing that extracts one-third of household income from desperately poor women. Vendors function as "veto players" (Hoelzel 2022) capable of obstructing alternative water provision initiatives—exemplified by successful sabotage of Baale Kalejaiye's free water attempt in Otumara (Paper 1/Chapter 4).

Politicians as Donors: Political candidates competing in local, state, or national elections serve as significant water infrastructure providers, donating boreholes during electoral campaigns (documented across Amukoko-Mosafejo, Mafowoku, Orisunmibare, Otumara). Following electoral success, politicians do not appear to advocate for improved slum water supply despite demonstrable awareness of infrastructure needs evidenced by donation practices. This creates dependency relationships and raises questions about sustainability when donated infrastructure breaks and politicians do not provide maintenance support. Precious Seeds benefits from an analogous relationship: an affluent woman adjacent to the community provides daily early-morning borehole access, though this single donor point serves the entire community inadequately.

Women's Exclusion: Across all governance modalities—CDAs, traditional leadership, vendor networks, political patronage—women remain systematically excluded from decision-making despite being primary water stakeholders. Female water vendors exist but remain exceptional (only one female vendor participated in Otumara's focus group discussion). Where women do

control water infrastructure, they predominantly operate through solidarity rather than profit maximization—providing free or subsidized water and flexible payment arrangements to neighbors. This gendered difference in water business operation suggests that women-centered governance might produce more equitable outcomes, yet male dominance of existing structures prevents testing this hypothesis at scale. The handful of women who have attempted organizing around water issues (detailed in Section 7.4.5.2) face immense barriers: time consumed by procurement labor, fear of male retaliation, internalized norms about women's proper roles, and lack of external support from government.

This governance landscape—characterized by weak, corrupt, or absent formal and traditional structures and male-dominated vendor control—creates conditions wherein effective hybrid water governance requires not simply partnering with existing actors but fundamentally transforming who governs through explicit women-centered approaches. Understanding this complex multi-actor terrain proves essential for interpreting the three papers' evolving recommendations: from seeking credible commitment mechanisms between state and community (Paper 1), through differentiating partnerships with trustworthy CDAs and baales versus vendor regulation (Paper 2), to ultimately recognizing the necessity of organizing women as primary governance actors bypassing male-dominated intermediaries (Paper 3).

The Lagos context documented above—60–80% slum population, 95% without piped water, multiple slum evictions since 2012 (Section 1.1)—establishes both the empirical severity and the political urgency this doctoral research addresses. The theoretical frameworks developed in Section 2.4 provide analytical tools for understanding how gendered power relations structure both access to water and control over water systems in contexts where state infrastructure provision is largely absent and where informal systems both enable survival and reproduce inequalities.

2.4 Theoretical Framework

Infrastructure has inherent social and political dimensions (Anand 2017; Graham and Marvin 2001; Larkin 2013; Mbembe 2001; McFarlane and Rutherford 2008; Simone 2004a, 2004b; Star 1999)—purely technical approaches cannot explain why interventions fail because they ignore power relations determining who controls systems. The biogas cooperative and MDDT infrastructure documented in Section 1.1 demonstrate this empirically: both functioned technically yet failed operationally by reproducing patriarchal structures. This dissertation therefore integrates four analytical frameworks—postcolonial urbanism, feminist geography, feminist political ecology, and hybrid governance theory—demonstrating that effective infrastructure intervention requires understanding social, political, and gendered dimensions alongside technical specifications. These frameworks serve the empirical analysis in Chapters 4–6 and inform the implementation frameworks in Chapters 7–8. Empirically, they establish comprehensive baseline understanding of water systems' material realities—how many boreholes exist, who owns them, how pricing structures function, what physical infrastructure loads women carry. Theoretically, they operationalize critical analytical distinctions—access versus control, everyday practices as labor, formal–informal entanglements—that reveal how seemingly neutral technical configurations embed and reproduce gendered inequalities.

Subsections 2.4.1–2.4.4 present the four frameworks. Subsection 2.4.5 presents the synthesis they generate: infrastructure as dignity, which emerges from bringing these four frameworks to bear on the productive limits of Anand's (2017) hydraulic citizenship concept.

2.4.1 Postcolonial Urbanism: Centering the South

Postcolonial urban theory provides the foundational analytical framework for understanding Lagos's informal water systems not as policy failures but as sites of urban production requiring their own analytical frameworks (Watson 2003; 2014). Vanessa Watson argues for recognizing the heterogeneous nature of African urban societies—a heterogeneity extending to governmental structures that opens new pathways for understanding both how megacities such as Lagos actually function and how urban development interventions might build upon rather than replace existing systems (Simone and Pieterse 2017). Rather than constituting developmental failure, Africa represents—according to Chabal and Daloz (1999)—a distinctive engagement with modernity fundamentally shaped by contextually specific economic and cultural dynamics, producing syncretic arrangements wherein Western institutional frameworks merge with traditional or informal mechanisms navigating accelerated transformation and economic precarity. Harris (2017) develops these arguments at the level of state theory, contending that the postcolonial state is not merely heterogeneous but constituted as an emergent effect of inclusions, exclusions, and infrastructural negotiations—the state itself produced through the very ambiguities of who is mapped, serviced, and recognized.

Two foundational theorists have particularly advanced understanding of how postcolonial African cities function through everyday practices. Achille Mbembe (2001) emphasizes the historical trajectory of actually existing Africa as constituted through formative experiences of violence and violent power exercise, challenging conventional binaries between seemingly dominant actors and seemingly subordinate populations. Mbembe argues that ordinary citizens engage in sophisticated, performative everyday practices—"toying, deceiving and guiding with power instead of directly confronting it" (Mbembe 2001, p. 128)—producing entangled dynamics wherein neither dominant nor subordinate actors achieve their aims. AbdouMaliq Simone (2004b; 2006) conceptualizes "people as infrastructure," positioning human agency not as adaptive response to state failure but as constitutive infrastructure of postcolonial African urbanism—people's practices actively produce the city rather than merely coping with governmental absence. Both theorizations are essential to this dissertation's analytical architecture—and both contain a gender blind spot whose consequences Section 2.4.5 makes explicit: when Simone theorizes people as infrastructure, whose bodies perform which practices remains uninterrogated; when Mbembe analyzes everyday tactics for navigating power, how gender shapes both the capacity to deploy such tactics and the labor that sustains urban life while men perform them stays invisible.

Contemporary scholarship on urban water infrastructure in Global South cities has extended these foundational insights toward empirically grounded analysis of how informal water systems actually operate. Recent contributions conceptualize urban water infrastructure through heterogeneous infrastructure configurations (HICs), emphasizing systemic complexity and relational dynamics between technical systems and social arrangements (Alba et al. 2022; Lawhon et al. 2016). Recent extensions of the HIC framework have begun to ask what makes some configurations work better than others and for whom (Lawhon et al. 2023)—a question this dissertation answers through gender as the analytic the HIC tradition has gestured toward but not centered. Empirical research across postcolonial African cities has documented diverse water

infrastructure configurations operating through hybrid formal-informal assemblages—from Accra (Alba et al. 2022; Harris 2021) and Dar es Salaam (Monstadt and Schramm 2017) to Nairobi (Guma 2019; Kasper and Schramm 2023; Sarkar 2020) and Lagos (Acey 2019b; Gandy 2006).[1] These studies establish a crucial finding: informal and hybrid infrastructure arrangements constitute permanent features of postcolonial urbanism rather than transitional systems pending formalization (Jaglin 2014; Monstadt and Schramm 2017). Scholars demonstrate that citywide water provision systems already exist through vendor networks, water filling points, and procurement labor—challenging deficit narratives that position Global South cities as lacking infrastructure and revealing instead that alternative configurations already provide urban-scale water access, albeit inequitably (Alba et al. 2022; Monstadt and Schramm 2017). Dakyaga's (2023; Dakyaga et al. 2023) comprehensive governance typology for Dar es Salaam's non-utility-networked water infrastructure—documenting informal co-production, market-oriented governance, and self-governance as dominant modalities—provides the most systematic recent treatment of how heterogeneous systems operate beyond the utility network, while illustrating a persistent analytical pattern: the gendered labor sustaining these systems receives empirical acknowledgment but no analytical attention, reproducing at the level of governance scholarship the invisibility Section 2.4.5 diagnoses in foundational urban theory.

A fundamental tension within this scholarship concerns the causal relationship between distributive inequities and structural inequality: whether uneven water distribution constitutes a manifestation of preexisting socioeconomic stratification or whether technical infrastructure configurations themselves generate and reproduce inequality patterns. This dissertation argues that both operate simultaneously but that neither formulation captures the gendered dimension: it is not merely that water is distributed unequally or that infrastructure configurations reproduce inequality, but that the labor of producing water access falls on women's bodies while the control of water systems remains in men's hands. The infrastructure *exists*—Lagos's slum residents have water—but its existence is produced through gendered extraction that neither distributive nor configurational analysis, absent feminist frameworks, can make visible.

Lagos represents a paradigmatic case within this scholarship, though one that has generated surprisingly limited scholarly attention relative to the city's size and significance. Gandy's (2006) comprehensive analysis positions Lagos as exemplar of “splintering urbanism” wherein elite enclaves receive infrastructure investment while majority populations navigate perpetual service deficits—the city possesses significantly less public infrastructure than any other metropolis of comparable size globally (Aliyu and Amadu 2017; OECD/UN ECA/AfDB 2022). Understanding Lagos's water infrastructure crisis requires historical analysis of how colonial infrastructure planning created lasting inequalities (Acey 2019a), postcolonial analysis of how government prioritizes global city status over citizen needs, and feminist analysis of how both colonial and postcolonial power structures operate through gendered violence and exclusion—the latter dimension largely absent from existing Lagos scholarship that this doctoral research addresses. The Lagos context established in Section 2.3 documents these dynamics empirically; the theoretical frameworks in Sections 2.4.2–2.4.5 provide the analytical tools for interpreting them.

[1] Key empirical studies include: Accra (Alba et al. 2022; Harris 2021), Benin City (Acey 2019a; 2019b), Cape Town (Jaglin 2014; Rakodi 2002), Dar es Salaam (Dakyaga 2023; Monstadt and Schramm 2017), Lagos (Acey 2010; 2019a; 2019b; Gandy 2006; Xiao and Adebayo 2020), Khartoum (Zug and Graefe 2014), Maputo (Baptista 2019), Nairobi (Guma 2019; Kasper 2025; Sarkar 2020), Ouagadougou (Dos Santos and LeGrand 2012; 2013), Port Harcourt (Acey 2010), and peri-urban Ghana (Peloso and Morinville 2014).

Policy debates about appropriate responses to informal water infrastructure remain unresolved and inform this dissertation's intervention. Some scholars and policymakers advocate expanding formal piped networks—an approach facing significant feasibility constraints including inadequate funding, the massive evictions construction would necessitate, and informal city production outpacing formal planning. Others argue for recognizing and supporting existing informal systems as the fastest and most realistic intervention. Roy (2005; 2009) provides the analytical framework for understanding why neither response suffices: informality is not a condition to be formalized or recognized but a mode of governance through which the state itself operates—deliberately maintaining ambiguity about settlement status, infrastructure obligations, and land tenure to retain flexibility for future intervention or demolition. In Lagos, this governance-through-informality means that slum water provision is not merely neglected but actively unplanned: the state's refusal to map, service, or acknowledge slum infrastructure is itself a political act that produces the conditions women's labor must fill. This dissertation demonstrates that both approaches inadequately address the crisis: formalization cannot reach 60–80% of the population at feasible cost; recognition without transformation reproduces the patriarchal structures through which informal systems extract women's labor while denying them governance authority. The organizing frameworks developed in Chapters 7–8 propose a third approach: women-centered hybrid governance that builds from actually existing informal systems while transforming who controls and governs them.

This theoretical framework proves essential for analyzing Lagos's water systems for two interconnected reasons. First, it enables treating informal water provision not as temporary deviation pending state formalization but as permanent mode of infrastructure provision requiring serious analytical engagement. Where slum populations constitute demographic majorities (Section 2.2), informal systems are not marginal but central to how cities actually function. Second, postcolonial urbanism's emphasis on household-level urban production provides analytical tools for understanding how water infrastructure emerges through daily practices rather than state provision. Harrison's (2006) proposition that African cities are produced at the household level—emphasizing how everyday material transformations constitute urban space (Appadurai 2002; Biehl et al. 2007)—proves particularly relevant for water systems where procurement, transport, storage, and rationing occur through household practices.

Postcolonial urbanism's emphasis on everyday practices as city-making provides the urban production framework within which infrastructure as dignity (Section 2.4.5) situates women's water labor—revealing not “people as infrastructure” in the abstract, but specific gendered bodies performing specific extractive labor as the condition of urban survival.

2.4.2 Feminist Geography: Spatial Production of Gender Inequality

Feminist geography examines how gender structures access to urban resources and how spatial arrangements both reflect and reproduce gendered power relations (Massey 1994; McDowell 1999). Doreen Massey's foundational work argues that space is a social product, constituted through power relations that are always already gendered. Space is not a neutral container for social relations but actively produces and is produced by gender inequality. Linda McDowell extends this analysis to urban contexts, demonstrating how cities' spatial organization—from household architecture to neighborhood infrastructure to governance—encodes and enforces patriarchal norms about women's appropriate places and mobilities.

Applied to Lagos's water systems, feminist geography illuminates how gendered spatial arrangements structure water access at multiple scales. At the household scale, patriarchal norms confine water procurement to women's domestic responsibilities while excluding them from decisions about household water use—men access water first, women last (Hoelzel 2025). At the community scale, water access points' spatial distribution and operating hours reflect male vendors' and leaders' assumptions about women's time and mobility rather than women's actual needs. While patriarchal systems extract costs from men too—male vendors in Papers 1 and 2 (Chapters 4 and 5) report experiencing violence and vandalism in competitive struggles over water territory—these harms differ fundamentally in scale and nature from gendered burdens imposed on women. Men's vulnerability to violence stems from their position as economic actors competing within water markets—an expression of what Segato (2018) identifies as the *mandato de masculinidad*, in which status and territory are maintained through competitive dominance (Section 2.4.3). Women's vulnerability on the other hand stems from their gendered assignment to unpaid procurement responsibilities that renders them dependent on those same exploitative markets. At the scale of the state, government water policy treats slums as spaces of illegality requiring demolition rather than neighborhoods deserving infrastructure—a spatial logic that renders slum women's water practices simultaneously essential to urban functioning and officially invisible. This policy orientation reflects hierarchical governmental priorities rather than LWC intransigence per se, as established in Section 2.3.3.

Feminist geography also contributes methodological insights about the politics of knowledge production. Researcher positionality—specifically the shift from infrastructure and governance analysis to feminist geography's embodied lens—transforms what becomes analytically visible, as documented in Chapter 1, Section 1.2.

Feminist geography provides infrastructure as dignity's multi-scalar architecture (Section 2.4.5): dignity violations at household, community, and state scales do not merely accumulate but compound—each scale's exclusion reinforcing and intensifying the others.

2.4.3 Feminist Political Ecology of Water: Embodied Experiences as Political Struggle

Feminist political ecology makes this dissertation's most consequential theoretical intervention: it reframes what postcolonial urbanism terms “everyday practices” as labor (Sultana 2011)—a shift that makes visible the economic and bodily work that patriarchal structures naturalize as women's domestic routines (Truelove 2019a). This reframing is not merely semantic but analytical: treating water procurement as labor rather than practice exposes the time, energy, and bodily capacity that women expend daily—resources extracted from income generation, education, rest, and care for themselves. Where postcolonial urbanism celebrates how “people as infrastructure” produce cities through everyday practices, feminist political ecology asks: whose bodies perform which infrastructure labor, who profits from this labor, and who bears its costs?

This question has generated a substantial and growing body of scholarship, yet gendered perspectives on urban water infrastructure provisioning remain rare relative to the scale of gendered water inequality (Zwarteveen and Meinzen-Dick 2001; UNESCO 2003; Acey 2010; Lawanson 2021). Existing gender and water scholarship is heavily weighted toward rural areas and irrigation systems (Ahlers and Zwarteveen 2009; Harris 2009), with urban water infrastructure—and particularly the intersection of gender, informality, and infrastructure labor

in slum settlements—constituting underexplored terrain. Scholars consistently document women's disproportionate responsibility for household water procurement across the Global South—South Asia (Joshi et al. 2011; Wutich and Ragsdale 2008), Latin America (Goff and Crow 2014), sub-Saharan Africa (Thompson et al. 2001)—and advocate for deeper analytical understanding of women's actual access to water infrastructure and control over water systems (Ahlers et al. 2014; Cleaver and Hamada 2010). Roy's (2003) feminist analysis of urban poverty in Kolkata—examining how women navigate livelihoods, land tenure, and state abandonment through gendered strategies that are simultaneously constrained by and productive of the urban condition—constitutes an early articulation of the analytical approach this dissertation extends to water infrastructure: treating women's material practices not as marginal coping but as constitutive of how postcolonial cities actually function. What this scholarship reveals is a pattern so consistent across geographies and cultures that it demands structural rather than contextual explanation: women and girls spend significantly more time than men and boys procuring water, carrying heavy containers over long distances, while bearing exposure to physical injury, sexual harassment at water points, and violence navigating access routes. This labor burden extracts time from income generation, education, and rest—a form of temporal and bodily extraction that feminist political ecology names as infrastructure labor rather than naturalized domestic routine.

Feminist political ecology of water, drawing particularly on Sultana (2011; 2020), Harris and Ganjeebhoy (2013), Mehta (2014), and Truelove (2019a; 2019b), extends embodied approaches by foregrounding how water access operates differently across gendered bodies. Sultana's research in Bangladesh demonstrates how water scarcity manifests not merely as quantitative deficit but as embodied suffering—physical exhaustion, shame from inability to maintain hygiene, anxiety about household conflict over water costs, vulnerability to violence at water sources. Harris and Ganjeebhoy's research in Mumbai demonstrates how slum water provisioning remains male-dominated—men owning water points, operating as vendors, making infrastructure investment decisions—despite women being primary users and daily procurers. Truelove's (2019b) work in Indian cities demonstrates how bodies function as urban water infrastructure—women's physical capacity to carry, store, and ration water substitutes for piped systems—and how gendered infrastructural violence accrues through patterns of infrastructure invisibility. Sarkar (2020) documents how water scarcity in Nairobi slums creates gendered vulnerabilities—women rationing their own hygiene, experiencing shame during menstruation, developing chronic health conditions from dehydration. Brewis et al. (2020) document water insecurity's psychological toll globally, including depression and intimate partner violence triggered by conflicts over water costs. Acey's (2010) ethnographic research in Lagos and Benin City documented systematic exclusion of women from water supply enterprises and vendor operations despite their daily engagement through procurement labor—the closest existing scholarship comes to what this dissertation documents at scale.

Research on women's exclusion from water governance reveals systematic patterns across diverse contexts. Cleaver and Hamada's (2010) work in Tanzania shows how ostensibly participatory water committees reproduce patriarchal power structures, with women's voices marginalized even when formally included. Ahlers et al. (2014) argue that gender mainstreaming in water planning often remains superficial—counting women's attendance at meetings without transforming actual decision-making power. These findings establish a critical distinction structuring this dissertation's analytical approach: the difference between *inclusion feminism* and *transformation feminism*. Inclusion feminism documents women's exclusion and recommends their participation in existing governance structures—add women to water committees, ensure female representation

in CDAs, include gender targets in policy frameworks. Transformation feminism asks a prior question: what governance emerges when theorized *from* women's infrastructure labor rather than from existing male-dominated structures into which women are subsequently inserted? The distinction matters because inclusion within patriarchal structures reproduces patriarchal outcomes regardless of female representation—as this dissertation demonstrates empirically through the biogas cooperative's capture (Chapter 1, Section 1.1) and the persistent exclusion of women from CDAs and traditional leadership despite their constituting the primary water stakeholders (Chapter 6).

Women are not, however, merely subordinated within these structures. Emerging scholarship documents women's agency within constraints—what this dissertation terms the relational logic operating outside patriarchal governance. Sarkar (2020) shows how female slum dwellers develop sophisticated mutual aid networks to manage water scarcity. Wutich (2009) documents reciprocal water-sharing among Bolivian women that challenges market logics embedded in vendor-controlled systems. Lawson and Asomani-Boateng (2013) reveal how Ghanaian women vendors use water businesses for economic empowerment despite male dominance in infrastructure ownership. This dissertation extends these findings by documenting how women's water solidarity in Lagos—sharing information about functional vendors, lending money for purchases, providing water at subsidized rates or for free—constitutes not merely coping but evidence of a fundamentally different relational form whose theoretical significance Segato's work illuminates (discussed below).

Applied to Lagos's water systems, feminist political ecology's labor reframing means recognizing that women's daily routines of fetching, transporting, storing, and rationing water constitute unpaid infrastructure labor subsidizing both household reproduction and urban functioning—labor that generates value while being systematically devalued. The two or more hours women spend daily procuring water represent extraction of bodily capacity—energy, health, safety—that subsidizes both household reproduction and urban functioning. Women's testimonies documenting these embodied consequences are analyzed in Chapter 6. These embodied experiences reveal water access as fundamentally about power: who has capacity to impose labor burdens on others, who profits from others' desperation, whose bodily needs are sacrificed to maintain systems benefiting men. When women organize collectively to challenge vendor exploitation, demand CDA accountability, or claim voice in community water decisions, they engage in what Sultana (2020) terms "feminist political ecology praxis"—transforming individual survival strategies into collective challenges to gendered power structures. This dissertation documents both the immense barriers to such organizing (detailed in Section 2.3.4) and moments where organizing emerges despite these constraints.

The Historical Depth of Patriarchal Infrastructure: Oyěwùmí, Segato, and the Question of Origins

A critical theoretical grounding for this dissertation's analytical approach emerges from African and decolonial feminist scholarship that insists on theorizing from African women's material conditions rather than adapting frameworks developed elsewhere. This grounding requires engaging a debate about patriarchy's origins that has direct implications for how infrastructure governance in Lagos is understood.

Oyěwùmí's (1997) foundational analysis argues that seniority rather than gender constituted the primary organizing principle of precolonial Yoruba society, and that gender hierarchy was substantially a colonial imposition—intensified through colonial institutions that formalized male

authority in ways precolonial structures had not. This analysis establishes an essential insight: patriarchal structures in Lagos cannot be understood through direct application of North American or European feminist frameworks but require analytical tools attending to their specific historical formation. However, Oyěwùmí's strongest claim—that precolonial Yoruba society lacked gender hierarchy—is contested on both empirical and theoretical grounds. Segato (2003; 2018), drawing on extensive ethnographic research in Afro-Brazilian communities inheriting Yoruba religious traditions, demonstrates that precolonial gender categories and patriarchal structures existed but operated at what she terms "low intensity"—a communal patriarchy in which gender organized social relations without the rigidity, binary enforcement, and systematic violence that characterize the colonial–modern form. Colonialism did not introduce patriarchy; it weaponized it—replacing low-intensity communal structures with high-intensity patriarchal systems embedded in state institutions, legal frameworks, and economic arrangements that persist through postcolonial governance (Segato 2022).

This distinction between low-intensity and high-intensity patriarchy matters fundamentally for how this dissertation interprets its Lagos findings. The patriarchal structures documented here—male vendor control over water infrastructure, CDA exclusion of women, household-level subordination in water access and rationing, intimate partner violence linked to water costs—are not colonial artifacts that decolonization might dissolve. They are deep formations, rooted in what Segato (2018) identifies as the "long history of patriarchy," whose intensity was massively amplified through colonial modernity and whose contemporary operation through infrastructure governance constitutes the persistence of high-intensity patriarchy in postcolonial settings. This explains the transversal pattern documented in Chapter 1: the reason gender subordination operates within every group sharing the same class position, ethnicity, and spatial marginalization—across Lagos slums, Abuja IDP camps, Dadaab refugee settlements, and Nairobi informal settlements—is not that each context independently produces patriarchy but that high-intensity patriarchy is a structural feature of the colonial-modern world that operates through infrastructure, among other domains, regardless of specific cultural context.

Segato's work provides a further theoretical resource essential to this dissertation's argument. She identifies gender as "the cornerstone around which all powers articulate" (Segato 2018, p. 202)—a formulation converging with this dissertation's empirical finding that gender operates as the transversal inequality within every social group (Chapter 1, Section 1.1). Moreover, Segato (2018) argues that male history is constitutively a history of violence—that the mandato de masculinidad, the mandate of masculinity, structures male sociality through honor, territorial control, and the performance of dominance. This theorization illuminates a pattern this dissertation documents across all five communities: male vendor competition operates through physical violence and infrastructure sabotage (Chapter 4), male CDA and traditional leadership maintains authority through exclusion and intimidation (Chapter 5), and household-level water allocation enforces male priority through implicit or explicit threat (Chapter 6). These are not individual pathologies but expressions of what Segato identifies as the structural mandate through which masculinity reproduces itself—a mandate whose operation through water infrastructure this dissertation makes empirically visible.

Mama's (1995) theorization of African women's agency within and against structural violence demonstrates that women's survival strategies and organizing capacity emerge from conditions of compound marginalization—patriarchy intersecting with colonial legacies, postcolonial state neglect, and economic precarity—that single-axis analysis cannot capture. Tamale's (2011) African feminist jurisprudence insists that rights frameworks adequate to African women's

conditions cannot be derived by extension from Western liberal frameworks but must be built from African women's actual experiences of law, power, and embodied survival as their generative material.

Together, these scholars—Oyěwùmí, Segato, Mama, Tamale—constitute the intellectual tradition from which infrastructure as dignity (Section 2.4.5) derives its normative force. The framework does not extend feminist political ecology to Lagos; it uses feminist political ecology's analytical tools in service of a theoretical project whose normative grounding emerges from what Lagos women's water labor specifically reveals: that the systematic extraction of women's infrastructure labor without recognition constitutes a dignity violation whose analysis requires both the empirical precision of feminist political ecology and the normative insistence of African and decolonial feminist thought that such conditions are not merely unjust but constitutive of the specific historical formations postcolonial cities inhabit. Segato is now explicitly included in this intellectual tradition—her decolonial feminism, developed through engagement with Yoruba religious traditions in the Americas, provides the historical depth (low-intensity to high-intensity patriarchy) and the relational alternative (women's solidarity as operating outside the mandate of masculinity) that the African feminist scholars provide for the normative ground.

In Lagos's slums, where almost no public water network exists, women have already built the infrastructure the state has not provided—making citizenship claims through labor even though state recognition has not followed. This is the empirical reality feminist political ecology's labor reframing makes analytically visible; its normative implications are theorized fully in the infrastructure as dignity framework (Section 2.4.5). Feminist political ecology's decisive reframing of “everyday practices” as labor—exposing the economic extraction and bodily cost that patriarchal structures naturalize as women's domestic duty—transforms the empirical foundation on which infrastructure as dignity rests, making the dignity violation visible as prior to, and more fundamental than, any question of state recognition.

2.4.4 Hybrid Governance Theory: Formal-Informal Entanglements

Hybrid governance theory analyzes how formal and informal systems interact, overlap, and mutually constitute urban service delivery in contexts where state capacity is limited and where informal provision predominates (Boonyabancha 2005; Jaglin 2014; Mitlin 2008; Monstadt and Schramm 2017). Rather than treating formal and informal as binary opposition—state versus market, legal versus illegal, planned versus spontaneous—hybrid governance frameworks recognize their entanglement. Informal water vendors purchase electricity from the formal grid to power boreholes; CDAs report to local government while operating outside official planning frameworks; traditional leaders (baales) receive government appointment yet govern through customary rather than statutory authority.

Scholarship on hybrid water infrastructure in southern African and East African cities establishes that hybridity is not a transitional state pending formalization but a permanent condition requiring new analytical and policy frameworks (Jaglin 2014; Monstadt and Schramm 2017)—and that states actively produce this hybridity, maintaining dual systems of sanctioned and unsanctioned service delivery whose inequities cannot be addressed by categorizing providers as simply state or non-state (Acey 2016). Within such configurations, domestic storage artefacts—jerry cans, tanks, containers of every scale—are not workarounds pending formalization but infrastructure

in their own right, constitutive of how heterogeneous systems actually function at the household level (Kasper and Schramm 2023; Kasper 2025).

Research documents how hybrid systems involve multiple actors without interrogating how patriarchal power structures determine which actors control which resources—and, crucially, how hybridity itself forecloses accountability: when the primary provider is informally classified, residents have no sanctioned channel through which to assert demands for improved supply, producing what Acey (2019b) terms structural silence. Schramm's (2024) recent commentary on co-production sharpens this point: when "community participation" is invoked without analytical attention to whose resources, time, and labor sustain it, co-production slides from transformative city-making into the extraction of marginalized people's unpaid work—a precarity the gendered structure of Lagos water provision makes especially visible. This research gap becomes critical in Lagos context where hybrid water systems—combining private boreholes, vendor networks, CDA management, occasional NGO interventions, and almost complete government absence—systematically exclude women from governance while extracting their labor and income.

This doctoral research contributes to hybrid governance theory by demonstrating that effective hybrid arrangements must explicitly address gender inequality rather than assuming "community participation" ensures equitable outcomes. Paper 2's comparison of "free-market" versus "solidarity" distribution models reveals that governance configuration matters profoundly for who benefits and who suffers. But Paper 3's feminist analysis exposes that even "solidarity" models managed by CDAs and baales can reproduce patriarchal exclusions if women are not centered as primary stakeholders—the distinction between inclusion within existing hybrid arrangements and transformation of who governs them (Section 2.4.3). Hybrid governance centering women—through local female water committees collaborating directly with LWC—represents not abandonment of hybridity but its feminist reconceptualization: acknowledging that sustainable co-production requires transforming rather than accommodating existing power structures.

Hybrid governance theory provides the institutional terrain within which infrastructure as dignity (Section 2.4.5) operates—revealing that formal-informal partnerships reproduce patriarchal exploitation through new institutional forms unless decision-making authority is transferred to those whose labor currently produces infrastructure.

2.4.5 Infrastructure as Dignity: Beyond Hydraulic Citizenship

"Infrastructure as dignity" does not constitute a fifth independent theoretical strand alongside the four frameworks established above. Rather, it is the theoretical synthesis that emerges when those four frameworks are brought to bear on the generative limit of Anand's (2017) hydraulic citizenship concept—illuminating what his concept reveals and, crucially, what it cannot see when confronted with the empirical reality of Lagos's water systems. This section proceeds in four moves: first, establishing what hydraulic citizenship contributes; second, demonstrating why Lagos demolishes the conditions under which Anand's framework operates; third, articulating the infrastructure as dignity framework that results, grounded in African feminist thought and the empirical findings of this research; and fourth, defining the analytical vocabulary—access, control, and governance—through which the framework operates across the empirical chapters.

What Hydraulic Citizenship Contributes

Anand's (2017) hydraulic citizenship makes a foundational contribution: it demonstrates that infrastructure access constitutes not merely service delivery but political belonging. In Mumbai's settlements, residents negotiate citizenship through their material relationships with water pipes—becoming legible to the state, or being rendered illegible, through the presence or withdrawal of water pressure. Infrastructure is the medium; citizenship is the prize; the state is the interlocutor. Most powerfully, Anand's analysis of Premnagar demonstrates hydraulic citizenship's reversibility: by letting pipes leak, rust, and run dry in a Muslim settlement, city engineers actively withdraw previously granted recognition. Following Nixon's (2011) theorization of slow violence—harm that accumulates gradually and invisibly—this infrastructural abandonment constitutes political technology: the deliberate production of civic death through neglect rather than direct force. Anand's framework reveals infrastructure as political terrain in ways that purely technical or governance-focused analyses cannot.

Why Lagos Demolishes This Framework's Conditions

Anand's framework presupposes a condition that Lagos's slums do not meet: the existence of state infrastructure through which citizenship can be negotiated. In Mumbai, however inadequate and intermittent the supply, there are pipes. There is water pressure to demand, connections to claim, a utility to petition. The state is present as interlocutor—hostile, neglectful, discriminatory, but present. Residents negotiate *with* the state *through* infrastructure.

In Lagos, this entire logic collapses. There are no pipes to connect to. There is no water pressure to demand. 95% of the slum population has no relationship with the state water utility whatsoever. The interlocutor is not the state but a private vendor—often violent, always profit-driven—who has no obligation to provide anything and whose pricing extracts one-third of household income from women who have no alternative. The infrastructure-citizenship negotiation that Anand theorizes cannot occur because its precondition—state infrastructure to negotiate through—does not exist.

And yet the city functions. 12–16 million slum residents have water. How?

Because women are the infrastructure. They fetch water from whatever source exists—vendor boreholes, distant taps, donated access points, rainwater, sachet water—and they transport it, store it, ration it, distribute it within households. They urbanize the water: they take raw supply from scattered, unreliable, exploitative sources and transform it into household-level provision through their own bodies, their own time, their own income. Without this labor, there is no water system. The "actually existing state water coverage" for Lagos's slum population is not a pipe network operated by a state utility. It is women's bodies carrying jerrycans across distances, women's income paying vendors, women's time managing scarcity, women's knowledge navigating which sources are functional on which days. This is what postcolonial urbanism's "people as infrastructure" (Simone 2004b) looks like when examined through the feminist lens this dissertation provides: not people in the abstract but women specifically, performing extractive labor that produces the city while being denied authority over what their labor produces.

This means that citizenship, understood as the material conditions enabling urban belonging, has already been produced—not through negotiation with the state but through women's labor in the state's absence. Women have already done what Anand's Mumbai residents are trying to do: they have built the infrastructure that makes urban life possible. They did not negotiate it with the government. They built it themselves, every day, without recognition, without compensation, without authority over the systems their labor sustains.

The question of why women occupy this position—why they, rather than men, constitute the actually existing infrastructure—requires reading Mbembe through Segato. Mbembe's (2001) analysis of postcolonial African politics documents how the relationship between the seemingly powerful and the seemingly powerless operates through a mutual performance of domination and subversion that renders both parties impotent: ordinary citizens "toy, deceive, and guide with power instead of directly confronting it" (Mbembe 2001, p. 128), producing a political dance that neither transforms power relations nor generates functional governance. This is among the most penetrating analyses of postcolonial power available—and it is, as Mbembe himself acknowledges, an analysis of male power. In the prologue to the second German edition of The Postcolony, responding to Butler's critique of his absent gender analysis, Mbembe concedes that "power in the postcolony takes on a masculine form from the very outset" (Mbembe 2016, p. 28, author's translation) and that the knowledge his framework produces regarding gender relations and their relationship to the world of power remains "incomplete" (pp. 27–28).[2] His attempt to address this incompleteness is instructive: when he turns to women, he can conceptualize them primarily as "victims, objects of exploitation and consumption" (p. 34, author's translation), approaching gender through male sexuality and men's fear of homosexuality rather than through women's material agency. This is not a failure of intellectual ambition but a structural limitation—and it is methodological. Mbembe's rejection of Marxist analysis as reductive for Africa (2001, pp. 5–6)—however justified in its critique of class-struggle reductionism—removed labor as an analytical category. In its place, he developed a framework of representation, performance, and everyday practices that brilliantly captures how men negotiate power but structurally cannot see what women produce. The irony is internal to his own project: Mbembe insists that power operates through materiality, not abstraction—yet the most material practice in the postcolonial city, women's daily infrastructure labor, is invisible to a framework that has discarded the vocabulary of labor in favor of the vocabulary of performance. Feminist political ecology's reframing of "everyday practices" as "labor" (Section 2.4.3) is precisely the intervention Mbembe's framework cannot make from within its own analytical commitments. This dissertation sees what his framework structurally cannot: not because it is smarter but because it restores the category—labor—that makes women's city-producing work analytically visible, while retaining Mbembe's insight that the male power dance it documents is genuinely how postcolonial male politics operates.

What Mbembe documents but does not theorize is the gendered consequence of mutual male powerlessness: if the political dance renders both state actors and male citizens impotent—producing neither functional governance nor functional infrastructure—then the labor of actually sustaining urban life must be performed by someone outside that dance. Segato (2018) provides the theoretical link. The *mandato de masculinidad* traps men in competitive performances of honor, territorial control, and dominance—performances that, as Mbembe brilliantly demonstrates, consume political energy without producing material outcomes. Women, operating outside this mandate through relational forms structured by solidarity and care rather than honor and competition (Section 2.4.3), fill the vacuum male powerlessness creates. They are the infrastructure not by default but by structural position: the male honor economy produces political theater; women's labor produces the city. Dangarembga (2022) adds the colonial-historical dimension: the intensification of patriarchy from Segato's low to high intensity operated through

[2] This prologue, titled "Das Füllhorn," appears only in the German edition (Mbembe 2016). The arguments cited here are not available in the English-language editions of On the Postcolony. All translations are the author's.

male complicity across the racial divide—white colonial and Black colonized men contested power between themselves while maintaining shared investment in the subordination of women, producing the historical formation whose contemporary expression this dissertation documents through water infrastructure governance. Infrastructure as dignity names women's labor, makes this structural relationship visible, and demands that those whose work sustains urban life receive the recognition, authority, and governance rights their labor has already earned.

Infrastructure as Dignity: The Framework

What is missing, then, is not citizenship. It is the recognition that women's labor constitutes citizenship-producing work and that those performing it deserve corresponding dignity: authority over the infrastructure they produce, compensation for the labor they perform, freedom from the violence they endure, and voice in the governance of systems their bodies sustain. This is the move from hydraulic citizenship to infrastructure as dignity—not an extension of Anand's framework but a departure from its normative ground.

Hydraulic citizenship asks: how do residents acquire citizenship through infrastructure? Infrastructure as dignity asks: what happens when citizenship has already been produced through labor but the producers are denied recognition? The first question presupposes the state as interlocutor. The second question operates prior to the state—in the space where women's labor sustains urban life regardless of whether any state institution acknowledges their existence. Rosalind Fredericks's (2018) ethnography of Dakar's waste workers presses closest to this terrain—gendered infrastructural labor, feminist political ecology, and citizenship in an African city—yet there the laboring body claims recognition from the state, asserting rights to fair labor against a politics of governing-through-disposability, whereas infrastructure as dignity begins where that claim has already been answered in practice: the labor has produced the infrastructure citizenship would promise, so the question is no longer how the worker becomes legible as a citizen but who holds authority over what her work has already built.

The framework operates across two interconnected dimensions that are separable for analytical clarity but inseparable in argument.

The *first dimension* is empirical-analytical. Infrastructure as dignity foregrounds the gendered labor that hydraulic citizenship renders invisible, revealing women's water procurement not as coping strategy or everyday practice but as the unacknowledged infrastructure through which urban life is produced and maintained. Drawing on feminist political ecology's decisive reframing of "everyday practices" as labor (Section 2.4.3), this dimension documents what women's bodies actually do—the hours, the distances, the physical loads, the income extracted, the violence endured—and names this as infrastructure labor whose systematic devaluation constitutes a dignity violation prior to any question of state recognition.

The *second dimension* is normative-theoretical. Its ground is not Kantian dignity (intrinsic rational worth), nor the capabilities approach's list of conditions for flourishing (Nussbaum 2000; Sen 1999), nor human rights frameworks asserting universal entitlements (Pogge 2002). Its ground is the African and decolonial feminist intellectual tradition established in Section 2.4.3—Oyěwùmí's insistence on culturally specific analysis, Segato's theorization of patriarchy's historical depth and women's alternative relational forms, Mama's account of agency within compound marginalization, and Tamale's methodological commitment to building frameworks from African women's material conditions as generative ground. Together, these scholars refuse to apply imported concepts to African data and instead theorize from women's embodied

experiences outward. The framework does not ask "what capabilities do Lagos women lack?" It asks "what are Lagos women already producing through their labor, and what does the systematic extraction of that labor without recognition reveal about the conditions of dignity in postcolonial African cities?"

The answer—that dignity is not a condition to be granted but a labor already performed whose non-recognition constitutes the foundational injustice—emerges from what the empirical findings specifically reveal, theorized through the African feminist commitment to building frameworks from women's material conditions rather than applying imported concepts to them.

The capabilities approach tells us what dignified life requires; human rights frameworks assert who is entitled to it; infrastructure as dignity reveals who is already producing it and being denied recognition for doing so. That is a structurally different analytical move—one that becomes visible only when the empirical starting point is not state provision or its absence but the labor through which women have already built what the state has not provided. In Lagos's slums, dignity is not waiting to be granted. It is being produced daily, in 25-liter increments, by women whose work constitutes the actually existing water system for twelve to sixteen million people. The injustice is not that dignity has been denied but that its production has been extracted without acknowledgment, authority, or rest.

This normative dimension—the ethics of non-abandonment that infrastructure as dignity entails—is grounded empirically in Chapters 4–6 and developed fully in Chapters 7 and 8, where its implications for policy (what obligations follow from recognizing women's labor as dignity-producing?) and practice (what institutional arrangements would constitute non-abandonment?) are articulated through the multi-scalar intervention frameworks and technical infrastructure standards this dissertation proposes.

Together, the four theoretical strands provide infrastructure as dignity's analytical scaffolding: *postcolonial urbanism* situates women's water labor as city-making (Section 2.4.1); *feminist geography* maps how dignity violations compound across scales (Section 2.4.2); *feminist political ecology* reframes "everyday practices" as extractive labor and provides the African feminist normative ground (Section 2.4.3); *hybrid governance theory* reveals the institutional terrain where transformation must operate (Section 2.4.4). What the four strands cannot individually provide—a framework that shifts normative ground from a politics of recognition to an ethics of non-abandonment—is what infrastructure as dignity generates through their synthesis with and beyond Anand's hydraulic citizenship.

From Individual Fragmentation to Collective Dignity

Anand's (2017) framework draws on Strathern's (1988) concept of the dividual—persons constituted through discrete exchanges and relations mediated by infrastructure, differentially composed through various infrastructure relationships rather than existing as unified subjects. This doctoral research documents a different dynamic. Women's water procurement networks—sharing information about functional vendors, lending money for purchases, collectively organizing early-morning access at Precious Seeds' single donor point—create collective survival and mutual recognition that exceeds the dividual framing.

Segato (2018) provides the theoretical grounding for understanding why these solidarity networks operate through a fundamentally different relational logic than the male-dominated governance structures this dissertation documents. Women's relationships around water—mutual aid, information sharing, subsidized provision, collective organizing—constitute what Segato

identifies as forms of friendship and mutual support that operate outside the male honor economy. Male vendor competition, CDA power struggles, and traditional leadership contests are structured through what Segato terms the *mandato de masculinidad*—the mandate of masculinity established in Section 2.4.3—in which status, territory, and authority are maintained through violence and the performance of dominance. Women's water solidarity networks refuse this logic entirely: they organize around survival and care rather than honor and control. This is not merely a different "style" of governance but a structurally different relational form—one that infrastructure as dignity identifies as the generative ground from which women-centered water governance should be theorized, rather than attempting to insert women into existing male-dominated structures whose relational logic is constitutively violent. When female water vendors sell water at subsidized rates or provide it free, when even highly competitive male vendors in Otumara (Chapter 4) recognize the struggle of water-procuring women, these micro-solidarities constitute moral communities affirming worth that state infrastructure and patriarchal governance deny.

Women's cross-community networks—proposed in Chapter 7, Section 7.4—do not merely improve water access; they constitute the institutional form through which collective dignity operates at scales resilient to both vendor exploitation and state violence. The relational form Segato theorizes is not aspirational; it already exists in the solidarity practices this dissertation documents. The task is to build governance from it.

Analytical Vocabulary: Access, Control, and Governance

Infrastructure as dignity operates analytically through three terms whose distinction structures the empirical chapters and whose relationship constitutes the framework's core analytical claim: who controls infrastructure determines who accesses it, and who governs infrastructure determines whether control produces dignity or extraction.

Access describes empirical patterns of who receives water, under what conditions, at what cost—procurement distances, temporal availability, economic burden, quality. Ribot and Peluso's (2003) theory of access establishes the foundational distinction between access as "the ability to benefit from things" and property as formal rights, demonstrating that access operates through social relationships, not merely legal entitlements. This dissertation extends their framework by revealing that in contexts of near-total state absence, access is produced not through social relationships with rights-holding institutions but through women's embodied labor—the "ability to benefit" depends on whose body performs the procurement work. Access is an outcome; analyzing it alone documents inequality but cannot explain how inequality is produced and maintained.

Control describes who owns infrastructure, sets prices, determines operating hours, decides placement, and benefits from provision. In vendor cartel communities (Otumara, Orisunmibare), men control all functional water infrastructure while women constitute the entirety of procurement labor (Chapters 4, 5, and 6). This disjuncture—between who controls systems and who performs the labor those systems depend on—reveals that water inequality cannot be addressed through access interventions alone. Inclusion feminist approaches recommend improving women's access through subsidies, expanded service hours, or reduced procurement distances. Transformation feminist approaches—which this dissertation enacts—ask whose labor produces infrastructure and what governance emerges when theorized from that labor rather than from existing male control structures (Section 2.4.3).

Governance describes who holds decision-making authority over infrastructure, including control dimensions plus accountability mechanisms and political legitimacy—determining infrastructure priorities, establishing protocols, setting pricing, managing conflicts, and exercising authority recognized as legitimate by both communities and state institutions. Zwarteveen et al. (2017) argue that water governance operates through three simultaneous distributions—of water itself, of voice and authority, and of expertise—foregrounding the political choices embedded in arrangements typically presented as technical or neutral. This dissertation extends their framework by demonstrating that in contexts where women produce infrastructure through labor yet are excluded from all three distributions, governance constitutes not merely political inequality but a dignity violation. The distinction between governance and control matters politically: vendors control water infrastructure through ownership but lack governance legitimacy—communities view them as exploiters rather than stewards. Women's committees governing infrastructure (attempted in Precious Seeds 2024–2025) establish authority deriving from labor rather than capital ownership. Infrastructure as dignity argues that those whose labor produces infrastructure deserve corresponding governance rights—not merely improved access or consultation in vendor decisions, but authority to determine how infrastructure operates, for whose benefit, and under what terms.

The three terms are not merely descriptive categories but an analytical sequence with political force: access without transformed control reproduces exploitation through new technical forms; transformed control without governance legitimacy proves vulnerable to state violence or male retaliation; governance authority without material control lacks capacity to implement decisions. Effective transformation requires addressing all three simultaneously—a requirement the multi-scalar organizing frameworks in Chapters 7–8 are designed to meet.

How This Framework Operates Across the Three Papers

The three papers operationalize different dimensions of infrastructure as dignity's analytical architecture. Paper 1 (Chapter 4) analyzes property relations structuring access and state-community strategic interactions determining control—revealing gendered differences in water infrastructure ownership (men's profit-oriented vending versus women's solidarity-based provision) that foreshadow Paper 3's argument. Paper 2 (Chapter 5) compares how different control arrangements produce different access outcomes while documenting gendered everyday water practices across communities. Paper 3 (Chapter 6) demonstrates that men's control over water infrastructure persists despite women's labor producing access—revealing governance as the political question that access and control analyses document but cannot answer: whose authority should determine infrastructure priorities when those who own systems (male vendors) differ fundamentally from those who perform infrastructure work (women procurers)?

The cumulative progression matters: no single paper delivers the full framework. Papers 1–2 operationalize access and control analysis without theorizing through dignity. Paper 3 demonstrates that women's exclusion from governance despite being primary infrastructure providers constitutes the dignity violation the framework names. Chapters 7–8 synthesize across all three and develop the normative implications—what an ethics of non-abandonment requires for policy and practice—that individual papers, constrained by journal formats, could not fully articulate. The framework is deliberately ahead of the empirical chapters because that is the cumulative dissertation's distinctive contribution: a theoretical synthesis exceeding what any single paper could see, made possible by the progressive analytical deepening the three-paper sequence documents.

2.4.6 Research Gaps and Theoretical Contributions

The theoretical framework established in Sections 2.4.1–2.4.5—postcolonial urbanism, feminist geography, feminist political ecology, hybrid governance theory, synthesized through infrastructure as dignity—reveals three critical gaps at the intersection of existing scholarship that this doctoral research addresses. These gaps are not merely absences in the literature but blind spots produced by the analytical limitations the framework itself diagnoses: postcolonial urbanism's gender blindness (Section 2.4.1), the absence of labor as analytical category in frameworks built to see performance (Section 2.4.5), and the failure to integrate feminist analysis with infrastructure scholarship in Lagos specifically.

Gap 1: Limited Technical Documentation of Informal Water Infrastructure Systems

Postcolonial urban theory richly theorizes everyday practices as city-making and hybrid infrastructure configurations as permanent features of southern urbanism (Section 2.4.1), yet the specific technical configurations through which informal water systems operate—how many water points exist, who owns them, how pricing functions, what hours they operate, how far women travel, what physical loads they carry—receive less scholarly attention than governance arrangements or policy frameworks. This gap matters because seemingly neutral technical specifications embed and reproduce gendered inequalities: water point locations, generator-dependent pricing, and procurement distances translate directly into hours of women's daily labor, bodily exhaustion, and economic vulnerability. This dissertation provides detailed technical documentation across five Lagos communities (Chapter 3), demonstrating that technical infrastructure configurations constitute not background conditions but active political decisions shaping who accesses water under what conditions. Section 7.3.5 translates this documentation into engineering specifications for compound-level water point distribution—establishing the technical standards required for gender-responsive infrastructure intervention.

Gap 2: Insufficient Multi-Scalar Analysis of Gendered Water Infrastructure Access and Control

Feminist geography's multi-scalar architecture (Section 2.4.2) reveals that gendered exclusion compounds across household, community, and state scales, yet existing scholarship tends to focus on either large-scale policy frameworks or individual women's experiences without systematically tracing how patriarchal power operates *across* scales to structure both access to and control over water infrastructure. This dissertation examines how exclusions reinforce each other: women's household-level time poverty from procurement labor constrains capacity to participate in community governance, while community-level exclusion from water infrastructure decision-making prevents women from advocating for configurations that would reduce household burdens. At the state scale, government policies treat water as a technical problem requiring pipes rather than a political problem requiring transformation of who controls infrastructure. Effective intervention requires simultaneous transformation across all three scales—a requirement the organizing frameworks in Chapters 7–8 are designed to meet.

Gap 3: Absence of Feminist Analysis in Postcolonial Urban Infrastructure Scholarship

This is the gap infrastructure as dignity (Section 2.4.5) directly addresses. Postcolonial urbanism's most powerful analytical frameworks—Mbembe's everyday practices, Simone's people as infrastructure, Anand's hydraulic citizenship—operate within what this dissertation has identified as a male analytical economy: they theorize how men negotiate power (Mbembe), how people in the abstract produce cities (Simone), and how residents negotiate citizenship through state

infrastructure (Anand), without interrogating whose gendered labor sustains urban life while these negotiations occur, or what framework is needed when the state is absent as interlocutor entirely. Lagos scholarship specifically—Gandy (2006), Acey (2010)—documents the city's infrastructure crisis without centering women's embodied experiences or examining how informal water systems extract women's labor while denying them governance authority. This dissertation demonstrates that centering women's experiences does not simply "add gender" to postcolonial urbanism but fundamentally transforms understanding of how urban water infrastructure production operates—revealing women as the actually existing infrastructure whose labor produces the city while the male power economy Mbembe so brilliantly documents produces mutual impotence (Section 2.4.5).

Contributions

Addressing these gaps generates contributions across four registers. *Empirically*, through 194 interviews across five Lagos slum communities over seven years (2018–2025), this research documents the technical configurations, gendered labor dynamics, and governance structures of informal water systems at a scale and depth unavailable in existing Lagos scholarship. *Theoretically*, through the infrastructure as dignity framework (Section 2.4.5), it demonstrates that infrastructure operates not only through access (who receives water) and control (who owns systems) but through labor (whose work produces infrastructure) and governance (whose authority is recognized as legitimate)—shifting the normative ground from a politics of recognition to an ethics of non-abandonment. *Methodologically*, through multi-scalar analysis revealing how household, community, and state exclusions compound rather than merely accumulate, and through the cumulative dissertation format enabling progressive analytical deepening from game theory through comparative analysis to feminist ethnography. *For policy and practice*, through women-centered hybrid governance frameworks that reject both formalization (technically sound but largely infeasible) and simple recognition of informal systems (fastest but insufficient to transform patriarchal power relations), proposing instead transformation of who controls and governs actually existing infrastructure—detailed in Chapters 7–8.

2.5 Research Questions

Building on the theoretical framework established in Sections 2.4.1–2.4.5 and addressing the three research gaps identified in Section 2.4.6, this doctoral research asks:

Primary Research Question:

How do gendered power relations structure water infrastructure access and control in Lagos slums where women function as de facto infrastructure providers yet remain systematically excluded from infrastructure decision-making, implementation, and management, and what forms of women-centered hybrid water infrastructure systems might transform these patriarchal arrangements while addressing infrastructure deficits?

This overarching question integrates postcolonial urban theory's insights about hybrid formal-informal systems with feminist political ecology's analysis of how infrastructure operates through gendered bodies. It guides the cumulative dissertation by examining water infrastructure not merely as technical provision problem but as political terrain where colonial legacies, postcolonial state priorities, informal urbanization dynamics, and patriarchal power structures intersect to

determine who accesses water under what conditions and who controls actually existing infrastructure systems.

Sub-Questions (Corresponding to Three Papers):

Paper 1 (Hoelzel 2022): State–Slum Power Dynamics and Non-Cooperative Equilibria

How do power dynamics between Lagos State government and slum communities shape water infrastructure provision and control in postcolonial contexts where government oscillates between neglect and violence, what mechanisms perpetuate non-cooperative equilibria despite potential welfare gains from collaboration, and how do property relations between landowners (including water vendors) and tenants structure water access patterns?

Property relations constitute a structural dimension of water access that Paper 1 analyzes at the community-state scale: the distinction between landowners and tenants determines not only who bears water procurement burdens but who profits from water infrastructure control. Landowners—including water vendors—may own boreholes or storage tanks, positioning them as infrastructure providers and economic actors within the water market. Tenants, by contrast, have no stake in infrastructure ownership, no leverage over pricing or access decisions, and no recourse when vendors exploit their dependence. This owner-tenant axis operates as a form of civic stratification analogous to Anand's (2017) hydraulic citizenship: infrastructure access mediates political standing within the community, with landowners constituting a class of informal infrastructure citizens and tenants rendered structurally subordinate. Paper 1 establishes this dimension empirically through the Otumara case—a community where the severance of state–community relations (the 2010 LWC disconnection) left tenants entirely exposed to vendor control with no alternative infrastructure claims. Papers 2 and 3 (Chapters 5 and 6) then demonstrate how the owner-tenant axis intersects with gender: women are disproportionately tenants, and even where women are landowners, patriarchal household structures and community governance arrangements deny them the infrastructure authority that male landowners exercise. The post-production notes in Chapter 4 (Section 4.3) address the limitations of game theory for capturing this gendered and property-differentiated complexity fully.

Contribution to research gaps: provides technical documentation of vendor-dominated water infrastructure systems (Gap 1) and analyzes state-community relational dynamics, examining how postcolonial governance neglect at state scale intersects with community-level vendor control and household-level owner-tenant divisions (Gap 2—multi-scalar analysis at state and community scales). Crucially, reveals gendered differences in water infrastructure ownership practices—men's profit-oriented vending versus women's solidarity-based sharing—foreshadowing Paper 3's argument for women-centered decision-making and infrastructure control models (Gap 3 beginning).

Paper 2 (Hoelzel 2024): Community Contexts and Water Provisioning Diversity

How do different communities' contexts on Lagos mainland—varying across settlement typologies, institutional arrangements involving traditional leadership and Community Development Associations (CDAs), and morphological and geographical locations—produce diverse water infrastructure provisioning systems across Lagos slums, and what patterns distinguish "free-market" vendor-dominated models from "solidarity" approaches?

Contribution to research gaps: documents heterogeneous infrastructure configurations, operational dynamics, and institutional variations across communities (Gap 1). Examines

community-scale decision-making structures—CDAs, traditional leadership, vendor systems—revealing how these intermediate-level institutions mediate water access (Gap 2—community scale). Documents gendered patterns (male vendor violence, women's exploitation) that establish empirical foundation for Paper 3's feminist analysis of how patriarchal power structures operate across scales (Gap 3 preparation).

Paper 3 (Hoelzel 2025): Women's Embodied Experiences and Gender as Transversal Inequality

How do women experience water infrastructure access and procurement labor in their daily lives across Lagos slum communities, how does their positioning as primary water procurers constitute them simultaneously as essential infrastructure providers whose unpaid labor produces urban-scale water access and as subjects of exploitation through male-dominated decision-making and control structures at household, community, and state scales, and how does gender mediate all other inequalities (property relations, vendor dynamics, community infrastructure control, state neglect) structuring water provision in postcolonial African cities?

Paper 3's research design asked analytical questions about how gender mediates existing water inequalities—questions reflecting an inclusion feminist orientation seeking to document women's exploitation within existing systems. The findings produced epistemological transformation: investigating how gender mediates inequalities revealed that effective response requires not including women in existing governance structures but theorizing those structures from women's labor as generative ground. This shift from documentation to transformation—what Black feminist scholars identify as the difference between privilege redistribution within existing hierarchies and creating fundamentally different systems (Eddo-Lodge 2017; Dangarembga 2022)—structures Paper 3's argument and the infrastructure as dignity framework it generates. The research question asked about mediation; the answer demonstrated transformation's necessity.

Contribution to research gaps: centers feminist analysis of postcolonial African urban water infrastructure (Gap 3 complete), demonstrates multi-scalar patriarchal exclusion across household, community, and state levels (Gap 2 complete), documents infrastructure through women's embodied navigation (Gap 1 gendered dimension). *Critical finding:* effective women-centered infrastructure governance requires cross-community organizing to transcend patriarchal constraints operating at individual community level, providing transformation from women's labor as generative ground rather than inclusion within existing power structures, and offering protection against both community-level male retaliation and state eviction violence.

Integration Across Papers: Cumulative Contribution

The three papers function cumulatively through progressive analytical deepening. Paper 1 establishes state-community power dynamics while revealing gendered differences in water infrastructure ownership. Paper 2 documents community-level governance diversity. Paper 3 demonstrates that gender mediates all dynamics documented in Papers 1 and 2, revealing it as the transversal inequality operating within every social group, through which all other exclusions are mediated. Most critically, the cumulative analysis identifies that effective women-centered governance requires organizing at cross-community scale: patriarchal constraints operate most

intensely at the hyperlocal level, and cross-community networks provide protection against violence at household, community, and state scales that single-settlement organizing cannot achieve.

2.6 Methodology

This doctoral research employs methodological approaches designed to answer research questions operating across three scales simultaneously—household dynamics, community governance structures, and state policies. The multi-scalar architecture of infrastructure as dignity (Section 2.4.5) is not only a theoretical claim but a methodological requirement: capturing how patriarchal exclusions compound across scales demands methods that can access each scale while tracking their interactions. The three-paper progression responds to this requirement directly—Paper 1 (Chapter 4) analyzes state-community strategic dynamics, Paper 2 (Chapter 5) examines community-level governance diversity, and Paper 3 (Chapter 6) centers household and bodily-scale experiences—with the cumulative dissertation integrating findings across all three scales into the infrastructure as dignity synthesis.

2.6.1 Cumulative Dissertation as Intellectual Journey

This doctoral research employs cumulative dissertation format—three published peer-reviewed papers as empirical chapters (4–6), framed by theoretical and methodological chapters—enabling progressive analytical deepening across an extended trajectory (2018–2025) while subjecting findings to external validation before submission.

The cumulative structure proved essential because analytical orientation transformed fundamentally across the research period: from documenting infrastructure arrangements and comparing support models (2018–2022) toward feminist frameworks centering women's labor and systematic exclusion (2022–2025). The three-paper progression documents this evolution—game theory (Chapter 4), comparative institutional analysis (Chapter 5), feminist ethnography (Chapter 6)—reflecting not predetermined design but emergent recognition that understanding Lagos's crisis requires multiple analytical lenses, with feminist methodology ultimately proving essential for explaining what earlier frameworks documented but could not fully account for. Each paper's method was appropriate for its specific analytical moment; the cumulative format made this evolution possible rather than requiring methodological uniformity across seven years of changing understanding.

Relationship to Framing Chapters

Chapter 2 establishes theoretical frameworks individual papers reference but cannot fully develop given journal constraints. Chapter 3 provides comprehensive fieldwork documentation serving a dual purpose for the dissertation's empirical and theoretical architecture—understanding informal water systems' material realities and operationalizing a critical feminist analytical distinction: access versus control. Chapter 7 synthesizes findings, examining how conclusions evolved and identifying tensions beyond what individual papers addressed. Chapter 8 articulates recommendations grounded in cumulative findings, connecting analysis to planned 2026 implementation and reflecting on scholar-activism's possibilities and limits.

2.6.2 Case Study Selection and Field Site Transformations

This doctoral research employs a multiple-case design appropriate to the comparative-explanatory aims set out in Section 2.5. Case study research is particularly suited to investigating contemporary phenomena within their real-world context where the boundaries between phenomenon and context are not clearly evident (Yin 2018, pp. 14–17), and where context-dependent knowledge of how power operates in specific socio-material configurations is itself the analytical object rather than a constraint to be controlled away (Flyvbjerg 2006; Stake 1995). The five communities were selected purposively—not as statistically representative units but as cases chosen for their analytical leverage on the research questions (Ragin and Becker 1992)—a logic that accepts the method's recognized trade-off: depth and contextual richness purchased at the cost of statistical generalizability, addressed through the validation strategies set out in Section 2.6.7.

This research examines five Lagos slum settlements: Otumara, Amukoko-Mosafejo, Mafowoku, Orisunmibare, and Precious Seeds. Precious Seeds was added in 2023; the rationale for this expansion of the case selection is detailed in Section 2.2. The five communities span significant diversity: lagoon front and inland, varying settlement scales, federal infrastructure adjacency, differing eviction vulnerabilities. This enables identifying which patterns hold consistently (women's exclusion from leadership, male vendor dominance) versus which vary by context (vendor exploitation severity, CDA effectiveness).

This case selection strategy means findings emerge from communities with sufficient organizational capacity or external engagement to facilitate researcher access. Given that organizational capacity likely correlates with relatively better—though still inadequate—water access, communities facing even more severe conditions than documented here may exist but remained inaccessible. However, the evictions of Orisunmibare and Precious Seeds demonstrate that even communities with organizational capacity face state violence—validating this research's emphasis on cross-community organizing and state-level policy transformation.

2.6.3 Data Collection: Fieldwork Methods and Timeline

This doctoral research draws upon extensive ethnographic fieldwork conducted across five slum settlements in Lagos. Ethnography is particularly suited to investigating socio-material practices that are not visible in official documentation and that emerge through sustained participant engagement rather than discrete observational moments (Hammersley and Atkinson 2019)—a fit confirmed empirically here by the absence of any official planning material on informal water systems and by the depth of trust required to surface women's accounts of vendor violence and household conflict. The multi-sited design across five communities, rather than diluting ethnographic depth, follows established multi-sited methodology in which the analytical object is constituted *across* sites rather than within a single bounded field (Marcus 1995); its acknowledged trade-offs—reduced single-site immersion, greater logistical complexity—are addressed through the seven-year longitudinal timeline detailed below and the validation strategies set out in Section 2.6.7.

Community boundaries, water access points, and water quality assessments (as reported by water procuring women, water vendors, and residents) were systematically mapped using GPS coordinates and corroborated through interviews with infrastructure owners and operators.

Significantly, none of the households within the five case study communities maintains connection to the public water network, and no water access points receive supply from state infrastructure. Historically, some locations maintained informal or illegal connections to the water distribution system. All current water access points operate through private in-situ boreholes or connections to private boreholes located several hundred meters distant (detailed maps in Section 3.3).

The qualitative research approach encompassed semi-structured interviews with multiple stakeholder categories, focus group discussions, and expert interviews, complemented by systematic observations, spatial mapping, and qualitative household expenditure surveys documenting water costs. Data collection occurred across multiple fieldwork phases enabling longitudinal engagement: preliminary research (2018), foundational DAAD-funded fieldwork (2019), and follow-up investigations (2021, 2022, 2023, 2024, 2025). This extended timeline—spanning seven years—proved methodologically essential for observing changes across seasons, policy implementation, and community transitions while building trust enabling candid conversations about sensitive topics including intimate partner violence and economic desperation. Detailed interview distributions and participant category breakdowns appear in Chapter 3, Section 3.5.

Each method anchors a distinct epistemological function within the ethnographic design. Semi-structured interviews allow comparable thematic coverage across participants while preserving conversational flexibility to follow unanticipated lines of inquiry (Brinkmann and Kvale 2015); their recognized trade-off—greater interviewer effects than fully standardized instruments—is the price of access to the candid, situated accounts feminist epistemology requires. Focus group discussions surface collective rather than individual narratives, making visible the negotiation of shared experience and the silences that mark contested topics (Krueger and Casey 2015). Expert interviews follow the distinct methodological tradition codified in German qualitative scholarship, in which the expert is treated not as a knowledgeable individual but as a representative of an institutional logic—planning bureaucracy, water utility, donor agency—whose practical knowledge constitutes the object of inquiry (Bogner, Littig and Menz 2009). The qualitative household expenditure surveys follow established practice in ethnographic anthropology of embedding structured numerical instruments within open-ended fieldwork, enabling cross-household comparison of water spending while preserving the qualitative context in which economic decisions are made (Bernard 2017).

In-depth conversations with women water procurers were designed to facilitate open discourse regarding daily hardships and violence experienced in water procurement activities, encompassing schedules, routines, available options, and adaptive strategies for managing economic constraints and water scarcity. These semi-structured field interviews served multiple purposes: tracing infrastructural water arrangements within communities, mapping water access points, documenting subjectively perceived water quality, noting water pricing, and—in a dedicated set of household economic interviews—analyzing detailed expenditure patterns and gendered financial decision-making. Interviews were conducted at community water points and with women engaged in water procurement activities. The distinction between community-level interviews examining water infrastructure governance and household economic interviews focusing on women's expenditure burdens is explained in Chapter 3, Section 3.5.

The majority of interviewed women are tenants without land or structure ownership. Women were encountered through purposive sampling at public spaces and water access points, while

additional interviews were conducted with water vendors (predominantly male), informal leaders, and traditional authorities. These latter participants frequently assume multiple, simultaneous roles as water vendors, informal leaders, and traditional authorities. Communities typically maintain between four (Orisunmibare) and approximately ten (Mafowoku) functional water access points, providing varying water quality, operating irregularly due to diverse technical constraints, and managed through extremely heterogeneous organizational structures.

Interview Composition Evolution

Interview composition evolved analytically across the research trajectory. Initial 2019 fieldwork already interviewed predominantly women water procurers alongside water vendors, traditional leaders, CDA members, and male community residents, yet my initial analytical focus on infrastructure mapping centered male actors who owned and controlled water points while treating women primarily as users whose procurement experiences provided supplementary context. Subsequent fieldwork (2021–2025) maintained empirical focus on women's experiences while shifting analytical frameworks: from technical infrastructure documentation toward feminist political ecology, from treating women as water users toward recognizing them as infrastructure providers systematically denied infrastructure agency. I deliberately sought diversity across age, household structure (single mothers, married women, widows), and economic status while spending significant repeated time in communities enabling long-term observation.

Focus Groups and Expert Interviews

Focus group discussions were primarily implemented to systematically document experiences and perspectives of women engaged in water procurement activities. One focus group discussion was conducted with water vendors (predominantly male) in Otumara, where vendors had previously organized an informal association—unusual given that water vendors typically engage in aggressive competition rather than cooperation. This focus group provided insight into vendors' concerns as key stakeholders in water infrastructure systems.

Governmental decision-making processes are characteristically marked by institutional opacity, constraining access to information generally, including official planning documentation. Expert interviews were conducted with water infrastructure and urban planning specialists within and external to Lagos State government to comprehend official water policy and political frameworks. Expert participants included politicians and planning professionals from state and local government levels (LWC, LASURA, local government officials), as well as international aid representatives (Chapter 3, Section 3.5 provides detailed breakdown). Most expert participants were male.

These expert interviews additionally served to present statements from slum settlement residents to government officials, including representatives from LWC—both senior-level administrators and field personnel—and representatives from development aid and philanthropic institutions, thereby facilitating verification and triangulation of resident testimonies.

2.6.4 Interview Documentation Methodology

All interviews were documented through detailed note-taking during and immediately after conversations rather than audio recording. This methodological choice reflected feminist research ethics and contextual appropriateness for Lagos slum communities.

Rationale for Note-Taking Approach

First, audio recording devices generate suspicion and discomfort in communities with histories of state surveillance, eviction threats, and researcher extraction without reciprocity. Women water procurers, male vendors, and community leaders alike expressed preference for conversational engagement over recorded formal interviews. Recording equipment shifts power dynamics, positioning researcher as data extractor and participant as subject under scrutiny—antithetical to feminist methodology's commitment to knowledge co-production and relational accountability (England 1994; Sultana 2007).

Second, note-taking enabled more organic conversational flow, allowing participants to control pacing, revisit topics, and speak off-record when desired. Many critical insights—particularly regarding vendor violence, household conflicts over water spending, and women's experiences of physical exhaustion and shame—emerged in conversation margins rather than direct responses to questions. These moments of trust required flexibility impossible when participants speak into recording devices aware that words become permanent archived data.

Third, feminist methodology prioritizes rapport and ongoing relationships over comprehensive data capture. My sustained engagement with communities (2018–2025, with intensive 2021–2025 presence in Precious Seeds) emphasized practice-based reciprocity—MDDT provision, DIS design, organizational support—rather than researcher-as-neutral-observer positioning. Note-taking rather than recording signaled that conversations served relationship-building and collaborative problem-solving, not merely academic data extraction.

Note-Taking Procedures

The note-taking procedures employed in this research follow established ethnographic practice in which fieldnotes are not a transparent record of what was said but an analytical artifact produced through deliberate writing choices about what to capture, when to capture it, and how to expand it (Emerson, Fretz and Shaw 2011; Sanjek 1990). The methodological literature on the trade-off between audio recording and note-taking is explicit: recording maximizes verbatim fidelity at the cost of conversational rapport and analytical immersion in the moment, while detailed note-taking sacrifices verbatim accuracy in exchange for relational openness and the capacity to attend to non-verbal, contextual, and silent dimensions of the encounter (Lofland et al. 2006). For research on socially sensitive topics in contexts of state surveillance and eviction threat, the latter trade-off is methodologically appropriate rather than a compromise—a point developed in the rationale below.

Interview notes were taken directly during conversations when contextually appropriate (typically with vendors, traditional leaders, LWC officials, and CSO representatives) or immediately following conversations when note-taking during felt intrusive or inappropriate (often with women water procurers, particularly during procurement activities or in household settings). Notes captured: key themes and patterns participants emphasized; specific phrases when particularly salient or analytically significant; contradictions, silences, or tensions in narratives; contextual observations about interview settings, body language, and emotional tenor; and my own reactions and reflexive questions emerging during conversations.

For the dedicated set of household economic interviews with women water procurers, a structured format documented water expenditures, household income sources, and spending allocations across necessities. These interviews combined standardized questions enabling quantitative comparison with open-ended discussion about economic decision-making, time poverty, and

gendered household dynamics. Notes included both numerical data and qualitative context explaining economic patterns.

Following each day's fieldwork, handwritten notes were expanded and typed, adding contextual details, analytical observations, and connections to emerging themes. This same-day expansion process served dual functions: preserving detail while memory remained fresh and beginning analytical work through reflexive writing about what interviews revealed, what questions they raised, and how findings connected to theoretical frameworks.

Analytical Implications

This documentation approach shaped analysis in specific ways. Without verbatim transcripts, analysis focused on thematic patterns across interviews rather than discourse analysis of specific linguistic choices. Quotes presented in published papers and dissertation chapters represent paraphrased content or specific phrases recorded in notes as analytically significant, not verbatim speech. Analysis involved: reading interview notes multiple times to identify recurring themes; systematically comparing how similar phenomena manifested across communities and participant categories; attending to what participants emphasized unprompted versus topics requiring careful questioning; and noting patterns of silence or contradiction suggesting complexity beyond surface narratives.

The absence of recorded transcripts meant analysis required trusting my interpretations of conversations, documented as thoroughly as possible but inevitably shaped by what I heard as significant in the moment. This interpretive dimension, rather than constituting limitation, aligns with feminist epistemology's recognition that all knowledge production involves positioned, partial perspectives (Haraway 1988). The approach prioritized depth of relationship and contextual understanding over breadth of verbatim data, accepting that feminist research aims not for impossible objectivity but for accountable, reflexive interpretation grounded in sustained engagement.

Expert Interview Exception

A final expert interview, conducted with a LWC official in September 2025 specifically for this cumulative dissertation rather than individual papers, employed the same note-taking methodology. This post-publication interview verified whether infrastructure conditions, policy frameworks, and institutional dynamics documented in earlier research (2018–2024) remained current, ensuring dissertation findings reflected Lagos's water governance landscape as of 2026 dissertation completion.

2.6.5 Analytical Approach: Grounded Theory, Feminist Methodology, and Multi-Method Analysis

This doctoral research employs multiple analytical approaches appropriate to each paper's specific research questions while maintaining overarching commitment to grounded theory and feminist methodology.

Grounded Theory

Following Glaser and Strauss's (1967) foundational work, this doctoral research allowed concepts to emerge inductively from empirical data rather than testing predetermined hypotheses. The

centrality of gender as analytical category emerged through accumulated observations rather than initial theoretical commitment; the discovery that none of the case study communities received external infrastructure support—contradicting initial research design assumptions—exemplifies grounded theory's iterative approach: fieldwork findings reshape analytical frameworks rather than being forced into preexisting categories. This inductive approach proved particularly valuable given Southern urban theory's call for theory emerging from postcolonial Southern contexts rather than applying Northern frameworks (Section 2.4.1).

Feminist Methodology

Explicitly adopted in later research phases, feminist methodology informed multiple dimensions of the research process. The constructivist-feminist tradition in qualitative research provides the methodological foundation for this orientation, treating knowledge production as situated and relational rather than as the extraction of neutral data from passive subjects (Charmaz 2014). First, centering women's narratives as primary rather than supplementary data sources, treating women's accounts not as subjective anecdotes requiring validation against “objective” data but as authoritative knowledge about water infrastructure systems women navigate daily. Second, attending to power relations throughout the research process: acknowledging my positionality as white European woman researcher (Chapter 1, Section 1.2), navigating practitioner-researcher duality creating expectations, and recognizing that who asks which questions shapes what becomes visible. Third, acknowledging emotional labor these conversations demanded—both for women sharing experiences of violence, exhaustion, and desperation, and for me as researcher exposed to extremely heavy testimonies (Chapter 1, Section 1.2.4). Fourth, committing to reciprocity: research findings informing practice through MDDT provision, DIS design, and planned 2026 LWC implementation project.

Game Theory (Paper 1)

Otumara case analysis employed game-theoretical frameworks, specifically the Prisoner's Dilemma model, to analyze strategic interactions between Lagos State government, LWC, and community actors. The decision to apply game theory—a method rarely used in postcolonial urban water infrastructure studies—requires explicit justification given this dissertation's commitment to Southern theoretical frameworks and embodied methodologies. Game theory proved appropriate for Paper 1's specific analytical aims for three interconnected reasons. First, Otumara presents a case of deliberate strategic choice: the community consciously severed ties with LWC in 2010 following infrastructure destruction, creating a situation where both government and community made calculated decisions about cooperation versus defection based on anticipated responses from the other party. Second, Otumara's water infrastructure and institutional arrangements exhibited what Scharpf (2018) terms an "anarchic field"—absence of formal institutional relationships and predetermined obligations—creating conditions where game-theoretical models of strategic interaction without enforceable contracts prove analytically powerful. Third, the persistent non-cooperation despite apparent mutual benefits demanded analytical tools for understanding why rational actors remain trapped in suboptimal equilibria—a puzzle game theory explicitly addresses through concepts like credible commitment problems and first-mover disadvantages.

However, game theory's analytical power comes with significant limitations that subsequent papers' methodologies address. Formal modeling necessarily reduces complex multi-stakeholder networks to simplified bilateral interactions, obscuring intra-community power dynamics—particularly gender relations—that later papers demonstrate are fundamental to water access

patterns. Game theory treats "community" as unified actor with coherent interests, when feminist analysis reveals community as site of patriarchal contestation where men and women occupy radically different positions. Additionally, game theory assumes actors possess complete information about payoff structures, when fieldwork revealed that incomplete information and deep mistrust profoundly shape strategic calculations. Finally, game theory's abstract formal language risks depoliticizing analysis by treating power relations as technical coordination problems solvable through mechanism design rather than requiring transformation of underlying structural inequalities.

Paper 1's use of game theory thus represents a methodologically pragmatic choice appropriate for analyzing state-community strategic dynamics while acknowledging what this approach cannot capture—limitations that motivated Papers 2 and 3's turn toward comparative institutional analysis and feminist ethnography.

Comparative Case Analysis (Paper 2)

Paper 2 employs systematic comparison across four communities (Otumara, Amukoko-Mosafejo, Mafowoku, Orisunmibare) to identify patterns and variations in water provisioning systems. Following Yin's (2018) multiple-case design principles, this approach enables moving beyond single-case particularity toward pattern recognition while maintaining attention to place-specific factors mediating water access—essential for understanding how community contexts produce diverse water infrastructure and institutional outcomes.

The analytical approach involved several steps. First, manually analyzing interview notes, field observations, and mapped infrastructure data to identify recurring themes (vendor exploitation, CDA dysfunction, traditional leadership roles) and divergent patterns across communities. Second, systematically comparing how the same phenomena (water pricing, governance structures, women's procurement strategies) manifested differently across cases, asking why Mafowoku achieved relatively equitable "solidarity" distribution while Orisunmibare suffered vendor cartel exploitation despite similar property structures. Third, theorizing from patterns: the distinction between "free-market" and "solidarity" distribution models emerged inductively from comparative analysis rather than being imposed a priori.

This method proved particularly valuable for Paper 2's aim of understanding how community-specific factors (leadership integrity, vendor organization, historical state relations) mediate water access. Comparison revealed that my initial hypothesis about external support variation was wrong—all communities lacked government infrastructure—but exposed alternative dimensions of variation (institutional arrangements, leadership functionality) more significant than anticipated. The comparative approach also enabled identifying when patterns held consistently (women's exclusion from leadership across all communities) versus when they varied (vendor exploitation severity, CDA effectiveness), providing nuanced understanding of which water infrastructure dynamics are structural constants versus which are amenable to community-level intervention.

Narrative Analysis (Paper 3)

The explicitly feminist paper employs narrative analysis to understand how women interpret their daily water experiences. Drawing on Riessman’s (2008) theorization of narrative as both method and phenomenon, this approach attends not only to what participants say but to how they structure, sequence, and interpret their experiences. Rather than treating women's accounts as data points for researcher-imposed analytical categories, narrative analysis attends to how women

themselves frame their situations: what they emphasize, what silences or contradictions appear, how they position themselves as agents despite constraints.

This methodological approach draws on feminist scholarship arguing that women's narratives constitute legitimate knowledge often dismissed as “subjective” or “anecdotal” by positivist research paradigms. Narrative analysis takes seriously the meanings women assign to experiences, the metaphors and imagery they use, and the emotional dimensions they foreground. Analysis involved: reading interview notes multiple times to identify narrative structures and recurring themes; attending to how women described temporal rhythms of water procurement (the early morning wake-ups, hours-long queues, daily repetition); noting bodily language describing physical exhaustion, hygiene deprivation, and shame; and recognizing how women's accounts navigated tension between documenting hardship and maintaining dignity, between acknowledging constraints and asserting agency.

This approach revealed patterns invisible to quantitative metrics or researcher-defined categories. For instance, women's accounts simultaneously documented extreme suffering and demonstrated sophisticated adaptive strategies—developing water-sharing networks with neighbors, timing procurement to avoid peak prices, negotiating vendor credit arrangements. Narrative analysis refuses simple victim narratives while not romanticizing resilience that desperate circumstances necessitate. It also illuminated gaps and silences: topics women raised unprompted versus those requiring careful questioning, differences between what women said in individual interviews versus focus group discussions, contradictions suggesting the complexity of surviving within systems that exploit while enabling life itself. This methodology proved essential for Paper 3's feminist aim of centering women's lived experiences as analytical foundation rather than illustrative examples for theories developed elsewhere.

Thematic Analysis Across All Three Papers

Across all three papers, interview notes and field observations underwent iterative thematic coding conducted manually. Thematic analysis was conducted following the iterative procedure codified by Braun and Clarke (2006), in which coding proceeds through successive phases rather than in a single pass, combined with the grounded-theory sequence of open, focused, and theoretical coding (Charmaz 2014): initial open coding identified emergent themes; focused coding organized these into analytical categories; theoretical coding established relationships between categories. Manual analysis enabled immersive engagement with data, allowing pattern recognition through repeated reading of interview notes and field observations, physically organizing excerpts into thematic groupings, and maintaining analytical flexibility as understanding deepened across fieldwork phases. This approach suited the extended timeline (2018–2025) and evolving analytical focus, as themes identified in later fieldwork prompted returning to earlier materials with fresh perspectives. Member checking—discussing preliminary findings with participants—served an analogous validation function. Notes were taken on multiple devices (phone, laptop), often combined with GPS data collection using the maps.me app, with data exported to Google My Maps for spatial analysis.

2.6.6 Ethical Considerations: Consent, Anonymization, Reciprocity, and Reflexivity

This doctoral research navigated multiple ethical challenges inherent to studying vulnerable populations in contexts of state violence (eviction threats), economic desperation, and gendered

violence. The ethical framework follows established principles for social research—autonomy, beneficence, non-maleficence, and justice—as adapted from biomedical ethics into the specific obligations of qualitative social inquiry (Israel and Hay 2006), and engages the feminist research-ethics tradition that has long argued these principles are insufficient absent sustained attention to power relations between researcher and researched (Wolf 1996). Where standard research-ethics frameworks treat consent and anonymization as procedural compliance, work on research with displaced and vulnerable populations argues that minimal harm-avoidance is itself an inadequate ethical horizon: the question is not only whether the research causes harm but whether it produces obligation (Hugman et al. 2011).

Informed Consent

Standard written consent procedures proved inadequate given oral cultures and semi-literate contexts. The methodological literature on research in resource-poor and non-Western settings supports adapted consent procedures—verbal rather than written, ongoing rather than single-instance, contextually negotiated rather than form-based—as more ethically appropriate than the rigid application of biomedical-trial consent norms developed for very different research contexts (Marshall 2007). Consent processes were adapted: verbal explanation of research purpose, voluntary participation, right to withdraw, and intended use of findings; opportunity for questions and clarifications; verbal rather than written consent when participants preferred (documented through researcher notes); and ongoing consent throughout interviews, with explicit permission requested before discussing sensitive topics (intimate partner violence, sexual harassment at water points, family conflicts over money).

Anonymization

Given slum eviction threats and potential retaliation for criticizing vendors or traditional leaders, all participants were anonymized. This includes expert interviews. While being officially a democracy, Nigeria (and Lagos) became more authoritarian. Nigeria's Democracy Index score according to the Economist Intelligence Unit is 4.16 out of 10, placing it in the “Hybrid Regime” category—a regime operating with democratic structures, including elections, but that struggles with authoritarian tendencies and deep-seated issues, ranking 106th out of 165 countries and reflecting issues like flawed political culture, weak institutions, and limited civil liberties despite democratic progress since 1999 (EIU 2025). Experts talking about the endemic corruption in the public water infrastructure bid and maintenance system required strict anonymization. Community names are real (as these are publicly known settlements) but individual names, specific addresses within communities, and identifying details were removed in published work, except for the location of water points. This anonymization creates tension for feminist methodology's commitment to centering women's voices and providing credit for knowledge production—ethical protection requires obscuring whose knowledge is being reported. This trade-off prioritizes participant safety while acknowledging what is lost: women's water expertise remains credited to anonymous sources rather than named authorities. Guma (2025) names what is at stake in this trade-off: across urban studies on Africa, those who hold local knowledge are routinely positioned as “data sources” rather than theorists, their expertise absorbed into work authored elsewhere. Anonymization here, though demanded by participant safety, reproduces that erasure at the level of credit—the dissertation's analytical authorship rests on knowledge it cannot attribute to the women who generated it. The protective rationale mitigates this tension without resolving it.

Reciprocity

The extractive nature of research in contexts of extreme deprivation demands reciprocity beyond symbolic gestures. Multiple forms operated: immediate reciprocity through providing small compensation for interview time (acknowledging opportunity cost of income-generating activities foregone); medium-term reciprocity through my organization's MDDT provision, DIS design, and ongoing advocacy challenging eviction policies—participants knew I was not solely extracting data; and long-term reciprocity through commitment to implementation of research findings via the planned 2026 LWC project (Section 8.2). However, reciprocity remains imperfect: dissertation writing took years, and even implementation will take longer—a temporal mismatch between research timelines and urgent daily needs that cannot be fully resolved.

Managing Dual Role

My practitioner-researcher duality created ethical complexities requiring careful navigation. Communities expected continued implementation work; I struggled with investigating water insecurity without providing immediate solutions (Chapter 1, Section 1.2.3). Ethical management involved: explicit communication about research versus implementation phases, clarifying when I was conducting interviews versus organizational work; managing expectations by committing to use research findings for future interventions while not promising immediate solutions during research phases; and reflexive journaling documenting when the dual role created access benefits (trust from organizational relationships) versus complications (expectations, potential to miss dynamics invisible to an implementer positioned as helpful outsider).

Researcher Safety

Fieldwork in slums involves security risks requiring practical precautions: conducting interviews during daylight hours, traveling with trusted local contacts, avoiding communities during periods of heightened vendor violence or government eviction operations, and maintaining ongoing communication with colleagues aware of fieldwork locations. These precautions shaped data collection—some dynamics observable only at night or during crisis moments remained beyond my direct access, as female residents would describe them but without the possibility of my own verification, constituting research limitations acknowledged in findings.

Reflexivity

Most fundamentally, ethical research in contexts of radical inequality and researcher privilege demands ongoing reflexivity about power relations shaping knowledge production. Chapter 1, Section 1.2 details positionality analysis—whiteness, European nationality, class privilege, gender as simultaneously facilitating access and risking false assumptions of sisterhood—that informed methodological strategies and analytical interpretations. Reflexivity operated throughout: questioning whose voices were amplified versus marginalized in my accounts, interrogating how my practitioner lens might create blind spots, recognizing what I might have missed as outsider, and acknowledging gaps between my feminist analysis and the theoretical frameworks women themselves might use to interpret their situations.

2.6.7 Methodological Limitations and Validation Strategies

Ethnographic investigations and case study methodologies yield comprehensive, contextually rich knowledge of specific empirical cases, which inherently possess limited transferability to

alternative contexts both within Lagos's slum settlement landscape and across broader geographical scales encompassing sub-Saharan or postcolonial urban centers in the Global South. This is not a defect peculiar to ethnographic and case study research but a structural feature of context-dependent inquiry: as the methodological literature on qualitative research has long established, the question is not whether case-based knowledge is statistically generalizable—it is not, and was never designed to be—but whether the analytical insights it generates are *transferable* to other contexts under conditions the researcher specifies and the reader evaluates (Lincoln and Guba 1985; Flyvbjerg 2006). Acknowledging this methodological constraint, this doctoral research systematically pursued the identification of recurring patterns across all case study communities to enhance analytical robustness and comparative validity.

Beyond transferability limitations, several methodological constraints require acknowledgment.

Language and Translation

While English serves as Nigeria's official language, Lagos residents speak Pidgin English, Yoruba, Igbo, and Egun—among Nigeria's 200+ indigenous languages. A young female translator facilitated Yoruba–English interpretation when required, though translation inevitably risks losing cultural nuances and subtle meanings. My understanding of Pidgin English is minimal, potentially missing informal conversations around water points or between community members that might have provided additional context.

Temporal Limitations

Fieldwork occurred across seven years but in discrete phases rather than continuous presence. Seasonal variations in water scarcity, cyclical patterns in vendor pricing, and evolving community dynamics between fieldwork visits may have been incompletely captured. Extended longitudinal presence would enable deeper understanding but was not feasible given professorial responsibilities and research funding constraints.

Access Limitations

As discussed in Chapter 1, Section 1.2.5 and Section 2.6.2, my access depended on communities with organizational capacity and my professional networks. The most marginalized, invisible, or inaccessible settlements—potentially facing even more severe conditions—remain beyond this doctoral research's empirical reach. Even though Orisunmibare captures a significant portion of such constraints—where the level of human-made water scarcity is extremely high, leading to violent fights and requests from informal water vendors for payment in order to continue accessing the community—the most extreme conditions may remain undocumented. Additionally, as a white researcher, I may not have heard certain critiques of academic institutions or NGOs that participants might share with Nigerian researchers.

Gender Analysis Evolution

My initial gender-blind analytical frame meant early fieldwork missed gendered dimensions that women might have articulated had I asked different questions from the outset (detailed in Chapter 1, Section 1.2.2). While later focused interviews addressed this gap, dynamics observable only through sustained gender-centered inquiry from the research beginning may remain undocumented. This represents a genuine methodological limitation, not merely an analytical evolution.

Validation Strategies

Despite these constraints, multiple validation approaches enhanced analytical rigor along the trustworthiness criteria established in qualitative methodology (Lincoln and Guba 1985; Tracy 2010): triangulation across data sources—interviews with diverse stakeholders, observations, expert interviews, document analysis, existing literature—following the multi-method validation logic established by Denzin (2017); member checking through follow-up interviews discussing preliminary findings with participants, applied with awareness of recent critiques that warn against treating member checking as automatic validation rather than as itself an interpretive practice (Birt et al. 2016); peer review through three publication processes providing external scholarly validation; and comparative analysis identifying patterns across multiple communities rather than generalizing from single cases.

Chapter 3: Fieldwork Documentation and Community Profiles

3.1 Introduction

This chapter documents the water infrastructure configurations across five Lagos slum communities—Otumara, Amukoko-Mosafejo, Mafowoku, Orisunmibare, and Precious Seeds—constituting the empirical foundation for the analyses in Chapters 4–6. All technical data presented here was collected during fieldwork conducted between 2018 and 2025; detailed interview distributions and participant categories appear in Section 3.5.

The chapter is organized as follows: Section 3.2 maps the three water provision models identified across communities; Section 3.3 provides spatial documentation including GPS-mapped water points and community boundary maps; Section 3.4 presents per-community water infrastructure overviews; Section 3.5 details interview composition and fieldwork timelines; Section 3.4.6 documents water pricing and currency devaluation; Section 3.6 presents the photographic documentation.

Throughout, the access/control distinction defined in Section 2.4.5 structures the data presentation: infrastructure tables record both who can obtain water and under what conditions (access) and who owns, operates, and prices water points (control). Read together, these columns establish empirically that control arrangements determine access outcomes—the analytical claim Chapters 4–6 investigate at community, household, and embodied scales.

3.2 Institutional Context: Lagos Water Corporation Policy Framework

Government officials, including Lagos Water Corporation (LWC) staff, characterize the city's non-networked, informal water supply systems as policy failures (Expert interview 1; Expert interview 2; Expert interview 5; Expert interview 8; Jaglin 2015). Official discourse frames Lagos's dysfunctional water supply primarily as a technical and managerial problem, citing inadequate funding, staffing shortages, poor monitoring systems, weak maintenance protocols, deteriorating infrastructure, and unrealistic objectives (LWC 2025, pp. 28–52). The LWC's historically subordinate position within governmental hierarchies has further marginalized water infrastructure concerns (Expert interview 1; LWC 2025).

The Lagos State Development Plan (LSDP) 2052 envisions implementing “world-class” large-scale water infrastructure over thirty years (LSG 2022, p. 43), with LWC focusing strategically on increasing production capacity through major infrastructure projects (LWC 2018; LSG 2022, pp. 112–113). However, these plans lack implementation specificity and require extensive resettlement and funding. The Lagos Water Supply Master Plan emphasizes demand gaps while neglecting supply, political, cultural, and economic dimensions, utilizing questionable demographic projections (LWC 2018, p. 11). Proposed public-private partnership funding mechanisms face inherent contradictions, as water infrastructure typically yields low returns for

international investors (Anand 2007, pp. 6–7; Expert interview 4; Expert interview 6; Sarkar 2022, p. 16), while the urban poor cannot afford fee structures necessary for system viability (Gandy 2006; Monstadt and Schramm 2017; Expert interview 1; Expert interview 5; Sarkar 2022). The recent USAID-funded Strategic Business Plan 2025–2030 maintains focus on production quantity and demand closure while neglecting distribution, accessibility, availability, and reliability issues (LWC 2025, pp. 52–77; Howard et al. 2020).

Critically, these policy frameworks systematically ignore gendered dimensions of water provision, particularly women's responsibilities for household water organization, despite acknowledged social, economic, physical, and mental health implications (Howard et al. 2020; Sarkar 2020; Expert interview 14). The analysis reveals a fundamental policy paradox: while LWC management acknowledges that women in slums bear responsibility for household water provision, no systematic efforts exist to understand or address the gendered dimensions of water insecurity within slum settlements (Expert interview 14).

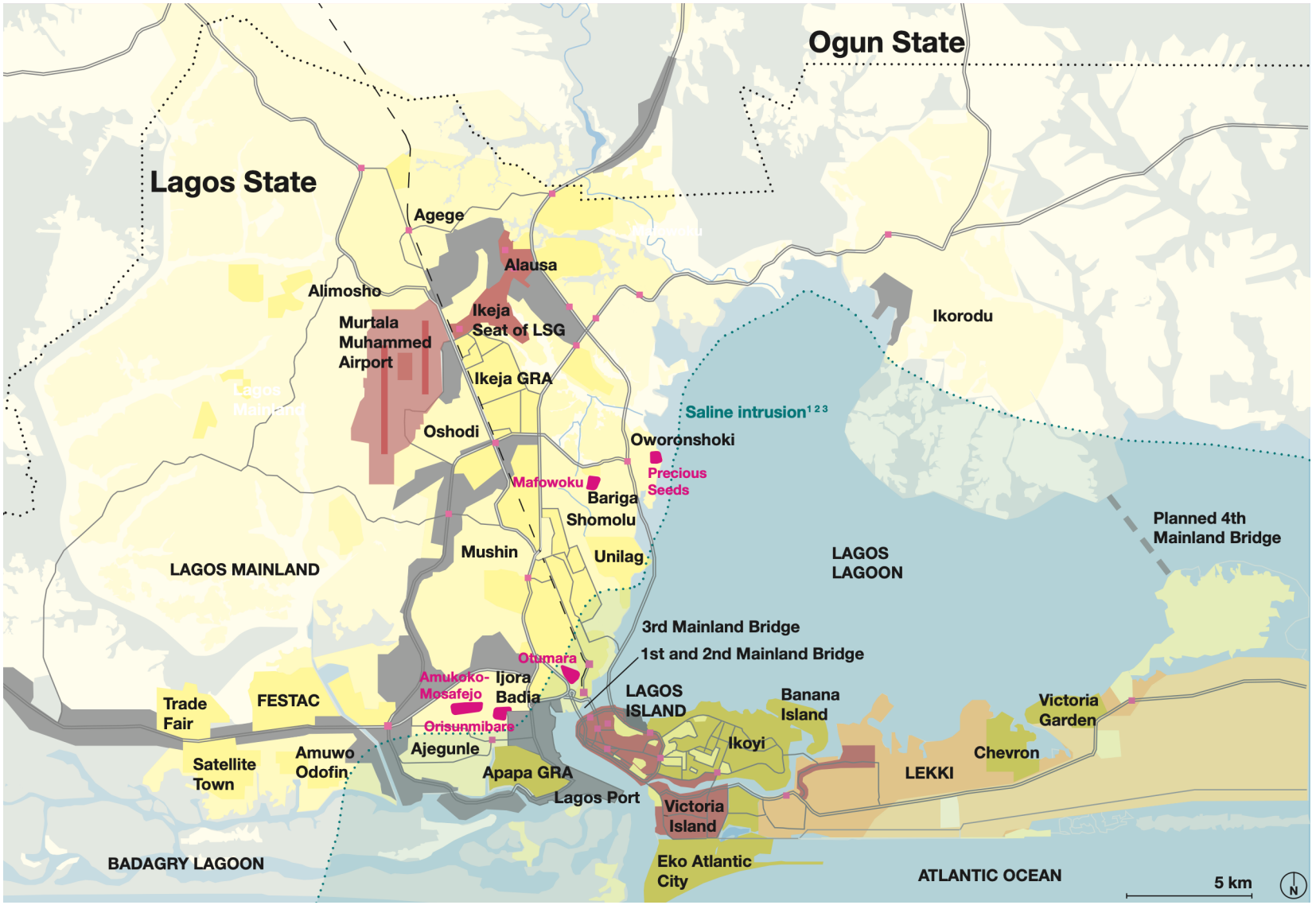
Corruption significantly undermines water infrastructure development through 'contract inflation' practices, where projects serve primarily as profit-sharing mechanisms for political-economic elites rather than service delivery objectives (Expert interview 1; Expert interview 11; Expert interview 10; Expert interview 12). International compliance requirements often prevent such arrangements, resulting in financial transactions without physical implementation (Expert interview 6; IBRD/World Bank 2015). Current USAID initiatives include waterworks for Ajegunle and Bariga communities, though policy uncertainties may affect project continuity (Expert interview 14; USAID 2025). The Akile waterworks in the Ifako-Ijaiye LCDA, implemented by WaterAid to serve 60,000 residents, became operational by September 2025 (Expert interview 14; Expert interview 15). While the infrastructure functions effectively, LWC encounters distribution obstacles necessitating partial pipeline replacement and expansion (Expert interview 15). Concurrently, residents have registered complaints about increased water pricing that renders the service financially inaccessible (Expert interview 15). LWC water supply is metered through two systems: conventional meters read by LWC officials who bill customers accordingly, and prepaid “smart” meters operating on a token system at NGN 250 per m³ (Expert interview 15). Prepaid systems constitute the predominant form of metering.

Where the state has absented itself from infrastructure provision (Section 2.3.3), communities have constituted three distinct alternative provision arrangements: solidarity-dominant provision (Mafowoku), where free community access through traditional leaders, CDAs, and politician-donated infrastructure predominates; vendor cartel control (Otumara, Orisunmibare), where male vendors monopolize functional infrastructure and exploit women through cartel pricing and documented violence; and mixed/unstable provision (Amukoko-Mosafejo, Precious Seeds), where solidarity and vendor infrastructure coexist but which model predominates shifts over time or varies spatially, creating chronic unpredictability for women water procurers. The community infrastructure documentation that follows reveals how these different provision models produce vastly different outcomes for women water procurers—outcomes LWC policy frameworks systematically ignore despite acknowledging women's water procurement responsibilities.

3.3 Spatial Documentation

Maps document water access point characteristics and locations and exemplary procurement distances shaping women's daily labor (Paper 3, Chapter 6).

Figure 3.1: Lagos Metropolitan Area with Five Case Study Communities. *Author (base map: Google Maps, 2026); adapted from Sawyer (2016, p. xvi); field observations 2019–2025.*


Ogun State
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Alausa
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Mafowoku
Bariga
Shomolu
Planned 4th
Mainland Bridge
Mushin
Unilag
LAGOS MAINLAND
LAGOS
LAGOON
3rd Mainland Bridge
1st and 2nd Mainland Bridge
Otumara
Amukoko-
Mosafejo
Ijora
Badia
LAGOS
ISLAND
Banana
Island
Victoria
Garden
Trade
Fair
FESTAC
Orisunmibare
Ikoyi
Chevron
Satellite
Town
Amuwo
Odofin
Ajegunle
Apapa GRA
LEKKI
Lagos Port
Victoria
Island
BADAGRY LAGOON
Eko Atlantic
City
ATLANTIC OCEAN
5 km
N

Case study communities

Saline intrusion

[1] The dashed line marks the landward limit of saline intrusion into the coastal aquifer—beyond it, shallow groundwater is brackish to saline and unfit for drinking without treatment. The worst-affected areas are Lagos Island, Ikoyi, Victoria Island and Lekki, together with lagoon-front communities on the mainland.

[2] The intrusion is driven chiefly by excessive groundwater extraction, which draws lagoon and seawater into the coastal aquifer (Adepelumi et al., 2009; Ayolabi et al., 2013).

[3] See Adepelumi et al. (2009) on the Lekki Peninsula; Oladapo et al. (2014) on the west-to-east extent across Lagos municipality; Ayolabi et al. (2013) on lagoon-driven intrusion on the mainland.

Urban development

Formally planned neighborhoods (colonial grid, public housing, and private estates)

Privatized residential enclaves (colonial enclaves, gated estates, and reclaimed land developments)

Informally grown neighborhoods—proximate (dense established settlements along arterial corridors)

Note: All case study communities fall in this categories. Orisunmibare and Otumara are slum settlements along large-scale infrastructure or adjacent to industrial sites, whereas Amukoko-Mosafejo, Precious Seeds, and Mafowoku are part of the large, densely populated low-incomevdistricts of Ajeromi-Ifelodun, Oworonshoki and Shomolu-Bariga. Precious Seeds falls additionally into the category of waterfront communities at the fringes of Oworonshoki.

Informally grown neighborhoods—intermediate (established residential settlements)

Informally grown neighborhoods—peripheral (dispersed peri-urban settlements)

Transport-oriented development—proximate (upscale residential estates and commercial corridors)

Transport-oriented development—intermediate (mixed residential estates and commercial strips)

Note: Lekki's informal settlements were systematically cleared to enable transport-corridor development—their absence from the map is not an oversight but a political fact.

Regional centralities (seat of government, CBD, major traditional markets)

Industrial zones

Nodal centralities (transport interchanges, local markets)

Figures 3.2–3.6: Individual community maps showing boundaries, water points by ownership type, residential areas, distance indicators. *Source: Author (based on Google Earth, 2019–2025).*

General Note for All Maps:

- Water quality assessments self-reported by female residents.
- Unless otherwise noted, private water infrastructure is fee-based; women-owned infrastructure typically offers subsidized pricing or installment arrangements.
- Household rainwater harvesting (practiced by women across all communities during rainy seasons) is not mapped.
- Maps show water access points serving multiple households (including free, fee-based, and subsidized provision); purely private household water tanks are not mapped (rare; found only on one or two streets in Amukoko-Mosafejo and Mafowoku).
- Community boundary markers shown as ○

Figure 3.2: Amukoko-Mosafejo



Water Infrastructure:

- Commercial sachet production facilities: 3 nearby sites (top right: 2 boreholes, top bottom: 4 boreholes; left: 4 boreholes; all ~50m deep)
- Private in-situ boreholes (medium to good quality: bathing, washing, sometimes cooking)*
- Women-owned in-situ borehole (medium to good quality)*
- Traditional leader in-situ borehole (baale; free community access; medium to good quality)
- Politician-donated in-situ borehole (electoral campaign; free community access; medium to good quality)
- Water tanks (Better Lifes delivery; medium to good quality)*
- Water pushers (mobile cart delivery; fee-based; operate throughout community)

Non-Functional Infrastructure:

- Dysfunctional solar-powered borehole (Lagos Metropolitan Development and Governance Project 2013)

Reference Features:

- Exemplary procurement routes to free points (left: ~350m, right: ~200m)
- Main street
- Local street
- Canal, waterbody

Figure 3.3: Mafowoku



Water Infrastructure:

- Traditional leader borehole (baale; free community access; medium to good quality)
- CDA-managed boreholes (free community access; medium to good quality)
- Solar-powered borehole (Save the Children; community access; solar pump broken, generator fuel costs)
- Politician-donated boreholes (electoral campaign; free community access)
- W Women-owned in-situ borehole (medium to good quality: bathing, washing, sometimes cooking; free community access)
- Private in-situ boreholes (medium to good quality: bathing, washing, sometimes cooking)
- Water pushers (mobile cart delivery; fee-based; operate throughout community)

Non-Functional Infrastructure:

- Dysfunctional in-situ borehole of government (Lagos Metropolitan Development and Governance Project, World Bank funded, 2013)
- Dysfunctional LWC standpipe
- Dysfunctional LWC pipe (partially visible, routed through drainage channel)
- LWC pipe (present but not connected to households, per women water procurers)

Reference Features:

- Exemplary procurement route to informal standpipe (~200 m)
- Main street
- Local street
- Canal, waterbody

Figure 3.4: Orisunmibare



Figure 3.5: Otumara



Water Infrastructure:

- Private boreholes at Olokodana St./Iya Agan St. with pipes to water tanks in community
- Private water tanks (connected to Olokodana/Iya Agan St. boreholes)
- Private in-situ boreholes (poor quality: washing only)*
- Female-owned boreholes and water tanks
- Private in-situ borehole of affluent landlady (resident since 1989): water pusher filling station (50 NGN)
- Water pushers (mobile cart delivery from filling station; fee-based; operate throughout community)
- Informal standpipe at Brickfield Rd. (illegally connected to LWC main, intermittent supply)

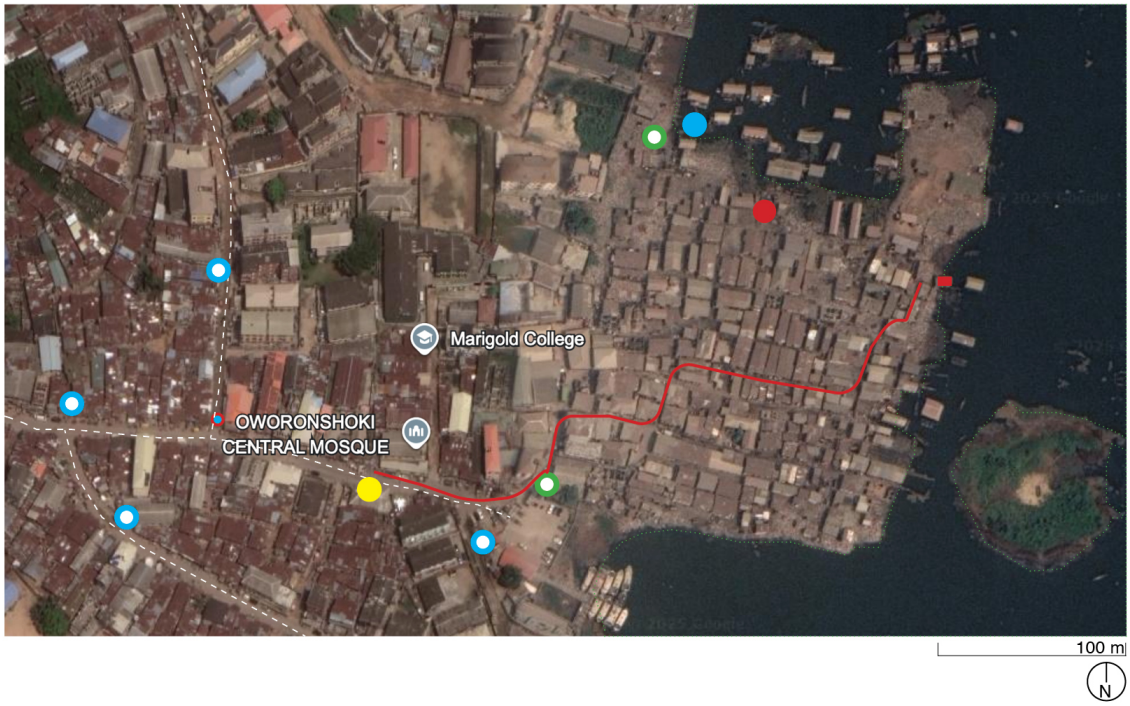
Non-Functional Infrastructure:

- Dysfunctional borehole of traditional leader (baale; politician-donated during electoral campaign)

Reference Features:

- Exemplary procurement route to informal standpipe (~1,000m)
- Main street
- Local street
- Canal, waterbody

Figure 3.6: Precious Seeds



Water Infrastructure:

- Private in-situ boreholes (medium to good quality: bathing, washing, sometimes cooking)
- Canoe water vendors from Makoko (twice weekly at shoreline; premium pricing due to distance/scarcity)
- In-situ borehole of affluent neighbor (free access 2 hours daily, 5-7 AM; medium to quality)
- Water pushers (mobile cart delivery; fee-based; operate throughout community)

Non-Functional Infrastructure:

- Dysfunctionl water tanks connected to LWC mains (no water supply for years; respective water vendor still billed, subject of dispute and tension)
- Dysfunctional LWC water mains

Reference Features:

- Exemplary procurement route to informal standpipe (~400 m)
- Main street
- Local street
- Canal

3.4 Community Water Infrastructure Overview

The maps and charts document water access points serving multiple households, including free, fee-based, and subsidized provision. Purely private household water tanks—rare infrastructure found only on one or two streets in Amukoko-Mosafejo and Mafowoku—are not mapped, nor is household rainwater harvesting, which women practice across all communities during rainy seasons. Unless otherwise noted, private water infrastructure is fee-based; women-owned infrastructure typically offers subsidized pricing or installment arrangements. Water quality assessments are self-reported by female residents. Each community numbers approximately 25,000 to 50,000 inhabitants; precise figures are unavailable, and estimates are based on declarations by traditional and community leadership.

Table 3.6 provides a cross-community comparative overview of key infrastructure metrics. Per-community detail follows in Sections 3.4.1–3.4.5.

Settlement	Provision Model	Infra-structure Control	Free Access Points	Women-Owned Points	LWC Status	Water Quality	Avg. Monthly Cost (NGN)	Current Status
Amukoko-Mosafejo	Mixed/ unstable	Male vendors + traditional leader + politician donors	2 – baale – politi-cian-donated	1 –sub-sidized/ installment	Abandoned; still billed historically	Medium–good	~23,000	Active
Mafowoku	Solidarity dominant	CDA + traditional leader + politician donors	Multiple – CDA – baale – poli-tician-donated	0	Dysfunc-tional (pipe in drain channel)	Medium–good (not drinking)	Below avg.	Active
Orisun-mibare	Vendor cartel	Male vendor cartel	1 – politi-cian-donated – poor quality; washing only	0	Non-functional; vendor still billed	Poor–medium	High	Evicted Feb. 2024
Otumara	Vendor cartel	Male vendor cartel	0	2 – subsi-dized/ install-ment	Severed 2010; 1 illegal standpipe (Brickfield Rd., 1,000m)	Poor–medium (saline zone)	8,000–30,000	Active
Precious Seeds	Mixed/ unstable	Canoe vendors +	1 – 400m distance; 5–7 AM only	0	Non-functional;	Variable	High	Evicted Dec. 2025

		external donor			vendor still billed			

Table 3.6: Comparative Overview of Water Infrastructure Across Five Case Study Communities. *Author's fieldwork (2018–2025). Provision model categories derived from Section 3.2 typology. Water quality assessments self-reported by female residents. Expenditure figures from household economic interviews (n=89); see Section 3.5. "High" expenditure denotes above-average burden relative to income; survey results in Chapter 6, Table 6.2.*

3.4.1 Amukoko-Mosafejo

Amukoko-Mosafejo exhibits mixed provision combining private vendors and free community access points. The settlement benefits from relatively better infrastructure conditions, with main streets paved and equipped with drainage systems. Groundwater quality supports commercial drinking water production (three facilities, six boreholes, 42–54m depth) when appropriately treated, though private vendor boreholes yield mixed quality reports. Several years ago, a few water tanks were connected to LWC water mains. However, the mains rarely carried water despite LWC continuing to bill residents, leading to abandonment of the connections.

Infrastructure Type	Details	Access/Status
Commercial sachet production	3 facilities (top right: 2 boreholes, top bottom: 4 boreholes, left: 4 boreholes; ~50m deep)	Commercial
Private in-situ boreholes	Multiple; medium to good quality (bathing, washing, sometimes cooking)	Fee-based
Women-owned in-situ borehole	Medium to good quality	Subsidized/installment
Traditional leader borehole (baale)	Free community access; medium to good quality	Free
Politician-donated borehole	Electoral campaign; free access; medium to good quality	Free
Water tanks	Better Lifes delivery; medium to good quality	Fee-based
Water pushers	Mobile cart delivery throughout community	Fee-based
Dysfunctional solar borehole	LMDGP 2013	Non-functional

Table 3.1: Amukoko-Mosafejo: Water Infrastructure Overview by Type and Access/Status

Key challenge: Variable water quality across private boreholes; uneven spatial distribution of access points.

Map Reference: Figure 3.2

3.4.2 Mafowoku

Mafowoku exhibits solidarity-dominant provision combining free community and private access points. The majority of water access occurs through CDA-managed boreholes, traditional leader provision, and politician-donated water points (installed during electoral campaigns). Similar to Amukoko-Mosafejo, main streets are paved and equipped with drainage systems. One LWC pipe runs inside the main street drainage channel but stopped carrying water several years before

fieldwork; it formerly served a standpipe, now dysfunctional. Water quality from multiple access points was reported as acceptable for domestic use.

Infrastructure Type	Details	Access/Status
Private in-situ boreholes	Multiple; medium to good quality (bathing, washing, sometimes cooking)	Fee-based (rarely); donated (common)
CDA boreholes	Multiple; medium to good quality (bathing, washing, sometimes cooking)	Free
Traditional leader borehole (baale)	Free community access; medium to good quality	Free
Politician-donated borehole	Electoral campaign; free access; medium to good quality	Free
Water pushers	Mobile cart delivery throughout community	Fee-based
Dysfunctional solar borehole	Save the Children	Non-functional

Table 3.2: Mafowoku: Water Infrastructure Overview by Type and Access/Status

Key challenge: Water quality unsuitable for drinking (acceptable for cooking, bathing, and washing); uneven spatial distribution of access points.

Map Reference: Figure 3.3

3.4.3 Orisunmibare

Orisunmibare experiences severe water scarcity. The settlement has four functional water points: one free (politician-donated during election campaign) and three vendor-operated. The free point connects to a borehole 50 meters away delivering poor water quality (washing only). Of the three vendor points, one connects to a borehole at Gaskiya Road (1,200m distance); the others are drilled in-situ. Additionally, one vendor maintains three water tanks connected to LWC mains 500 meters away—a disputed arrangement as LWC has not supplied water for several years yet continues billing.

Note: Community evicted February 2024

Infrastructure Type	Details	Access/Status
Private in-situ boreholes	Medium quality (bathing, washing); vendor cartel pricing	Fee-based (cartel)
Private water tanks	Medium to good quality (bathing, washing, sometimes cooking)	Fee-based
Politician-donated borehole	Poor quality (washing); electoral campaign	Free
Private vendor pipes	Connected to LWC mains 500m away	Vendor infrastructure
Private borehole	Gaskiya Rd. roundabout (1,200m)	Vendor infrastructure
Dysfunctional baale borehole	Fee-based despite role (per women); medium quality	Non-functional
Dysfunctional water tanks	Connected to LWC; no supply for years; vendor still billed	Non-functional
Dysfunctional LWC mains	Non-functional	Non-functional

Table 3.3: Orisunmibare: Water Infrastructure Overview by Type and Access/Status

Key challenge: Extreme vendor cartel control intersecting with poor water quality; vendor violence and exploitation documented

Map Reference: Figure 3.4

3.4.4 Otumara

Otumara operates exclusively through private vendor boreholes. The settlement severed its LWC connection in 2010 after government destroyed the connections from the LWC water main to community storage tanks during disputes over unpaid water bills. Located beyond the saline intrusion line, all water requires treatment regardless of borehole location. In-situ boreholes deliver poorer water quality than those outside the community, which is why many vendors drill boreholes at Iya Agan Street, connecting them to water tanks in the community several hundred meters away. An informal standpipe at Brickfield Road remains illegally connected to LWC mains, several hundred meters away.

Infrastructure Type	Details	Access/Status
Private in-situ boreholes	Poor to medium quality (bathing, washing); vendor cartel pricing	Fee-based (cartel)
Private water tanks (borehole outside of community)	Medium to good quality (bathing, washing, sometimes cooking)	Fee-based
Women-owned in-situ boreholes	Medium to good quality	Subsidized/installment
Private vendor pipes	Connected to Iya Agan St. 200–300m away	Vendor infrastructure
Private borehole	Iya Agan St. (200–300m)	Vendor infrastructure
Dysfunctional baale in-situ borehole	Poor quality	Non-functional
LWC mains	Brickfield Rd. (1,000m); good quality (bathing, washing, sometimes cooking)	Informal standpipe

Table 3.4: Otumara: Water Infrastructure Overview by Type and Access/Status

Key challenge: Vendor cartel control; water requires treatment (beyond saline line)

Map Reference: Figure 3.5

3.4.5 Precious Seeds

Waterfront settlement with no water points within the community except canoe-delivered water sold twice weekly at the shoreline. The nearest free water point (400m away) operates only 5–7 AM, delivering bathing and washing quality water. Four fee-based water points at 500–700m distance deliver varying quality (some suitable for cooking). Water pushers delivering bathing/washing quality water constitute a major infrastructure source. Additionally, one vendor maintains several water tanks connected to LWC mains 400–500 meters away. LWC has not supplied water for several years; the owner stopped paying bills accordingly. FABULOUS URBAN intervention (2024–2025) formed women's water committee from Oworo Reality Women Group (2021–2025).

Note: Community evicted December 2025

Infrastructure Type	Details	Access/Status
Private in-situ boreholes	Medium to good quality (bathing, washing, sometimes cooking)	Fee-based
Canoe water vendors	From Makoko; twice weekly at shoreline; premium pricing	Fee-based (premium)
Neighbor donor borehole	Affluent female neighbor; medium to good quality; 5–7 AM only	Free (2 hours daily)
Water pushers	Mobile cart delivery throughout community	Fee-based
Dysfunctional water tanks	Connected to LWC; no supply for years; vendor still billed	Non-functional

Table 3.5: Precious Seeds: Water Infrastructure Overview by Type and Access/Status

Key challenge: Significant procurement distances (400–700m) combined with time poverty (5–7 AM access); mixed water quality.

Map Reference: Figure 3.6

3.4.6 Water Pricing and Currency Devaluation Impact

Water prices documented during fieldwork (2019–2023) reflect diverse infrastructure types and operational costs (Table 3.7, Figure 3.1). Private vendor prices range from 74–138 NGN per bowl/bucket (5–15 liters), with higher costs when generators substitute for unreliable electricity. Water pushers charge 32–46 NGN per 20-liter jerrycan for mobile delivery. Commercial drinking water sachets cost 230 NGN per package (20 × 500mL sachets). Donated infrastructure—providing free or heavily subsidized access (Free–14 NGN)—varies significantly across communities: relatively common in Mafowoku and Amukoko-Mosafejo, rare in Precious Seeds and Orisunmibare, and entirely absent in Otumara.

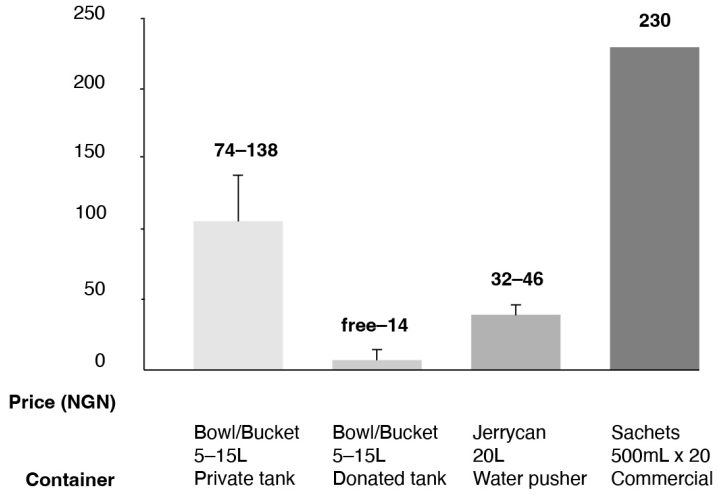
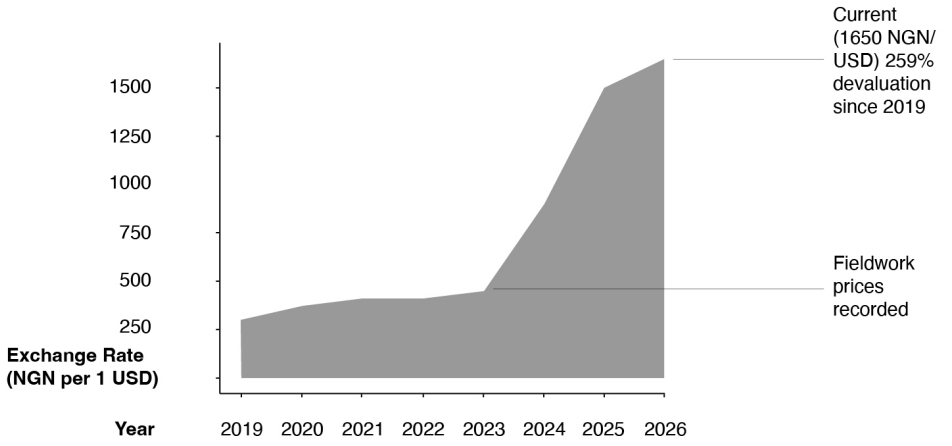


Table 3.7: Water Prices in Nigerian Naira per Container

Figure 3.7: Nigerian Naira Devaluation (2019–2026). *Central Bank of Nigeria exchange rate data; World Bank 2026).*



These prices were recorded at an exchange rate of 1 USD = 460 NGN (January 2023). The Nigerian Naira has since devalued catastrophically: from 306 NGN/USD in 2019 to 1,650 NGN/USD by January 2026 (Figure 3.7)— a 439% rise in the naira price of the US dollar since 2019, a loss of about 81% of the naira's dollar value. While water prices in Naira remain nominally stable, Nigeria's dependence on imported goods means consumer price inflation has far outpaced income growth. Women spending 74–138 NGN per container face the same nominal water cost, but household purchasing power has collapsed as food, fuel, and basic necessities surge in price.

This currency crisis compounds gendered exploitation documented across all five communities. Women procure water from informal income (petty trading, domestic work) devastated by inflation. Water expenditure—already approximately one-third of women's earnings—constitutes an increasing proportion of shrinking real income. Chapter 6's feminist economic analysis examines how devaluation-driven impoverishment intersects with vendor exploitation, household patriarchy, and state neglect to produce compounding crises for women water procurers.

3.4.7 Economic Burden

Monthly water expenditures range across communities from 8,000 to 30,000 NGN (drinking water: 5,000–14,000 NGN). Average total expenditure is approximately 23,000 NGN monthly—primarily paid by women (Chapter 6)—representing approximately one-third of average women's income who mostly pay the water for the household, independent from the household structure. Nigeria's Naira devaluation intensifies this burden: 23,000 NGN represented approximately 50 EUR in 2019 but only 14 EUR in January 2026, while costs for imported goods increased substantially. Qualitative household expenditure surveys (January 2025, analyzed Paper 3/Chapter 6) document women's water procurement burden increases.

3.5 Interview Distribution and Participant Profiles

Fieldwork conducted between 2018 and 2025 comprised 194 semi-structured interviews, 10 focus group discussions, and 15 expert interviews. The interview sample included two distinct components: (1) 105 community-level interviews distributed across seven participant categories (women water procurers, male water vendors, female water vendors, traditional leaders, CDA representatives, male community residents, other stakeholders), examining water infrastructure, water governance, procurement practices, and community dynamics; and (2) 89 household economic interviews specifically with women water procurers, documenting water expenditures within overall household budgets and gendered economic decision-making patterns. This second interview set was conducted specifically for Paper 3's (Chapter 6) feminist analysis of women's economic exploitation through water pricing. Table 3.8 presents interview distribution across participant categories and communities.

Participant Category	Amukoko-Mosafejo	Mafowoku	Orisunmi-bare	Otumara	Precious Seeds	Total
Women water procurers (water infrastructure, water quality)	16	13	14	21	16	**80**
Women water procurers (water expenses)	28	10	0 (evicted in 2024)	21	30	**89**
Male water vendors	3	N/A	2	2 (plus focus group discussion with 8 male vendors and 1 female vendor)	2	**9**
Female water vendors	0	0	0	4	0	**4**
Traditional leaders (male)	1	1	2	2	0	**6**
CDA representatives (all male; one exception)	3	3	(2) (water seller in dual role)	0	(7) (by the time in formation process)	**6**
Community Total	**51**	**27**	**18**	**50**	**48**	**194**

Table 3.8: Interview Distribution by Participant Category and Community

Focus Group Discussions (n=10):

- Women water procurers: 8 groups (5–15 participants each)
- Male water vendors: 1 group (Otumara vendor association)
- CBO/NGO members: 1 group

Expert Interviews (n=15):

Expert interviews (n=15) were conducted throughout the research period (2019–2025) to understand institutional perspectives and policy frameworks. The breakdown across institutions reflects strategic sampling to capture multiple governmental and non-governmental perspectives on Lagos water infrastructure:

- Lagos Water Corporation officials: 6 (providing policy, technical, and operational perspectives)
- LASURA representatives: 3 (urban planning and slum policy)
- Local government officials: 4 (community-level governance interface)
- CSO/NGO representatives: 1 (advocacy and service delivery perspectives)
- Aid organization staff: 1 (international development perspectives)

The final expert interview (September 2025) verified that earlier findings remained current as of dissertation completion.

Interview distribution reflects gendered water procurement patterns documented in Chapter 6, with women water procurers constituting the majority of participants. Of the initial 105 community-level interviews, 80 were with women water procurers (76%). An additional 89 interviews were conducted specifically for the water expenses survey, all with women. Combined, 169 of 194 total interviews (87%) were with women water procurers. The distribution evolved across fieldwork phases (2018–2025) as feminist analysis sharpened (Chapter 1, Section 1.2.2): while initial 2019 fieldwork included interviews with male vendors, traditional/informal leaders, CDA members, and male community residents alongside women water procurers, subsequent phases concentrated increasingly on women water procurers as their analytical centrality became apparent.

3.6 Photographic Documentation of Water Infrastructure

This section presents photographic documentation of water infrastructure types documented across the five case study communities. Images capture the material realities of water procurement systems, illustrating technical configurations, spatial arrangements, and embodied dimensions of women's daily water labor that maps and charts cannot fully convey.

3.6.1 Private Vendor Boreholes

Fee-based water access points owned and operated by male vendors, representing the predominant water provision model in vendor-dominated communities like Otumara and Orisunmibare.



Otumara: Borehole outside of the community



Otumara: Water pipes connecting boreholes outside of the community with water tanks inside the community



Otumara: Water pipes connecting boreholes outside of the community with water tanks inside the community (bottom center right)





Otumara: In situ boreholes



Precious Seeds: In situ borehole outside of the community

3.6.2 Traditional Leader and CDA-Managed Water Points

Free or subsidized community access points provided through traditional leadership (baales) and Community Development Associations (CDAs), exemplifying solidarity provision models in communities like Mafowoku.

Amukoko-Mosafejo: In situ borehole of Baale





Mafowoku: CDA implemented and managed community borehole

3.6.3 Politician-Donated Infrastructure

Boreholes installed during electoral campaigns, providing free access but often lacking maintenance support post-election.



Amukoko-Mosafejo: Donated in situ borehole



Mafowoku: Donated in situ borehole



Orisunmibare: Donated in situ borehole

3.6.4 Women-Owned Water Infrastructure

Boreholes and tanks operated by female residents, typically offering subsidized pricing and flexible payment arrangements contrasting with male vendor practices.





Otumara: Tank and in situ borehole, owned and operated by women



Precious Seeds: Tanks and in situ boreholes, owned by an affluent woman outside the community and open for free fetching (two containers/woman) for two hours daily

3.6.5 Commercial Sachet Production Facilities

Industrial-scale water purification and packaging operations utilizing deep boreholes, demonstrating groundwater quality potential when appropriately treated.



Amukoko-Mosafejo: Entrance of commercial water sachet facility

3.6.6 Commercial Sachet Delivery

Commercially packed drinking water, delivered in plastic sachets to communities once or several times a week.



Otumara: Water sachet delivery, usually Mondays and Wednesdays

3.6.7 Mobile Water Pushers

Cart-based water delivery systems operated predominantly by young northern Nigerian and foreign migrants, providing last-mile distribution throughout communities.



Mafowoku: Water pushers at their shelter



Otumara: Water pushers at the filling station



Precious Seeds: Water pusher delivering water into the community

3.6.8 Non-Functional Government Infrastructure

Dysfunctional boreholes and pipes from government programs (LMDGP, LWC), documenting state provision failures and infrastructure abandonment.



Amukoko-Mosafejo: Dysfunctional LMDGP borehole (Lagos State government with World Bank funds)



Amukoko-Mosafejo: Dysfunctional LWC pipe in the drainage channel



Mafowoku: LWC water pipe inside drainage channel; dysfunctional standpipe



Orisunmibare: Water vendor owned pipes connecting to LWC mains (dysfunctional)



Precious Seeds: Water vendor owned tanks connecting to LWC mains (dysfunctional)

3.6.9 Women's Water Procurement Labor

Documentation of women's embodied infrastructure practices including fetching, transporting 25-liter jerrycans, queuing at access points, and managing household storage.



Amukoko-Mosafejo: Woman fetching water



Amukoko-Mosafejo: Woman fetching water



Mafowoku: Woman fetching water



Orisunmibare: Women waiting for the water



Orisunmibare: Women waiting for the water



Otumara: Women fetching water



Precious Seeds: Rainwater collection



Precious Seeds: Water storage inside the house

3.7 Conclusion

Across five communities, the technical documentation reveals consistent structural patterns beneath considerable surface variation. Community profiles range from vendor-dominated free-market systems (Otumara, Orisunmibare) through solidarity-dominant provision (Mafowoku) to mixed/unstable arrangements (Amukoko-Mosafejo, Precious Seeds), as established in Section 3.2. Pricing data across communities confirms that women allocate between one-quarter and one-third of household income to water regardless of provision model—a pattern consistent with Hoelzel (2025) and independent of whether vendors or CDAs formally control access points.

The control column of the infrastructure tables reveals a consistent structural pattern: in all five communities, water infrastructure ownership and pricing authority rests with men—vendors, CDA representatives, traditional leaders, or donor-patrons—while procurement labor is performed overwhelmingly by women. This disjuncture between who controls systems and who sustains them through daily labor constitutes the empirical core that Chapters 4–6 analyze through game-theoretical, comparative institutional, and feminist lenses respectively.

Chapter 3's technical documentation does not resolve the question of why these patterns persist or what would transform them—those are analytical and theoretical tasks. It establishes what exists: the material substrate on which the dissertation's arguments rest.

Chapter 4: State–Community Power Dynamics and Non-Cooperative Water Provision

Published Paper:

Hoelzel, F. (2022). Lagos, Nigeria: A Study in Anarchy and Negotiation. Bhúmi, The Planning Research Journal, 9(1), 18–34. DOI: 10.4038/bhumi.v9i1.86

4.1 Chapter Introduction

Position within Cumulative Doctoral Thesis:

This paper examines state–community strategic interactions in Otumara following the settlement's 2010 severance from Lagos Water Corporation, employing game-theoretical frameworks to analyze how mutual distrust perpetuates non-cooperative equilibria despite potential welfare gains from collaboration. It establishes the macro-structural context—government oscillation between neglect and violence, vendor cartel control, property relations between landowners and tenants—within which subsequent papers' comparative community analysis (Chapter 5) and feminist reconceptualization (Chapter 6) are situated. The paper addresses foundational questions about power dynamics structuring water access in contexts of comprehensive state abandonment, examining how postcolonial governance patterns (Chapter 2, Section 2.4.1) shape possibilities for hybrid co-production (Chapter 2, Section 2.4.1). The technical infrastructure configurations documented in Chapter 3—vendor pipe connections extending 200–300 meters from Iya Agan Street to community tanks, saline intrusion requiring treatment of all in-situ borehole water, vendor cartel pricing structures—provide the material baseline for this paper's game-theoretical analysis. While this analysis initially employed technical frameworks focusing on property relations and institutional structures, it documented gendered patterns—specifically, differences between male profit-oriented water vending and female solidarity-based sharing—that foreshadowed Chapter 6's argument for women-centered governance. The Otumara case represents an extreme of vendor-dominated provision, providing critical contrast to the “solidarity” models examined in Chapter 5 and establishing why technical solutions alone prove insufficient without addressing patriarchal exclusions.

Research Questions Addressed:

This paper addresses the first sub-question from Chapter 2, Section 2.5:

How do power dynamics between Lagos State government and slum communities shape water infrastructure provision and control in postcolonial contexts where government oscillates between neglect and violence, what mechanisms perpetuate non-cooperative equilibria despite potential welfare gains from collaboration, and how do property relations between landowners (including water vendors) and tenants structure water access patterns?

Methodological Approach:

The paper employs game-theoretical analysis, specifically the Prisoner's Dilemma framework, to model strategic interactions between Lagos State/Lagos Water Corporation and Otumara community following the settlement's deliberate 2010 severance of LWC connection. This analytical approach—uncommon in postcolonial urban water studies—proved appropriate for Otumara's case given the community's conscious strategic choice following government infrastructure destruction, creating an "anarchic field" without formal institutional relationships (Scharpf 2018). Game theory's analytical power comes with significant limitations addressed through subsequent papers: formal modeling necessarily reduces complex multi-stakeholder networks to simplified bilateral interactions, obscuring intra-community power dynamics—particularly gender relations fundamental to water access patterns. Game theory treats "community" as unified actor with coherent interests, when feminist analysis (Chapter 6) reveals community as site of patriarchal contestation where men and women occupy radically different positions. These limitations motivated Chapters 5 and 6's turn toward comparative institutional analysis and feminist ethnography.

Methodological details, including interview protocols, participant selection, and analytical procedures, appear in Chapter 2, Section 2.6.

Key Findings:

- **Non-cooperative equilibria perpetuation:** Power dynamics between Lagos State and slum communities generate mutual distrust that perpetuates non-cooperation despite potential welfare gains. Government oscillation between infrastructure neglect and violent eviction threats creates conditions where neither party can credibly commit to cooperation, trapping both in suboptimal outcomes.
- **Property relations structuring access:** Water access patterns follow property ownership structures, with landowners (including water vendors controlling boreholes) exercising oligopolistic power over tenants who comprise majority residents. Vendor cartel coordination prevents free provision that would undermine profits, exemplifying how informal governance can reproduce exploitative hierarchies.
- **Gendered ownership patterns**: Male water vendors operate profit-maximizing businesses with exploitative pricing, while female water infrastructure owners (rare exceptions) provide subsidized access and flexible payment arrangements to neighbors. This gendered difference in business operation—documented but not yet centered analytically—foreshadows Chapter 6's argument that women-centered governance might produce more equitable outcomes.
- **Coordination problems requiring intervention:** Game-theoretical analysis reveals that overcoming non-cooperation requires credible commitment mechanisms, third-party mediation, and hybrid co-productive systems engaging both state and community actors. However, the paper's recommendations for partnerships with existing community structures (CDAs, traditional leaders, vendors) prove inadequate once gender analysis reveals these structures systematically exclude women who perform water procurement labor.

This paper's analytical value lies in establishing the macro-structural context—state abandonment, vendor oligopolistic control, mutual mistrust perpetuating non-cooperation—that subsequent chapters interrogate through different methodological lenses. However, its limitations

are equally significant for understanding the dissertation's intellectual trajectory. Game theory's formal modeling, while powerful for analyzing strategic interactions between constituted actors (state versus community, landowners versus tenants), systematically obscured the processes determining who gets constituted as legitimate actor in the first place. By treating "community" as unified strategic player, the analysis missed how gender, age, household position, and daily survival responsibilities produce radically different relationships to water infrastructure even among residents sharing the same property status and facing identical vendor exploitation. The paper documented that male vendors operate profit-maximizing businesses while female vendors provide subsidized access—an empirical observation noted in passing but not centered analytically. Only through subsequent comparative analysis (Chapter 5) revealing governance heterogeneity and feminist ethnography (Chapter 6) centering women's embodied experiences did it become clear that this gendered pattern wasn't incidental detail but rather pointed toward the root inequality structuring all water access dynamics. This paper established what needed explaining; subsequent papers explained why gender proves essential to the explanation.

Note on Paper Presentation:

The paper appears as published, with minor formatting adjustments for dissertation consistency (heading styles, figure/table numbering, citation format). Figure and table numbers have been updated to match dissertation chapter numbering (4.1, 4.2, etc.). The paper's original theoretical framing, analytical approach, and conclusions remain unchanged, preserving the published work's integrity while situating it within the broader cumulative dissertation argument.

4.2 Lagos, Nigeria: A Study in Anarchy and Negotiation

4.2.1 Abstract

Lagos is a megacity like no other. Not so much because it is predicted to become the world's most populous city—with approximately 80 million inhabitants in 2100 (Hoornweg and Pope 2017)—but rather because Lagos has nothing that is really public. There's no crystal ball, nevertheless, it is likely to say that Lagos will never have (functioning) centralized services. Classic urban planning and classic developmentalism call for large-scale infrastructure and centrally organized urban services. The logic, followed by the UN and development banks establishes a strong link between well-functioning and accessible infrastructure on the one hand, and development and prosperity on the other hand. Not in Lagos. Even though the already big West African metropolis has almost no public infrastructure and services, it has become Africa's top startup ecosystem, for instance (Omoruyi 2022). On the micro-scale, residents thrive by giving resourceful responses to the conditions of partly extreme vulnerability (Harrison 2006). As a result, and despite of the lack of an efficient central government, the city functions quite well. By studying the informal water provision of Otumara, an inner-city slum community in Lagos, the paper draws from the observation of everyday practices recommendations for practical-normative urban planning approaches. In doing so, the substantive policy problem (water supply) is used to analyze actor constellations (Scharpf 2018) and to decipher the conflict of elite urban visions versus everyday realities of the urban poor majority (de Satgé and Watson 2018).

Keywords: Lagos, Sub-Saharan Africa, Local Governance, Slum, Water Supply

4.2.2 Introduction

All citizens of Lagos, poor and rich, join in the constant struggle of maintaining and operating their everyday life infrastructure, given the fact that urban services like water, electricity, or waste are only erratically available or constantly faulty. This led, among others, to a city driven by people who have developed enormous capacities to provide urban services and which is – to a large extent – produced and operated informally (Heinrich Böll Stiftung Abuja and Fabulous Urban 2018/19). Most Lagosians are poor or very poor (Human Rights Watch 2021). Even if government would provide the urban services, most people could not pay for them. Here, Lagos is no exception to other cities in sub-Saharan Africa and the global South where everyday life is constructed at a micro-scale, and not through normative planning approaches and master plans (Harrison 2006). In the last decades, there has been a debate in theory and practice on "society-centered" governance, especially in the global North, rethinking the roles of governments and civil societies (Grube 2013). Equally in the field of urban planning, where collaborative decision-making processes have become the norm. However, collaborative approaches require collective goals (Innes and Booher 2018, pp. 6-7). In a context like Lagos, the relationship between the government and its citizens is mostly characterized by serious disagreement (Heinrich Böll Stiftung Abuja and Fabulous Urban 2018/19), which was conceptualized by Vanessa Watson as "conflicting rationalities" (2009). Technical and managerial efforts undertaken by the government are often imported and follow an elite urban vision (Watson 2014). The Lagos State government's vision for Lagos is to become "Africa's model mega city" (Lagos State Government 2022). Such approaches and visions collide heavily with the complex and messy reality on the ground, where human beings simply try to survive and thrive (Watson 2009). Even though the efforts of the informal sector more or less succeed, visible every day in the form of water supply, waste management, urban transportation, and so on, the Lagos State government tries to impose a technical-instrumental approach that does not acknowledge these small-scale and decentralized responses (Heinrich Böll Stiftung Abuja and Fabulous Urban 2018/19).

Despite heavy investments, loans, and grants from the World Bank in recent decades, West African economies primarily develop from the informal fringe (Chenal 2014, p. 9). Instead, slum life is the norm in most African cities and towns (Pieterse 2014), and so it is in Lagos (Heinrich Böll Stiftung Abuja and Fabulous Urban 2018/19). This paper argues that urban futures in Lagos and beyond in the sub-Saharan region can only happen once the processes at the micro-level of slum communities are understood and form the basis for further development efforts (Simone and Pieterse 2017, pp. 157-158). It may be an argument that action at that level is limited (Simone 2014, p. 228); nevertheless, there is an enormous power of micro transformations in the domain of everyday living (Simone and Pieterse 2017, p. 156). Since many decades, Lagos has been functioning relatively well at the community level because people – individuals and groups of all kinds in changing constellations – manage to implement small-scale decentralized infrastructures as well as small-scale decentralized urban services (Koenigsberger 1983; Harrison 2006). People show enormous inventiveness and cleverness in doing so. They have become experts in implementing, operating, and maintaining all kinds of urban services under very harsh circumstances, including extreme climate and weather conditions, vandalism, and forced evictions, just to name a few. As precarious and poor these solutions might be, they succeed in a certain way, contrary to the actions of the government, which are often ineffectual both socially and technically (Heinrich Böll Stiftung Abuja and Fabulous Urban 2018/19) – at least if the

political objective is to include the majority in the benefits of political action (Simone and Pieterse 2017).

Otumara, the case study of this paper, is one such community that relies on the mentioned small-scale, decentralized infrastructure and urban services; not only because it has to, due to the absence of functioning centralized infrastructure. The Otumara people decided to quit any cooperation with the government due to extremely negative experiences in the past, including harassment and evictions. This mode of interaction can be described as an “anarchic field,” hence an institution-free context (Scharpf 2018, p. 98). Here, individual actors interact with one another in the absence of preexisting relationships or specific obligations (Scharpf 2018, p. 98). This applies both, to the community people of Otumara and to representatives of the government. In an anarchic field, actors use all strategies within their capability and they're only limited by physical limitations or countermoves of other actors (Scharpf 2018, p. 98). Anarchic fields are characterized by unilateral action and sometimes by negotiated agreement (Scharpf 2018, p. 47). Actors may communicate and set up agreements but they are free to break such agreements any time if it suits their interests (Scharpf 2018, p. 98). This applies to Otumara, as the results section shows. For the discussion section, the results from the field research will be interpreted by using the archetypical game constellation of the “Prisoner's Dilemma” (Scharpf 2018, pp. 72-84), inter alia. The well-known “Prisoner's Dilemma” is a so-called “mixed-motive” game with players (or actors) whose preferences are partly harmonic and partly conflictual (Scharpf 2018, pp. 72-84). However, the “Prisoner's Dilemma” is a constellation in which defection (or “non-cooperation”) is the dominant strategy of both sides (Scharpf 2018, pp. 72-84), here the Lagos State government and the Otumara community. It is hence a rather conflictual constellation.

4.2.3 Methodology in Field Research

The applied methods in the field research in the Otumara community include:

- observations;
- mapping;
- one-to-one open-ended field interviews;
- group interviews and focus group discussions with persons of similar backgrounds or experience to discuss a specific topic of water supply in daily experience;
- expert interviews with individuals from all government tiers, state planning entities, and NGOs, based on their knowledge and official functions and positions.

Since there is no official or recorded planning material available at all, mapping via GPS coordinates and interviews were the only methods to understand the community's boundaries, water supply, water infrastructure, water quality, and water use. The mapping with the GPS coordinates included the territorial expansion of the “jurisdictions” of the two baales (traditional community leaders), the 22 privately owned and privately operated water tanks and boreholes within and partly outside the community, and the public water main at Brickfield Road close to the community's northeast boundary.

In total, 4 focus group discussions; 33 one-to-one field interviews; 10 expert interviews with government representatives, and 5 interviews with NGO representatives were conducted. The discussion was mainly drawn through narrative analyses in order to understand how the Otumara community people and representatives of the government or of NGOs interpret their everyday experience and everyday work, respectively. Nevertheless, there was also a content analysis as

certain expressions were repeatedly used by many of the interviewees. The analytical strategy was inductive as used in grounded theory research (Glaser and Strauss 1967). In the process, the analytic technique of "explanation building" was applied (Yin 2018, pp. 179-181).

A tool kit for capacity development in international cooperation, developed by NADEL/ETH Zurich (2018) was used as a base and adapted accordingly for the actor mapping.

4.2.4 The Case of the Otumara Community

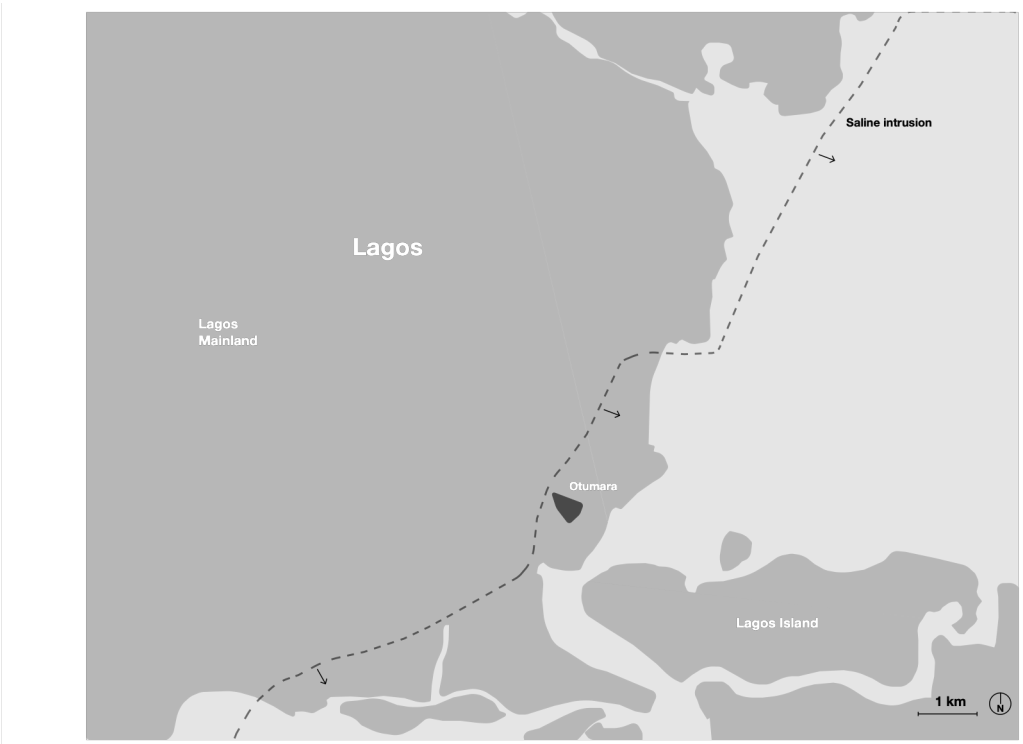
4.2.4.1 Community-Led Water Supply

The Otumara community in Ebute-Metta, Lagos Mainland Local Government Area in Lagos State is the case-study community for this research paper. The research design was initiated with the assumption that state and local government tiers play to a certain extent a role in water provision, with regard to the infrastructure provision as such and with regard to the supply. The in-depth field research clearly showed that the community provides its own water supply (infrastructure and services) in relatively complex actor-networks, and that state actors do not play a role.

Preliminary investigation suggested that the community is internally well organized, based on strong informal structures and influential community leaders as well as community organizations that are able to relate with each other and with official authorities. Furthermore, some residents (in their function as water vendors) were among the founders of the erstwhile Water Vendors Association stretching across several communities, an informal and loose coalition of residents authorized by the Lagos Water Corporation (LWC) to sell water. In the early 2000 years, their water reservoirs were officially connected to the LWC main pipe. The association stopped functioning in 2010.

The community's decision to voluntarily terminate all business relations with Lagos Water Corporation (LWC) in 2010 after officials destroyed water pipes in reaction to residents' and water vendors' unpaid bills is another reason for choosing Otumara as the case study community for this paper. The community members deliberately decided to play an active role in the water supply despite their high vulnerability and precariousness. Among Southern scholars and scholars working in the global South there is the general recognition that in world regions like sub-Saharan Africa people are exposed to conditions of (extreme) vulnerability, to which they manage to give resourceful responses (Harrison 2006; Simone and Pieterse 2017; de Satgé and Watson 2018, pp. 33-58). The Otumara community underlines this assertion, especially with their strong will to confront the Lagos State government (LASG), which comes from a certain confidence in their strength (as precarious it might seem). Nonetheless, the community finds itself caught up in differences and conflicts; this applies to both the leaders and the residents, male and female.

Figure 4.1: Location of Otumara community in Lagos Mainland. *Source: Author, 2026 (base map: Google Maps). Map updated from Hoelzel (2022) using cartographic methodology from Chapter 3.*



4.2.4.2 Founding History, Community Leaders, and Land Ownership

The founding history and current land ownership status of Otumara is unresolved. Like in many other slum areas, the land is contested, with several authorities and families claiming ownership. The name Otumara comes from Otu-mi-lara, meaning “a place of comfort and peace” in the Ilaje dialect. There was one forced eviction, when then-Governor Babatunde Fashola (2006-2014) invoked the Land Use Act to construct a canal in 2012. There are currently two traditional community leaders (baales) in power, though they have not yet been confirmed by local and state government and they are hence not yet on the government payroll.

However, according to officials from the Lagos State Urban Renewal Agency (LASURA), which falls under the Ministry of Physical Planning and Urban Development, the land belongs to the Federal Government of Nigeria. They acquired it already in 1967, prior to the creation of Lagos State, and the father of baale Kalejaiye received by then compensation as he was the recognized owner of the land by the government.

People have continued to settle in Otumara and the community currently includes about 2,500 households and between 25,000 and 50,000 residents. More precise numbers are not available, also to the fact that there are more tenants than landlords. In terms of ethnic groups, the community is diverse. Yoruba, Igbo, and Hausa people share the neighborhood. Originally, the Yorubas were in the majority; today, the majority are Igbo. Igbo people traditionally vote for the opposition Peoples Democratic Party (PDP), which causes a problem for the baales, as they serve under an All Progressives Congress (APC) local and state government. The Hausa people, mostly young men from the north of Nigeria are mostly engaged in the water-pusher sector.

4.2.5 Results

4.2.5.1 Actors and Their Relations

Otumara is ruled by a complex, largely hidden network of informal rules, rationalities and desires. The community does live quite well with the two rival baales, who have somewhat subdivided their areas of influence, and, more importantly, residents are quite able to assert themselves, thanks to their own organization in, for instance, the Nigerian Slum/Informal Settlement Federation (Nigerian Slum/Informal Settlement Federation 2022) and, more informally, as water vendors (formerly the Water Vendor Association). Another interesting detail is that baale Festus is a member of the Nigerian Slum/Informal Settlement Federation.

The governance structures within the community ("civil society") and outside ("public sector/state," "private sector") were studied at the example of water provision. Water for drinking, cooking, bathing, and washing is vital. People fetch their water from different sources for different uses (Table 4.1). Table 4.1 underlines the strong position of the water vendors, who are usually residents of Otumara and landlords, as they provide most of the water in the community.

Purpose	Source	Quality	Provider
Drinking	Water sachets	Good	Private sector actors, daily delivery (truck), distribution mostly via small shops in the community
Cooking	Boreholes outside the community, mostly drilled around Brickfield Road	Relatively good	Private water vendors, usually residents of Otumara, usually landlords
Bathing	Boreholes outside or inside the community	Moderately satisfactory	Private water vendors, usually residents of Otumara, usually
Washing	Boreholes inside the community	Moderately satisfactory	Private water vendors, usually residents of Otumara, usually landlords; Water

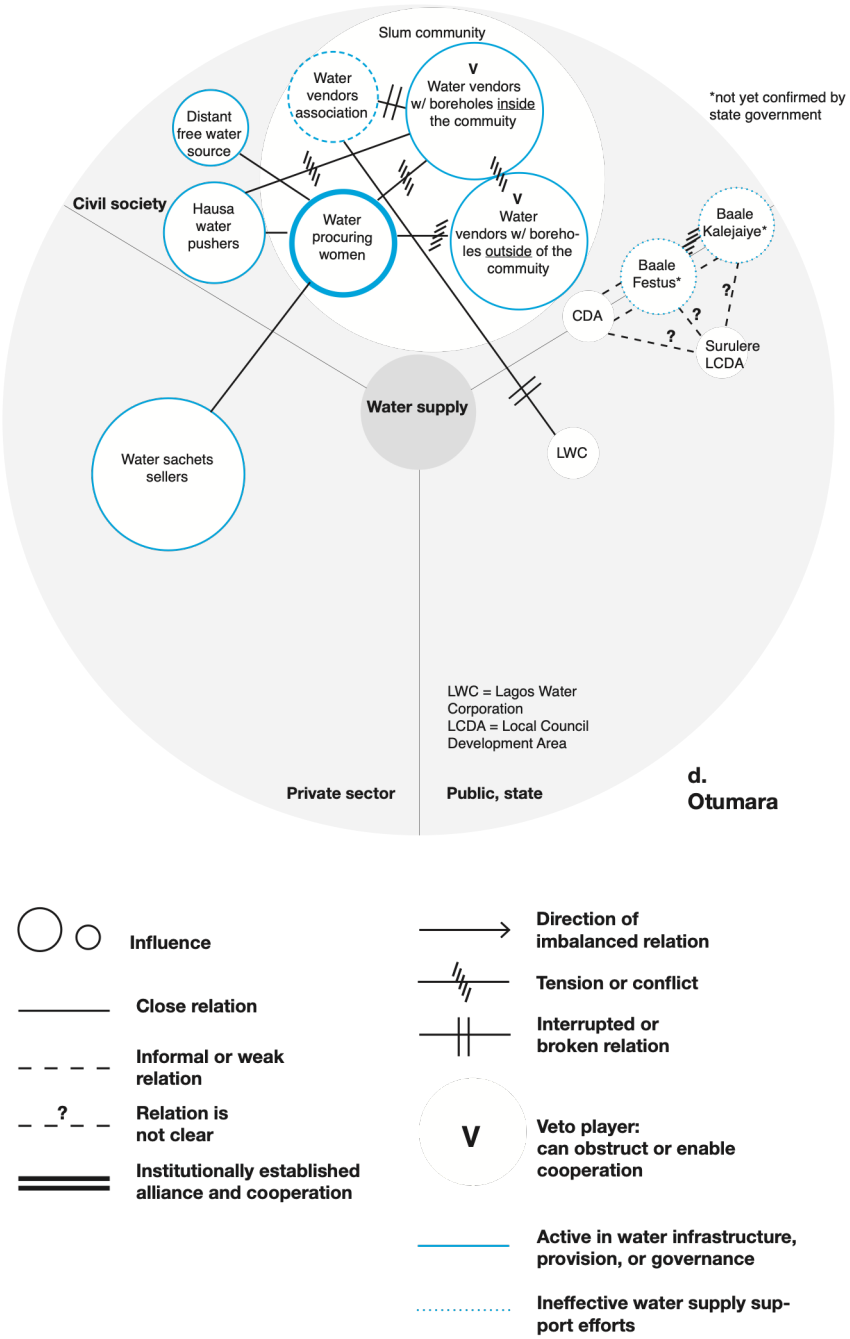
Table 4.1: Overview of water quality in Otumara according to purpose, source, and related actors. *Source: Author, fieldwork.*

In order to analyze the relationships between the actors, the insights of Table 4.1 were mapped into Figure 4.2. The field research revealed that the water vendors have enormous power.[1] They are marked with a V' for "veto player," indicating their capacity to veto or otherwise hinder water-provision projects by other players (Tsebelis 1995).

Figure 4.2: Stakeholder mapping for water provision showing civil society, private sector, and public/state actors with relationships indicated by lines showing close relations, tensions,

[1] All 22 water vendors identified in Otumara were male—a pattern this paper documented but did not analyze as significant. Chapter 6 examines why water vending as commercial enterprise remains male-dominated while women perform the unpaid procurement labor that creates vendor customer base. The gendered division between male infrastructure ownership/profit and female procurement labor/expenditure structures water access across all five case study communities.

conflicts, and broken relations. Water vendors marked with “V” for veto player. Source: Author, 2026. Updated from Hoelzel (2022).



The two baales are not involved in the water provision like in other communities, where the baales often provide water for free at their houses, relieving a bit the distress of the community. Both tried to contribute: Baale Festus has two boreholes in the courtyard of his house, one installed by himself and one donated by a politician, but they are both not functioning. Baale Kalejaiye tried to supply the community with free water, in cooperation with the government, but failed due to the strong position and the resistance of the water vendors. This was confirmed by the water vendors.

Various sources holding different positions within the community confirmed a lack of solidarity among the community residents. The reasons given were the absence of time for pursuing common goals and the prevalence of poverty. According to the field research, people are too busy with their own struggle for survival to engage in larger community goals. Community representatives lamented the difficulty of organizing people, for instance, against the dominance of the water vendors. On the other hand, they claimed that it would be the task of a sincere, honest, and straightforward baale to mobilize the people. This opinion was equally shared by LASURA officials.

The water pushers, usually young boys from the Hausa communities, are important actors on the ground. Their position is ambiguous. On the one hand, they are definitely among the key players in water provision. Even though the water they deliver is only usable for washing, people very much appreciate that they deliver water to the doorstep, especially given the fact that most parts of Otumara do not have tarred roads. On the other hand, their relation to the resident water vendors is naturally tense, as they compete for customers. The field research also revealed that they are seen as a necessary or "welcome" evil, but they are clearly not respected as persons.

Unlike a baale, who receives his position by appointment or inheritance, Community Development Associations (CDAs) are community organizations that elect their own leaders. Any resident may become a CDA member and any member may be elected to a position. CDAs hear about needs and problems, such as broken or dysfunctional infrastructure, and report these to the local government to take action. In Otumara, there is a CDA in place but it is accused of inefficiency and corruption. According to the residents, it is not fulfilling its duties and therefore not efficient.

4.2.5.2 The Role of Lagos Water Corporation (LWC)

Officially, the Lagos Water Corporation (LWC) is in charge of the water supply. Lagos State as a whole – despite a wealth of water resources – is facing a major water crisis, like many other African cities (Chiori 2018).

Potable water supply in Lagos began in 1910, with the construction of the Iju Waterworks to serve Lagos Island. In 1915, it was upgraded to serve Apapa and Ebute-Metta. Further expansion led to coverage of Ikeja, Ikorodu Road via Iddo and eastern Lagos State. In 1977, the Isashi waterworks were commissioned to serve Isashi and Satellite Town to Festac Town. In 1982, the Iju Waterworks was modernized to boost the pressure in the existing mains and ten additional mini-waterworks were built. In 1992, in the Adiyan Phase 1 of the Lagos Water Supply Expansion Project, additional main, secondary and tertiary mains were constructed, and 88,200 properties were connected to the water supply systems (Lagos Water Corporation 2018).

There is the Lagos Water Supply Master Plan (Lagos Water Corporation 2018) in place. It focuses mostly on the quantity of water supply, water demand, and the demand gap. Issues of supply are not addressed. The inability and/or unwillingness of citizens to pay the bills are mentioned but there's no strategy or approach outlined how this could be solved. The following challenges for public water supply can be identified, applicable to Otumara, other communities, and Lagos in general:

1. Intergovernmental: LWC must compete with other ministries and departments for funding. Also, insufficient information and exchange between the ministries means that upcoming or

pending projects are not coordinated. For example, new or existing water infrastructure is often destroyed when roads or drainages are repaired or constructed.

2. Urbanization: The already insufficient and faulty water infrastructure cannot keep up with the rapid growth of the population in Otumara and Lagos in general.

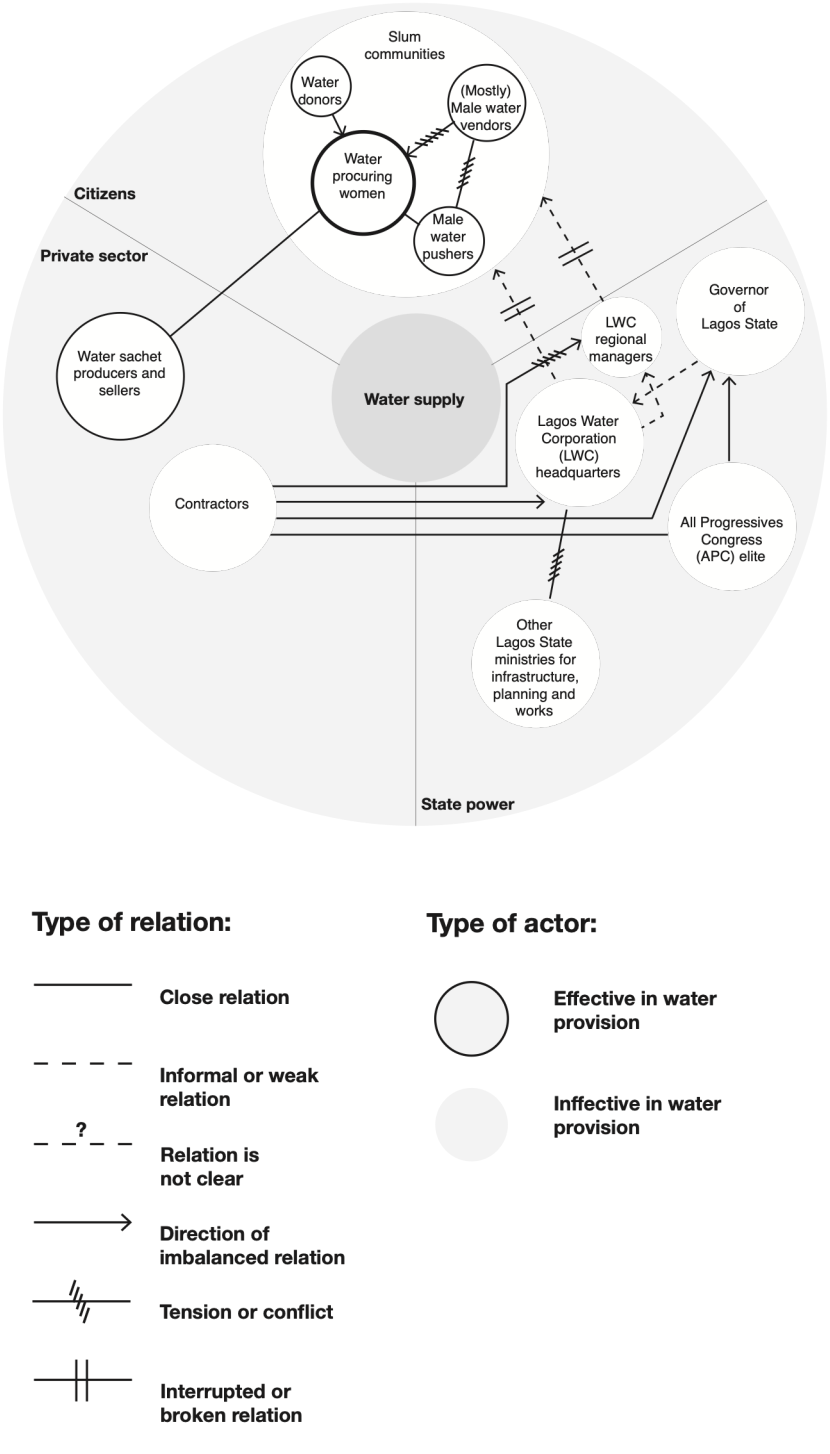
3. Developmental model: Governor Fashola's administration (2006-2014) tried to implement a public-private partnership approach to attract foreign direct investment through large-scale infrastructure projects (Heinrich Böll Stiftung Abuja and Fabulous Urban 2018/19). This mostly failed due to the lack of participation of residents during planning stage and the lack of maintenance culture. In general, there is not enough focus and attention the processes.

4. Revenue: Unpaid bills, especially in the poorer neighborhoods, are a major challenge. LWC usually bills customers a flat rate, no matter how much water is being consumed or whether water is provided by the public means at all. The latter reinforces an unwillingness to pay the bills. As people cannot afford or are unwilling to pay for the service, LWC stops the supply or, worse, willingly destroys the pipes in the communities. Water meters are hardly available and if, usually only for businesses. Also here, some sort of prepayment is the norm.

5. Informal water vendors: People must then purchase water from informal water vendors who sometimes illegally tap into LWC pipes.

6. Corruption: The most difficult aspect to analyze is corruption and nepotism. According to LWC officials, pro-forma contracts are used to commission repairs for broken or faulty mini-waterworks and other infrastructure. The contracts are paid but the work remains undone and the existing infrastructure continues to decay.

Figure 4.3*:* Mapping of the rather dysfunctional Lagos Water Corporation showing relationships between state actors, civil society, and private sector with water supply at center. *Source: Author, 2026. Updated from Hoelzel (2022).*

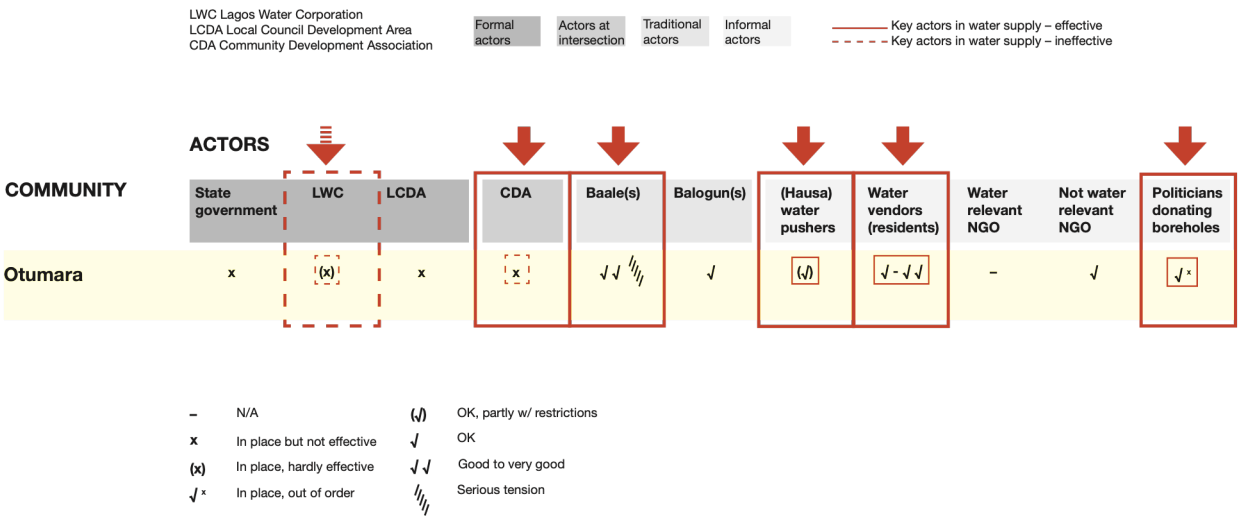


In Otumara, the conflicts with LWC led in 2010 to the community's subsequent decision to stop any cooperation with the government-owned corporation. Figure 4.4 shows that the formal state actors are not significantly involved or efficient in the water supply. There is still an existing water main in Brickfield Road, but it has not been in operation since 2010. However, some of the

interviewed residents and water vendors said that some pipes are still (or again) in use and currently three of the landlords receive water from LWC. They had applied to the head office of LWC and after making the required payment, LWC connected the pipes to the principal main, from there, the landlords had to organize and pay for their own connection to their house. They complained that this does not go without having to bribe officers and that LWC immediately stops delivery if bills are not paid – even though LWC often does not supply water, sometimes for more than three months. LWC seems to blame this non-supply to people tapping water illegally (not certified water vendors) or even packaging the water from the mains for sale; although such a case could not be identified in Otumara.

In summary, the water supply in Otumara is basically run by the private water vendors. They have a high level of expertise in providing the respective infrastructure, which includes drilling of boreholes and laying of pipes several hundred meters into the community. This infrastructure needs to be financed, maintained, and protected against vandalism and vehicles. Selling the water only partly redeems the high investments costs. Figure 4.3 shows that LWC is largely not able to meet its obligations. There is little or no attention to issues of maintenance, supply, and distribution or to address customers' unwillingness or inability to pay. The overall assessment of the water supply in Otumara (Figure 4.4) shows on a technical scale a moderately good water supply and on the governance level a rather poor outcome. Within the community, the latter is reflected by the weak positions of the two baales, the inefficient CDA, and consequently the dominant position of the water vendors. Viewed from the outside, the poor outcome on the governance level is reflected in the completely inefficient role of the government.

Figure 4.4: Comparison of formal and informal actors and their efficiency in water supply, showing matrix of actors (State government, LWC, CDA, Baales, Baloguns, Hausa water pushers, Water vendors residents, Water vendors NGO, Not water relevant NGO, Politicians donating boreholes) with effectiveness ratings. *Source: Author, fieldwork.*



4.2.6 Discussion

4.2.6.1 Conflicts Between and Within Governance Systems

The Otumara community's decision to implement their own water system, independent of all government tiers, makes this a particularly interesting case study to investigate the efficiency of informal and/or traditional ruling systems. As described above, the decision followed a severe conflict over unpaid bills and the subsequent destruction of water pipes by LWC officers. The community does not dispute these facts. However, it is unclear according to the community whether the LWC officers destroyed the pipes in their official function or in their personal capacity because the community refused to pay the bribes they demanded.

The community has developed a remarkable capacity and expertise in providing vital infrastructure and services. The investment and maintenance costs for the infrastructure are significant, leading to relatively expensive water prices. There is no free water available in Otumara. In some communities, baales offer free water at their houses, but the boreholes of baale Festus do not function and baale Kalejaiye's attempts failed completely, due to the resistance of the powerful water vendors who fight against losing their business.

The analyses of the relation between formal and tradition/informal in Figure 4.2 shows that all of the key stakeholders and stakeholder groups are either in tension with one another or have completely stopped cooperating. Collaboration between civil society (the Otumara community) and the state (state and local government tiers) does not exist. Only the two baales have, by virtue of their function, contact with the local government. Seen from outside, the community is quite successful in its fragile and voluntary self-supply, which is even more astonishing considering that the official actors mandated to link them with government, the CDA (extended arm of the local government tier, the Surulere LCDA) and the two baales are seemingly limited in their influence. On the other hand, both baales play some sort of double game, whilst being in court against each other over land issues in which they have a personal interest.

4.2.6.2 Anarchy and Negotiation

The community seems to be quite efficient and able to join forces when there is a threat from outside (LWC in 2010) or from above (example of the aborted forced eviction by Lagos state government of Otumara Market 2 for a proposed secondary school).

The community, basically surviving without government support, is an example of a self-containing supply system, in which certain actors—here the water vendors—control each other suspiciously. In a certain way, this type of water supply system can be described as “radically market-liberal”—offer and prices depend on the logic of a free-market approach. One could even call it anarchic, a situation in which the state institutions are absent and the “law of jungle” applies (Scharpf 2018, p. 98).

The water vendors do have a lot of influence and power, as repeatedly shown in this paper (Figure 4.2). They implement a sort of market-oriented water supply system, as there are no other reliable sources of water. The field research revealed that many female residents buy from them on credit as they are not able to pay the price for daily water.[2] They repay their debts in installments to the

[2] This credit arrangement, noted here as evidence of vendor flexibility that legitimizes their power, appears quite differently through feminist analysis (Chapter 6). Women's inability to pay daily water costs reflects systematic economic marginalization—allocating one-third of household income to water while excluded from income-generating activities by time consumed through procurement labor. Vendor credit systems don't alleviate exploitation but rather create debt dependencies that compound women's vulnerability. That vendors extending credit "often are women themselves" (as noted in the published text) hints at the gendered solidarity provision

water vendors, who often are women themselves. It is quite unthinkable that LWC would agree to such installment payments. While this model is also precarious it seems to give the water vendors the legitimacy and power to be key actors.

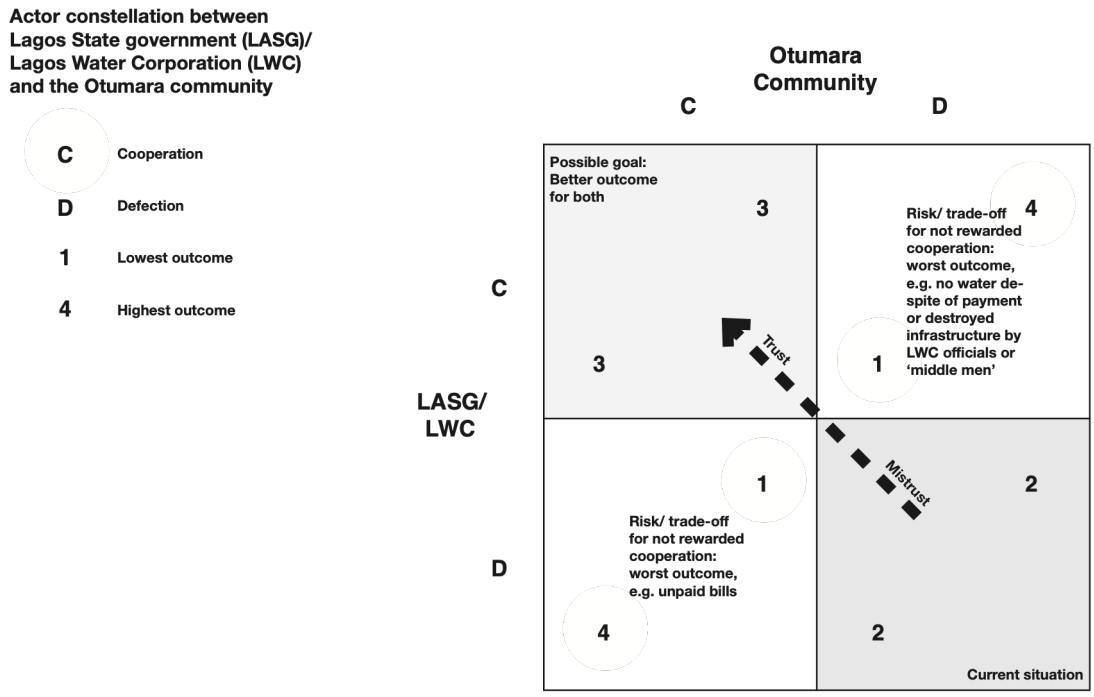
The government tiers, both state and local, have no (positive) impact at all. Moreover, they do not even show interest in fulfilling their role and assist the community with basic services. The state-owned LWC is more or less dysfunctional making the centralized water infrastructure and supply very volatile and scanty (Figure 4.3).

Figure 4.5 shows an adaptation of the “Prisoner's Dilemma” applied to the Otumara case study. “Prisoner's Dilemma” is one of four archetypal game constellations, borrowed from the field of game theory and used in social sciences (Scharpf 2018, p. 75). Even though being a “mixed-motive game,” hence a mix between conflictual and harmonic preferences of the two actors, it belongs to the overall conflictual actor constellations. “Defection” is the dominant strategy as “cooperation” would create the risk of being exploited by the other side (LASG/LWC or the Otumara community). The “exploitation” on the side of LASG/LWC would for instance be reflected in unpaid bills or informally tapped and informally sold water. The “exploitation” on the side of the community could for instance result in irregular water supply despite of paid water bills due to the insufficient and faulty water infrastructure or even the destruction of water supply infrastructure in case of unpaid bills, as reported by the community. On both sides, there's a lot of mistrust, whereas the community is clearly more vulnerable in their struggle for survival. However, Figure 4.5 shows that the approach “cooperation”/”cooperation” would lead to the second-best outcome “3/3” for both sides (4 is the best result, 1 is the worst outcome). Such an approach could be summarized with the “co-production” of urban services as it existed in Otumara with regard to the water supply before 2010. “Co-production” would as well include the recognition, improvement, and support of the existing micro-governance in Otumara. The improvement of the existing micro-governance could break the dominance of the water vendors, lower the water prices for the community members, and help LASG and LWC to find workable ways to supply low-income communities with water. This would address the blind spot of the Lagos Water Supply Master Plan (Lagos Water Corporation 2018) that neglects most issues of supply as well as the inability and/or unwillingness of people to pay the bills. In return, functioning “co-production” (Simone and Pieterse 2017, pp. 155-158) and “hybrid” governance (Myers 2011, p. 103)[3], hence a mix of official government actions and informal/traditional government action would strengthen the mutual trust and improve the living conditions in Lagos.

that Chapter 6 documents more systematically, contrasting female water infrastructure owners' subsidy-based sharing with male vendors' profit maximization.

[3] The hybrid governance and co-production frameworks recommended here—partnerships between state and community actors—remain central to this dissertation's final policy proposals (Chapter 8), but with fundamental reconceptualization of who constitutes legitimate community partners. Rather than co-production channeled through male-dominated CDAs, traditional leaders, or vendor associations (as this paper implicitly assumed), Chapters 7-8 propose women's water committees as primary state partners. Hybrid governance proves essential for addressing Lagos's water crisis, but successful hybridity requires transforming rather than accommodating existing patriarchal power structures at community scale.

Figure 4.5: Analysis of actor constellation between LSG/LWC and the Otumara Community, using the "Prisoner's Dilemma." Matrix showing cooperation and defection strategies with outcomes rated 1-4, with current situation marked in defection/defection quadrant. *Source: Author, adapted from Scharpf (2018, p. 75).*



4.2.7 Way Forward and Conclusion

The knowledge and efficiency through which the community of 25,000 to 50,000 residents has organized its water supply services since 2010 are remarkable. However poor and precarious life might appear at first glance, people in Otumara successfully struggle to provide and access basic infrastructure water services. This is a problem at the same time: with their daily survival struggles, the community is too busy to advocate the relevant public actors for more lasting solutions. The weak commitment of tenants in engaging in community matters demonstrates the close link between land ownership, influence, and veto power. In Otumara, the water vendors and landowners have the big say.[4]

The prospects for Lagos are since ever gloomy. Policy makers are in search for "solutions" that could tackle the enormous challenges in the already dense city, short of public urban services (OECD/UN ECA/AfDB 2022). Numbers of the current population size vary between 15 and 24 million (Lagos State Government 2022). Some modellings see Lagos rising up by 2100 to 80-million city (Hoornweg and Pope 2017). Whereas the exact numbers do not matter that much (and it's questionable whether these projections will ever materialize), it is more crucial to realize and

[4] This analysis of property relations structuring power—landowners versus tenants, vendors versus consumers—proved accurate at one analytical scale but obscured that gender mediates all property relations. Female landowners rarely operate water vending businesses; when they do control water infrastructure, they provide subsidized access rather than profit-maximizing pricing (a pattern documented in this paper's field notes but not theorized). Female tenants bear disproportionate water procurement burdens compared to male tenants in identical property positions because patriarchal household structures assign water collection to women regardless of who holds tenancy. Property ownership matters for water access, but Chapter 6 demonstrates that gender determines how property ownership translates into either exploitation or solidarity, profit extraction or mutual aid.

accept the fact that Lagos will never have truly public and centralized infrastructure and services. The modelled projections immediately raise call for billions of USD for infrastructure projects through loans or foreign investment, claiming that only large-scale infrastructure can efficiently manage the economy of access and address "developmental issues" (Simone and Pieterse 2017, pp. 155-158). Besides the probable fact that parts of the funds and grants will quickly disappear through corrupt practices (Sorunke 2016), or will indebt the city government and its citizens for decades without services being supplied, such claims ignore the power of micro-transformation in everyday life (Harrison 2006; Simone and Pieterse 2017, pp. 155-158).

The way forward seems to be twofold: interventions must focus on the communities and draw from the enormous technical knowledge that they have gained in their struggle for survival (Simone and Pieterse 2017, pp. 155-158). The communities must be supported in developing functioning governance structures with leaders and supervisory boards.[5] Government must be kept involved in a learning and potentially supporting role although it often does not show interest in developing such communities (Myers 2011, p. 103).

As government has not been able over the past decades to provide clean water to all (Heinrich Böll Stiftung Abuja and Fabulous Urban 2018/19), the suggestion is hence that improved service delivery can only be achieved through a practical-normative orientation to urban planning and governance (based on "what works"), and not through the "ideal" technical-instrumental orientation of planning (Harrison 2006; Meuser 2021, p. 62). So far, in Lagos, in West Africa, and in many parts of the African continent, the investments through loans and grants have not yet offered solutions to relatively simple problems, such as the affordable and sustainable provision of clean drinking water (Günther 2016). And yet, despite these failings, international organizations, international development cooperation, and governments, including Lagos State government claim "classic developmentalism" with heavy donor involvement in infrastructure provision to be the way forward (Simone and Pieterse 2017, p. 156; Heinrich Böll Stiftung Abuja and Fabulous Urban 2018/19). Drawing from this research, the focus must be on the already functioning everyday ways of life (Simone and Pieterse 2017, pp. 155-158) and not on an abstract or "imported" centralized vision depending mostly on "big" infrastructure projects (de Satgé and Watson 2018, p. 50). As communities like Otumara have proven their ability to provide for themselves, as basic as it is, the question is possibly not so much how the government should be supported, e.g. through funds, grants, or capacity building programs by development banks or international corporation, but rather how the communities can be supported. Here, communities could be supported with so-called "soft skills," hence capacity strengthening measures. Support through "hardware" infrastructure always has to fit into functioning community governance structures and real community needs.

It is therefore urgent to better understand and to accept the way the city functions today (Simone and Pieterse 2017). The city's "DNA" or peculiarity is about micro-governance with numerous forms of informal and/or private service delivery: Lagos is a study on anarchy and negotiation. What is needed, is a different understanding of "government": rather than assuming the role of an investor and private player, Lagos State government needs to take a learning role, promoting and coordinating these forces efficiently. The first issue at stake is how dysfunctional micro-

[5] This recommendation for strengthening existing community governance structures—CDAs, traditional leadership, vendor associations—proved inadequate once subsequent research (Chapter 6) revealed these structures systematically exclude women despite women being primary water procurers and de facto infrastructure providers through their daily labor. The paper's call for "functioning governance" presumed that effectiveness problems stemmed from corruption or capacity deficits rather than from patriarchal exclusions fundamental to how these structures operate. Chapter 8's policy recommendations propose women's water committees as alternative governance actors rather than attempting to reform inherently male-dominated institutions.

“governments” can be eliminated and two, how functioning micro-“governments” in communities can be established (if necessary), strengthened (where already in place) and then “connected” (rather than “upscaled”). Government, local and international experts, and civil society organizations need to cooperate to develop a platform, which clusters the many functioning micro-governments without trying too much of synchronizing them (Simone and Pieterse 2017, pp. 28, 155-158). Local NGOs, civil society, and the private sector can help the communities with technical expertise and capacity building so that community members can establish economic entities which are capable of playing a relevant part in the city's economic development. International funding should be channeled towards such initiatives and directly target local NGOs and other civil society organizations in doing so.

Concluding, the current policy and planning approaches focusing on heavy investments and (imported) large-scale infrastructure implementation will fail, for two reasons (Heinrich Böll Stiftung Abuja and Fabulous Urban 2018/19): the lack of funding and the lack of political will to accept the society the way it functions (Watson 2009; Simone and Pieterse 2017, pp. 155-158). As the bulk of urban services and the city production is already delivered by various actors outside the government, those actors should be encouraged to do what they have been doing for so long (Simone 2004). The first and relevant step should be the recognition of the many mini-governments (Simone and Pieterse 2017, p. 26). The second step would be the active support of these mini-governments in tackling their everyday problems (Simone and Pieterse 2017, p. 26). The third step would be a loose coordination of the mini-governments through targeted, small-scale interventions in the areas of water supply (and other urban services). The basic concept is to no longer to separate between planning, production, and supply but rather to see the production and supply of urban services as planning (Simone and Pieterse 2017).

Finally, this paper highlights a specific African case that is Lagos and therein the community of Otumara. However, empirical research on and in one of the largest cities on the African continent also reflects upon overall questions such as the nature of modernity, urban governance, and the material conditions of actually existing cities in the global South (Gandy 2006). While improving lives in urban slums has been on the political agenda of international organizations since 2003 (UN-Habitat 2003), the reasons for urban poverty and the structural frameworks that prevent full and equal citizenship in global South cities in Africa, Latin America, and Asia are often not generally confronted (Parnell 2008). To make a difference and to be able to give workable advice how to improve the lives of urban slum dwellers, often poor and indigent, scholars must dare to go beyond the abstract endeavor of what the good city or the just city could or should be like (Friedmann 2000). Researchers and professionals must enter the contested and messy terrain of urban politics and administration alongside communities, administration officials, and politicians in order to achieve the common goal of more livable and more just global South cities (Parnell 2008).

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4.3 Post-Publication Reflection

Note on referencing: In the reference list of the published paper (Section 4.2.8), Simone (2004) refers to *For the City Yet to Come: Changing African Life in Four Cities* (Durham: Duke University Press). In the master bibliography of this dissertation, this work is listed as Simone (2004a) to distinguish it from Simone (2004b)—'People as infrastructure: intersecting fragments in Johannesburg', *Public Culture*, 16(3), pp. 407–429—which is cited in Chapter 2.

Game theory's analytical power for modeling state–community strategic dynamics came at a cost that only became visible through subsequent feminist analysis: the framework assumed actors were constituted before analysis began, when the central question was precisely who gets constituted as legitimate actor in the first place. This distinction—between coordination (how do constituted actors overcome non-cooperation?) and constitution (whose labor produces infrastructure, and why does that labor not generate corresponding governance authority?)—is what separates this paper's analytical contribution from the dissertation's central argument, and understanding the gap between them explains why feminist political ecology proved necessary rather than merely supplementary.

The conceptual ground for that gap is the distinction between inclusion feminism and transformation feminism that hooks (1984) and Collins (1990) identify and that Segato's (2018) theorization of the *mandato de masculinidad* extends to postcolonial contexts: the difference between bringing women into existing systems and creating fundamentally different systems theorized from women's labor as generative ground. Returning to this paper from the dissertation's feminist vantage point, its inclusion-feminist framing becomes strikingly apparent. I was not gender-blind—I was acutely aware that all 22 identified water vendors were male, that CDAs and traditional leadership remained exclusively male-dominated, that women appeared primarily as customers bearing water burdens. But I believed gender equity could be achieved through inclusion rather than transformation: that women could be integrated into existing governance structures after infrastructure was functioning, that deferring gender confrontation was strategic rather than structurally flawed. The biogas cooperative's collapse had already demonstrated this logic's failure empirically, yet the paper's analytical framework reproduced it by treating patriarchal governance as given context requiring better coordination rather than as political structure requiring transformation.

This explains the paper's single most significant limitation: game theory treats “community” as unified strategic actor, obscuring how gender, age, household position, and daily survival responsibilities produce radically different relationships to water infrastructure even among residents sharing identical property status and facing identical vendor exploitation. The observation that female water infrastructure owners provided subsidized access while male vendors profit-maximized appears as footnote to the vendor power analysis because I had not yet recognized that this gendered difference in operation—women practicing solidarity principles when given infrastructure authority, men practicing extraction—was not incidental detail but pointed toward the root inequality structuring all water access dynamics. Game theory documented what needed explaining; feminist political ecology, drawing on Oyěwùmí (1997), Mama (1995), and Tamale (2011), provided tools to ask what inclusion feminism cannot ask: whose labor sustains the systems that formal frameworks model, and what does centering that labor reveal about how transformation rather than accommodation must proceed?

The game-theoretical analysis of Otumara retains analytical validity for the specific question it addressed: why mutual cooperation between government and community would produce substantial welfare gains yet both parties remain trapped in strategic defection. Non-cooperative equilibria driven by deep institutional mistrust remain foundational to understanding why hybrid governance proposals face the specific barriers they do in Lagos—and rebuilding trust sufficient for collaborative governance remains perhaps the central practical challenge the dissertation's intervention frameworks must address. But the analytical vocabulary for understanding why gender determines who bears the costs of that non-cooperation, and whose organizing capacity is suppressed within communities trapped in exploitative vendor systems, required moving beyond what game theory's formal modeling could provide. The coordination problems this paper identified remain real; the solution requires transforming who coordinates while simultaneously addressing the constitution problem game theory could not see.

The paper's recommendations for hybrid co-productive systems engaging existing community structures accordingly appear transformed in Chapter 7's policy framework. Rather than partnerships with CDAs, traditional leaders, or vendor associations—all male-dominated institutions whose governance failures the dissertation documents—the dissertation proposes women's water committees as primary state partners, with governance mechanisms explicitly protecting women's authority against patriarchal capture at household, community, and state scales. The insight that mistrust-driven non-cooperation's costs demand collaborative governance capable of rebuilding credibility between state and communities remains foundational. What changed is the understanding of who must be at the table, why they have been systematically excluded, and what protecting their governance authority requires structurally rather than procedurally.

Chapter 5: Community Contexts and Water Provisioning Diversity

Published Paper:

Hoelzel, F. (2024)
Water Supply Systems in Urban Slum Communities in Lagos, Nigeria: Between Self-supply and Co-production
The International Journal of Community and Social Development, 6(1), 27–55
DOI: 10.1177/25166026241231434

5.1 Chapter Introduction

Position within Cumulative Doctoral Thesis:

This paper provides comparative analysis across four Lagos mainland communities (Otumara, Amukoko-Mosafejo, Mafowoku, Orisunmibare), revealing how different community contexts—varying across settlement typologies, governance arrangements involving traditional leadership and Community Development Associations (CDAs), and morphological/geographical locations—produce diverse water infrastructure provisioning systems. It advances beyond Chapter 4's single-case game-theoretical analysis to identify patterns distinguishing “free-market” vendor-dominated models from "solidarity" approaches where CDAs and traditional leaders provide subsidized access.

The paper bridges Chapter 4's macro-structural focus on state–community relations and Chapter 6's feminist analysis of women's embodied experiences. While documenting heterogeneous governance arrangements and their implications for water access equity, the paper reveals persistent gender patterns across all community types: male vendor violence, women's systematic exclusion from CDAs and traditional leadership, and women's economic exploitation through water pricing that extracts one-third of household income. These documented patterns—present throughout the analysis but not yet centered as primary analytical lens—establish the empirical foundation for Chapter 6's argument that gender mediates all other inequalities (property relations, vendor dynamics, community governance, state neglect) structuring water provision in postcolonial African cities. The paper also establishes—though it does not theorize explicitly—the inseparability of technical infrastructure configurations and governance outcomes: the comparative analysis demonstrates that identical technical infrastructure (boreholes, tanks, pipes) produces vastly different access outcomes depending on governance arrangements, while governance structures (CDAs, traditional leaders, vendor cartels) operate through and are constrained by technical infrastructure configurations. This technical-governance inseparability, theorized in Section 7.3.5, is among the empirical findings Chapter 5 produced that the dissertation's framework subsequently articulated.

The paper's advocacy for differentiated hybrid governance—partnering with trustworthy CDAs/baales in solidarity communities, or regulating vendors in free-market contexts—represents an intermediate position that subsequent feminist analysis (Chapter 6) fundamentally

challenges by revealing that partnerships with male-dominated community structures reproduce rather than transform patriarchal exclusions.

Research Questions Addressed:

This paper addresses the second sub-question from Chapter 2, Section 2.5:

How do different communities' contexts on Lagos mainland[1]—varying across settlement typologies, institutional arrangements involving traditional leadership and Community Development Associations, and morphological/geographical locations—produce diverse water infrastructure provisioning systems across Lagos slums, and what patterns distinguish "free-market" vendor-dominated models from "solidarity" approaches?

Methodological Approach:

The paper employs comparative case study methodology, systematically analyzing four communities to identify patterns and variations in water provisioning systems. This approach enables moving beyond single-case particularity toward pattern recognition while maintaining attention to place-specific factors mediating water access—essential for understanding how community contexts produce diverse infrastructure and institutional outcomes.

Comparative analysis involved: (1) manually analyzing thematic analysis of interview records (detailed notes taken during and immediately after conversations), observational notes, and mapped infrastructure data to identify recurring themes (vendor exploitation, CDA dysfunction, traditional leadership roles) and divergent patterns across communities; (2) systematically comparing how the same phenomena (water pricing, governance structures, women's procurement strategies) manifested differently across cases, asking why Mafowoku achieved relatively equitable "solidarity" distribution while Orisunmibare suffered vendor cartel exploitation despite similar property structures; and (3) theorizing from patterns—the distinction between "free-market" and "solidarity" distribution models emerged inductively from comparative analysis rather than being imposed a priori.

This method proved particularly valuable for revealing that initial hypotheses about external support variation proved wrong—all communities lacked government infrastructure—while exposing alternative dimensions of variation (institutional arrangements, leadership functionality) more significant than anticipated. The comparative approach also enabled identifying when patterns held consistently (women's exclusion from leadership across all communities) versus when they varied (vendor exploitation severity, CDA effectiveness), providing nuanced understanding of which water infrastructure dynamics are structural constants versus which are amenable to community-level intervention.

Methodological details appear in Chapter 2, Section 2.6.

[1] Lagos is traditionally divided into Lagos mainland—where the majority of the population, especially lower-income residents, live—and Lagos Island, which includes Lagos Island, Victoria Island, and Lekki Peninsula, where more affluent populations reside. All case study communities in this doctoral research are located on Lagos mainland.

Key Findings:

- **Heterogeneous water provisioning models:** Communities exhibit fundamentally different provision systems despite universal state abandonment. “Free-market” communities (Otumara, Orisunmibare) operate through vendor cartels charging exploitative prices with no free alternative (Otumara) and one free alternative (Orisunmibare), if there is power. “Solidarity” communities (Mafowoku, Amukoko-Mosafejo) feature substantial CDA-managed or traditional leader provision offering free or subsidized access, with vendors serving backup rather than primary function.
- **Governance configuration determines equity outcomes:** The presence of functioning CDAs and traditional leaders committed to community welfare produces dramatically different water access conditions than vendor cartel control. Mafowoku's solidarity model demonstrates that equitable provision within informal systems is achievable when community leadership prioritizes collective welfare over profit maximization.
- **Women's systematic exploitation across all models:** Regardless of governance type, women bear disproportionate water procurement burdens—allocating approximately one-third of household income to water, spending 2–4 hours daily on procurement labor, accessing water last within households. Even in “solidarity” communities with better overall access, women remain excluded from CDA leadership and infrastructure decision-making despite being primary users and procurers.
- **Differentiated hybrid governance recommendations:** The paper advocates community-type-specific partnerships: engaging trustworthy CDAs and traditional leaders in solidarity communities; regulating vendors through pricing controls and access guarantees in free-market contexts. However, Chapter 6's feminist analysis fundamentally challenges these recommendations by revealing that partnerships with male-dominated structures—even “trustworthy” ones—perpetuate women's exclusion from governance.

Consistency with Chapter 3:

The four communities analyzed in this paper correspond to Chapter 3 profiles: Amukoko-Mosafejo (3.3.1), Mafowoku (3.3.2), Orisunmibare (3.3.3), and Otumara (3.3.4). Chapter 3's technical documentation—infrastructure charts, spatial mapping, informal water prices—provides the empirical foundation for this paper's comparative institutional analysis.

Note on Paper Presentation:

The paper appears as published, with minor formatting adjustments for dissertation consistency. The published paper analyzed four communities; Precious Seeds (added to research in 2023–2024) does not appear in this paper but is incorporated in Chapter 6's feminist analysis. Cross-references updated to match dissertation numbering.

5.2 Water Supply Systems in Urban Slum Communities in Lagos, Nigeria: Between Self-supply and Co-production

5.2.1 Abstract

By investigating the contribution of the "informal sector," this article explores the resourcefulness of place-based practices and how they shape the urban water provision in Lagos. It also provides a detailed and critical view of the enormous efforts of inhabitants in urban slums in the daily water provision. Analyzing the qualitative field data collected from observations, 89 semi-structured interviews (field notes), 6 focus group discussions and 12 expert interviews, water supply systems, the utilization in slum communities and power and politics around it are exposed. Even if people can afford to pay the bills, the provision of urban services by state actors (or commissioned firms) is erratic and often not available. The daily infrastructure provision remains the responsibility of individuals and groups, mostly organized in complex yet fragile and changing networks. Drawing from the research on the existing, largely informal water supply in slum communities, this article argues for the recognition and pro-active implementation of hybrid approaches in the planning, implementation and administration of urban infrastructure. It calls for co-production and "hybrid water governance."

Keywords: Co-production of urban services, co-production of water supply, informal water supply systems, local level community and social development, micro governance

5.2.2 Introduction

The present research works across the divide between "formal" institutions and "informal" service provision, including illegal practices in the water supply in urban slums. The term slum is used in this article with a politically empowering meaning, recognizing the reality of the lives of slum dwellers not primarily as a problem (without neglecting the urgent need to improve the lives of people) but as already existing answers to urban problems. The definition of a slum by UN-Habitat (2003, p. 12) refers to inadequate access to safe water, inadequate access to sanitation and infrastructure, poor structural quality of housing, overcrowding and insecure residential status.

Water is essential to life. Whereas the availability of water is for some countries a concern, water scarcity is rooted in power, poverty and inequality (UNDP, 2006). The strongest indicator of social inequality is access to water (Gandy, 2006), which is reflected by the UN (2022) claiming water and sanitation for all by 2030 (see SDG 6). In 2017, 61% of residents in sub-Saharan African cities had access to piped water (Livingston, 2021). As Africa's urban population is projected to be 1.5 billion by 2050 (OECD/SWAC, 2020), the access to water is likely to decrease (UN Water/Africa, 2022). Whereas these numbers require urgent action, academic literature fails largely to grasp the paradox of the contemporary sub-Saharan city to be both, dysfunctional yet dynamic and thriving, as it still focuses on deficit analyses and problem-solving approaches to "development issues" (Gandy, 2006; Simone and Pieterse, 2017). Stereotyped representations of failed African urbanism prevail in a significant part of the academic and policy-oriented literature (see Myers, 2011, pp. 1–20, 112), but worse yet, millions of people are told every day, in some way or other that the manner they live their lives has no value (Sarr, 2019, p. xi).

The article is structured in five parts. (a) First, Lagos and its slums will be portrayed, including the historical perspective on water infrastructure planning during and after colonial rule, and objectives and research questions. (b) The data and the methodology will be presented. (c) The approach of the Lagos State Government (LSG) to the water infrastructure crises, towards slums, and to urban planning in general will be discussed. (d) This will be followed by a detailed presentation of the community water supply systems, the political-administrative machineries, power-connections and actors involved in that water supply system. (e) The article concludes with the call for co-production and "hybrid water governance," hence the suggestion to work towards the aggregation of the existing contribution of the informal water supply system with the challenges formulated by Lagos Water Corporation (LWC).

5.2.2.1 Lagos and Its Slums

In Lagos, 20 million people live in slums (Human Rights Watch, 2021), reflecting the share of 71.8% of urban slum dwellers in overall sub-Saharan Africa, the highest proportion in the world (Ramin, 2009). Lagos has less infrastructure than any of the world's other largest cities (The New Humanitarian, 2006), yet to become home to up to 80 million people by 2100 (Hoornweg and Pope, 2017). Lagos may hopefully begin to articulate its own vision of African urbanization, separate from colonial ideals and postcolonial models (Iyal, 2016), however, it can certainly be declared representative of contemporary global South cities, both conceptually and materially (Gandy, 2006). Koolhaas (2001) argued that the form of urbanization found in Lagos could become a generic model. While some activists lament that despite of Lagos' importance due to its size and growth; it is one of the cities least studied, understood and planned for (Morka, 2007), some scholars raise the hope that Lagos can "bring the African city to the center of policy deliberation and debate" (Gandy, 2006).

Figures vary greatly, depending on the source, but approximately 16–24 million inhabitants turn Lagos to one of the largest urban centers on the African continent (LSG, 2023; UN, 2018, p.12). Despite of being West Africa's largest commercial hub, 80% of the households are affected by urban poverty (LSG, 2016) having less than $1.9 World Bank Purchasing Power of Parity (PPP) available per day (LSG, 2016). Two out of three people live in urban slums (Henderson and Venables, 2017, p. 17). Currently, there are 380 slum settlements (Human Rights Watch, 2021).

Informality is the predominant mode of operation in today's Lagos, with 68% of the population working in the informal sector (LSG, 2013). LSG perceives informality mostly as an obstacle to a modern city (Gandy, 2006), though it could also be seen as a response to existing problems such as the delivery of urban services which LSG fails to provide. Against this backdrop, Lagos is an appropriate place to analyze the potential for the co-production of urban services, in academic literature also discussed as "hybrid forms" of urban service delivery (Myers, 2011, pp. 71–103). It describes a condition, in which citizens and the government share the provision of water, waste management, and mobility, among others. In such mixed systems, infrastructure implemented and managed by the government co-exists with place-based solutions, implemented by citizens. In order to lead to more just cities, place-based solutions must be acknowledged by the government. Simone and Pieterse (2017, p. 153) refer to blended systems of urban services co-powered by government and citizens as "politics of experimentation." However, the precondition for working towards co-production and "hybrid forms" in urban service delivery, is the detailed understanding of the nature and form of the contribution by the informal networks in Lagos. For this purpose, four slum communities were analyzed and compared through the lens of water supply systems

with the aim to bring to light the enormous capacity of the informal water supply and to draw from their implications for the co-production of urban water supply.

Therefore, a research focus on Lagos draws attention to overarching questions about the nature of modernity and the material conditions of global South cities in the twenty-first century (Gandy, 2006; Sarr, 2019, pp. 12–17).

The extent of the lack of access to water indicates the challenge governmental institutions and policies face, though it demonstrates simultaneously the survival strategies, creative maneuvering and resourceful responses of urban dwellers to conditions of extreme vulnerability (Harrison, 2006). Much scholarly and professional focus lies on the deficiencies of the formal water supply, discussing institutional weakness, poor governance and planning, and how better-managed formal institutions would improve access to urban water (see Monstadt and Schramm, 2017; Sarkar, 2022, p. 10; Simone and Pieterse, 2017, pp. 21–29). This article aims to adopt a different attitude, conceptually drawing on the thinking of scholars like Mbembe, Pieterse, Sarr and Simone, among others by providing critically and politically aware insights into the materiality of existing conditions. Postcolonial studies of urban infrastructure in sub-Saharan Africa are still rare, with exceptions, among them Gandy (2006) on Lagos, Harris (2021) on Accra, Monstadt and Schramm (2017) on Dar es Salaam, Sarkar (2020) on Nairobi, Jaglin (2014) and Rakodi (2008) on Cape Town.

This research aims at filling the knowledge gap about everyday life practices in the water supply in today's Lagos, hopefully contributing to a different attitude and mindset in policy design and infrastructure planning in Lagos (and beyond), separate from “developmentalism” (Sarr, 2019) and imported global North planning models of the networked city (Monstadt and Schramm, 2017).

5.2.2.2 Objectives and Research Questions

The present research works across the divide between “formal” institutions and “informal” service provision, including illegal practices in the water supply in urban slums. By investigating the contribution of the “informal sector,” this article explores the resourcefulness of place-based practices and how they shape the urban water provision in Lagos. In doing so, the article provides a detailed and critical view of the enormous efforts of inhabitants in urban slums in the daily water provision. It exposes how material aspects are entangled with social and political aspects, in order to decipher everyday politics. Further, it contributes to postcolonial studies on urban infrastructure and service supply and to post-structuralist debates on the co-production of urban services through the lens of urban water supply by identifying common ground between the “formal” and the “informal.”

The following research questions guided the fieldwork:

1. Which water supply systems (with a focus on access and distribution) are common in slum communities in Lagos State?

2. What is the ratio between place-based, private and/or informal water supply systems and public, centralized, networked water supply systems?

3. What are the power relations between water corporation officers, informal water vendors, traditional leaders and slum dwellers?

5.2.3 Research Method

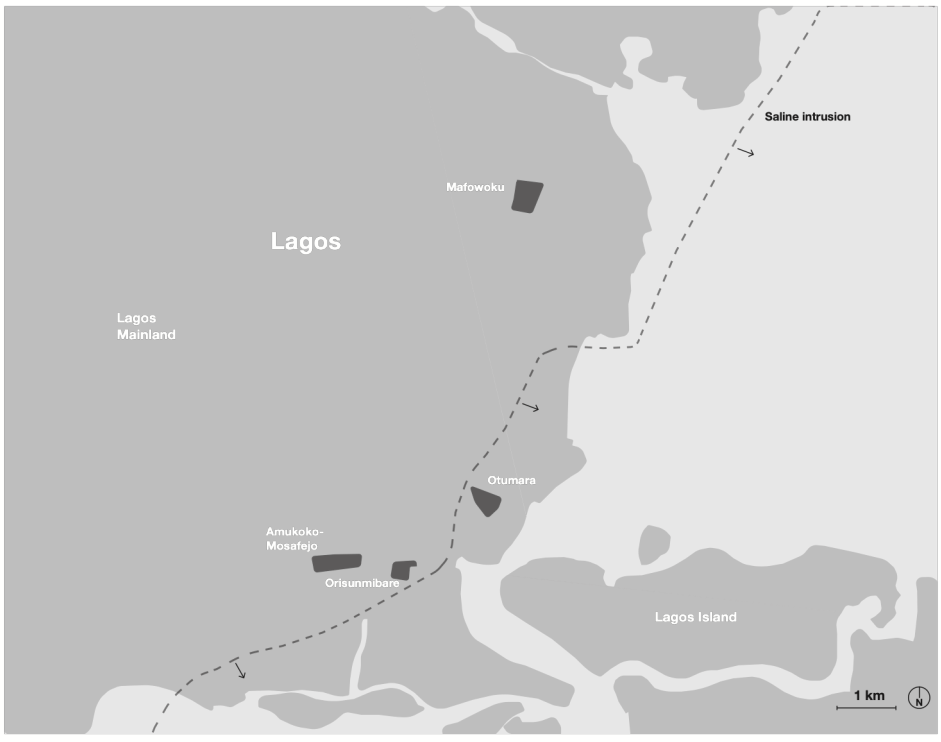
Using the qualitative research method, the grounded theory (Glaser and Strauss, 1967) approach was followed. Slums in Lagos range from clusters of sheds in leftover spaces to entire districts (Gandy, 2006). Four communities were purposively selected: Orisunmibare and Otumara are slum settlements along large-scale infrastructure or adjacent to industrial sites, whereas Amukoko-Mosafejo and Mafowoku are part of the large, densely populated low-income districts of Ifelodun and Bariga (Figure 5.1). The four communities have similar preconditions: there is little or no water supply by the government, as shown in Table 5.1.

The qualitative methods used for the data collection include mapping, observations and 89 semi-structured open-ended field interviews in the four case study communities and their entirety referred to as field notes, for each community separately (see Appendix A), 6 focus group discussion (see Appendix A) and 12 expert interviews (see Appendix A). The choice of methods was based on the objective of identifying the physical water infrastructure as well as the way, in which the relevant actors are involved in the water supply in the communities. As there is no official or recorded planning material available at all, the community boundaries and water points, including the water quality (as reported by the residents and vendors) were mapped with GPS coordinates and through the mentioned 89 interviews with owners, operators and users of the respective infrastructure. All of them are residents assuming different roles, yet partly acting simultaneously as water vendors, informal leaders and/or traditional leaders. The focus group discussions were conducted with water vendors and women (primary bearers of organization of water for the family). The expert interviews were conducted with politicians and planning professionals of state and local government tiers and NGO representatives. To qualitatively analyze the data, the collected data was constantly viewed to clarify the research questions. Each day, field notes were described in a narrative form, summaries of the interviews were written and statements by the interviewees were organized according to topics, complemented by descriptions of the roles of and social interactions among the informal water vendors, traditional leaders and slum dwellers.

	1	2	3	4
Criteria	Community-led water provision	NGO-driven water provision	State or local government driven water provision	International organization driven water provision
Description	Community members initiate and render urban water supply; government tiers with subordinate role	Local or regional NGOs initiate and render urban water supply; community members with active role; government with subordinate role	State or local government authorities initiate and render urban water supply; community members with active role; other actors may play a role as well	International organizations initiate urban water supply; community members with active roles; state and other actors with active roles
Communities to which the criteria apply	Amukoko-Mosafejo Mafowoku Orisunmibare Otumara	Mafowoku to a very limited extent	Mafowoku to a very limited extent	Mafowoku to a very limited extent

Table 5.1: Overview of the existing water supply in case study communities. *Source: Author. Field notes (2019).*

Figure 5.1: Location of case study communities. *Source: Author (base map: Google Maps). Updated from Hoelzel (2024) using cartographic methodology from Chapter 3.*



5.2.4 Water Infrastructure Crises, Slums and Urban Planning: Lagos State's Approach

In 2022, Lagos ranked second-to-last of 172 cities in the Global Liveability Index (Economist Intelligence, 2022). The quality of the infrastructure, including water provision, has a weight of 20% of the overall calculation of the rating. Less than 10% of the population has access to public water (Environmental Rights Action, 2016; Gandy, 2006). Or: more than 90% depend on “informal” or “self-sustaining” place-based water supply systems. However, Lagos' worsening water infrastructure crisis is not new.

The city is produced by the values of the respective society (King, 2007), and so is Lagos' urban infrastructure development rooted in its colonial past. Colonial administrations since the 1850s failed to meet the challenges of overcrowding, disease and inappropriate urban infrastructure (Gandy, 2006). Under British colonial rule, Lagos was spatially organized to the service of a small metropolitan elite (Iyal, 2016); strategies of segregation between the wealthy enclaves and the poor African majority were actively advanced (Gandy, 2006; Myers, 2011, pp.71–72). A cultural dualism between “modernity” and “tradition” was produced to justify infrastructure investment in the wealthy neighborhoods only (Gandy, 2006). In 1964, shortly after Nigeria's independence, a United Nations survey identified Lagos's rapidly growing slums and inadequate sanitation, inter alia (Gandy, 2006). In the following decades, Lagos' ruling class attempted to maintain the sanitized colonial districts, whereas ordinary Lagosians continued to live in unregulated, underserved urban settlements (Iyal, 2016). Most of the (90%) metropolitan Lagos had to rely on shared taps, wells and polluted creeks, while 10% of the dwellings were directly connected to the municipal water system (Gandy, 2006). In the 1970s, Nigeria's oil-rich economy led to a divided society with extreme wealth for a few and rising poverty and unemployment for the majority. The global recession in 1981 resulted in collapsing oil prices; planned infrastructure programs were abandoned (Gandy, 2006). Since the 1980s, Lagos has suffered from intense social polarization and spatial fragmentation, and the state has been unable to improve the urban conditions for the majority urban poor (Gandy, 2006). To this day, this is reflected in the fact that many households, poor and wealthy, must provide their own water supply, power generation and security services, presenting an ongoing crisis of legitimacy for urban government.

Addressing the mentioned challenges, in 2013 former governor Fashola drafted the Lagos State Development Plan (LSDP), seeking to provide an overall vision for Lagos' development until 2025 (LSG, 2013). An updated version was circulated in 2022, valid until 2052 (LSG, 2022). The LSDP continues the elitist urban development approach. It envisions Lagos to become Africa's model mega city and a global hub for infrastructural development, though it remains unclear where the massive funding should come from and how the majority of urban poor can benefit (LSG, 2022). Since 2007, LSG sought to deliver large-scale infrastructure projects and services in the public sector through private-public partnerships (PPP), focusing on concessions and foreign direct investments (FDI) (Heinrich Böll Stiftung Abuja, Fabulous Urban, 2018/19, pp. 195–202). Despite of the high number of people living in slums, there is only one government institution responsible for low-income communities and urban regeneration, the Lagos State Urban Renewal Agency (LASURA) (LSG, 2023b). It is low in the hierarchy of the government institutions delivering urban development and infrastructure, subordinate to the Ministry of Physical Planning and Urban Development, and not even mentioned in the LSDP 2022.

The Lagos Metropolitan Development and Governance Project (LMDGP) was a World Bank-assisted project starting in 2007 and aiming to intervene in nine major slum communities in Lagos

State. The LMDGP focused on infrastructure such as water, roads, education, inter alia. It closed in 2013, achieving only 75 completed boreholes with 20 operating satisfactorily, 31 km of project roads and 70 classrooms, both under construction (World Bank, 2014). In 2019, during the fieldwork for this research, none of the implemented boreholes was found in operation (Field notes Mafowoku, 2019). In 2015, the French Development Agency (AfD) initiated in cooperation with the Ministry of Economic Planning and Budget the follow-up program EKO-UP focusing on the low-income districts Ifelodun and Bariga (Expert interview 2, 2019). It was cancelled in 2018, due to "insufficient profit" for the involved consortium including the government (Expert interview 5, 2019). LASURA intends to implement the projects with tax money (around USD$7.8 million) and PPP funds, simultaneously acknowledging the limited prospects of success as slum regeneration projects offer little profit for investors (Expert interview 2, 2019).

Lagos Water Corporation (LWC) is officially in charge of the water supply in Lagos State. The 2018 Lagos Water Supply Master Plan focuses on the quantity of water supply, the demand and the demand gap (LWC, 2018). The water supply covers theoretically 30% of the population, requiring 800 million liters of water daily (Expert interview 1, 2019). Practically, this amount cannot be achieved, due to technical and administrative issues (Expert interview 1, 2019). Often, there is no water for weeks or even months, reinforcing the unwillingness to pay the bills (Expert interview 1, 2019). LWC offers two billing systems: flat rates and meter rates, while the first is common for households and the second is offered to commercial customers. Unpaid bills are one of the major challenges. Attempting to supply the majority of poor and off-grid slum communities, LWC has issued "contracts" with informal water vendors who sell water to their neighbors (Expert interview 1, 2019). Table 5.2 gives an overview of the water infrastructure systems in Lagos State.

LWC competes with other ministries and departments for funds (Expert interview 1, 2019). Much of new or existing water infrastructure is destroyed when roads or drainage is constructed (Expert interview 7, 2019). Also, the liaison between the ministries is insufficient, and upcoming or pending projects are not coordinated (Expert interview 1, 2019). To meet the current and future water demand, LWC intends to implement heavy-donor-oriented, large-scale infrastructure (Expert interview 1, 2019), despite of the fact that plans to construct large-scale systemic water infrastructure have hardly materialized over the last 100 years; both under colonial and postcolonial administrations, for many reasons unlikely changing in predictable time. Among these reasons are the huge amounts of necessary funds, danger of debt traps, danger of corruption, necessary infrastructural adjustments to accommodate a growing population, and the necessary relocation of communities to implement the infrastructure (Expert interview 1, 2019; Expert interview 8, 2019; Expert interview 11, 2019; Monstadt and Schramm, 2017, Simone and Pieterse, 2017, pp. 17–29). The investment should be accelerated through PPP and FDI approaches (Expert interview 1, 2019; LWC, 2018, p. 14; LSG, 2022, p. 112), despite of the fact that water infrastructure is not popular among investors due to the elaborate implementation process and the small revenue, as widely discussed by scholars (Sarkar, 2022, p. 16) and confirmed by LWC itself (Expert interview 1, 2019). The acknowledged economic reality on the ground is that the majority of urban poor cannot afford to pay high enough fees for the water supply to make the necessary extensions and improvements in urban water systems viable let alone profitable; be it in Lagos (Expert interview 1, 2019; Gandy, 2006) or beyond (Monstadt and Schramm, 2017; Sarkar, 2020). Nevertheless, there are plans by UK-based WaterAid to implement a large-scale water ring (Expert interview 1, 2019). To date (2023), there is no official document accessible.

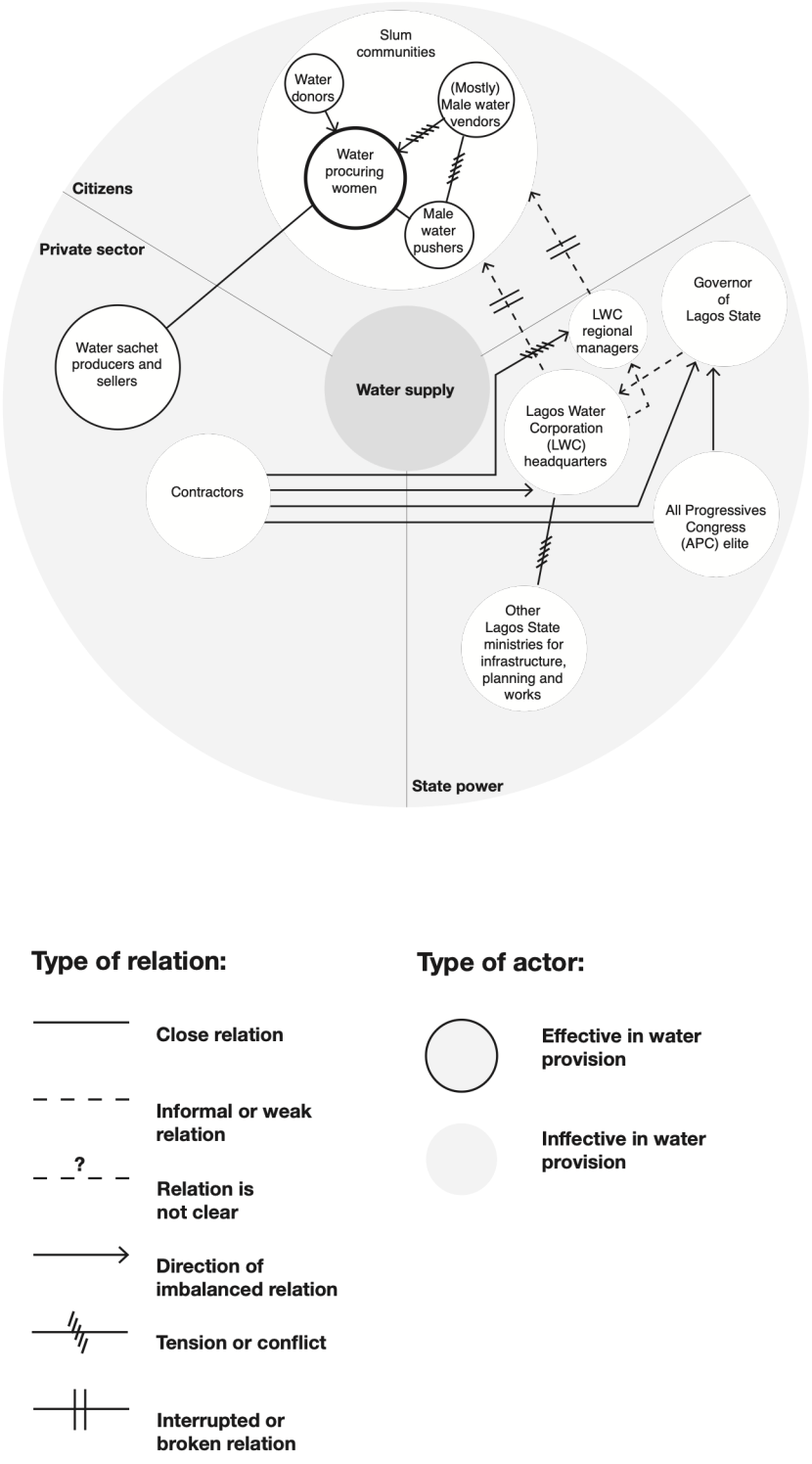
The most elusive aspects of Lagos' official water supply are nepotism and corruption (Expert interview 8, 2019; Expert interview 12, 2019). According to LWC officials, pro-forma contracts are issued by the ruling elite of the All Progressives Congress (APC) to favorites (Expert interview 10, 2019). The bills are settled, the repairs remain undone and the little existing infrastructure further decays (Expert interview 10, 2019). Figure 5.2 summarizes the limited reach of LWC.

Infrastructure System	"Standard" Unit	Costs	Usages	Reliability	Provider
Private borehole	Sold in buckets and bowls	Minimum USD 1600* (Investment costs, without maintenance)	Cooking; bathing; washing dishes, clothes	Steady, if properly implemented and maintained	Private
Shallow wells	Sold in buckets and bowls		Contaminated smelly water ′	Mostly in operation during the rains	Private
Standpipes	Sold in buckets and bowls		Drinking water	Often out of order	Lagos State government
LWC piped system	Flat or meter	Around USD63*/ month (flat) or USDO.62* to USDI.2*/ cubic meter	Drinking water	Erratic, often no water for months	Lagos State government
LWC water trucks	Tank filling	From USD1.6*/cubic meter	Drinking water	Upon order	Private operators

Table 5.2: Water supply systems in Lagos State. *Source: Author. Field notes (2019).*

*1USD = 460 NGN (exchange rate as of January 2023).

Figure 5.2: Role of Lagos Water Corporation (LWC). *Source: Author, 2026. Updated from Hoelzel (2024).*



5.2.5 Case Study Communities and Water Supply Systems

5.2.5.1 Profile of the Community Water Infrastructures

The four case study communities rely mainly on two sources of water: private water tanks and shallow wells (Table 5.2). Both sources do normally not offer drinking water quality, making the supplementary purchase of drinking water sachets necessary.

The private water tanks are either powered by nearby boreholes (inside or outside of the community), linked to LWC water mains or filled by water trucks, usually by private operators. The boreholes are privately drilled, owned and maintained. The extracted water is used for their own consumption and/or sold and/or given to neighbors (Figure 5.3). In order to connect private tanks to official LWC mains, an application must be filed with the LWC headquarters. The billing is usually issued as a monthly flat rate. The water supply via the official mains is not reliable as LWC has serious issues providing water. LWC water is also delivered per truck by private operators and paid upon delivery. The water in tanks connected to the LWC mains or filled by private operators is as well sold and/or given to neighbors, depending on the area (Field notes Amukoko-Mosafejo, 2019; Field notes Mafowoku, 2019; Field notes Orisunmibare, 2019; Field notes Otumara, 2019).

There are basically two distribution models in place. One is the radical “free-market economy” approach with private water vendors dominating the water supply (Orisunmibare, Otumara) (Field notes Orisunmibare, 2019; Field notes Otumara, 2019). The other one is the “solidary sharing” approach, in which water tank owners, among them traditional community leaders (baales, baloguns) share their water for free, complemented by donated boreholes by politicians during election campaigns and/or erratically functioning boreholes by international organizations (Mafowoku) (Field notes Mafowoku, 2019). In Amukoko-Mosafejo, a blend of the “free-market economy” approach with the “solidary sharing” approach is implemented (Field notes Amukoko-Mosafejo, 2019).

In the radical “free market economy” approach, the water vendors implement a “cartel-like” organizational structure and determine the price structure, regardless of whether they own borehole-powered tanks or LWC water-powered tanks. Some water vendors own several boreholes powered and LWC-linked water tanks to “diversify” their business. Power cuts are frequent and lasting, making the use of generators necessary and leading to increased prices. Erratically and unpredictably functioning water sources lead to an expensive and fluctuating supply structure for the slum dwellers. A bowl of 10 or 15 l of water is usually sold for USD0.16 or more (Field notes Orisunmibare, 2019; Field notes Otumara, 2019).

In Otumara, the dominance of the water vendors is only “interfered” by migrant workers from the north, young men from the Hausa tribe operating as water pushers (Figure 5.4). They deliver jerrycans for USD0.07 to USD0.1 each to the doorsteps. The water is fetched from boreholes of inferior quality, used for washing. In Otumara, the water vendors rely nearly 100% on their own boreholes inside or outside of the community, offering different qualities of water. Only three people have connected their tanks to the LWC mains (Field notes Otumara, 2019).

In Orisunmibare, the dominance of the water vendors is even stronger than in Otumara. A handful of water vendors own together approximately 10 tanks. Water from the tanks linked to LWC mains costs about USD0.4 per bucket (drinking water), and water from borehole-powered tanks costs about USD0.15 per bucket, if there is electricity. Otherwise, prices almost double. Since the water

scarcity in Orisunmibare is so stark and selling prices are so high, residents also rely on shallow wells with extremely substandard quality, sourced from polluted surface water. The misery of the residents is a little eased as Hon. Oputa, a parliamentarian, donated during his campaign in 2016 one borehole, from which water can be fetched for free if there is electricity. Otherwise, a token must be paid (FGD 1, 2019).

In a free-market economy, scarcities are resolved through changes in relative prices rather than through regulation. Buyers and sellers come together voluntarily to decide on what products or services to produce and sell and buy, and how the resources of labor and capital are used (OECD, 2004). The radical nature of this approach in the water supply is reflected in the vulnerable and marginalized environment where it takes place, neglected slum communities. The provision of this valuable good in Otumara and Orisunmibare is entirely left to the law of supply and demand, whereas the first is permanently precarious and the second is permanently high. Prices are high and people are extremely poor. One can hence not speak of a voluntary decision on the use of resources. It is rather a daily survival struggle without any chance or hope that a superordinate body would regulate at least a bit to ease the cruelty (FGD 1, 2019; FGD 2, 2019; FGD 5, 2019). However, the struggle is on both sides (vendor and buyer), which is another aspect of the radicality. The implementation and maintenance of water infrastructure are expensive (borehole drilling, connecting pipes often several 100 m long), and it is a daily struggle to defend it against vandalism of area boys at night (sometimes "commissioned" by jealous rivals in the community) and random destruction due to soaked untarred roads during the rains (FGD 6, 2019). There is a lot of competition and pressure among the vendors to provide reasonable water quality (no smell, no color, etc.) (FGD 6, 2019). It is hard to say who suffers more, the vendors or the buyers; it is a system of mutual exploitation (Figure 5.5). It seems to be a lose-lose situation and hence the opposite of what free markets promise: an efficient allocation of a good or service, here water, and a win-win situation for vendors and buyers (Field notes Orisunmibare, 2019; Field notes Otumara, 2019).

In Mafowoku ("solidary sharing" approach), several water tanks with free water are available (FGD 4, 2019). The traditional community leader (baale) offers from his borehole water for free. A token must be paid for the expenses of the generator, usually USD0.03 per bucket if applicable. Several state and federal politicians standing for elections donated boreholes. The Community Development Association implemented one public borehole, referring to it as a "self-help" project, funded through donations by the residents. The organization Save the Children donated another borehole, though not operating smoothly (Expert interview 6, 2019). There are LWC pipes along one of the main streets, but people complain about pipes running along or even in the drainage canals, serving de facto as open sewerage and about the erratic service. Hausa water pushers sell jerrycans for USD0.5 each. Like in the other communities, people need to buy drinking water sachets (Figure 5.6). Prices vary locally, 20 sachets cost about USD0.5 (Field notes Mafowoku, 2019).

In Amukoko-Mosafejo ("solidary sharing" approach blended with "free-market economy" approach), the main water source is a steadily functioning borehole, donated by Hon. Rita during the 2019 election campaign for the State House of Assembly (Field notes Amukoko-Mosafejo, 2019). The traditional community leader (baale) operates a borehole at his house, offering water for free if there is electricity. Other water tanks are partly borehole powered, shared for free or sold, while others are filled by private water trucks and shared for free or sold (FGD 3, 2019).

In any case and in any approach, the communities organize themselves, whereas water supply by the government hardly exists (Table 5.3). In the investigated communities, few people have their water tanks connected to LWC mains, and if, the reliability of the governmental water provision is extremely limited. Standpipes hardly exist, and if, they are out of order (Mafowoku) (Field notes Mafowoku, 2019).

Concluding, Amukoko-Mosafejo and Mafowoku face serious issues with access to reliable and usable water sources. Nevertheless, they cope with it, implementing specific community-led water provision systems that can be described as "successful," especially as the state is not considerably involved. The drinking water problem is unsolved in both communities. Orisunmibare suffers from dramatic water scarcity, not only in terms of drinking water. The community undergoes deep internal power struggles, reflected in the community-led, "free-market economy" driven water supply system with high and fluctuating prices. The situation concerning the water provision is not acceptable. Otumara is similarly ruled by a handful of powerful water vendors dominating the water supply system. The water provision though can be described as "moderately successful." The "solidary sharing" approach (Mafowoku; partly Amukoko-Mosafejo) is "regulated" by community associations and baales, replacing the function of the government and exposing the vulnerable slum dwellers a bit less to the allocation battle of water.

Figure 5.3: Water vendor (left) in Otumara at her house. *Source: Author (2019).*



Figure 5.4: Hausa water pushers in Otumara. *Source: Author (2019).*



Figure 5.5: Waiting for the water: Women in Orisunmibare put their bowls in the queue. *Source: Author (2019).*



Figure 5.6: Drinking water sachets seller in Amukoko-Mosafejo. *Source: Author (2019).*



Existing water distributions principles	"Standard" unit	Costs	Quality	Reliability	Provider	Amukoko-Mosafejo	Mafowoku	Otumara	Orisunmibare
Private water tank, privately owned, powered by nearby borehole	Bowl or bucket (5 to 15 litres)	0.13*USD to 0.26*USD (depending on available electricity or the use of the generator)	Cooking, bathing, washing dishes/ clothes	Steady, if generator is available	Private-informal ownership and sale	• •	x	• • •	• • •
Private water tank donated, and/ or with 'public function', powered by nearby borehole	Bowl or bucket (5 to 15 litres)	Free or 0.02*USD (depending on available electricity or the use of the generator)	Cooking, Bathing, washing dishes/ clothes	Steady, if generator is available	Private and/ or private-informal donation (NGO, politicians during campaigns), managed by CDA or traditional leader	• •	• • •	x	•
Hausa water pushers	Jerrycan (20 litres)	Around 0.5*USD to 0.8*USD	Bathing, washing dishes/ clothes	Steady (purchase per unit from cart)	Private-informal sale (water pushers pay a daily tax fee to the government)	•	• • •	• • •	-x

Table 5.3: Overview of water distribution principles, costs for water supply in relation to the distribution, water quality, service reliability and availability in the case study communities. *Source: Author. Field notes (2019).*

*1 USD = 460 NGN (exchange rate as of January 2023).
Key: • (yes) x (no) – based on field interviews, focus group discussions and own observation/mapping

Principles											
Private water tank filled by private trucks	Bowl or bucket (5 to 15 litres)	Around 0.3*USD	Drinking water	Steady	Private and private-informal ownership and sale	•	•	x	x	x
Private water tank, privately owned, powered by nearby borehole	Bowl or bucket (5 to 15 litres)	0.13*USD to 0.26*USD (depending on available electricity or the use of the generator)	Cooking, bathing, washing dishes/ clothes	Steady, if generator is available	Private-informal ownership and sale	••	x	•••	•••	
Water sachets	Sachets (500 ML)	Usually 0.3*USD (package of 20 sachets)	Drinking water	Steady	Commercial distribution	•••	•••	•••	•••	

To be continued – **Table 5.3:** Overview of water distribution principles, costs for water supply in relation to the distribution, water quality, service reliability and availability in the case study communities. *Source: Author. Field notes (2019).*

*1 USD = 460 NGN (exchange rate as of January 2023)
• (yes) x (no) – based on field interviews, focus group discussions and own observation/mapping
⋯ (high) ·· (medium) · (low) **x** (none) – indicatively expressed by residents in field interviews and focus group discussions and through own observation and mapping

5.2.5.2 Political-administrative Machineries, Power-connections and Actors involved in Water Supply Systems

The four case study communities are governed by complex networks of traditional and informal leaders; formal actors are hardly involved. The traditional informal networks have elusive "interfaces" with formal actors (Field notes Amukoko-Mosafejo, 2019; Field notes Mafowoku, 2019; Field notes Orisunmibare, 2019; Field notes Otumara, 2019). Formal actors in this context are LWC, Local Governments (LGA) and Local Council Development Areas (LCDA). LCDAs are informal subdivisions of LGAs.

Slum dwellers often refer to LWC officials as "plumbers" (Figure 5.2). They "officially" connect private pipes to water mains and issue sometimes "contracts" with informal water vendors (Expert interview 1, 2019; Field notes Orisunmibare, 2019; Field notes Otumara, 2019) (Figure 5.7). For the informal water vendors, it is difficult to verify whether these "plumbers" work on behalf of LWC or whether they perform undeclared work, earning some extra money (FGD 6, 2019). Either way, the interface between LWC regional managers, "plumbers" and "certified" water vendors involves bribes (Expert interview 1, 2019; Field notes Orisunmibare, 2019; Field notes Otumara, 2019). The relationship between the "plumbers" and the water vendors, and the water vendors and the community is conflictual and often violent, filled with mutual accusations of not fulfilling the "agreement" (unpaid bills or bribe), resulting in the destruction of connections (FGD 6, 2019). The general accusation by LWC is the illegal sale of water and/or illegal tapping into mains (Expert interview 1, 2019; Expert interview 7, 2019), whereas the slum dwellers accuse LWC of denunciation and discrimination (FGD 6, 2019).

The Community Development Associations (CDA) operate at the intersection of formal and informal institutions. Their existence goes back to pre-colonial times, when people organized themselves to provide physical improvement in their localities (Akinsorotan and Olujide, 2006). CDAs exist in Lagos State under different names and sizes, developing rules and regulations themselves. They plan and implement projects with little or no interference from external institutions. Theoretically, every resident can become a member, practically the membership is often limited to landlords. The CDAs report issues around broken or dysfunctional infrastructure to the LCDAs who should report to the LASG. Water supply is one of their key concerns (Field notes Amukoko-Mosafejo, 2019; Field notes Mafowoku, 2019).

Informal actors are water vendors, mostly landlords residing in the community. They are supplemented by water pushers, mostly migrant workers from the Hausa tribe. Politicians donating boreholes during election campaigns are among the most important informal actors in the community water supply (Field notes Amukoko-Mosafejo, 2019; Field notes Mafowoku, 2019; Field notes Orisunmibare, 2019). However, they also mirror the perverted understanding of politics and public administration. Politicians donate the much-needed water supply before the election, while being in office or in parliament, the infrastructure crisis of the city is not addressed or rather, cannot be addressed due to the "rent-seeking activities" (Gandy, 2006; Simone, 2005, pp. 1–26) of a small, but highly influential yet entangled economic and political elite (Expert interview 5, 2019; Expert interview 8, 2019).

Traditional actors on the community level are baales and baloguns. Baales, always male and descending from a certain family, act as mediators in minor disputes among community members. They are crowned in long-lasting processes by appointment or by heritage, confirmed by LCDAs/LASG and appearing on the payrolls of LASG. In three of the four analyzed communities, the baales have boreholes at their house but only two of them work, offering water

for free (Amukoko-Mosafejo and Mafowoku) (Field notes Amukoko-Mosafejo, 2019; Field notes Mafowoku, 2019). In Orisunmibare, the traditional leader is a balogun (Field notes Orisunmibare, 2019). Baloguns are traditional chiefs, mostly male, subordinate to the baale and usually responsible for a specific street or an entire community. The role of traditional leaders is seen rather critically, both by LSG and academic literature. LSG and LCDAs perceive baales and baloguns as ridiculous relicts that need to be removed in the aspiration of becoming a modern African city (Expert interview 4, 2019), whereas the scholarly writing considers the significant influence of traditional rule in the modern African city as problematic as they represent non-democratic, patriarchal sources of power in a fragile yet fully to emerge strong civil society (Gandy, 2006; Mbembe, 2021). Though the present research reveals that baales, if of integrity (Amukoko-Mosafejo, Mafowoku) can have a positive equalizing influence on the access to water supply (Field notes Amukoko-Mosafejo, 2019; Field notes Mafowoku, 2019).

LCDAs are supposed to consult the baales and the CDAs. However, in practice, this does not happen. Rather, the CDAs write letters to the LCDAs to report issues like broken infrastructure. Usually, these letters are not forwarded to responsible state ministries and agencies, giving the impression that the local government tiers are not willing and unable to support the communities (Field notes Amukoko-Mosafejo, 2019; Field notes Mafowoku, 2019; Field notes Orisunmibare, 2019; Field notes Otumara, 2019). Similarly, LCDAs report hardly getting responses from LASURA upon their complaints concerning community development issues (Expert interview 3, 2019; Expert interview 4, 2019). The ambiguous role of traditional leaders is reflected in the fact that corrupt CDAs and LCDAs use them for revenue-raising activities among the slum dwellers (Orisunmibare) (FGD 1, 2019; Gandy, 2006). Non-existent regulatory authorities in the water supply in Lagos' slums demand the communities' self-management, resulting in radical and cruel deregulation of the water supply which then turns into a “water market.” Weak or corrupt LCDAs, CDAs and traditional leaders enable the rise of “water-cartels” (FGD 1, 2019; FGD 2, 2019). “Water lobbies” consisting of baloguns and CDA members who sell water (Orisunmibare) charge high rates. Arrangements among water vendors (Orisunmibare, Otumara) (FGD 1, 2019; FGD 2, 2019) hinder initiatives from baales (Otumara) or NGOs (Orisunmibare) to bring free water into the communities (Expert interview 9, 2019; FGD 6, 2019). The combination of both, a weak state and a weak civil society, lead in Lagos' slums to the exploitation of almost everything and everybody. Simone (2006) describes such a condition as piracy: political-administrative machines lack will, interest and interest in implementing regulatory normative politics and politics, allowing for all kinds of unregulated and illegal activities.

Informal and traditional actors are partly efficient in the water supply, whereas formal actors do not contribute to the water supply (Table 5.4). Donated boreholes by politicians during election campaigns contribute significantly to the overall water supply in three of four communities. Regarding the analyzed power relations, Orisunmibare represents a dramatic case. CDA board members sell water, using the CDA for their own private interests. The balogun's own borehole is broken, and the community accuses him of corruption as he's involved in the water business of CDA board members. Consequently, the CDA has no regulating capacity in the interest of the community. A rather successful case is Mafowoku where the CDA is effective in maintaining the donated boreholes by politicians, in engaging the community, and to a certain extent, the LCDA in implementing additional public boreholes with international donors such as Save the Children. The CDA reports as well damaged hoses to the LWC regional manager. The repairs are usually not implemented. The baale's private borehole functions as “public” borehole. The CDA and the baale respect each other, implementing a collaborative approach. Consequently, water vendors do

not play a role in the water supply. Amukoko-Mosafejo has a well-established CDA that controls the water vendors. Opposite to Mafowoku, water vendors sell from their private tanks to supply the community but there is free water at two boreholes: one at the house of the baale, one donated by Hon. Rita in 2018. The third "public" borehole, implemented by the LMDGP in 2013 is broken. The residents of Otumara depend solely on private water vendors, once organized in the informal Water Vendors Association and as such also LWC "certified." In 2010, they dissolved voluntarily all relations with the government concerning water supply, due to a conflict around unpaid bills and the subsequent destruction of water pipes by LWC "plumbers." Whether the latter acted officially or privately, remains unclear. The two baales competing for power and influence struggle both to bring free water into the community. In Otumara, neither the baales nor the CDA can control the water vendors. The borehole at the house of baale Festus, donated by a politician dried up.

Altogether, the capacity of CDAs and baales is relevant for a functioning water supply. In communities, where the water vendors are controlled by the CDA (Amukoko-Mosafejo) or are not relevant to the water supply (Mafowoku) people feel less stressed and show solidarity. This is confirmed by the findings of the field research in Otumara. Here, the community has a technically functioning water supply, provided by the water vendors but the residents lament the lack of solidarity among each other, the same applies to Orisunmibare. In both communities, the CDAs and baales are inefficient or corrupt (Table 5.5) (Field notes Amukoko-Mosafejo, 2019; Field notes Mafowoku, 2019; Field notes Orisunmibare, 2019; Field notes Otumara, 2019).

Case Studies (Slums)					**Efficiency of the Actors in the Studied Slums**			
	Amukoko-Mosafejo	**Mafo-woku**	**Orisun-mibare**	**Otu-mara**	**Amukoko-Mosafejo**	**Mafo-woku**	**Orisun-mibare**	**Otu-mara**
Formal	Ijeromi-Ifelodun Local Council Development Area (LCDA)	Bariga LCDA	Apapa-Iganmu LCDA	Surulere LCDA	**x**	**x**	**x**	**x**
Formal-informal	Community Development Association (CDA)	CDA	CDA	CDA	●	●	**x**	**x**
Informal	Hon. Rita	Several Hon.s	Hon. Oputa	Hon. Banjo	●	●	●	**x**
	Water vendors	Water vendors	Water vendors	Water vendors	●	**x**	●	●
	(Hausa) water pushers	(Hausa) water pushers	(Hausa) water pushers	(Hausa) water pushers	**x**	●	**x**	●
Traditional	Baale Akeem	Baale Ariyo	Baale Adebayo	Baale Festus Baale Kalejaye	●	●	**x**	**x**

• (yes) x (no) – based on field interviews, focus group discussions and own observation/mapping

Table 5.4: Formal/informal actors and their efficiency in the water supply system of the case study communities. *Source: Author. Field notes (2019).*

Figure 5.7: Vendor's certificate, issued by LWC "plumbers." *Source: Author (2019).*



Actor and institutional efficiency	1		2	3	4	5	6	7						
Infrastructure provision									**Regulatory effectiveness**					
	LWC	LCDA	CDA	Donating Politicians	Water vendors	Water pushers	Traditional leader(s)		LWC	LCDA	CDA	Donating Politicians	Water vendors	Water pushers	Traditional leader(s)
Mafowoku – **Overall assessment of water supply:** Moderately satisfactory **Approach:** Solidary sharing	●	x	●	●	x	●	●		x	x	●	x	x	x	●
Amukoko – **Overall assessment of water supply:** Moderately satisfactory **Approach:** Solidary sharing	x	x	x	●	●	●	●		x	x	●	x	x	x	●
Orisunmibare – **Overall assessment of water supply:** Unsatisfactory **Approach:** Free-market	x	x	x	●	●	x	x		x	x	x	x	●	x	x
Orisunmibare – **Overall assessment of water supply:** Moderately satisfactory **Approach:** Free-market	x	x	x	x	●	●	x		x	x	x	x	●	●	x

Key: • (yes) x (no) – based on field interviews, focus group discussions and own observation/mapping

Table 5.5: Analysis of relevant actors in relation to their role. *Source: Author. Field notes (2019).*

5.2.6 Conclusions and Policy Implications

“The issue at stake,” Gandy (2006) wrote almost 20 years ago, “is whether a workable concept of the public realm can be established in a context where social and economic relationships are in a constant state of flux and uncertainty.” Acknowledging water as both a common good and a human right (Sarkar, 2022, pp. 16–19) and using water supply in urban slums as a lens to study the access to urban infrastructure in postcolonial Lagos, as this article does, one has to conclude: there is nothing really public in Lagos, if more than 90% of the population do not have access to public water. Historically, the majority of Lagosians never had access to functional water supply. In light of the enormous growth predictions for Lagos, one must assume that there will not be a public realm as such in the foreseeable future, neither in terms of infrastructure nor in terms of governance. How can these numerous and splintered realms (Mbembe, 2021), neither private nor public, form the base for improved water supply systems for the majority of urban poor in contemporary Lagos (Table 5.5)? To approach the water infrastructure crisis in Lagos, combined technical, organizational and anthropological knowledge of informal networks, strategies and practices is needed, including discussions about the role, legitimacy and possible transformation of traditional power structures.

The common but obviously inaccurate dichotomy of “formal” versus “informal” is not only unproductive when approaching the water supply problem in the slums of Lagos, but it also does not coin the entanglement and motivation of actors and institutions. A “hybrid”" approach is suggested in order to address the “conflicting rationalities” (Watson, 2009) between the government and the poor in order (a) to stop the neglect of slums, perceived as obstacles to modernization and development, (b) to stop the mutual exploitation of sellers and vendors in the informal “water market,” and (c) to ease the daily hardship of slum dwellers. “Hybrid” water supply can be defined as the common ground between the formal and the informal. Such “hybrid” approaches would lead to the recognized coproduction of services and infrastructure, giving legitimacy to informal and traditional actors and using the existing knowledge of community water supply. Moreover, it would immediately support LSG's (2022, pp. 112–114) declared intentions to improve the water infrastructure but by focusing on distribution and supply instead of (increasing) demand gaps. Even if Lagos State is able to come up with the huge amount of the necessary funds to implement the required adjustment in the water infrastructure to accommodate the growing population and to adapt to the increasing water scarcity, it would have to work with a lot of uncertainty given the complex social, spatial and economic realities on the ground (Simone and Pieterse, 2017, p. 17). This includes questions on how to roll out such infrastructure and how to deal with Lagos' densely populated neighborhoods while implementing it. Therefore, it is likely that both financial and infrastructure inputs will happen incrementally with a major emphasis on localized systems (Simone and Pieterse, 2017, p. 17).

The Lagos Water Supply Masterplan (LWC, 2018) is focused on quantities. The actual and tangible issues though are with questions of distribution and supply, which, to a large extent, have to do with everyday life realities of the poor urban and the limitations therein (Sarkar, 2022), requiring a shift in policy thinking and making. Opposite to that, the understanding of real politics by LSG politicians and officials is guided by the claim that only large-scale infrastructure can change the economy of access and citizenship, not willing or able to see the power that micro transformations can unfold in everyday living (Simone and Pieterse, 2017, p. 156). In reaction to the enormous infrastructure crisis the city faces, slums dwellers, in different constellations, assume the task of the government (Harrison, 2006). Regrettably, their efforts in providing the water supply are neither acknowledged, nor supported. This is disastrous, for several reasons. The

contribution of the informal networks is vital for people to have access to water. Community-built and -managed infrastructure and services can and should not become vehicles through which the state can bypass its responsibility (Simone and Pieterse, 2017), but communities can and should become acknowledged co-producers. The recommendation is hence to work towards politics that includes both, the systemic and the acupunctural, the formal and the informal. By nature, systemic, large-scale infrastructure must be led by the government (Gandy, 2006), but this does not mean that government cannot acknowledge, support and connect the many informal "mini government networks" in place in order to achieve a better city and an acceptable water supply for all.

As shown, "micro government networks" are complex and dynamic yet pragmatic relations between slum dwellers, depending on the materiality (here: water supply) and the power positions due to tradition, expertise (here: water supply), and status (ethnicity, gender, land ownership). If they function well, they may be the mechanisms through which the sustainable implementation and administration of water supply in slums in Lagos might succeed (Table 5.5: column b). In communities, where people express a "moderate satisfaction" with the overall water supply and the "solidary sharing" approach is implemented, the traditional leaders are personalities of integrity and take their roles as "community shepherd" seriously. They stick to their role as mediators in community quarrels and offer water for free to the community. The CDA is opposite to the baale a democratic institution. The positions of the chairman, secretary, etc. rotate and residents can run for office. Whenever these semi-formal institutions can perform efficiently their duties, the community has better access to water. The "free-market" approach in which private water vendors dominate the events is only implemented if the informal-traditional "government" of the CDA and the baale is not functioning. The two semi-formal and traditional institutions are familiar with the needs and potentials of "their" communities to improve the water supply. They also know how to mobilize the communities, and they need themselves to be involved if the improvements in infrastructure and services should be lasting. But the research shows as well that communities with a "free-market" approach, hence without any infrastructural hardware support by the government and without any "regulatory power" of the CDA and the baales, are well capable of sustaining themselves in the water supply (Table 5.5: column (a) and (b) Otumara), technically and regarding governance despite of rougher conditions for the vulnerable dwellers.

This calls either for a targeted cooperation of LWC with the CDAs and the baales, on behalf of the communities, or for targeted cooperation of LWC directly with the water vendors in the communities. Both approaches demand the establishment of non-negotiable requirements, acknowledging the vulnerability of the slum dwellers. In both cooperation models, "solidary" and "free-market approach," the non-negotiable framework conditions should include the amount of spatially equally distributed water points and the delivered water quality. Ideally, one-third or half of these water points provide drinking water quality. Another aspect that needs to be negotiated is the price structure and the payment modalities. In the "solidary" model, there should be a reliable yet affordable structure for the people who cannot afford their own boreholes but buy or receive from neighbors. A purely "donor-oriented" model may seem sympathetic, though creates dependences on goodwill. In return, the borehole owners can use the revenues from the water sale for the maintenance of the water infrastructure. In the "free-market" model, the price structure should respond to the needs of the water vendor for whom the business is their livelihood, and to the needs of the slum dwellers who live on very little on a hand-to-mouth base. In the case of the "solidary model," the CDA would be the body that would hold the involved actors accountable for their duties. For internal community disputes, such as unpaid water purchases or destroyed

infrastructure, the baale is traditionally the mediator. In the “free-market” model, an additional, citizen-based board with an equal representation of men and women should be created to hold the water vendors accountable and prevent overcharged water prices, poor water quality or insufficient amounts of water. Such a board would also help to make the difficulties of the water vendors transparent to the slum dwellers.

The key to a functional water supply and a better city life lies in the understanding of the entanglement of the materiality (water) and its distribution (water supply system, including the people). There is no uniformity in these entanglements. To ease the struggle for the millions of slum dwellers in Lagos, the many existing water supply systems in place, in their totality, must be the starting point for improvement, rather than idealized or disapproved conceptions of good or poor governance and supply systems. The challenge lies in accepting the imperfect practices by simultaneously supporting the communities in eliminating the worst exploitation and corruption factors.

In an institutional reform, the baales should be released from the payroll of the government to be able to advocate for their communities. The “crowning process” of the baales could become a democratic election process, in which the community can participate. In return, the CDAs could receive a simple set of uniform rules with both landlords and tenants becoming members. Some CDAs might need some support from NGOs or similar in running their associations as well as in the planning, construction and administration of water infrastructure. LWC should actively cooperate with the communities, rather than taking on a learning and connecting role. With such a “hybrid” and certainly experimental approach (Simone and Pieterse, 2017, p. 9), finding common grounds between the formal and the informal in planning (Myers, 2011, p. 105), implementing and administrating urban infrastructure, Lagos could start to implement its own version of “African urbanity,” based on lived realities. The radical extension of citizenship rights based on practical needs (Gandy, 2006) and on the factual everyday production of the city would automatically constitute the “right to the city.”

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5.3 Post-Publication Reflection

Women navigate compounded structural exploitation at every institutional scale simultaneously—state abandonment, community exclusion, and household burden converging on the same bodies performing the same daily labor. This multi-scalar convergence is what the paper's comparative framework documented empirically, and the Orisunmibare eviction of February 2024 validates its central finding about the depth of state–community mistrust while revealing something the comparative analysis could not anticipate: eviction does not merely destroy infrastructure but destroys the hybrid governance possibilities that hybrid governance theory proposes as the solution to infrastructure inequality.

This is the analytical insight the eviction makes available that the paper could not have offered. Orisunmibare's documentation includes a specific detail that carries theoretical weight: one of the community's major vendors had installed pipes connecting to LWC mains—a fragile but real form of state–community accommodation, a tacit institutional collaboration operating outside official channels. The mains carried no water for years, yet this infrastructure represented precisely the kind of informal–formal entanglement that hybrid governance theory identifies as the productive ground for co-production. The eviction destroyed it entirely: vendor boreholes, vendor-installed pipes, and the informal LWC collaboration vanished simultaneously with the settlement. This vendor-installed pipe infrastructure also demonstrates, ironically, the technical feasibility of what Section 7.3.5 proposes: piped distribution from borehole to multiple water points is not a theoretical innovation but already practiced by vendors across the case-study communities. What the dissertation proposes is its standardization under women's committee governance for equitable compound-level coverage rather than vendor profit maximization. What Orisunmibare's documentation and analysis demonstrate is not merely that the community was neglected then demolished—the familiar cycle—but that the specific hybrid arrangements hybrid governance proposes as the path forward are themselves rendered impossible by the state violence hybrid governance theory does not adequately theorize. Eviction is not merely the failure of co-production; it is its negation, destroying the very institutional relationships through which transformation might have proceeded.

The eviction scattered Orisunmibare's women water procurers across Lagos, dissolving the organizing knowledge and relationships documented across this doctoral research. The paper's comparative analysis—distinguishing vendor-dominated free-market communities like Orisunmibare from solidarity communities like Mafowoku—remains analytically valuable for revealing that diverse institutional configurations produce different equity outcomes. But the evictions of both Orisunmibare (February 2024) and Precious Seeds (December 2025) demonstrate that neither governance model protected against state violence when government

prioritized land for elite development: vendor exploitation and women-centered organizing proved equally insufficient at the scale where eviction decisions are made. This validates that community-scale interventions, however well designed, operate at insufficient scale to challenge state development priorities driven by land value politics—insufficient not only upward (against state power) but downward (against household patriarchal structures suppressing women's organizing). Addressing the crisis requires simultaneously working above the community scale through cross-community networks and state policy reform, and below it through household-level organizing challenging gendered resource allocation.

These recognitions—sharpened by witnessing both evictions after publication—fundamentally shaped the dissertation's analytical argument in Chapters 7 and 8—for instance, the cross-community network framework (Section 7.4.1) and the 2026 LWC implementation project (Section 8.2). Rather than proposals operating at the scale of individual settlements, each vulnerable to isolated destruction, the dissertation proposes building Lagos-wide women's water networks transcending specific geographic locations, and pursues LWC partnerships explicitly designed to protect women's governance authority against both community-level patriarchal capture and state-level erasure. Addressing Lagos's water crisis means confronting the impossible situation these evictions epitomize: communities systematically neglected yet violently erased when land becomes valuable, hybrid governance possibilities—like the vendor-installed LWC connections that once functioned but had carried no water for years—destroyed before restoration could be attempted, and women bearing compounded exploitation at every institutional scale—while the analytical tools most suited to theorizing their situation, hybrid governance and co-production theory, remain inadequate to the state violence that forecloses the possibilities they propose.

Chapter 6: Gendered Waterscapes and Women's Embodied Experiences

Published Paper:

Fabienne Hoelzel (2025)
Unpacking female everyday water practices: the uneven waterscapes of Lagos's slum communities
International Development Planning Review 47(4),449–476
DOI:10.3828/idpr.2025.12

6.1 Chapter Introduction

Position within Cumulative Thesis:

This paper centers women's lived experiences of water access across all five case study communities (adding Precious Seeds to the four examined in Chapter 5), arguing that gender constitutes the root inequality through which all other dynamics—property relations, vendor exploitation, community governance, state neglect—operate. The publication examines women's daily water procurement struggles in Lagos slum communities, advancing the thesis that water access operates through household-powered urban waterscapes that reproduce women's subordination by making them solely responsible for water procurement while denying them control over water resources, allocation, and use within households and communities.

The paper represents the culmination of the intellectual trajectory documented in Chapter 1, Section 1.2.2: from initially gender-blind infrastructure analysis (Chapter 4) through comparative institutional study documenting women's exploitation without centering it analytically (Chapter 5) to explicitly feminist reconceptualization revealing women simultaneously as essential infrastructure providers whose unpaid labor produces urban-scale water access and as subjects of systematic exclusion from governance at household, community, and state scales. This progression reflects not abandonment of earlier insights but their integration into more complete understanding: technical coordination mechanisms and institutional arrangements (Chapters 4 and 5) matter, but they operate through patriarchal structures that position women as essential infrastructure providers while denying them governance voice.

The paper demonstrates that women's daily routines—rising at 4 AM to queue at water points, allocating one-third of household income to water purchases, carrying 25-liter jerrycans across distances, accessing water last within households—constitute infrastructure provision that produces the actually existing municipal water coverage for large portions of Lagos. Women are the primary stakeholders in Lagos's informal water sector, yet are not treated as such politically, socially, or culturally. This positioning—simultaneously essential and excluded—reveals why technical solutions (Chapter 4's coordination mechanisms) and partnerships with existing community structures (Chapter 5's solidarity models with CDAs and traditional leaders) prove inadequate: they accommodate rather than challenge the patriarchal governance excluding women who perform infrastructure labor.

The publication documents how gender inequalities intersect with water scarcity to create disproportionate burdens on female slum residents, depicting women's agency within material constraints alongside their subordinate social position. Drawing on embodied approaches to water inequality that examine how water access manifests at the bodily scale—particularly for women and marginalized groups—the paper challenges dominant technocratic approaches that focus on infrastructure rather than social dynamics. The analysis employs postcolonial intersectionality to examine how gender intersects with class and urban marginality to shape water experiences, arguing that water governance in Lagos reflects broader postcolonial patterns where power operates through patriarchal structures and women remain subject to subjugation through the convergence of historical trajectories, societal imaginaries, and current political structures.

Drawing from ethnographic fieldwork between 2019 and 2025 (detailed in Chapter 3), the publication employs narrative analysis to understand how women interpret their daily water experiences. The methodological approach—centering women's own accounts of procurement labor, economic burdens, time poverty, physical exhaustion, and household exclusion—enabled documentation of the profound disconnect between government water policy and lived realities, underpinning one of the core concerns of the entire doctoral research project: that Lagos's water crisis cannot be addressed through technical or institutional interventions alone but requires fundamental transformation of gendered power relations at all scales.

Critical empirical contribution: The paper's feminist analysis demonstrating women's exclusion from water governance despite performing all procurement labor provided the analytical foundation for subsequent intervention. Paper 3's conclusion recommends that Lagos Water Corporation implement gender policy recognizing "water supply is not a purely technical infrastructural issue, but linked to, and rooted in, cultural, political and social norms," specifically proposing that "local, neighbourhood-based female water committees should manage and oversee non-commercial water points." Following publication, FABULOUS URBAN | NIGERIA FOUNDATION implemented this recommendation in Precious Seeds (2021–2025), working with the Oworo Reality Women Group to form a women's water committee—positioning women who procure water daily as legitimate infrastructure decision-makers rather than merely vendors' customers. The committee developed water point management plans and engaged directly with local government officials who assessed the site for borehole provision in early 2025, demonstrating women's capacity to organize collectively and partner with government when interventions bypass male community intermediaries.

Yet the community's December 2025 forced eviction—bulldozers demolishing homes, water points, and organizing spaces—exposed community-scale organizing's ultimate insufficiency against state violence prioritizing elite waterfront development over slum populations' spatial claims. The committee's destruction validated Paper 3's critique of governmental neglect while revealing its practical limitations: community-scale organizing, though necessary for building women's agency, remains insufficient when settlements themselves face erasure. This recognition—from implementing Paper 3's recommendations and witnessing both Precious Seeds' and Orisunmibare's (February 2024) evictions—reveals that divergent internal conditions (women-centered organizing vs. vendor cartel control) proved equally insufficient against state-scale displacement. Both evictions demonstrate that protection requires cross-community women's networks transcending specific geographic locations, direct Lagos Water Corporation partnerships bypassing male intermediaries, and explicit legal-institutional protection mechanisms—interventions operating at scales beyond what individual settlements can provide.

This longitudinal evidence directly informs Chapter 8's central argument: when one community is destroyed, cross-community networks enable organizing knowledge, relationships, and strategies to persist, allowing continued advocacy in communities not yet demolished.

Research Questions Addressed:

This paper addresses the third sub-question from Chapter 2, Section 2.4:

How do women experience water infrastructure access and procurement labor in their daily lives across Lagos slum communities, how does their positioning as primary water procurers constitute them simultaneously as essential infrastructure providers whose unpaid labor produces urban-scale water access and as subjects of exploitation through male-dominated decision-making and control structures at household, community, and state scales, and how does gender mediate all other inequalities (property relations, vendor dynamics, community infrastructure control, state neglect) structuring water provision in postcolonial African cities?

Methodological Approach:

The paper employs feminist ethnographic methodology, centering women's narratives as authoritative knowledge about water infrastructure systems women navigate daily. Drawing from ethnographic fieldwork between 2019 and 2025 (detailed in Chapter 3), the publication employs narrative analysis attending to how women themselves frame their situations: what they emphasize, what silences or contradictions appear, how they position themselves as agents despite constraints. Analysis involved reading interview transcripts multiple times to identify narrative structures and recurring themes; attending to temporal rhythms of water procurement (4 AM wake-ups, hours-long queues); noting bodily language describing physical exhaustion, hygiene deprivation, shame; and recognizing how women's accounts navigated tension between documenting hardship and maintaining dignity. This approach revealed patterns invisible to quantitative metrics: women's accounts simultaneously documented extreme suffering and demonstrated sophisticated adaptive strategies—developing water-sharing networks with neighbors, timing procurement to avoid peak prices, negotiating vendor credit arrangements. The paper's feminist methodology also required acknowledging power relations throughout the research process: my positionality as white European woman researcher (Chapter 1, Section 1.2), the emotional labor these conversations demanded, and commitment to reciprocity through MDDT provision, DIS design, and planned 2026 LWC implementation project.

Methodological details appear in Chapter 2, Sections 2.5.3–2.5.5.

Key Findings:

- **Women as infrastructure providers:** Women's daily water procurement labor—fetching, transporting, storing, rationing—constitutes essential infrastructure provision that produces urban-scale water access. Following Simone's (2004) "people as infrastructure" concept, this research demonstrates how women specifically function as water infrastructure through embodied practices, their everyday routines constituting the actually existing municipal water system for large portions of Lagos rather than government-provided pipes.
- **Triple exclusion from governance:** Women remain systematically excluded from water decision-making at household scale (men control spending despite women procuring), community scale (male vendors, traditional leaders, CDA leadership), and state scale

(LWC policies ignore gendered dimensions). This multi-scalar exclusion means women who perform infrastructure labor cannot influence infrastructure placement, pricing, operating hours, or investment priorities.

- **Economic and bodily extraction:** Women allocate up to one-third of household income (8,000–30,000 NGN monthly) to water purchases—resources extracted from other necessities. The daily hours long procurement labor extracts bodily capacity (energy, health, safety) from income generation, education, rest, and self-care. Nigeria's Naira devaluation (23,000 NGN = 50 EUR in 2019 → 14 EUR in 2026) intensifies burden while water costs remain constant, demonstrating worsening precarity.
- **Gender as root inequality:** The paper's central theoretical contribution demonstrates that gender isn't one inequality among many but the root inequality structuring all others. Property relations, vendor exploitation, community exclusion, and state neglect all operate through patriarchal structures positioning women as infrastructure providers while denying them governance agency. Addressing Lagos's water crisis requires not merely technical solutions or community partnerships but fundamental transformation of gendered power relations at all institutional scales.

Consistency with Chapter 3:

This paper draws on all five community profiles documented in Chapter 3: Otumara (3.3.4), Amukoko-Mosafejo (3.3.1), Mafowoku (3.3.2), Orisunmibare (3.3.3), and Precious Seeds (3.3.5). The technical infrastructure documentation, economic burden data (Section 3.3.7), and spatial mapping provide the material foundation for feminist analysis of how women navigate these systems daily.

Critical post-publication developments: Both Orisunmibare (February 2024) and Precious Seeds (December 2025) were forcibly evicted during or after this research, destroying infrastructure documented in Chapter 3 and displacing tens of thousands. The Precious Seeds eviction occurred despite multi-year infrastructure work and women's water committee formation, validating this paper's argument about community-scale intervention limits. Both evictions underscore the necessity of cross-community organizing at scales transcending individual settlements vulnerable to erasure—the core recommendation elaborated in Chapter 8.

Note on Paper Presentation:

The paper appears as published, with minor formatting adjustments for dissertation consistency. Cross-references updated to match dissertation numbering. The paper analyzes all five communities; Precious Seeds was added to the research specifically to enable the feminist focus documented here, providing longitudinal depth through sustained organizational engagement (2021-2025) impossible in the other four communities where my presence remained periodic.

6.2 Unpacking Female Everyday Water Practices: The Uneven Waterscapes of Lagos's Slum Communities

6.2.1 Abstract

Although it is widely acknowledged that women in the global South and more specifically, in urban Africa, play a central role in providing and storing water, a gendered approach to everyday water practices remains underutilized. Drawing from fieldwork in five slum communities in Lagos, the research analyzes the enormous daily struggle of female slum dwellers, mostly poor, in obtaining water for their households. Water supply infrastructure by the government is faulty, not maintained and/or non-existent. Power in everyday water practices is held by males; the informally implemented and managed water infrastructure is almost exclusively run by men, and within the household, the men, if/when around, claim the right to use water first. The paper traces the everyday water practices of female slum dwellers within the prevailing water scarcity and economic limitations, reproduced by their social position. The way out of Lagos's water crisis is a nuanced, gendered approach to water supply. The paper concludes with recommendations on how this can be achieved.

Keywords: everyday practices, everyday urban practices, everyday water practices, gendered, female, women, slum, urban poor, urban water, sub-Saharan Africa, Lagos

6.2.1 Introduction

Dominant approaches to water inequality, water insecurity and water unavailability tend to overlook the connection between these concerns and gender and class, especially at the scale of the body (Blaikie 2006; Acey 2010; Loftus 2015; Cleaver 2018; Truelove 2019a, 2019b; Sarkar 2020). The present research documents the everyday water practices of poor women in five slum communities in Lagos, Nigeria. Women bear the physical and economic responsibility for organizing the water for their households. Within the households, the men claim the right to use the water first, forcing women to rationalize the water, at their own expense. The allocation, distribution and sale of water in the five slum communities is implemented and controlled by men. These 'household-powered' urban waterscapes reproduce the subordinate position of the women, recreating additional unevenness in their lives and increasing their hardship. These dynamics surrounding water access are inherently entwined with women's agency, i.e. their capacity as individuals to act independently and make choices that shape their lives and social structures (Editorial Office 2024). The research documents the women's agency, maneuvering in the liminal space produced by material and economic scarcities and their low social status (Mbembe 2001, 6).

The central role of women in water issues was recognized by the Dublin Statement on Water and Sustainable Development (Gorre-Dale 1992), while the Agenda 21 of the Rio Declaration on Environment and Development (UN 1992) and the International Covenant on Economic, Social and Cultural Rights General Comment on the Right to Water (UN 2003) underlined the significance of gender in water supply and provision.

In today's Lagos, two out of three people live in urban slums (Lall et al. 2017, 17), of which there are estimated to be 380 (Human Rights Watch 2021). The numbers concerning Lagos's current

population vary greatly. The Nigerian government estimates Lagos State's population at 21 million inhabitants (LSG 2024), significantly different from the UN/World Urbanization Prospects' (2025) most recent data, according to which the population is 17.2 million. A total of 80 percent of the households have less than $1.9 World Bank Purchasing Power of Parity (PPP) available per day (LSG 2016). This research addresses the living conditions of the majority population in Lagos, and the overlap between self-sustained urban water supply, urban slums and urban poverty, and focuses therein on the water-procuring women. The term slum is used in this article in an empowering sense and refers otherwise to the living conditions (UN Habitat 2003, 12). People living in Lagos are referred to as citizens, aware of the fact that 20 percent (or more) of the population are migrants (Lawanson 2022).

Access to water is defined as a human right (UN 2010); the lack thereof manifests perhaps the most distressing indicator of social inequality (Gandy 2006). Lagos has long suffered from a huge and increasing water demand-and-supply gap, due to a mix of a fast-growing population, degraded water infrastructure and poor maintenance, among other things (Expert interview 1; Expert interview 14; LWC 2018; LWC 2025). A total of 90 percent or more of Lagos's population covers its daily water needs through 'informal' or 'self-sustaining' place-based water supply systems (Gandy 2006; ERA 2016; Lawanson 2021), 5 percent have household connections (Expert interview 14; Oyerinde and Jacobs 2022) and 5 percent have access to illegal standpipes. The insufficient public water supply necessitates Lagos's citizens to source their own water. Using qualitative data from five slums in Lagos, the research focuses on how female slum dwellers urbanize water, i.e. how they make water available for their urban households. Accordingly, the research aims at contributing to postcolonial studies on urban water, comprehending people as infrastructure (Simone 2004), in a reorientation towards everyday practices, with a specific focus on water-procuring women in slums. As Harrison (2006) put it powerfully and beautifully, the African city is produced at the scale of the household. The social position of women requires them to provide the water for the household, independent from the structure of the household (single/sole bread winner or financially supported by a partner/spouse). The research traces how female slum dwellers in selected slums in Lagos access urban water for their households and how these everyday water practices manifest at the bodily scale. While it is clear that case-study investigations cannot be generalized as, and transferred to, all female slum dwellers in Lagos, the research concludes with recommendations on how the access to water infrastructure for female slum dwellers could be improved.

6.2.3 Objective and Background

A growing body of southern-centered theories, analysis and conceptualizations of urban water evolves around water inequality, water insecurity and water unavailability, whether or not these terms are explicitly named. Scholarship of urban water infrastructure arrangements has been addressing access of water to, and beyond, the network, consisting of several hybrid, formal and informal water infrastructure systems (Gandy 2006; Chitonge 2014; Furlong and Kooy 2017; Monstadt and Schramm 2017). Theories, conceptualizations and analyses of everyday practices in African cities (Demissie 2007; Simone 2004; Gandy 2006; Harrison 2006; Myers 2011; Pieterse 2008; Lawhon et al. 2014; Simone and Pieterse 2017) have not explicitly been linked to urban water, representing one of the reasons why issues around water supply haven't been solved (Anand 2007; Sarkar 2020; Lawanson 2021). Scholarly work has discussed the messiness of

informal water activities and water networks, often contested and renegotiated daily (Cleaver and Hamada 2010; Ahlers et al. 2014). The heterogeneity of informal water practices was documented in specific contexts, for instance in peri-urban areas in Ghana (Peloso and Morinville 2014), in Khartoum, Sudan (Zug and Grafe 2014) and in Ndola, Zambia (Liddle et al. 2014).

Loftus (2015), Truelove (2019b) and others critique dominant approaches to water inequality, water insecurity and water unavailability as being primarily technocratic, depoliticized and environmentally deterministic. These scholars argue that common frameworks such as the Sustainable Development Goal 6 – to ensure safe and sufficient water for all by 2030 – deservedly bring the scarcity of potable water for poor populations to the forefront of addressing water security. However, they tend to explain the existing water scarcity and insecurity as a product of environmental events and insufficient technocratic fixes. 'Embodied' approaches to water inequality, water insecurity and water unavailability aim at finding explanations through the analyses of power and politics, hence in political, cultural and economic processes (Lawhon et al. 2014). While a growing body of scholarship has employed the concept of 'waterscape' as an analytical vehicle to investigate the linkages between water, power and politics (Norman et al. 2012), Loftus (2015) and Truelove (2019b) critique that analyses of water inequality, water insecurity and water unavailability have a 'scale issue'. Scholarly work on water, power and politics focuses on the watershed, the nation-state or the community, but rarely links water inequality, water insecurity and water unavailability to the scale of the body (Hungerford 2012). In response to this, recent feminist and 'embodied' analyses of the distribution of, and access to, urban water address the site and scale of the body as critical for understanding inequalities in everyday water practices (Truelove 2019b). These approaches document how processes manifest in bodies of women and ethnic minorities differently (Truelove 2019a), also conceptualized as 'postcolonial intersectionality' (Mollett and Faria 2013).

Ahlers et al. (2014) argue that a gendered perspective on the provision of water remains rare, although it is widely acknowledged that women in the global South (UNESCO 2003) and more specifically, in urban Africa, play a central role in the supply, management and safeguarding of water (Thompson et al. 2001; Acey 2010; Graham et al. 2016; Lawanson 2021). Accordingly, Cleaver and Hamada (2010) argue for a deeper understanding of how women indeed may access the results of water governance. Acey's (2010) research in poor communities in Lagos and Benin City has found women being excluded from actual participation in the water supply business and associated opportunities. Similar to Truelove (2019a, 2019b), Sarkar (2020) critiques the lack of adequate documentation of the everyday water practices at the bodily scale, here specifically at the scale of the female body.

The present research takes up these calls and aims at contributing to the exploration of agency, gender and embodiment in scholarly work on female everyday water practices by documenting how women in the slums of Amukoko-Mosafejo, Mafowoku, Precious Seeds, Orisunmibare and Otumara in Lagos gain access to water. The women's social position reinforces their household's weak purchasing power and the unreliability and/or unavailability of water. The research traces the direct and indirect implication of male power on women when (trying to) access water on a daily basis, causing distress and harming their physical and mental well-being and their dignity.

The 'bigger picture' of the female slum dwellers' water drama is the extreme, largely man-made water scarcity and inadequate public water supply at the state level, mainly through poor politics, inadequate policies and venality in public procurement (Gandy 2006; ERA 2016; Chiori 2018; Lawanson 2021; Ogundari 2024; Expert interviews 5, 10, 12 and 14). The resulting place- and

'community-based' infrastructural arrangements are unreliable, insecure and expensive. Silted up boreholes, the use of diesel powered mini-generators (due to frequent power blackouts) and vandalism (due to competing water vendors) cause high operating costs and maintenance. The informal, profit-oriented networks are almost exclusively run by men (Acey 2010; Lawanson 2021), involve violence, greed and robbery (Gandy 2006) and exploit the water insecurity of the communities' households, under which particularly the water-fetching women and their helping (female) children suffer, as it will be shown.

Achille Mbembe's (2001, 128) analysis on sub-Saharan postcolonial power relations challenges obvious perceptions of power balances between those, seemingly in power (e.g. government, elite) and those, seemingly obeying (ordinary citizens). Mbembe identifies postcolonial violence and situations of powerlessness precisely in the entangled practices of the government, elite and ordinary citizens. According to Mbembe (2001, 128), ordinary citizens engage in sophisticated, dance-like everyday practices, 'toying, deceiving and guiding with power instead of directly confronting it'. However, this seductive explanation is an analysis of purely male behavior, lacking the gendered aspect and the female experience and perspective. In response to feminist critique, Mbembe (2016, 28) indeed specifies that power in postcolonial sub-Saharan Africa takes on a male form from the outset. In the logic of postcolonial power, women are above all objects of use and consumption (Mbembe 2016, 34). Tsitsi Dangarembga's (2022, 76) description of women's everyday lives in postcolonial sub-Saharan Africa finds women only fit for subjugation. The present research will demonstrate that power exercised in the everyday water practices of female slum dwellers in postcolonial Lagos is male.

The research will document the embodied and daily acquisition of erratically available water by female dwellers for their households in the slums of Amukoko-Mosafejo, Mafowoku, Precious Seeds, Orisunmibare and Otumara. The women rely on an unstable and insecure and almost daily varying set of informally managed water sources, offering equally varying water qualities. The research unpacks the violent everyday experience in the water procurement of women in Lagos's slums by first tracing how the female slum dwellers urbanize the household water. Second, the research documents how these female everyday water practices emerge from, and shape, the social position of women in slum communities of postcolonial Lagos, thereby, three, reproducing uneven urban waterscapes at the bodily scale of female slum dwellers, constituting the existing postcolonial water supply in the slum case-study communities.

6.2.4 Research Design and Methodology

The paper draws from ethnographic fieldwork in five slum communities, tracing and analyzing everyday water practices of female slum dwellers, most of them poor to very poor. Most of the interviewed women are tenants, hence they do not own land and/or structures. Slums in Lagos range from clusters of sheds in leftover spaces to entire districts and fringes along the lagoon (Gandy 2006); the five communities were selected accordingly. Orisunmibare and Otumara are slum settlements along large-scale infrastructure or adjacent to industrial sites, whereas Amukoko-Mosafejo, Precious Seeds and Mafowoku are part of the large, densely populated low-income districts of Ajeromi-Ifelodun, Oworonshoki and Shomolu-Bariga. Precious Seeds falls additionally into the category of waterfront communities at the fringes of Oworonshoki (Figure 1).

The qualitative methods used in the ethnographic fieldwork include mapping, observations, interviews and focus group discussions. In total, ten focus group discussions, 105 semi-structured, open-ended field interviews and 14 expert interviews were conducted. Additionally, a qualitative survey of household incomes was implemented, including the expenses for household water and drinking water. The focus group discussions were implemented to trace the experiences and perspectives of the water-procuring women.

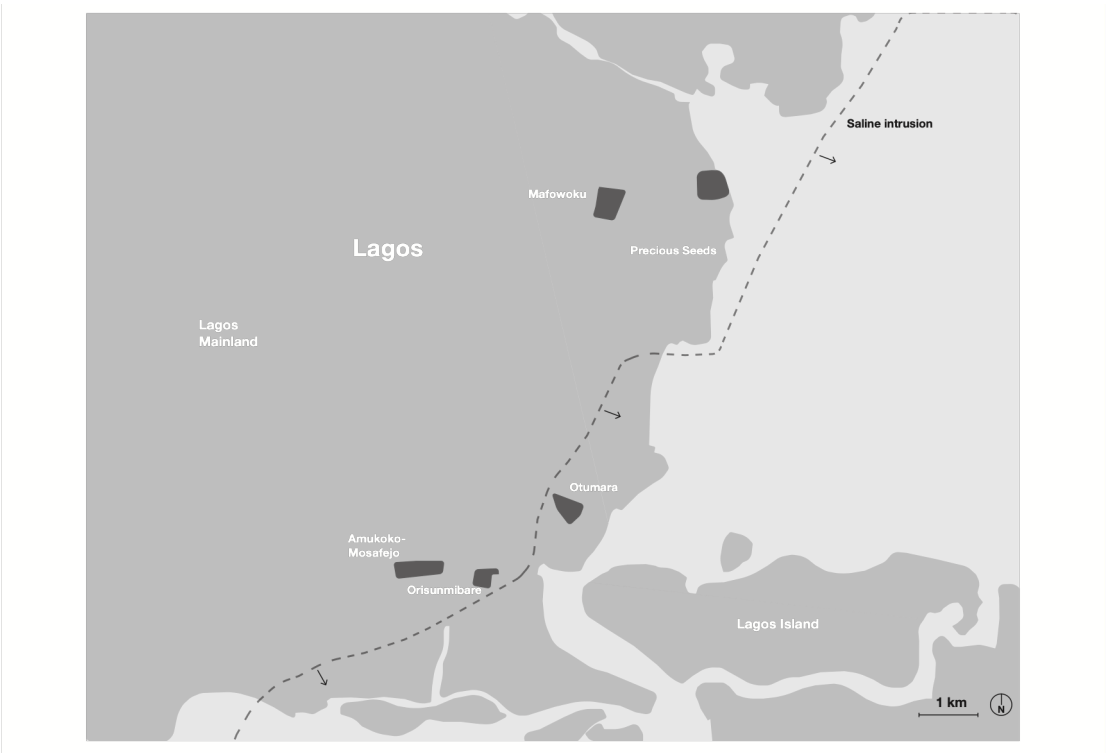
These in-depth conversations with female residents were held to allow open discussions about the daily hardship and violence in the water-procuring activities, including their schedules, routines, rules, options, if any, and 'coping strategies' with economic constraints and water shortages. The semi-structured field interviews served primarily to trace the infrastructural water arrangements within the communities, such as mapping water points, subjectively perceived water qualities and water prices, as reported by the women. They were held at the community water points and with water-carrying women. A total of 80 interviews were conducted with randomly selected women in the streets and at water points, and 25 interviews were conducted with water vendors, mostly male, and male informal and traditional leaders. Governmental decision making and practice is traditionally characterized by secrecy, hampering the access of information in general, including official planning documents. The 14 expert interviews with water infrastructure and urban planning experts within and outside of Lagos State Government (LSG) were hence conducted to understand the official water policy and politics of Lagos State. Experts include politicians and planning professionals from the LSG state and local government and NGO representatives, mostly male, with two exceptions. The expert interviews were also held to confront these experts (government representatives, Lagos Water Corporation (LWC) officials – both high-level and in the field – and representatives of aid and philanthropic institutions) with the statements of the female/male slum dwellers.

Community boundaries, water points and water quality (as reported by female/male slum dwellers) were mapped with GPS coordinates and through interviews with the owners and operators of the respective infrastructure. The ethnographic fieldwork was mostly conducted in 2019, with preliminary research in 2018 and follow-up and additional investigations, including focus group discussions and field and expert interviews, in November 2021, February 2022, May 2023, August 2023, May 2024 and January 2025.

6.2.5 Infrastructural Arrangement of Water in Case-Study Communities

None of the women's households in the five case-study communities is connected to the public water network (Figure 2; Table 1). The women rely on a mix of free and/or donated water points and on commercially managed (usually by men) water points. There are females who can afford their own tank and give or sell water to neighbors. The tanks at the waterpoints are either connected to boreholes in situ, if the community's hydrospatial soil conditions allow for it, or they are connected to boreholes outside of the community, requiring the installation of pipes that are several hundred meters long. These private-informal boreholes use ground water, usually offering reliable and good quality water. However, the large number of private and/or informal boreholes has resulted in observable saline intrusion in the coastal areas (Figure 1, dashed line). One of the five case-study communities is within the saline intrusion line: Otumara (Figure 1). Due to this, the sourced ground water is saline.

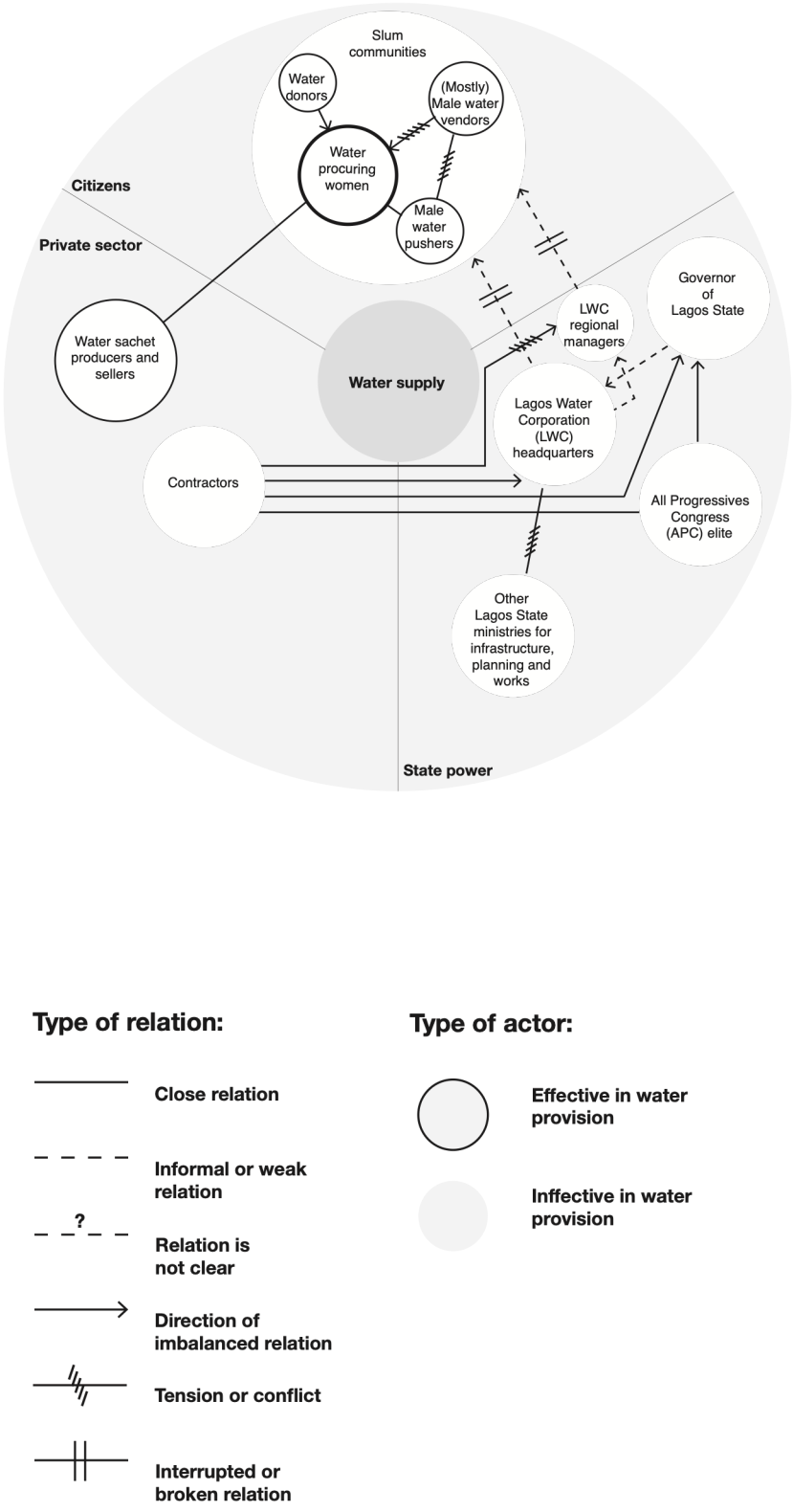
Figure 6.1 Map of Lagos, showing case-study communities. *Source: Author (base map: Google Maps).*



The women, supported by their (female) children usually fetched by container (bucket, can). The prices vary among and within the communities and are subject to change, sometimes daily, i.e. they also depend on the availability of electricity or the use of generators to pump the water. As well as fetching water on a daily basis, many women collect and store rainwater, an option only during the rains (usually April to June, September to December). In recent years, seasons have become less predictable, presumably due to the impacts of climate change. Besides fetching, collecting and storing water, women purchase sachets water for drinking and sometimes for cooking (Figure 2).

The amount of water used by the households of the women and by the women themselves is largely determined by the accessibility to water (Howard et al. 2020; Sarkar 2020). The definition of accessibility to water is the time taken and distance traveled to collect water, by continuity (availability all the time), reliability (availability when expected or needed) and price (Howard et al. 2020). According to the WHO report on domestic water quantity, service level and health, it is suggested that 20 L/person/day may be sufficient for drinking, cooking, food hygiene, handwashing and face washing, but not for other hygiene practices (Howard et al. 2020). The use of 20 L/person/day equals 100–1000 m in distance or 5–30 minutes total collection time and is considered by the WHO as 'basic' (Howard et al. 2020). Less water used/person/day is considered as 'inadequate'; from 50 L water used/person/day as 'intermediate' and 'optimal' from 100 L water used/person/day, respectively (Howard et al. 2020). Figure 2 applies the WHO criteria (Howard et al. 2020) to the qualitative findings in the five case-study communities. Two case-study communities have inadequate water access, three case-study communities have basic water access, and two case-study communities have partly intermediate water access.

Figure 6.2: Conflictual "community-based" water supply and dysfunctional public water supply. *Source: Author.*



Case-study community	Access level according to Horward et al. (2020	Justification from qualitative fieldwork
Amukoko-Mosafejo	Basic*	Two free water points; female water tank owners sell or give to neighbors; several male borehole and tank owners, maintaining a commercial water business
Mafowoku	Basic, partly intermediate**	Several free water points; female water tank owners sell or give to neighbors; no commercial water business
Orisunmibare	Inadequate***	Two free water points with long queues; several male borehole and tank owners, maintaining a commercial water business and selling at high prices
Otumara	Basic, partly intermediate	No free water point reachable below 1000 m; female water tank owners sell or give to neighbors; several male borehole and tank owners, maintaining a commercial water business
Precious Seeds	Inadequate***	One free water point reachable in more than 1000 m with long queues and limited fetching times; several male borehole and tank owners, maintaining a commercial water business, whose water points are farther away than 1000 m

*100–1000 m in distance or 5–30 minutes total collection time; average quantity unlikely to exceed 20 L/person/day; health concern high

**More than 1000 m in distance or 30 minutes total collection time; quantity collected can be below 5.3 L/person/day; health concern very high

***Water delivered through one tap on plot, or within 100 m or 5 minutes total collection time; average quantity about 50 L/person/day; health concern medium

Table 6.1: Water access, adequacy and level of health concern according to Howard et al. (2020), applied to case-study communities. *Source: Fieldwork 2019–2025, by author*.

Amukoko-Mosafejo's water supply (Figure 1; Table 1) consists of several privately owned boreholes, mostly male, whose owners sell water to neighbors, besides two freely accessible boreholes, of which one was donated by a female politician, and another one is provided by the baale (traditional leader) at his house. One water tank is filled by a private company, whose male owner sells to the community women, and there are several shallow wells, mostly used during rains. The 'Fashola borehole' has been faulty for a few years. It was funded by the World Bank and implemented by the no longer existing Lagos Metropolitan Development and Governance Project (LMDGP), under then-Governor Fashola's administration (2007–2015).

Mafowoku's water supply (Figure 1; Table 1) consists of several freely accessible boreholes. One is operated by the Community Development Association (CDA), at the house of a former CDA board member. CDAs operate at the intersection of state institutions and citizens and in Lagos State under different names and sizes, developing their own rules and regulations. Another free water point is provided by the baale at his house and several boreholes were donated by politicians during election campaigns, many still functional. Another borehole was implemented by UK-based WaterAid. It is faulty, as the solar powered water pump does not work properly. Maintenance and/or repair are the main issues as no-one seems to feel responsible. One openly visible LWC pipe runs along one of the main streets, attached to the wall of the open drainage sewer. Until several years ago, a woman's household was connected to that pipe. According to

her, the water pipe had stopped carrying water a long time ago. Drinking water is purchased in water sachets. In streets with no freely accessible boreholes, women buy or receive water for free from neighbors or buy from informal water pushers. None of the women runs a commercial water business with one or several tanks.

Otumara (Figure 1; Table 1) embarked decidedly on a self-sustaining water supply after a violent conflict with LWC in 2010 which included fatalities. Today, the residents rely on a series of water tanks, either powered from boreholes outside of the community or directly drilled in the community. The water quality is saline (Figure 1, dashed line). There is no freely accessible water. Drinking water is bought in sachets. The boreholes at the baale's house, donated by a political candidate, are broken. Informal water pushers deliver water in jerrycans to the doorstep, fetching outside of the community. A few women own their own water tanks, selling to the community women and children mostly against installment payments. None of the women runs a commercial water business with one or several tanks. One woman used to be a member of the informal, no longer existing community water association whose tanks were until 2010 connected to the LWC water network.

Orisunmibare's water supply (Figure 1; Table 1) is extremely precarious. There are two freely accessible boreholes, donated by the then-deputy leader of the Apapa-Iganmu Local Council Development Areas (LCDA) legislative council, during his political campaign, and are functional if there is power. Two male water vendors sell at high fees from their water tanks. Female owners of shallow wells sell or give water occasionally to female neighbors, mostly during the rains. The precarity of Orisunmibare's water supply lies in the low reliability of the water, leading to long queues and violent fights in front of the free water points.

Precious Seeds' water supply (Figure 1; Table 1) is precarious. There is no functional water point within the community. Twice a week, water vendors from another waterfront community, Makoko, come by and sell from their boats. There is one free water point outside the slum community, whose owner, a wealthier woman, opens her borehole daily for the women of Precious Seeds. During the given slot, between 5 a.m. and 7 a.m., the women are allowed to fetch two containers per day. As with Orisunmibare, the precarity of Precious Seeds' water supply results from a low reliability of the water, leading to long queues and violent fights in front of the free water points.

6.2.6 Community Water Governance in Case-Study Communities

The most important community governance structure are Community Development Associations (CDA). According to the female/male slum dwellers in the case-study communities, CDAs, if existing and/or functional, are supposed to supervise the water vendors, preventing exploitation of the water-fetching women and violence among the rivaling water vendors. This happens successfully in Mafowoku and partly in Amukoko-Mosafejo. In Orisunmibare, the CDA sells water itself, hence it has lost its regulatory power. In Otumara, the CDA is weak, considered to be corrupt and without influence on the water business in the community. In Precious Seeds the newly formed CDA has not yet embarked on community water supply issues but is planning to do so.

The existence of CDAs, a form of self-help, goes back to pre-colonial times (Muse and Narsiah 2015; Akinsorotan and Olujide 2006). Every resident can become a member, though membership

in the investigated communities is mostly limited to structure owners (all case-study communities) and/or used for personal benefits (case-study communities of Orisunmibare and Otumara). Women who manage to be members of CDAs are usually among the few female community figures of influence, often married to a male community leader. Female membership in the CDAs in the case-study communities is low (Amukoko-Mosafejo, Mafowoku, Precious Seeds), reflecting the endemic patriarchal order in which women in Lagos have limited representation and decision power in community governance structures (Lawanson 2021). Otumara's and Orisunmibare's CDAs have no female members. Only one woman is in a leading position in the respective CDA (Mafowoku). Only one woman used to be member of a no-longer existing informal water association (Otumara).

Three of five case-study communities have a traditional leader, the baale (Amukoko-Mosafejo, Mafowoku, Otumara). Baales are traditional male leaders, by heritage or by appointment through the oba (local king). Orisunmibare is led by a balogun, appointed by the baale who oversees several communities. Precious Seeds has no baale. In Amukoko-Mosafejo and Mafowoku baales play a role in the water provision by offering free water at their house. In Orisunmibare, the balogun and the CDA collude, selling water at high prices. In Otumara, the CDA and the baale are accused of corruption, however both groups of actors do not have influence on the water supply in the community, in contrast to Orisunmibare.

6.2.7 Everyday Water Practices: Female Slum Dwellers' Perspectives

6.2.7.1 Water Scarcity

Within these communities, social norms dictate that it is the societal, unquestionable duty of women to organize the water for their households and especially for the husband, if/when he is around. Many men have two wives and families, respectively, though they usually live in the household of the 'first wife'. Men/husbands do not help to fetch the water, so the (female) children have to help. A woman, resident of Orisunmibare, described her daily routine as follows: 'First thing in the morning is to assemble the buckets in front of the tanks of the water vendor to wait for the water […] that is sometimes not coming'. Some women get up at 4 a.m. to mark their spot in the water queue by putting down the cans or buckets. Around 6 a.m. they go back to fill the containers and carry them home. 'Most children in the community wake up at 5 a.m. to do different chores', a female resident of Precious Seeds recounted: 'some children go to fetch water, others stay at home to do other household chores'. Fetching the water involves waiting in the queue, sometimes for hours. The waiting time is mostly linked to the frequent power cuts. If the generator is broken, diesel is scarce and/or prices are soaring, the women use to say: 'The water is not coming'. As the women can only carry one bucket at the time, they leave full buckets behind to get them later. In the meantime, when bringing the first load home, the buckets get stolen. 'It is a big fight for water, people [women] steal from each other', a woman from Orisunmibare complained. This is especially the case at the free water points, where the water-fetching includes fighting and shouting, next to the stealing of water containers. Stealing of water containers can escalate into community turmoil, for instance if the stolen containers belong to the wife of an informal or traditional leader. In such cases, the perception is that it is the man (the community leader) who has been insulted and therefore that the men 'must' resolve the issue among themselves, sometime violently, as observed in Orisunmibare.

The women define and describe the water qualities according to the subjectively perceived eligibility for different uses: 'bathing' (washing oneself), cooking and washing dishes and cloths. Accordingly, they use different water sources. For drinking, the women purchase usually sachet water, if they have the money for it. The women identify the quality of the water by its color, smell, consistency (salty, sandy), and in the worst case, itching and rashes on the skin. The general scarcity of water and the extremely limited household budget reduces the options of 'choosing' a 'suitable' water source significantly. A woman from Precious Seeds complained in a focus group discussion: 'bad water turns the food bad as well'. Another woman added: 'Sometimes I use [the expensive] sachet water for cooking'. Often, the women are forced to use water of poor quality and/or pay high prices, despite the poor quality. A woman from Orisunmibare said: 'It [water from shallow well] smells terrible, but sometimes we have to use it for bathing […] even the thirsty cows refuse to drink that water'. Dry seasons impose additional hardship on the women as shallow wells dry up, illustrating the drama the women face between economic and material scarcity. During the rainy season, the women don't spend as much time and money on finding water for cooking and bathing. A woman from Precious Seeds said in a focus group discussion: 'Rainwater harvesting is the most efficient [way of organizing water] in the community'. However, the water quality requires purification measures. The women add substances that 'clean' the water or free it from smell. Usually, the rainwater is used for cooking, washing and bathing, and sachet water is used for drinking. The extremely poor women use the rainwater for drinking. As a result, the water vendors and water pushers earn less money during the rainy seasons and complain about this fact.

The women's daily average income is 3,500 Nigerian Naira (NGN) daily (around 2.3 US$). A few earn less, around 2,000 NGN daily, while the highest daily income among the interviewees was indicated with 8,000 NGN daily. Taking into consideration the distribution of the most frequently mentioned values, the monthly income is an average of 70,000 NGN[1] monthly (Table 2). This equals not exactly an income but rather the revenue of the women's micro-businesses. Part of that revenue is used to buy water, foodstuff and other components to produce the sales product (food, beverage, soap). The women spend an average of 14,000 NGN monthly on water for cooking, bathing and washing, and an average of 9,000 NGN monthly for drinking water, sometimes also used for cooking. The total expenses on water amount to an average of 23,000 NGN monthly, equaling an average of one-third of the average monthly income (Table 2). The precise expenses for water depend on many factors: household size, type of micro-business, distance to water points, availability of water, water quality, availability of free water sources and opportunities of rainwater collection, among others (Figure 2).

Category	Amount
Daily average income*	3,500 NGN
Range of daily income	2,000–8,000 NGN
Monthly average income	70,000 NGN
Range of monthly income** (20 working days)	20,000–160,000 NGN
Range of monthly water expenses	8,000–30,000 NGN
Monthly average water expenses	14,000 NGN
Range of drinking water expenses monthly	5,000–14,000 NGN
Monthly average drinking water expenses	9,000 NGN
Total monthly average water expenses	23,000 NGN

*89 women at all ages in case-study communities

**mostly revenue from micro-businesses like food, beverages, soap etc., hence parts of it is used to buy foodstuff or other components for the businesses, including water

[1]As of July 2025, the Nigerian national minimum wage is 70,000 NGN (NBS 2025).

Table 6.1: Water access, adequacy and level of health concern according to Howard et al. (2020), applied to case-study communities. *Source: Author, Fieldwork.*

Whenever the women have enough money, they buy water from vendors to avoid the time exposure and violence at the free water points. Sometimes, there are no free water points within the community, for instance in Otumara (Figure 1). If the women can't afford to buy water, they walk outside of the community, approximately one kilometer, to get free water (Figure 2; Table 1). The use of the generator increases the water prices. A token must also be paid at free water points, if the use of the generator is necessary. If the women can afford it, they buy from water cart pushers, usually young male migrant workers. The women appreciate the relief of water being delivered to their house, though they complain about the high prices and the poor water quality. The male water vendors' perspective is different. A vendor in Otumara said: 'Hausa [tribe from the North of Nigeria] men are disturbing the business because they bring the water directly to the […] house, they [the women] don't have to carry it'. A woman in Precious Seeds concluded in a focus group discussion laconically: 'The point of view of women is different from men'. Within the shared reality of life of the community waterscape, male water vendors perceive water as a (competitive) business opportunity. In contrast, the water-procuring women perceive water and the organization thereof as something that significantly determines their lives.

Despite their daily hardship and struggle, the female slum dwellers relate to the experience of women in other communities. A woman from Amukoko-Mosafejo said in a focus group discussion: 'Badia [another large slum area] is much worse, people are lining up [to fetch water]'. Another woman who runs a shop in Badia added: 'I bring water in the Keke [Tricycle] to the shop […] the slums in Orile and Alaba are also suffering a lot from water scarcity'. The women in Mafowoku evaluate their situation as similar to other communities in the Bariga LCDA. A woman said: 'Mafowoku is like all other communities in Bariga LCDA […] having poor or no water infrastructure', though 'it is better off than other communities'. Another woman confirmed in the same focus group discussion: 'Other communities are worse especially those at the lagoon'. One such community at the lagoon is the case-study community, Precious Seeds. The women in Orisunmibare are certain that the extreme water scarcity in their community is exceptional within

the larger area of Apapa-Iganmu LCDA. They blame the high population density and the combined poor leadership, greed and corruption of their LCDA, of their CDA and of their traditional leader for it. The informal and/or traditional leadership in all the case-study communities is male, with one exception, Mafowoku, where a woman is currently the secretary of the local CDA. The women perceive their leaders – over whose appointment they have practically no influence – as ineffective, as they don't feel any positive impact on their everyday lives in which the daily water-fetching plays a major role. The women in all the case-study communities said that they accepted, and adapted to, the circumstances in which their daily lives unfold. A woman in Amukoko-Mosafejo said: 'We have no choice'. The women are largely excluded from the community decision-making in general and from the community water governance specifically. Precisely because of their unalterable female duties to organize the water, they feel that their needs are not considered by the male leadership as they do not affect the men.

6.2.7.2 Responsibility for the Water

One of the main sources of grief and suffering is the fact that the husbands, and more generally, the men, do not care to contribute, either financially or physically, to the supply of water for the households they live in. The women suffer enormously from this denial of financial support by the husbands, especially in combination with the husbands' claiming the right to use the water first. One woman, resident of Amukoko-Mosafejo, said in a focus group discussion: 'The husbands don't drop money for the water'. Asking for financial support is humiliating and even dangerous for the women. A woman said in a focus group discussion in Precious Seeds: '[I/we] […] stopped asking men for money for water […] and the upkeep of the family […] it always leads to altercation with the husbands'. Some women reported that their husbands beat them up whenever they are asked to provide for the family. Some single mothers prostitute themselves to be able to feed their children. A single mother from Precious Seeds said: 'I prefer to stay single and only rely only on my business […] it's hard […] but it is less violent' [domestic violence]. A woman from Orisunmibare told: 'We have begged the water vendors for affordable water prices […] but we are not heard'. A male water vendor from Otumara admits: '[competitive, aggressive and exploitative water business] is true. Most of them [water vendors] depend on this source of livelihood. The fight for the water is obvious but the water vendors are under stress as well […] it's not easy to make water available'. The combination of water as commercial good, implying an aggressive business attitude from the (male) water vendors, and water as life necessity and female duty to make it available for the household, leads to an enormous physical and mental stress among the slum dwellers, harming the relations between women and men.

The women perceive the community people in general as selfish. In a focus group discussion in Orisunmibare, one woman said: 'People are not cooperative, not showing solidarity'. According to her, reasons are time and poverty: 'They [people] are too busy with their own struggle and survival'. Another woman agreed: 'difficult […] to mobilize people' [for community water points, bypassing water vendors]. In all focus group discussions, it becomes clear that the women don't waste thoughts and energy in challenging their responsibility to organize the water for their households. The only leverage they see in making their lives easier and more efficient is freely and reliably available water. Organized, collective and solidary community efforts seem difficult to materialize. An elderly woman in Orisunmibare, experienced in community mobilization, said: 'People are only showing up if there's monetary benefit, not if there's research or shared projects […] people want to earn money'. In Mafowoku, some of the women can afford their own boreholes. The women said they receive free water from these female borehole owners so they don't have to rely on water vendors.

In Otumara, there are a few female water tank owners, though most do not see themselves as water business owners, with one exception. These female water tank owners often grant payment by installments or sometimes give the water for free. One female tank owner said: 'What can I do? The women need water!'. In a focus group discussion in Otumara, a woman said: 'We're not feeling comfortable with […] buying water. Water should be free from the government'. Another woman said: 'Government would dig deep enough, and the pipes are not visible, so they can't easily be vandalized […] there should be free water in the middle of the community'. Given the current water governance situation, reliable water supply by the government for free or, rather, affordable prices, seems very far away. The other option, equally distributing the responsibility for water between men and women, is out of reach for the women. One of the women in Precious Seeds concluded in a focus group discussion: 'The provision of [the] household by the women is the norm […] we bear it […] because of the resilience of the Nigerian women with the constant struggle of everyday life'. Another woman confirmed: 'The husband doesn't help at all'. Another woman added: 'The men in the community are promiscuous […] they keep their money only for themselves'. The women feel anxious and tired, though stressing again and again that they accepted the situation.

6.2.7.3 The Female Body as Battleground

Besides the anxiety due to financial and physical distress regarding the water supply, the women feel shame. The unreliability of the water sources and the economic limitations of their households lead inevitably to the rationing of water within the household. During raining seasons, the rationing is a little eased as the women can store rainwater and the shallow wells are more likely to have water. However, the rationing of the water, the responsibility for the children and the right of the husband to use water first, makes the women last in line, also when it comes to bodily hygiene. One woman from Orisunmibare said in a focus group discussion: 'We don't wash ourselves before going to work, it's a big shame […] there's no water [for us]'. A woman in Amukoko-Mosafejo told in a focus group discussion: 'Sometimes the husband uses the drinking water to bathe because he has to go out […] I feel bad because it's expensive'. One woman in Precious Seeds explained in a focus group discussion: 'The men expect water […] to eat and bathe when they get home from work every night'. The women set aside their own needs, which is next to washing themselves washing their clothes on a regular basis. During menstruation, this becomes more urgent, doubling the feelings of shame and discomfort. However, the women would rather abstain from using water to wash themselves or their clothes than confronting their husbands. Opposition usually ends with beating and humiliation, often in front of the children or the community.

Feelings of shame are also caused by the fact that women have to use their bodies to 'organize' money to buy water. Intercourse is used or granted against money, especially by single mothers who have boyfriends. The women feel ashamed that intercourse is linked to a 'reward' in the form of 'housekeeping money', though it also gives them freedom. They said they wouldn't call their boyfriends if they had enough money. Married women often suffer from domestic violence, especially when asking for money to buy water. Married women tell of husbands who smell their pants, then accusing them of promiscuity. Many of the women say they would prefer to get a divorce. 'Getting by in life is hard', one woman in Amukoko-Mosafejo sighed in a focus group discussion, 'no help anywhere, except hard work'. Since the husbands don't help, neither financially nor physically, and are additionally to be served with water and food, the women say they would somehow prefer to be single. However, the social status of a married woman is still

perceived as more 'prestigious'. 'After the divorce', a single mother from Precious Seeds said, 'children prefer to stay with the mother'. Another single mother recommended: 'It's better to take care of the children […] and wait to grow up' [until the children are grown up] 'than remarry'. The women are torn between the desire to live in a caring partnership and the opposite experiences they have had in this regard. As always, the women conclude such conversations with: 'What choice do we have?'. The fight for, and the conflicts around, the availability of household water illustrates in the five case-study communities the endemic patriarchal order, systematically harming the physical and mental integrity of the women (Field notes Amukoko-Mosafejo, 2019; 2023; 2025; Mafowoku, 2019; 2023; 2025; Orisunmibare, 2019; 2023; Otumara, 2019; 2023; Precious Seeds, 2024; 2025).

6.2.8 Public Water Supply

The water supply condition in all the case-study communities has one trajectory in common, i.e. the state is not involved. State and nature of the (non-existing) public water supply has led to an enormous distrust among women and men in the slum case-study communities in the government concerning its abilities and will to provide water. For instance, the women in Amukoko-Mosafejo feel they are being told lies: 'During the campaigning time, they [political candidates for LCDA executive and legislative arms] come and promise [water]. When they're elected, they don't deliver […] we rely on ourselves to provide water'. A former informal male leader in Amukoko-Mosafejo commented on the role of the state in water supply as follows: 'Amukoko is far from governance and social services' [referring to the physical seat of the state government]. A traditional leader, 'responsible' for Orisunmibare, among other communities, said: 'All communities under Ifelodun LCDA have the same problems […] On water the government is zero'. A male water vendor in Otumara said: '[The Lagos Water Corporation is] not doing independent research to find out why these communities have no water'. The frustration and consternation regarding the dysfunctional public water services unifies female/male slum dwellers, despite the different everyday impacts it has on the bodies of women/men. While men have a choice to enter the water business, women, due to their being female are responsible for organizing the household water.

To complete the analysis of female everyday water practices in selected slum communities, the activities and effects of the state's activities and intentions are also discussed (Table 1). In stark contrast with existing reality, the not-networked and informally provided water supply of Lagos is seen by government officials, including LWC staff (Expert interview 1, 2019; Expert interview 2, 2019; Expert interview 5; Expert interview 8) as failure (Jaglin 2015). Lagos's dysfunctional and poor water supply is primarily considered – by official LWC policy documents and in conversation with members of the LWC management – a technical and managerial issue, including the lack of funding, the lack of (qualified) staff, the lack of monitoring, the low maintenance culture, decaying water infrastructure and unrealistic goals (LWC 2025, 28–52). Additionally, the historically low position in hierarchy among the governmental agencies has led to a non-prioritization of LWC concerns and projects (Expert interview 1, 2019; LWC 2025).

The Lagos State government announces in their overarching planning document, the Lagos State Development Plan 2052 (LSDP 2052) (before LSDP 2012–2025), the implementation of 'world-class', large-scale infrastructure, including water (LSG 2022, 1, 43). Accordingly, LWC's strategic and practical focus is on increasing water production by implementing large-scale water

infrastructure within the next 30 years (LWC 2018; LSG 2022, 112–113), though without any specification concerning the implementation, requiring resettlements in densely populated Lagos and extensive funding. The Lagos Water Supply Master Plan (LWC 2018) focuses on water demand and the demand gap. Supply issues and political, cultural or economic aspects are hardly addressed. The document seems to be based on imprecise and incorrect numbers, projecting a population of 30 million in 2020 (LWC 2018, 11). The funding should mainly come from public–private partnerships (PPP), against better knowledge that water infrastructure is not popular among international/national investors due to the elaborate implementation and low revenue (Anand 2007, 6–7; Expert interview 1, 2019; Expert interview 6, 2019; Sarkar 2022, 16). LWC is aware that even in the event of the acquisition of funding from PPPs, the majority of the urban poor cannot afford to pay high enough fees to make the necessary extensions in urban water systems viable, let alone profitable (Gandy 2006; Monstadt and Schramm 2017; Expert interview 1, 2019; Expert interview 5, 2019; Sarkar 2022). The currently followed policy approach practically eliminates LWC's efforts to provide water (Expert interview 1, 2019; Lawanson 2021; Expert interview 14, 2025) (Table 1).

Very recently, in collaboration with, and funded by, USAID, the Strategic Business Plan 2025–2030 (LWC 2025) was published. It lays out a strategic road from 2025 to 2030, foreseeing the rehabilitation of broken, and the implementation of new, waterworks (LWC 2025, 52–77). The focus remains on the quantity of the water production and how to close the demand gap, though also aims for more efficient operation, revenue collection and collection efficiency. It does not address the distribution issues, hence the accessibility to water (time, distance to water source), the availability (all the time) and the reliability of the water (Howard et al. 2020). There is no assessment on why slum communities don't have proper access to water and there is no data on the women's responsibility for the households' water provision. This is not only a social issue but also has economic implications, as the women lose significant time in organizing the water, as well as having physical (Howard et al. 2020) and mental health implications (Sarkar 2020), as the reports from the interviewed women demonstrate. Confronted with the latter, a (female) member of the LWC management admits that 'public water supply is a huge problem', especially as not 'much has […] been done about women and children' [having secure, affordable and easy access to public water] (Expert interview 14, 2025). Despite 'somehow knowing', there are no efforts to develop a deeper understanding about how the dysfunctional water supply plays out at the expense of female slum dwellers.

Venality is a serious issue in Lagos's water politics (Expert interview 1, 2019; Expert interview 11, 2019). In recent years, the implementation, repair and maintenance of water infrastructure was supposed to be funded through extensive private donor investment, linked to profit-sharing for the political-economic-traditional elite (Expert interview 1, 2019; Expert interview 11), called 'contract inflation'. Only projects eligible for 'contract inflation' were pursued (Expert interview 10, 2019; Expert interview 11, 2019; Expert interview 12, 2019), making their materialization less likely, as for instance, compliance requirements of international organizations prohibit 'finance structures' leading to embezzled funds (Expert interview 6, 2019; IBRD/World Bank 2015). Often money has changed hands, while nothing was physically implemented or repaired, resulting in further decaying water infrastructure (Expert interview 10, 2019; Expert interview 12, 2019). It is unclear whether LWC will be able to change these politics in the future. In 2025, LWC receives more funding through tax revenue from the government (Expert interview 14, 2025). Precise figures were not available. Since 2023, USAID has worked with LWC on the mapping and assessment of the existing water network. According to the LWC management, the

funds from USAID were not passed through the LWC (Expert interview 14, 2025). In 2025, USAID is supposed to implement two waterworks for the urban poor, the Ajegunle and Bariga waterworks (Expert interview 14, 2025), though the recent and dramatic change in US foreign policy may result in the cancellation of all USAID projects (USAID 2025). WaterAid is supposed to implement by August 2025 the Akile water works, providing water for 60,000 people (Expert interview 14, 2025).

None of the above-mentioned water policy documents have a gender aspect or acknowledge the role of women in general and more specifically, of female slum dwellers, in the household water supply. LWC seems to be aware that women in slums are responsible for financing the household's water supply, at least when this aspect is directly raised in personal conversations (Expert interview 14, 2025).

In the meantime, it is unclear how Lagos's citizens, and more specifically, Lagos's slum dwellers, are supposed to cover their water needs. There is no policy document available, though in conversation a (female) LWC management member explained that there are plans by USAID to install water ATMs in slum communities, operated with tokens (Expert interview 14, 2025). The suggestion is to engage the existing water vendors by installing the ATMs at their water points and give the water at discounted rate of 50 NGN per cubic meter (Expert interview 14, 2025). On the question of how women can become active in the water business, the more general answer is that projects funded by USAID strive to achieve gender equity in the community water sale (Expert interview 14, 2025). (Field notes Amukoko-Mosafejo, 2019; 2023; 2025; Mafowoku, 2019; 2023; 2025; Orisunmibare, 2019; 2023; Otumara, 2019; 2023; Precious Seeds, 2024; 2025).

6.2.9 Discussion

6.2.9.1 Male Power, Territory and Water Scarcity

In the case-study slum communities, the household is the entity that actually provides for the water (Harrison 2006). The household water provision is the responsibility of the women, financially and in terms of the physical provision, as the investigations of the everyday water practices demonstrate. Women bear the water unavailability literally with their own body by fetching it, storing it, rationalizing it, financing it, and processing it efficiently through cooking (for the household), washing dishes and clothes (of the household), and making it available for the personal hygiene (of household members) (Acey 2010; Truelove 2019b; Sarkar 2020; Lawanson 2021). The specific severity of the female experience of male power in the everyday water practices at the bodily scale may vary slightly among the group of women, depending on the socio-urban and socio-economic specifications of the household and hydrospatial condition of their community's soil. However, the perception that water chores are women's responsibility, residing with females, cannot be challenged by the women (Dangarembga 2022). In cases where the women remind the men of their economic responsibility to provide for the household, the women risk dispute and often domestic violence.

The smaller the women's household income, the more they suffer from the impacts of male power. In this case, the women are forced to queue long hours in front of free water points (Zug and Graefe 2014), sacrificing their valuable time. The smaller the household's water availability, the more the women must prioritize the water use by the husband and the children over their own, impacting their own body hygiene and the regular washing of their own clothes (Howard et al.

2020; Sarkar 2020). If the women make enough money from their businesses and they can socially 'afford' a divorce, they don't have to rely on a husband/boyfriend or on free water sources, involving long waiting times and limited fetching. They can buy water from water vendors or pay for water delivery by water pushers, making the vital necessity of water less labor-intense and violent. Women who can afford their own borehole are willing to help other women by donating water (Zug and Graefe 2014). It was further shown that the informal water provision as a business in the case-study slum communities is run by men (Acey 2010; Lawanson 2021). The male exploitation of the water scarcity also affects men, especially in the water business, often leading to vandalism and violent conflicts among the water vendors.

The existing water governance in the case-study slum communities is also dominated by men (Lawanson 2021). Independent from whether the respective CDA is able and/or willing to exercise control over the water vendors to avoid overpriced water, only a small number of women are CDA members, if at all. Traditional leadership is reserved for men, independent from whether the respective male leader (baale) is able to play a productive role in the water supply by offering free water at his house. Whether there is a functional 'community water governance' or not, the water provision of the household depends on the women. The water provision and the water use in the case-study slum communities is hence negotiated at the scale of the female body. Men largely control the access to water in the community, not only in terms of the infrastructural arrangements of water points, but also within the household, as shown (Acey 2010; Truelove 2019b; Sarkar 2020; Lawanson 2021). The women though are trapped in the gender stereotype that obliges them to organize the water for their households, physically and financially (Cleaver and Hamada 2010; Truelove 2019b; Sarkar 2020).

6.2.9.2 Ineffective and 'Gender-Blind' Public Water Supply

There is a gap between the intentions of the government to improve the access to water and the effects – and perceptions – of citizens and, especially, water-procuring women (Lawanson 2021). The attempts by LWC must certainly be recognized but they are literally no more than a drop in the ocean. The announced repair of existing water works and the planned implementation of new waterworks by LWC is supposed to benefit three million people, when completed, and target 60,000 poor people in low-income communities in the Agege area, with water ATMs and tokens by the end of August 2025 (Expert interview 14, 2025; LWC 2025). The fact that female slum dwellers and/or poor women are actually the primary bearer and primary stakeholders in the state's water sector is not sufficiently reflected in the state's water policies nor in the planned projects.

6.2.10 Conclusion

The research traced in detail the everyday female water practices in five slum communities, portraying lived realities and demonstrating the unevenness they reproduce in the accessing of water. There is a serious gap between the state's effort to improve the access to water and the everyday water experience of female slum dwellers. Water is urbanized at the scale or contour of the female body and shaped by the social position of women, respectively (Loftus 2015; Truelove 2019a; Sarkar 2020). Hence, to solve Lagos's water (infrastructure) crisis, a gendered perspective is inevitable (Ahlers et al. 2014; Truelove 2019a, 2019b; Sarkar 2020). The existing water supply puts the water-procuring women under permanent and massive psychological and physical stress,

seriously harming their well-being (Anand 2007, 12; Sarkar 2020). Precisely due to the combination of the material and economic scarcity and the women's subordinate social position, they are not capable of challenging their roles as primary bearer of the water for their households (Mbembe 2001, 6; Dangarembga 2022, 67–108). The research demonstrates that women are the primary stakeholders in Lagos's water sector, but they are not treated as such, neither politically nor socially nor culturally. How must the complex needs of female slum dwellers, mostly poor, be addressed? Biehl et al. (2007 cited in Pieterse 2011), suggest recognizing 'the power of micro transformations in the domain of everyday living and psychological disposition', not only counting large-scale systemic interventions as real politics, slammed by Simone and Pieterse (2017, 156) as a 'masculinist claim'.

To improve the access of women, especially female slum dwellers and/or poor women, to water, the following strategies could be considered:

1. Lagos Water Corporation (LWC) needs to implement a gender policy, analyzing and describing the needs of women, especially in the many poor slum settlements. The present research demonstrates that water supply is not a purely technical infrastructural issue, but linked to, and rooted in, cultural, political and social norms and traditions that need to be understood and addressed. Local, neighborhood-based female water committees should manage and oversee non-commercial water points.
2. Women are diverse – able-bodied, physically challenged, old, young, structure owners, tenants, poor, very poor – and that diversity must be included in the suggested gender water policy.
3. With 80 percent of the population living on a few dollars daily in unserved and underserved neighborhoods, LWC needs to implement a pro-poor gendered policy. As household connections for every household are not realistic, water should be reliably delivered on the plot or within 100 m walking distance and be of good quality. The payment must be per container, with tokens or similar, as the women cannot afford monthly bills in advance. Most women in slum communities live from hand to mouth.
4. Water is not a commercial good and it should not be treated as such, neither at state level, e.g. in the form of public–private partnerships or in the form of privatized water works, nor at the community level where informal water vendors exploit the water scarcity, forcing the women into begging, negotiating, waiting, stealing and even domestic violence. Commercial water points in neighborhoods should be banned, including an eligible control mechanism that involves the local governments and possibly, with some caution, the CDAs. CDAs do not implement gendered approaches and all too often, they have no or only a few female members.
5. Condition and nature of Lagos State's dysfunctional water supply will not allow for a centralized approach in the foreseeable future. The only way forward is a decentralized and gendered approach to water supply, actively involving the water-procuring women, implemented and accompanied by the local governments, supplemented (but not substituted) by philanthropic and aid organizations, civil society groups, politicians and managed by women water committees.

Lagos State's severe water crisis will only be tackled if the focus on large-scale infrastructure (LWC 2018; LSG 2022; LWC 2025) will be replaced or at least considerably complemented by a more nuanced, diverse, even messy approach to water supply (Simone and Pieterse 2017),

actively involving those who actually urbanize the water – the women (Anand 2007; Acey 2010; Cleaver and Hamada 2010; Cleaver 2012; Ahlers et al. 2014; Loftus 2015; Truelove 2019a, 2019b; Sarkar 2020, 2022; Oyerinde and Jacobs 2022; Ogundari 2024). Water supply in Lagos has for the many female dwellers and poor women a deeply psychological component, occupying their physical and mental health and integrity excessively. To open the space for agency for them is a political, social and economic necessity.

6.2.11 References

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6.2.12 Field Work

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Expert interview 5 (28 August 2019).

Expert interview 6 (29 August 2019).

Expert interview 7 (12 September 2019).

Expert interview 8 (12 September 2019).

Expert interview 9 (16 September 2019).

Expert interview 10 (18 September 2019).

Expert interview 11 (19 September 2019).

Expert interview 12 (19 September 2019).

Expert interview 13 (20 September 2019).

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Focus group discussion 3 (24 August 2019).

Focus group discussion 4 (27 August 2019).

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Field notes Otumara (February, March, August, September 2019; May, August 2023).

6.3 Post-Publication Reflection

This paper's core argument—that women constitute essential water infrastructure providers through embodied daily labor while remaining systematically excluded from governance at all scales—has been starkly validated by events occurring during and immediately after publication. Both Orisunmibare (February 2024) and Precious Seeds (December 2025) faced forced eviction, destroying the infrastructure documented across this research and displacing tens of thousands of women whose water procurement practices this paper analyzes. The evictions' significance for this research lies not in any imagined connection between water governance and eviction vulnerability—land politics operate at entirely different scales and through entirely different state mechanisms than water infrastructure provision—but rather in what happens to women's water organizing when the spatial foundation for that organizing disappears. The Precious Seeds women's water committee, established in early 2025 as direct application of this doctoral research's findings and operating for less than a year before the eviction, simply ceased to exist when bulldozers demolished the settlement. The organizing knowledge, relationships, and governance strategies women had built vanished with the physical community. Women's water committees operating within single settlements remain vulnerable to that settlement's erasure for reasons having nothing to do with water governance. When Precious Seeds was destroyed, four years of community relationship-building—and the water governance work that had only just begun to operationalize this doctoral research's findings—disappeared not because these efforts failed or succeeded, but because land politics rendered the settlement's continued existence incompatible with state development priorities. Had cross-community networks existed linking

Precious Seeds women with counterparts across Lagos's slum settlements, that knowledge and those strategies could have persisted even as one location vanished—the network itself constituting infrastructure more resilient than place-based interventions.

This recognition fundamentally shaped Chapter 8's recommendations. Rather than replicating the Precious Seeds model across individual settlements (each vulnerable to isolated destruction), the dissertation proposes building Lagos-wide women's water networks transcending specific geographic locations. Such networks would enable organizing capacity to survive individual community evictions: when one settlement faces demolition, women's relationships, organizing capacity, and advocacy infrastructure persist across the network, with remaining communities continuing to pressure LWC for policy transformation. Future research—tracking former Precious Seeds committee members post-eviction and exploring network-building possibilities with women across multiple settlements—will provide empirical foundation for operationalizing this recommendation, operationalized through the planned 2026 LWC implementation project (Section 8.2). The WHO service level classification applied in this paper (Table 6.1)—demonstrating that only water available within 100 meters achieves intermediate access levels of approximately 50 liters per person per day—generated a further implication developed in Section 7.3.5: the technical infrastructure standard of 75 liters per person per day as the minimum threshold at which women's bodily needs documented in this paper cease to be systematically sacrificed. The engineering specification emerged directly from this paper's embodied evidence—the hygiene deprivation, menstrual management difficulties, and rationing practices women described— translated through the WHO framework into a quantitative target for compound-level water point distribution.

This iterative cycle—research findings informing practice, practice failures and successes informing theoretical refinement—exemplifies the scholar-activism methodology detailed in Sections 1.1, 7.5.2, and 8.4: infrastructure as dignity is not only an analytical framework but a commitment to transformation grounded in accountability to the 194 women and men whose knowledge enabled this research. The evictions also underscore methodological and ethical dimensions of feminist research in contexts of state violence. This research documented women's lives, relationships, and organizing strategies with their generous consent and active participation. When government demolished Precious Seeds, did comprehensive documentation—maps, interviews, organizational charts now comprising this dissertation—somehow contribute to state surveillance making the settlement more vulnerable? Or conversely, does documentation constitute act of refusal against erasure, ensuring that when communities disappear physically their social worlds and residents' agency persist in academic record, potentially informing future organizing? These questions without clear answers haunt the research process, demanding ongoing reflection on feminist methodology's promises and limits in contexts where knowledge production itself implicates researchers in power relations we critique.

Post-eviction, the paper's findings about women's triple exclusion from decision-making (household, community, state scales) require extension to a fourth scale: eviction itself as masculine state violence through which government reasserts control over land by erasing women's place-making and infrastructure provision. When Precious Seeds disappeared, government destroyed not merely physical structures but social infrastructure—women's water committee, neighborly support networks, collective knowledge about navigating chronic scarcity. This destruction pattern suggests that state violence targets not just land but the autonomous social reproduction that women's organizing enables, rendering slum populations precarious and dependent rather than self-organizing. The evictions thus reveal an additional dimension of

patriarchal governance: dispossession as tool for maintaining gendered, class-based hierarchies essential to neoliberal urbanism in postcolonial contexts—and the strategic necessity of cross-community networks building collective power beyond single-settlement scale, developed in Chapter 7.

Chapter 7: Discussion – From Insights To Intervention Frameworks

7.1 Introduction: Synthesizing Findings Through Theoretical Lenses

This chapter synthesizes findings from three papers through eight insights and one methodological implication (Section 7.2), forming the foundation for two complementary intervention pathways: comprehensive policy reforms targeting Lagos Water Corporation (LWC) and Lagos State government (LSG)—essential but politically uncertain (Section 7.3); and experimental, multi-scalar, multi-stakeholder frameworks operable regardless of state receptivity (Section 7.4). The insights emerged through the epistemological transformation from inclusion to transformation feminism documented in Chapter 1 and theorized in Section 2.4.3—together demonstrating that technical or institutional interventions failing to transform gendered power relations will inevitably reproduce existing inequalities through new arrangements.

The discussion draws on both the theoretical framework established in Chapter 2 and the technical infrastructure documentation of Chapter 3. Chapter 3's infrastructure inventories—mapping water point locations, borehole depths, pipe connection distances, water quality assessments, and pricing structures across all five communities—provide the technical baseline against which intervention frameworks must be calibrated. Chapters 4–6 build on this baseline, progressively demonstrating how technical parameters translate into gendered bodily consequences. Throughout, the three papers demonstrate what the infrastructure as dignity framework insists upon: that technical infrastructure configurations, political governance arrangements, and gendered cultural norms are not separable analytical domains but co-constitutive dimensions of the same systems. The policy reforms and experimental frameworks proposed in Sections 7.3–7.4 are grounded accordingly—in the material infrastructure conditions Chapter 3 documents and the socio-technical analysis Chapters 4–6 develop from them.

7.2 Eight Insights and One Methodological Implication from Multi-Scalar Analysis

The insights synthesized below answer the primary research question (Section 2.5) by revealing how patriarchal power operates across scales—from community infrastructure control (Insights 1–3) through household resource allocation (Insights 4–6) and cross-community spatial reconceptualization (Insight 7) to state-level political processes (Insight 8)—with gender mediating all dynamics documented in Papers 1–3. This sequence moves deliberately from the institutional conditions of water provision, down to the household bodies bearing its costs, out to the cross-community organizing scale that escapes localized patriarchal constraints, then up to state-level political processes. While Insights 1–3 establish the institutional and economic conditions through which patriarchal power operates at community scale, Insights 4–8 center gender as the primary analytical lens.

A clarification of the analytical claim is necessary before the insights are presented. This dissertation does not argue that gender is the only inequality structuring water access, nor that

exploitation would disappear if gender hierarchies were eliminated. Vendor cartel exploitation of households operates through power asymmetry—between those who own infrastructure and those who depend on it—that would produce exploitative pricing regardless of who performed procurement labor. Male tenants are also exploited by male vendors; class and property status structure access independently of gender. The analytical claim is different and more precise: gender determines *who occupies which position* within the power structure and *why that structure reproduces itself*. The question is not whether exploitation would exist without gender but why women are the ones who fetch water, why men are the ones who control infrastructure, and why these positions are maintained across all five communities despite vastly different institutional configurations—from Mafowoku's solidarity model to Orisunmibare's vendor cartel. The answer this dissertation provides, drawing on Segato's (2003; 2018) theorization of the *mandato de masculinidad* developed in Section 2.4.3, is that the current configuration of power in Lagos's water systems is itself constituted by patriarchal ordering. Male vendor competition operates through violence, territorial control, and the performance of dominance—expressions of what Segato identifies as the structural mandate through which masculinity reproduces itself. Women's water solidarity operates through relational forms—mutual aid, subsidized provision, information sharing—structured outside that mandate entirely. These are not two styles of water governance but two structurally different relational logics, and the fact that the exploitative one dominates is not an accident of institutional design but a consequence of the patriarchal ordering this dissertation documents.

Gender is constitutive, then, not because it explains everything but because it is the inequality that operates *within* every other group. Among tenants sharing the same class position, spatial marginalization, and vendor exploitation, gender determines who carries water, who pays from household income, who drinks last, and who faces sexual harassment at water points. Among vendors, gender determines who operates through cartel violence and who provides subsidized access. Among community leaders, gender determines who holds CDA and traditional leadership positions and who is excluded despite performing the labor those positions are supposed to govern. This transversal pattern—gender operating within every social category, not merely between men and women as aggregate groups—is what "constitutive" means in this dissertation's usage, and it is what distinguishes the argument from a claim that gender is the only or most important inequality. Gender is not ranked above class or property status; it is the inequality that structures how class and property status produce specific exploitation forms for women that they do not produce for men in the same positions. The intervention frameworks in Sections 7.3–7.4 are designed accordingly: they address power relations (vendor regulation, institutional reform, credible commitment mechanisms) AND the gendered structure through which those power relations operate (women's governance authority, cross-community networks transcending patriarchal constraints, protective mechanisms against gender-based violence)—because addressing one without the other reproduces the problem through new institutional arrangements.

Community-Scale Power Relations and Institutional Dynamics

Insight 1: Patriarchal power fills institutional vacuums in water governance

Where formal institutions fail or are destroyed, patriarchal power structures fill the vacuum—not neutrally, but through male-dominated vendor cartels, CDAs, and traditional leadership that systematically exclude women from the governance of resources their labor sustains. The absence of robust regulatory or mediating frameworks does not produce a power-neutral anarchic field but a gendered one: women and tenants, already the most precarious populations in slum contexts, bear the greatest costs of institutional absence while remaining excluded from the informal arrangements that replace formal governance.

The theoretical framework explains why this filling is not contingent but structural: Segato's (2018) mandato de masculinidad identifies territorial control and competitive dominance as the relational logic through which masculinity reproduces itself—making infrastructure governance, with its material assets, pricing authority, and spatial control, a domain patriarchal power captures not by accident but by structural affinity. The vacuum does not await any actor; it awaits the actor whose relational logic is organized around precisely the resources infrastructure governance commands.

Empirical foundation (Chapters 4–5): Paper 1 (Chapter 4) demonstrated how Otumara's deliberate severance from governmental cooperation following 2010 infrastructure destruction created what Scharpf (2018) terms an "anarchic field"—where vendor cartels filled the vacuum, enabling exploitative pricing and violent infrastructure control that fell hardest on women and tenants, precisely those patriarchal governance structures position as least eligible for decision-making authority. Paper 2 (Chapter 5) revealed across four communities that where intermediary institutions (CDAs, traditional leadership) function with integrity, more equitable "solidarity sharing" models emerge (Mafowoku), whereas weak or corrupted institutions enable "free-market" vendor exploitation (Orisunmibare, Otumara). The dialectic between autonomous functionality and systematic exclusion operates consistently: communities achieve fairly functional provision while women and tenants bear the greatest costs of institutional absence without corresponding voice in the informal arrangements replacing formal governance.

Insight 2: Water markets extract from women what patriarchal households deny them

Water commodification under unregulated market conditions does not produce gender-neutral exploitation—it compounds patriarchal household hierarchies through commercial ones. Male vendors extract maximum rents from women who lack control over household water budgets, cannot negotiate pricing, and bear sole accountability for procurement regardless of cost. The result is a double subordination: women are last in domestic water allocation hierarchies and first to bear the economic burden of market-based provision, creating recursive cycles wherein their unpaid reproductive labor subsidizes both household survival and male vendors' capital accumulation. This double subordination—household and market operating through the same bodies—is what infrastructure as dignity makes visible as a single system rather than two separate problems: the household hierarchy that assigns procurement to women and the market hierarchy that extracts from them are not parallel but sequential, each producing the conditions the other exploits.

Empirical foundation (Chapters 4–6): Paper 2 (Chapter 5) identified two distinct water provision models across Lagos slum communities—solidarity-dominant and vendor-controlled—alongside hybrid forms combining aspects of each, with all three configurations producing different gendered outcomes. Solidarity-dominant provision in Mafowoku creates relatively equitable distribution through free or subsidized access points, significantly reducing women's economic burden without however altering their primary responsibility for household water procurement. Vendor cartel control in Orisunmibare and Otumara produces systematic exploitation through oligopolistic pricing and documented violence disproportionately targeting women water procurers. Hybrid and unstable provision in Amukoko-Mosafejo and Precious Seeds creates chronic unpredictability—a precarity intensified by distance to water points, variable quality, and structural economic constraints documented in Chapter 6. Paper 1 (Chapter 4) demonstrated vendor cartels' capacity to suppress solidarity alternatives when Otumara's vendor "veto players" sabotaged Baale Kalejaiye's free water provision attempt—revealing that market fundamentalism and patriarchal hierarchy are not parallel systems but mutually reinforcing ones: suppression falls hardest on women who cannot negotiate pricing, cannot exit the market, and bear sole procurement accountability regardless of cost.

Insight 3: The sustainability paradox is a gendered extraction paradox

Water infrastructure's financial logic reproduces patriarchal exploitation at structural scale: vendors must recoup substantial capital investment through pricing, and those pricing structures extract unsustainable proportions of income from precisely those least able to pay—poor women who bear sole procurement responsibility without controlling household water budgets. The sustainability paradox is not merely a mismatch between infrastructure costs and community capacity; it is a mechanism through which women's economic vulnerability is systematically deepened, their unpaid labor subsidizing a market system that neither compensates them nor recognizes their centrality to its functioning. Read through the infrastructure as dignity framework, the sustainability paradox inverts: the system is not unsustainable—it is sustained precisely through women's extraction. Vendors profit, male governance structures persist, households receive water, and the city functions. What is unsustainable is the conditions under which it is sustained—conditions that the framework names as dignity violation and the ethics of non-abandonment identifies as requiring institutional transformation rather than technical optimization.

Empirical foundation (Chapters 4–6): Vendors face infrastructure capital requirements—borehole drilling 800,000–1,200,000 NGN, pumps and generators 400,000–600,000 NGN—that they must recoup through pricing structures, generating the profit-maximization logic Insight 2 identifies as structurally incompatible with equitable access. Paper 1 showed how Otumara's autonomous water provision following LWC severance required ongoing operational costs passed entirely to consumers through vendor pricing—women allocating one-third of household income to water while lacking any control over the pricing mechanisms extracting it. Paper 3 (Chapter 6) demonstrated that women spend 8,000–30,000 NGN monthly from 70,000 NGN household income, with Nigeria's Naira devaluation intensifying burden while water costs remain constant. The sustainability paradox is gendered at its core: it is women's income that vendor pricing extracts, women's labor that compensates for what pricing cannot cover, and women's governance authority that the resulting system systematically denies.

Household-Scale Gender Hierarchies and Resource Allocation

Insight 4: The paradox of female stakeholder marginalization

Women constitute the primary stakeholders in urban water provision systems through their comprehensive responsibility for household water procurement, storage, rationing, and quality assessment, yet remain systematically excluded from recognition within formal policy frameworks and informal decision-making structures that determine water access, pricing, and infrastructure development. This institutional invisibility perpetuates both psychological and material contradictions wherein those who bear the greatest burden of water provision labor and possess the most intimate knowledge of community-level water dynamics are denied meaningful participation in decision-making processes directly shaping their daily survival strategies and long-term well-being.

Empirical foundation (Chapters 4–6): Paper 1 (Chapter 4) revealed gendered differences in water infrastructure ownership practices—men operating profit-oriented vending while women (when they own boreholes) predominantly provide solidarity-based sharing with flexible payment arrangements. Yet Paper 1's game-theoretical analysis treated "community" as unified actor, obscuring these gendered dimensions that Papers 2 and 3 foregrounded. Paper 2 (Chapter 5) documented across four communities that CDAs, traditional leadership, and vendor networks remain overwhelmingly male-dominated despite women being primary water users and procurers. Paper 3 (Chapter 6) demonstrated the household-scale dialectic: women bear complete accountability for water procurement while remaining systematically excluded from decision-making about water resource allocation, creating what Truelove (2019a) terms the "urbanization of water at the scale of the female body"—where women's embodied experiences become primary sites through which urban water infrastructure systems operate, yet their agency remains constrained by patriarchal household and community hierarchies.

Insight 5: The gendered political economy of water access

Water provision operates through fundamentally gendered logics that construct distinct and contradictory meanings for different actors: for predominantly male water vendors and infrastructure owners, water represents a commercial opportunity enabling capital accumulation and market control, while for women, water provision constitutes unremunerated reproductive labor that simultaneously drains household financial resources and consumes their physical, mental, and temporal capacity. This bifurcated political economy reveals how water systems function as sites of gendered exploitation wherein women's unpaid labor subsidizes both household survival and the profit-generation activities of male-dominated water enterprises, creating recursive cycles entrenching women's economic vulnerability while enabling men's capital accumulation through commodification of essential resources.

Empirical foundation (Chapters 4–6): Paper 1 (Chapter 4) documented in Otumara how vendor cartels coordinate pricing to maximize profit extraction, with vendors functioning as "veto players" (Tsebelis 1995) blocking alternative provision threatening their commercial interests. Paper 2 (Chapter 5) revealed that water vending as business is almost exclusively male-controlled across all four communities, with vendors experiencing violence and vandalism in competitive struggles over territory—yet this male-on-male violence stems from their position as economic actors competing within capitalist markets, fundamentally different from gendered burdens

imposed on women. Paper 3 (Chapter 6) demonstrated the stark economic dimensions: women allocate approximately 23,000 NGN of 70,000 NGN monthly household income (approximately 33%) to water procurement from male vendors, yet lack control over pricing mechanisms or infrastructure ownership. Within domestic water allocation patterns, patriarchal hierarchies determine that men access water first and women last, forcing women to compromise personal hygiene and health maintenance. This systematic subordination creates recursive cycles wherein women's unpaid reproductive labor subsidizes both household survival and broader community water provision while male vendors accumulate capital through extracting women's household income.

Embodied-Scale Experiences and Temporal Entrapment

Insight 6: The structural entrenchment of gendered water responsibilities

The gendered impacts of water provision emerge from patriarchal structures that prescribe women's responsibility for household water procurement regardless of the community water supply model in place. While implementing gendered approaches to water provision in policy and practice represents an urgent necessity that would alleviate women's immediate burdens, such interventions alone cannot fundamentally transform underlying gender role expectations or eliminate women's primary responsibility for household water provision. Transferring decision-making authority, infrastructure implementation control, and ownership and management control of water infrastructure to women could potentially monetize their currently unremunerated labor while challenging prevailing perceptions of gendered competencies in water infrastructure—thereby creating pathways for broader transformation of gender relations within the water sector and potentially extending to other infrastructure domains (transportation, energy, solid waste management, sanitation, flood mitigation) and social organization more broadly.

Empirical foundation (Chapters 5–6): Paper 2 (Chapter 5) documented that regardless of water provision model—"free-market" vendor exploitation or "solidarity sharing" by CDAs and baales—women remain responsible for daily water procurement. The institutional arrangement determines economic burden and time requirements but not the gendered division of labor itself. Paper 3 (Chapter 6) demonstrated through extensive ethnographic documentation how water insecurity manifests at the embodied scale: women's daily practices—rising early, enduring hours-long waits, conducting continuous quality assessments—consume large portions of temporal and physical capacity, creating a dialectical relationship between survival and political agency wherein immediate demands of water procurement preclude the community organizing necessary to challenge structural conditions. The embodied consequences encompass hygiene deprivation particularly acute during menstruation, chronic exhaustion from transporting heavy containers, shame and anxiety from inability to maintain personal cleanliness, financial stress from competing necessities, and intimate partner violence triggered by requests for water money—interconnected impacts demonstrating how water insecurity operates as both symptom and mechanism of broader socioeconomic inequalities.

Cross-Community Scale: Patriarchal Violence and Organizing Constraints

Insight 7: The multi-scalar violence trap suppressing women's water organizing

Multi-scalar patriarchal violence systematically traps women's organizing capacity at every scale where organizing might emerge. Women organizing at household level face intimate partner violence when challenging male control over water spending; organizing at community level exposes them to sexual harassment at water points and gender-based violence from vendors and male leaders retaliating against threats to their authority; organizing at state level triggers eviction threats destroying entire settlements. This multi-scalar violence trap reveals that the scales where women bear greatest infrastructure burden are precisely the scales where patriarchal power operates most intensely to suppress their political response—making community-based organizing structurally insufficient regardless of its internal quality or commitment.

The integration of existing male commercial water vendors through mixed-gender collaborative frameworks presents potential benefits but requires critical evaluation given endemic patriarchal structures that may undermine genuine partnership. Both integration and compensation strategies carry significant risks of precipitating intensified gender-based and intimate partner violence, as challenges to traditional male economic dominance may generate retaliatory responses further endangering women's safety—requiring careful consideration of protective measures and conflict mitigation strategies in any implementation framework.

Empirical foundation (Chapters 4–6, Chapter 1): Papers 1 and 2 (Chapters 4–5) documented how localized patriarchal constraints operate intensely at community scale: Otumara vendors functioning as "veto players" (Tsebelis 1995) suppressing alternatives; Orisunmibare cartel controlling entire community; male-dominated CDAs and traditional leadership excluding women across all communities. Paper 3 (Chapter 6) centered women's accounts of multi-scalar violence—sexual harassment at water points, vendor retaliation, intimate partner violence—revealing that organizing capacity is not merely constrained by time poverty but actively suppressed through violence at every scale where organizing might emerge. Long-term observation across all five communities (2018–2025) confirmed that cross-community networks reduce vulnerability to both localized male power dynamics and individual settlement erasure: when one community faces demolition, organizing knowledge and relationships persist across the network. The forced evictions of Orisunmibare (February 2024) and Precious Seeds (December 2025), despite vastly different internal conditions, validate this structural analysis empirically—community-scale resilience cannot protect against state violence operating through land politics. Section 7.4.5 develops the analytical implications of these evictions in detail.

Multi-Scalar Political Processes and Governance Contradictions

Insight 8: Gender as constitutive inequality mediating all water access dynamics

Water provision inequalities are structured through gender intersecting with class and spatial location—not as parallel inequalities but as co-constitutive dimensions where gender determines who occupies which position within the power structure that class and space delimit. Patriarchal structures determine not only who controls water resources and infrastructure but who bears procurement labor and its costs, who is last in household water allocation, and whose bodily needs are systematically sacrificed—positions that class and property status alone cannot explain, because men sharing identical class position and spatial marginalization do not occupy them. Gender operates as constitutive inequality in intersection with class, property status, and spatial location—not as isolated variable but as dimension through which poverty, tenancy, and slum residence produce specific exploitation forms impossible to understand through single-axis analysis. This foundational relationship means technical or policy interventions failing to address underlying gender power dynamics will inevitably reproduce existing inequalities through new institutional arrangements.

Empirical foundation (Chapters 4–6): The three papers function cumulatively. Paper 1 (Chapter 4) analyzed property relations (landowners versus tenants) and state–community strategic interactions, documenting gendered patterns peripherally—men as profit-oriented vendors, women providing solidarity-based sharing—without yet centering gender analytically. Paper 2 (Chapter 5) provided comparative analysis revealing institutional heterogeneity, documenting women's exploitation across all models without theorizing how gender intersects with class and property to produce water access inequalities. Paper 3 (Chapter 6) centered gender as the organizing analytical lens, demonstrating it mediates all dynamics documented in Papers 1 and 2 specifically for poor slum-dwelling women. Within slum contexts, gendered exploitation compounds at every scale because women lack economic resources, property rights, and political power that might mitigate patriarchal constraints operating at household, community, and state levels simultaneously (Dangarembga 2022; Mama 1995; Massey 1994; McDowell 1999; Oyěwùmí 1997). Political processes at state level maintain these intersecting inequalities through strategic institutional neglect: LSG's focus on large-scale infrastructure serving elite and middle-class neighborhoods, LWC's neglect of slum distribution, and gender-blind policies systematically ignoring how water scarcity falls specifically on poor women's bodies—creating an institutional paradox wherein formal institutions maintain policy frameworks while failing to recognize economically marginalized women as primary stakeholders in water infrastructure.

Methodological Implication: The Imperative for Comprehensive Social Analysis

The eight insights above collectively establish that patriarchal power—not technical failure or institutional absence alone—is the organizing condition of Lagos's water crisis. This demands a methodological conclusion: research and intervention frameworks treating water provision as primarily a technical or managerial problem will inevitably reproduce the inequalities the insights document, because they cannot see the gendered labor foundation on which any infrastructure solution must be built. This is the central premise of the infrastructure as dignity framework (Section 2.4.5): technical solutions that do not address who procures water, who controls infrastructure, and whose decision-making authority determines access will reproduce existing power relations through new technical forms.

Empirical foundation (Chapters 4–6): All three papers documented a shared blind spot across actors with otherwise different mandates: LWC plans pipe networks and waterworks rehabilitation; politicians donate boreholes as patronage; international development organizations fund borehole installation—yet none interrogates distribution, pricing, or governance authority: precisely the dimensions determining whether infrastructure serves women or extracts from them (Massey 1994; McDowell 1999; Sultana 2020; Tamale 2011). Paper 1 (Chapter 4) revealed how LWC's 2010 Otumara infrastructure destruction—a punitive response to billing disputes that disregarded community dynamics—created conditions for vendor cartel exploitation persisting fifteen or more years. Paper 2 (Chapter 5) demonstrated that institutional configurations (CDA functionality, traditional leadership integrity) profoundly affect water access equity, yet government makes no serious attempt to understand why communities lack adequate water access or what institutional conditions shape that deprivation. Paper 3 (Chapter 6) showed that LWC planning remains focused on supply deficits and demand projections, rendering entirely invisible how water—if it arrived—would reach women's households, at what cost, and under whose governance authority. The canceled USAID water ATM project exemplifies the same blind spot at international scale: proposing to partner with existing male-dominated water vendors to introduce technology without interrogating how vendor exploitation, women's economic burdens, or patriarchal decision-making structures would be addressed—reproducing existing inequalities through new technological form. This invisibility exemplifies how a physical infrastructure focus denies women infrastructure citizenship: their essential labor producing urban water access generates no corresponding recognition, decision-making authority, or compensation—precisely the denial infrastructure as dignity names.

Corruption mechanisms documented across papers—contract inflation prioritizing elite profit-sharing, failed World Bank LMDGP achieving minimal outcomes despite substantial funding—further demonstrate how interventions ignoring political, social, and cultural contexts reproduce rather than address structural causes. Comprehensive social analysis is not peripheral concern but analytical and political foundation for effective water infrastructure intervention—because it reveals whose labor sustains systems, whose exclusion enables exploitation, and whose recognition as legitimate infrastructure stakeholders remains systematically denied.

7.3 Pathway One: Comprehensive Policy Reforms

Comprehensive policy reforms targeting institutional transformation at LWC and LSG levels operationalize the infrastructure as dignity framework (Section 2.4.5) by transforming water infrastructure from site where women's labor is extracted without recognition into site where their work generates corresponding decision-making authority, institutional legitimacy, and political voice. These reforms are analytically derived from empirical findings and practice engagement—they constitute evidence-based frameworks requiring empirical testing and political negotiation rather than proven solutions, and their implementation faces substantial barriers addressed in Section 7.4.6.

The recommendations that follow carry different evidence statuses that warrant explicit differentiation—because analytical precision about what this dissertation has demonstrated, what it has theorized, and what it has committed to normatively strengthens rather than weakens the intervention frameworks. Three categories structure the recommendations across both pathways.

Empirically grounded recommendations derive directly from findings documented across Chapters 3–6 and the practice engagement detailed in Chapter 1. These include: the documented correlation between distance to water source and quantity of water per person per day (Howard et al. 2020; Chapter 6, Table 6.1), establishing the technical imperative for compound-level water point distribution (Section 7.3.5); the demonstrated capacity of solidarity-model communities—particularly Mafowoku—to achieve relatively equitable distribution through CDA-managed and traditional-leader-provided free access (Chapter 5); the empirically documented practice of female infrastructure owners providing subsidized, solidarity-based water access where male vendors extract maximum rents (Chapters 4–6); and the demonstrated capacity of women to organize collectively for infrastructure governance, negotiate with government, and develop operational management protocols—achieved through the Precious Seeds intervention (2024–2025) even though the community's eviction prevented long-term outcome assessment (Chapter 6, Section 6.3; Section 7.4.5.2). The borehole-to-multiple-water-point distribution technology itself is empirically established—vendors in the case-study communities already operate piped connections from boreholes to distant tank points (Chapter 3)—though its standardization under women's committee governance at the specifications proposed in Section 7.3.5 remains untested.

Theoretically derived recommendations emerge from the analytical frameworks established in Chapters 2 and 7 but have not been empirically tested at the scale or in the form proposed. These include: cross-community women's water networks operating across settlement boundaries (Section 7.4.1)—grounded in the structural argument that community-anchored organizing is vulnerable to eviction and localized patriarchal capture, but untested as an organizational form; hybrid financing models combining NGO, government, and community contributions at the proportions specified (Section 7.4.2)—logically derived from existing expenditure patterns and funding mechanisms but requiring empirical calibration; micro-governmental networks positioning vendors within women's committee-determined pricing and quality structures (Section 7.4.3)—conceptually coherent but facing the implementation barriers Section 7.4.6 addresses; and the specific technical parameters for borehole-to-standpipe distribution systems in Lagos's settlement conditions (Section 7.3.5)—drawn from established sub-Saharan African engineering practice but requiring Lagos-specific calibration through the 2026 project (Section 8.2). The 2026 LWC implementation project is designed to generate the empirical evidence these theoretically derived recommendations require (Section 8.2).

Normative commitments are generated by the infrastructure as dignity framework regardless of empirical evidence—they represent what the framework's ethics of non-abandonment demands as a matter of principle. These include: the commitment that those whose labor produces infrastructure deserve corresponding governance authority (the framework's core claim, Section 2.4.5); the 75-liter-per-person-per-day standard as the threshold at which women's bodily needs cease to be systematically sacrificed (Section 7.3.5); the insistence that gender-based violence protective mechanisms are constitutive of, not supplementary to, women-centered infrastructure organizing (Section 7.4.4); and the inclusion-versus-transformation distinction establishing that inserting women into existing patriarchal governance structures is analytically and politically insufficient (Section 2.4.3). These commitments are not contingent on whether specific implementation mechanisms succeed—they define the conditions any intervention must meet to constitute transformation rather than accommodation.

These categories are not hermetically sealed—empirically grounded findings inform theoretically derived recommendations, which in turn operationalize normative commitments. But making the distinctions explicit guards against two errors: treating untested proposals as proven solutions,

and dismissing normatively grounded commitments because they lack empirical validation. The recommendations that follow are marked by their evidence status where the distinction is consequential for implementation.

7.3.1 Lagos Water Corporation (LWC): Gender-Responsive Institutional Transformation

LWC Restructuring: From Technocratic Provision to Supporting Community-Based Infrastructure Management

LWC's current technocratic approach fundamentally misunderstands the social dimensions of water provision and systematically denies infrastructure citizenship to women whose labor produces urban-scale water access—the core problem the infrastructure as dignity framework reveals. Effective intervention requires comprehensive policy reform transcending purely technical and managerial frameworks by recognizing infrastructure as political terrain where dignity, recognition, and citizenship are contested (Section 2.4.5).

The institutional transformation proposed here operates simultaneously as power relations reform and as gendered governance transformation—and the distinction matters analytically. Prioritizing households, customers, and the powerless over vendor cartels (as Section 7.3.1 proposes) is indeed a power relations approach: it shifts institutional weight toward those currently lacking it, regardless of gender. But a power relations approach that does not interrogate gender will route governance through existing community structures—CDAs, traditional leaders, vendor associations—that are themselves constituted by patriarchal ordering. Wolfgang Scholz's observation from Tanzania is instructive here: women serve as directors of formal water utilities without difficulty but rarely lead informal water cartels (Scholz 2026, personal communication). This is not a paradox but a precise illustration of the inclusion-versus-transformation distinction developed in Section 2.4.3. Formal utilities operate through institutional logics—bureaucratic appointment, professional qualification, regulatory compliance—that can accommodate women's leadership because the institutional form is not itself structured by the *mandato de masculinidad*. Informal cartels, by contrast, operate through the competitive, territorial, violence-backed relational logic Segato (2018) identifies as constitutive of male sociality—a logic that structurally excludes women not because they lack competence but because the cartel's organizational form *is* the mandate of masculinity expressed through infrastructure control. Dakyaga's (2023; Dakyaga et al. 2023) comprehensive governance typology for Dar es Salaam's non-utility-networked water infrastructure exemplifies this pattern precisely: his recommendation for mixed governance—co-governance, co-management, formal co-production—represents sophisticated institutional reform that addresses the power asymmetry between utility and non-state providers without interrogating the gendered structure through which those non-state providers operate, thereby proposing inclusion without transformation. Power relations reform that replaces cartel control with regulated utility provision addresses the exploitation problem. Gendered governance transformation asks the prior question: why do men control infrastructure through cartels in the first place, what relational logic sustains that control, and what alternative governance forms emerge when theorized from women's solidarity-based infrastructure labor rather than from existing male-dominated structures? The policy recommendations that follow address both dimensions—because addressing power relations without transforming their gendered structure

produces inclusion (women accommodated within reformed institutions) rather than transformation (governance reconceived from women's labor as its generative ground).

This transformation demands that LWC fundamentally reconceptualize its operational mandate from centralized service delivery toward supporting citizen-based water infrastructure systems organized across communities through regulatory frameworks, technical assistance, and resource mobilization. Simultaneously, international organizations and local NGOs and CSOs must advocate for, and implement, water supply approaches that explicitly recognize women as primary stakeholders rather than passive beneficiaries, ensuring their meaningful participation in planning, implementation, and management processes. Such policy reorientation requires moving beyond the conventional infrastructure development paradigm toward hybrid governance models that leverage existing citizen, household, and community knowledge systems while addressing their structural limitations through targeted interventions enhancing equity, accountability, and democratic participation in urban water provision.

Co-Production Framework Implementation

The findings suggest transitioning from deficit-based approaches toward recognizing the resourcefulness of existing community water systems as legitimate infrastructure providers rather than temporary solutions or management failures. This transformation involves creating partnerships with existing CDAs that demonstrate institutional integrity, while simultaneously fostering new citizen-led organizations—particularly women-led urban water networks operating across community boundaries—and cautiously engaging traditional leadership structures despite their fundamentally undemocratic and exclusively male character that may ultimately require systematic reform or replacement.

Where informal and traditional governance structures remain weak or corrupted, developing regulatory frameworks for water vendors becomes essential, particularly when replacing existing institutions with new citizen-led organizations proves institutionally or politically unfeasible. Regardless of specific organizational forms, such hybrid approaches must establish non-negotiable standards for water quality, pricing structures, and distribution equity while preserving local autonomy and indigenous knowledge systems demonstrating functional capacity.

Credible Commitment Mechanisms

The game-theoretical analysis of Otumara (Chapter 4) reveals that mutual cooperation between government and communities would produce substantial welfare gains, yet both parties remain trapped in strategic defection due to fundamental credibility problems. Drawing on Mbembe's (2001, p. 111) analysis, this represents a condition of systemic disempowerment wherein situations of powerlessness become “situations of violence par excellence” (Mbembe 2001, p. 133). Within Lagos's water politics, power operates through what Mbembe characterizes as vulgar and transgressive modalities, manifesting across both macro-institutional and micro-community scales. This doctoral research reveals levels of entrenched mistrust that may fundamentally obstruct hybrid collaboration approaches, as such frameworks inherently require foundational trust between parties with histories of mutual exploitation and abandonment.

Potential pathways for transcending this deeply embedded power and violence dialectic include third-party mediation through CSOs, NGOs, or international organizations capable of providing neutral oversight and credible commitment mechanisms. Alternative or complementary approaches involve implementing small-scale pilot projects enabling gradual reciprocal testing of commitment levels without exposing either party to significant risk, while simultaneously

developing enforcement mechanisms guaranteeing agreement compliance without creating external vulnerabilities. These interventions must acknowledge that technical solutions alone cannot address the underlying structural violence and historical trauma generating persistent mistrust, requiring longer-term processes of relationship-building and institutional transformation extending beyond immediate water provision concerns.

Women's committees offer a structural rather than merely personnel substitution: because existing male-dominated institutions (CDAs, traditional leaders, vendor associations) either participated in or failed to prevent the exploitation generating community mistrust of state partnerships, routing new governance arrangements through these same institutions reproduces the credibility problem under new procedural forms. Women's committees, by contrast, are not implicated in previous governance failures and already operate through solidarity rather than profit-maximizing principles—empirically demonstrated by female tank owners and vendors providing subsidized access where male vendors extracted maximum rents. Community trust in women's infrastructure authority therefore rests on demonstrated behavioral track records, not institutional promises, which is precisely what the credibility problem requires: a partner the community can assess through action rather than take on faith. This proposal confronts its own contradiction: if patriarchy is as entrenched as documented throughout this dissertation, women's committees may face rejection precisely because they center women. Yet this tension explains why transformation feminism—not inclusion feminism—proves necessary: women's governance authority requires deliberate multi-scalar protections against patriarchal capture (Sections 7.4.2–7.4.6), not optimistic assumptions about institutional openness. The framework's plausibility rests not on patriarchy's dissolution but on structures functioning despite its persistence.

Conflict-Sensitive Institutional Transformation

To address the structural violence and historical trauma embedded within Lagos's water politics, conflict-sensitive approaches to policy formulation, institutional restructuring, and organizational development represent essential prerequisites for sustainable intervention. Conflict sensitivity—understood following Swisspeace (2022) as the capacity to comprehensively understand operational context, analyze dynamic interactions between interventions and broader environment, and avoid unintentionally contributing to social division while maximizing opportunities to enhance social cohesion—provides an analytical framework applicable across sectors and institutional levels. Within Lagos's water infrastructure context, conflict-sensitive approaches must acknowledge how water access intersects with existing social cleavages including gender hierarchies and class stratification, developing interventions that address immediate water needs while simultaneously strengthening social bonds across these fault lines rather than inadvertently reinforcing existing divisions through poorly designed institutional arrangements.

7.3.2 Gender-Responsive Infrastructure Implementation and Management Transformation

Women-Centered Decision-Making Structures

Transferring water infrastructure decision-making authority to women operationalizes the infrastructure as dignity framework's core premise: those whose labor produces infrastructure deserve corresponding governance rights and political recognition. The doctoral research reveals

that despite constituting primary stakeholders, women remain systematically excluded from water infrastructure decision-making structures (Chapter 5; Chapter 6). Policy implementation must establish local female water committees with autonomous management and oversight authority over non-commercial water points, ensuring women's substantive participation in resource allocation decisions rather than limiting their role to procurement responsibilities. These committees could operate through loose networks or systematic inter-community coordination structures, potentially creating economies of scale and reducing women's vulnerability to localized power dynamics while preserving community-specific knowledge and autonomy.

The challenge of transferring infrastructure governance from informal male-dominated systems to women-centered structures parallels challenges across other infrastructure domains—and the parallel illuminates why the inclusion-versus-transformation distinction proves essential beyond water. The transition from informal minibus systems to formalized Bus Rapid Transit (BRT) in Lagos and other African cities demonstrates the same structural logic: existing operators—predominantly male, organized through informal networks maintained by patronage relationships with political actors—resist formalization not merely because they lose income but because formalization threatens the relational logic through which their authority operates. Including existing operators within formalized BRT systems (the inclusion approach) preserves their positional power within new institutional arrangements; building BRT systems from passenger needs as generative ground (the transformation approach) produces governance structures that may require entirely different organizational forms. The water infrastructure case is structurally analogous: including existing male vendors within reformed hybrid governance (the approach Papers 1 and 2 recommended before Paper 3's feminist reorientation) accommodates vendor power within new institutional forms, while centering women's infrastructure labor as the ground from which governance is theorized produces the women's committee model this dissertation proposes. In both cases, the inclusion approach is politically easier and institutionally familiar; the transformation approach challenges who governs and on what relational basis. The fact that the same inclusion-versus-transformation tension operates across infrastructure domains—water, transport, energy—where informal male-dominated provision faces formalization pressure suggests that the analytical distinction this dissertation develops for water carries implications beyond the water sector, a direction for future research identified in Section 8.5.

Traditional Leadership Reform

While traditional leaders can provide effective community mediation when demonstrating institutional integrity, their exclusively male composition and appointment through patriarchal lineage systems require fundamental structural examination. Policy frameworks should pursue either comprehensive democratization of traditional leadership selection processes through community-wide participation or develop parallel community governance mechanisms ensuring gender equity and democratic accountability. Reform efforts might utilize traditional leaders' wives as entry points—though this requires critical scrutiny, as the approach risks reproducing patriarchal structures by channeling women's political participation through their relationships to male authority figures rather than recognizing their independent political agency and leadership capacity.

Intersectional Policy Design

Gender-responsive policies must acknowledge the heterogeneity of women's experiences across multiple dimensions including age, physical ability, economic status, household position, and social identity rather than employing essentialist conceptualizations treating women as a uniform

category (Mollett and Faria 2013). This analytical approach requires addressing the specific vulnerabilities and capacities of physically disabled women, elderly women, tenants versus property owners, female-headed households, and women experiencing varying degrees of economic marginalization. Such intersectional frameworks must simultaneously recognize shared patterns of gender-based exclusion while remaining attentive to how other forms of social stratification mediate women's relationships to water access, community power structures, and potential for collective organizing.

7.3.3 Regulatory Frameworks and Anti-Exploitation Measures

Commercial Water Point Regulation

The research documents systematic exploitation through commercial water vendors who maintain inflated prices while not always providing reliable services (Chapters 4–6). Within hybrid, co-productive water supply systems, regulatory interventions must prohibit exploitative commercial practices and implement robust community-level oversight mechanisms. Who implements regulation will determine whether it succeeds. While local governments and democratically accountable CDAs could theoretically provide oversight, their frequent lack of integrity undermines regulatory effectiveness. Establishing citizen-based oversight boards with mandatory gender parity offers one pathway for holding water vendors accountable, though such boards require sufficient authority and resources to enforce compliance (Acey, 2019). Alternatively, the proposed female urban water organizations operating across community boundaries could incorporate regulatory frameworks as integral organizational components, potentially providing more effective oversight given women's direct experience with vendor exploitation and their stake in ensuring equitable access.

Quality and Safety Standards

Current water provision frequently involves significant health risks through contaminated sources and inadequate treatment protocols. Comprehensive regulatory frameworks must establish and rigorously enforce water quality standards, implement systematic monitoring systems ensuring reliable service delivery, and create accessible complaint mechanisms enabling women and community members to address service failures without fear of retaliation or service termination. Regulatory effectiveness depends on whether female urban water organizations can be successfully established or whether improvements must work within existing vendor-dominated systems. The latter approach faces inherent limitations given vendors' financial incentives to minimize treatment costs, while the former requires substantial organizational capacity and technical expertise that may require external support.

Violence Prevention and Safety

The documented prevalence of interpersonal violence at water points, theft of water containers, and intimate partner violence triggered by water procurement costs requires comprehensive policy attention to the safety dimensions of water access (Chapter 6). Interventions must encompass strategic design of water access points to minimize conflict potential through adequate spacing, lighting, and queue management; implementation of community-based security measures that do not rely on formal policing; and systematic addressing of intimate partner violence linked to resource scarcity through coordinated social services. Women-led water organizations may possess greater sensitivity to safety concerns and stronger incentives to address

gender-based violence, while vendor-dominated systems may lack both motivation and capacity to prioritize women's safety over profit maximization. Any approach must acknowledge that addressing violence requires broader social transformation beyond water sector interventions alone.

7.3.4 Systemic Transformation and Anti-Corruption Measures

Corruption Elimination

The research exposes systematic “contract inflation” practices wherein water infrastructure projects function primarily as mechanisms for political-economic elite profit-sharing rather than genuine service delivery. This pattern manifests in both failed implementation of international development initiatives—exemplified by the Lagos Metropolitan Development and Governance Project (LMDGP) achieving minimal outcomes—and projects that never commence implementation, such as the EKO-UP initiative denied funding due to compliance and ethical violations associated with contract inflation schemes. Effective policy reform requires implementing robust transparency mechanisms for all water infrastructure contracts, establishing enforceable accountability measures for project implementation and fund disbursement, and conducting systematic auditing of development assistance effectiveness with consequences for non-performance.

Inter-Agency Coordination

Inadequate coordination between LWC and other governmental departments systematically undermines infrastructure development and maintenance. Water infrastructure is frequently destroyed during road construction or drainage projects due to absent communication protocols, while eviction operations demolish publicly funded boreholes alongside residents' homes—simultaneously wasting governmental resources and perpetuating the water insecurity that prompted infrastructure investment. Binding inter-ministerial coordination mechanisms, mandatory consultation before infrastructure-affecting activities, and protective measures preventing demolition during construction and eviction operations are required. Such coordination demands fundamental shifts in institutional culture, not merely technical protocols.

Democratic Accountability Enhancement

CDAs demonstrate significant organizational potential yet frequently lack effective oversight mechanisms and exclude meaningful participation from substantial portions of community populations, particularly tenants and women. Policy interventions should establish uniform governance frameworks requiring inclusive participation mandating representation of both property owners and tenants, implement transparent accountability mechanisms linking organizational authority to demonstrated performance in service delivery and equitable resource distribution, and create accessible complaint procedures enabling community members to challenge CDA decisions without fear of retaliation. External imposition of governance rules risks reproducing top-down approaches undermining community autonomy, suggesting that reforms must emerge through participatory processes enabling communities to develop context-appropriate accountability structures while adhering to fundamental principles of democratic inclusion and gender equity.

Local Government Authority and Capacity

Strengthening local government institutions in Lagos State—LGs and LCDAs—represents a longstanding yet persistently unresolved institutional challenge. Local governments theoretically function as critical intermediary institutions responsible for channeling community infrastructure inquiries to state-level agencies while facilitating essential services. However, this doctoral research provides compelling evidence that this intermediary function systematically fails in practice, with community requests regarding infrastructure deficiencies routinely ignored or inadequately addressed.

While isolated cases demonstrate that communities supported by CSO and NGO advocacy can occasionally secure borehole implementation through local government channels, such successes remain exceptional. This partly reflects communities' reasonable expectation that infrastructure provision constitutes an inherent governmental responsibility rather than a service requiring persistent advocacy. The structural obstacles constraining local government effectiveness operate across multiple dimensions: chronic under-resourcing in both fiscal capacity and technical expertise; inadequate jurisdictional authority relative to the scale of infrastructure deficits; and the instrumentalization of local government positions for patronage distribution, whereby appointments serve political loyalty rewards rather than administrative competence or service delivery.

This configuration creates an institutional paradox wherein local governments possess formal responsibility for community-level infrastructure without corresponding authority, resources, or institutional capacity to fulfill these mandates. Strengthening local government therefore requires not merely increased funding allocations but fundamental restructuring of fiscal federalism arrangements, merit-based appointment systems reducing patronage dynamics, and clearer delineation of responsibilities between state and local tiers aligning formal authority with actual capacity.

7.3.5 Technical Infrastructure Standards for Compound-Level Water Point Distribution

The governance recommendations developed in Sections 7.3.1–7.3.4 require concrete technical infrastructure specifications to be operationalizable. Without engineering parameters defining what women's committees would actually manage—how many water points, at what distances, delivering what volumes, from what sources, through what distribution systems—governance reform remains an institutional shell without material content. This section establishes the technical standards that translate infrastructure as dignity from normative framework into engineering target, drawing on WHO service level classifications (Howard et al. 2020), this dissertation's empirical documentation of existing infrastructure configurations (Chapter 3), and established borehole-to-distribution-point system design for sub-Saharan African contexts (Davey et al. 2018; Danert et al. 2014; Haarhoff and Rietveld 2009).

The technical documentation of water infrastructure configurations across all five communities (Chapter 3) provides the empirical baseline against which these standards are set. Chapter 3's spatial mapping of water points, infrastructure inventories documenting borehole depths, water quality assessments, vendor pipe connection distances, and pricing structures constitutes the technical evidence that existing infrastructure—while operationally functional in producing water

access—fails to meet engineering standards for equitable coverage, adequate service levels, and safe water quality. Vendors in Otumara connect boreholes at Iya Agan Street to community tanks through 200–300 meters of private pipe (Chapter 3, Section 3.4.4); in Orisunmibare, a vendor maintained pipes to a borehole at Gaskiya Road roundabout 1,200 meters away (Chapter 3, Section 3.4.3); in Precious Seeds, fee-based water points required 500–700 meters of travel (Chapter 3, Section 3.4.5). These are not merely access statistics but technical specifications revealing how vendor-configured infrastructure systematically exceeds the distance thresholds at which water quantity drops to inadequate or basic levels. The technical standards proposed below specify what community-scale distribution systems require to transform this baseline—using the same piped connection technology vendors already employ but configured for equitable compound-level coverage under women's committee governance rather than for profit-maximizing point-source control.

The Distance-Quantity Correlation as Engineering Imperative

The WHO classification of water service levels (Howard et al. 2020)—applied to the five case-study communities in Chapter 6, Table 6.1—establishes a correlation between distance to water source and quantity of water available per person per day that carries direct engineering implications. At "basic" access level (100–1,000 meters distance, 5–30 minutes total collection time), average quantity is unlikely to exceed 20 liters per person per day—sufficient for drinking, cooking, food hygiene, and handwashing, but not for bathing, laundry, or menstrual hygiene. At "inadequate" access (exceeding 1,000 meters or 30 minutes total collection time), quantity can fall below 5.3 liters per person per day—a health emergency by any standard. Only at "intermediate" access—water delivered within 100 meters or 5 minutes total collection time—does average quantity reach approximately 50 liters per person per day, covering laundry and bathing needs alongside basic consumption. "Optimal" access requires water supplied continuously through multiple taps on the premises, yielding 100 liters per person per day (Howard et al. 2020).

Three of the five case-study communities documented in this dissertation achieve only basic access; two—Orisunmibare and Precious Seeds—rated inadequate (Chapter 6, Table 6.1). None reached intermediate access as a consistent community-wide standard. The engineering implication is unambiguous: reducing distance to water points is not merely a convenience improvement but the single most consequential technical intervention for increasing water quantity per person per day and thereby reducing the health burden, time poverty, and bodily extraction that this dissertation documents as gendered infrastructure labor.

The technical target this dissertation proposes is 75 liters per person per day as the minimum acceptable standard for women-centered water infrastructure—positioned deliberately above the WHO "intermediate" threshold of 50 liters per person per day and below the "optimal" threshold of 100 liters per person per day requiring continuous piped on-premises supply. The 75-liter target is not derived from a WHO category but from the empirical findings of this dissertation: Chapter 6 documents that women sacrifice personal hygiene—particularly during menstruation—ration children's bathing water, and forego laundry to preserve drinking and cooking allocations. At 50 liters per person per day, basic bathing and laundry become possible but remain constrained; at 75 liters, adequate hygiene including menstrual hygiene management, regular child bathing, food preparation, and domestic cleaning becomes achievable without the rationing that this dissertation identifies as embodied dignity violation. The 75-liter standard is therefore not an engineering convenience but the technical translation of infrastructure as dignity: the volume at which

women's bodily needs cease to be systematically sacrificed to household water scarcity. Achieving this target requires at least one functional, potable water point within 100 meters of every compound, with sufficient standpipe capacity and operating hours to prevent queuing from reintroducing the time poverty the technical standard is designed to eliminate. This standard is set below optimal (piped on-premises supply) because piped household connections remain infrastructurally and financially infeasible across Lagos's slum settlements for the foreseeable future—the same recognition that motivates the hybrid governance approach throughout this dissertation.

Borehole-to-Distribution-Point System Design

Achieving intermediate access across Lagos's slum communities does not require a borehole at every compound. A single properly constructed and adequately yielding borehole can feed multiple community water points through a piped distribution network—a system design well established in sub-Saharan African water engineering (Davey et al. 2018; Danert et al. 2014) and already practiced informally in the case-study communities, where several vendors connect boreholes to water tanks several hundred meters away through private pipe networks (Chapter 3, Sections 3.4.3 and 3.4.4). The technical innovation this section proposes is not the distribution model itself—it already exists in Lagos—but its standardization under women's committee governance, applying engineering specifications for equitable compound-level coverage to a system vendors currently configure exclusively for profit maximization. The borehole-to-multiple-standpipe system operates through five interdependent components, each carrying specific technical requirements for Lagos's slum conditions.

Borehole construction and yield. Borehole depth varies significantly across Lagos's geological zones. In Amukoko-Mosafejo, commercial boreholes reach approximately 42–54 meters depth, producing water of medium to good quality suitable for domestic use after basic treatment (Chapter 3, Section 3.4.1). In communities beyond the saline intrusion line—Otumara's situation documented in Chapter 4—boreholes must penetrate significantly deeper to access freshwater beneath the saline-freshwater interface, requiring professional hydrogeological siting to avoid the abandoned boreholes that litter Lagos's coastal zones (Danert et al. 2014). A 24-hour yield test must be conducted to ensure sustainable extraction rates (Danert et al. 2014). For community-scale supply serving 250–500 households, borehole yield must sustain extraction of at least 18–31 cubic meters per day—calculated from the WHO intermediate access level of 50 liters per person per day for a population of 300–500 persons per water point cluster (15–25 cubic meters), plus distribution losses of approximately 15–20 percent. Achieving the 75 L/p/d normative target established above would require proportionally greater yield— approximately 27–47 cubic meters per day for the same population range—achievable through higher-capacity boreholes or multiple boreholes per cluster, specifications the 2026 LWC project (Section 8.2) will calibrate to Lagos-specific hydrogeological conditions. Borehole casing must use corrosion-resistant PVC or stainless steel, with screens appropriately positioned relative to aquifer depth and water table levels to prevent low-yield or unreliable supply—a construction quality problem affecting over 25 percent of boreholes in sub-Saharan Africa according to systematic field studies (MacAllister et al. 2022).

Pumping system. Submersible pumps in Lagos typically range from 0.5 to 2 horsepower for residential and community boreholes, with pump selection depending on borehole depth, required flow rate, and total dynamic head—the vertical distance from the water table to the discharge point plus frictional losses in the pipe system. Two power options exist, each with implications

for women's committee governance. Generator-powered systems (the current Lagos norm) create dependency on fuel costs and availability—a significant operational burden that vendors currently pass to women consumers through pricing. Solar-powered submersible pump systems, increasingly established across sub-Saharan Africa (UNICEF n.d.), eliminate fuel dependency entirely: a 3–4 kilowatt-peak solar array can power a submersible pump sufficient for community-scale supply, with the elevated storage tank providing water during non-sunlight hours through gravity distribution (Davey et al. 2018).[1] Solar systems carry higher initial capital costs (approximately 30–40 percent above generator-powered equivalents) but dramatically lower operational costs—a cost structure better suited to women's committee management, where operational budgets derive from modest user fees rather than vendor profit margins. The 2026 LWC implementation project (Section 8.2) should pilot solar-powered systems in at least two communities to generate comparative cost-benefit data against generator-powered alternatives.

Elevated storage tank. An elevated water storage tank—positioned at minimum 5–10 meters above ground level—serves two functions: it stores water pumped during peak solar hours (or generator operating hours) for continuous distribution throughout the day, and it generates the hydrostatic pressure head required to feed water through distribution pipes to standpipe points by gravity, eliminating the need for downstream pumping (Davey et al. 2018). Tank volume must accommodate at least one day's community water demand as buffer against pump failure or cloudy days in solar-powered systems. For a community cluster of 300–500 persons at 50 liters per person per day, storage capacity of 15–25 cubic meters is required—achievable with commercially available polyethylene or ferrocement tanks; at the 75 L/p/d target, 23–38 cubic meters, achievable through additional tank units. Tank elevation between 5 and 10 meters provides sufficient pressure head for distribution distances up to 500 meters through appropriately sized pipes, while elevations above 10 meters increase structural costs and solar array size requirements disproportionately to pressure gains (Davey et al. 2018).

Distribution pipe network. PVC pipe—widely available and affordable across Lagos—constitutes the standard distribution material for community-scale systems. Main distribution lines of 50–75 millimeters diameter connect the elevated tank to standpipe clusters, with branch lines of 25–32 millimeters diameter serving individual standpoints.[2] The pipe network can follow either a dendritic (branched) or looped configuration. Looped networks—where pipes form closed circuits rather than dead-end branches—offer significantly greater resilience to maintenance disruptions and more even pressure distribution, though they require more pipework and higher initial cost (Davey et al. 2018). In Lagos's slum settlement morphology, where building density, irregular plot boundaries, and narrow access paths constrain pipe routing options, dendritic networks may prove more feasible for initial installation, with loop connections added as the system matures.

Pipe routing must address two distinct settlement conditions documented across the case-study communities (Chapter 3). In communities with unpaved pathways and informal construction—the condition characterizing Precious Seeds and Orisunmibare before their respective evictions—distribution pipes should be buried at minimum 300 millimeters depth in trenches with compacted

[1] At Lagos's average solar irradiance of approximately 4.5–5.5 peak sun hours per day, a 3.5 kWp array generates 16–19 kWh daily, exceeding the approximately 9 kWh required by a 1.1 kW (1.5 HP) submersible pump operating 8 hours—providing margin for system losses and panel degradation

[2] Applying the Hazen-Williams equation (C = 150 for PVC), a 50 mm main at 500 meters length with 10 meters hydrostatic head produces approximately 1.9 l/s, roughly 83 m³ over 12 operating hours—well above the 15 m³ required for the 50 L/p/d design basis for 300 persons. A 75 mm main under the same conditions produces approximately 5.6 l/s, roughly 240 m³—well above the 37.5 m³ required for the 75 L/p/d target serving 500 persons, with ample margin for distribution losses.

backfill, protecting against surface damage from foot traffic, construction activity, and seasonal flooding. In communities with tarred roads and constructed drainage systems—the condition characterizing Mafowoku and Amukoko-Mosafejo—pipe routing requires a different approach. Current LWC practice in these communities attaches water mains to open drainage channel walls (Chapter 3, Sections 3.4.1 and 3.4.2)—a technically unsound arrangement creating cross-contamination risk from surface water runoff, sewage infiltration, and physical damage during drainage maintenance. Community-scale distribution networks should instead route pipes through shallow trenches along road verges or building setback lines, avoiding both the road surface (where trenching and reinstatement is prohibitively expensive and disruptive) and drainage channels (where contamination risk undermines water quality regardless of source treatment). Trench depth of 450–600 millimeters along tarred road verges provides adequate protection from vehicle loading while remaining accessible for maintenance—a critical consideration for women's committees managing systems without the heavy equipment LWC deploys for deep-buried municipal mains.

Standpipe (water point) design and placement. The standpipe is the user interface—the infrastructure element women interact with daily—and its design determines whether the technical system translates into dignified access or reproduces the queuing, crowding, and conflict this dissertation documents. Standpipe placement must follow the 100-meter maximum distance standard, ensuring every compound falls within the intermediate access threshold. Haarhoff and Rietveld (2009), documenting over 100 standpipes across 21 South African villages, demonstrate that standpipe design receives inadequate engineering attention despite constituting less than 5 percent of total water system capital cost—a finding directly relevant to Lagos, where water point design has been determined entirely by vendor profit logic rather than user welfare. Ingram et al. (2018), investigating smart standpipe systems in the same Gambian context Davey et al. (2018) modeled, demonstrate that pre-payment and real-time monitoring technology at community water points can cycle revenue back into operation and maintenance while generating consumption data enabling adaptive management—a technical capacity directly relevant to women's committee governance, where transparent financial accounting and usage monitoring constitute both operational necessities and accountability mechanisms. Each standpipe should serve a maximum of 250 persons—the WHO emergency standard adapted for permanent community infrastructure—to prevent the queuing documented across this dissertation's case-study communities. Multiple taps per standpipe (minimum two) reduce waiting times and provide redundancy against individual tap failure. Hardened concrete aprons with drainage prevent standing water and mud—conditions creating health hazards and particularly affecting women who collect water barefoot or in inadequate footwear. Platform design must accommodate jerrycan filling without requiring users to lift full containers from ground level—a load-bearing consideration directly relevant to women's bodily health documented in Chapter 6.

Water Quality Treatment Requirements

Water quality varies significantly across Lagos's hydrogeological zones and determines what treatment infrastructure women's committees must manage. In communities with acceptable groundwater quality (Amukoko-Mosafejo, Mafowoku), basic chlorination at the storage tank level may suffice for potability. In saline intrusion zones (Otumara and similar coastal communities), reverse osmosis or desalination treatment may be required—significantly increasing both capital and operational costs and technical management complexity.

Saline intrusion communities may therefore require a differentiated financing model or dedicated LWC technical partnership for treatment infrastructure that the standard hybrid financing framework (Section 7.4.2) does not cover. Between these extremes, communities with iron and manganese contamination—common in Lagos's sedimentary aquifer—require aeration and sedimentation treatment, achievable through relatively simple open-tank systems at the borehole-to-tank interface. Water quality testing at minimum quarterly intervals, using portable field testing kits measuring turbidity, pH, chlorine residual, and bacterial contamination (total coliforms and E. coli), constitutes a non-negotiable management responsibility for women's committees—a technical competency that capacity-building programs (Section 8.2.2) must address explicitly.

Technical Research Requirements Within the 2026 LWC Project

Three engineering questions require empirical investigation through the planned 2026 LWC implementation project (Section 8.2) rather than theoretical specification alone. First, what borehole yield is achievable and sustainable across the specific geological formations underlying Lagos's slum communities on the mainland versus waterfront zones, and how many standpipe points can a single borehole reliably supply without exceeding sustainable extraction rates? Existing data from commercial borehole operations (Chapter 3) provides partial answers—vendors successfully pump from boreholes feeding multiple tank connections—but systematic yield testing under continuous community-scale extraction has not been conducted for the case-study communities. Second, what is the optimal pipe network configuration for Lagos slum settlement morphology, where building density, irregular plot boundaries, and narrow access paths create routing constraints absent from the rural contexts where most sub-Saharan African distribution network design has been tested (Davey et al. 2018)? Third, what solar array sizing and orientation achieves year-round supply reliability in Lagos's climate—characterized by a bimodal rainfall pattern and cloud cover variation between dry season (November–March) and wet season (April–October)—and does the lower solar irradiance during wet season months create supply deficits requiring generator backup or additional storage capacity?

These questions are not gaps undermining the technical recommendations above but specifications the 2026 project is designed to generate. The borehole-to-distribution-point model is proven technology across sub-Saharan African contexts; what requires Lagos-specific empirical testing is the calibration of system parameters—borehole yield, pipe sizing, solar array capacity, storage volume—to local hydrogeological and settlement conditions. This calibration constitutes part of the technical partnership LWC can provide (Section 8.2.2): hydrogeological data, distribution network modeling expertise, and water quality testing capacity that women's committees need not develop independently but must understand sufficiently to exercise informed governance authority over the systems their labor will sustain.

The Technical-Governance Interface

The technical specifications above are not separable from the governance framework this dissertation proposes. Every technical parameter carries a governance dimension: borehole siting determines which compounds fall within the 100-meter access threshold—a decision currently made by vendors based on profit potential rather than equitable coverage. Pump operating hours determine when water is available—currently set by vendors to maximize revenue rather than accommodate women's procurement schedules. Pricing per container reflects infrastructure cost recovery calculations—currently opaque, set by cartels, and extracting one-third of household income from women who cannot verify whether pricing bears any relationship to actual

operational costs. Water quality monitoring determines whether water is safe—currently unmonitored because vendors have no financial incentive to test or treat.

Women's committee governance transforms each of these technical decisions: siting prioritizes equitable compound-level coverage over profit maximization; operating hours reflect women's actual procurement needs rather than vendor convenience; pricing becomes transparent, based on documented operational costs with margins set by community decision rather than cartel coordination; quality monitoring becomes a governance responsibility linked directly to the health of those who manage the system and their families. The technical standards this section specifies are therefore not engineering constraints on governance but the material through which governance operates—the infrastructure whose dignified management constitutes the practical expression of the infrastructure as dignity framework.

7.4 Pathway Two: Experimental, Multi-Scalar, Multi-Stakeholder Frameworks

Toward Experimental Approaches

The doctoral research reveals fundamental tensions within gendered everyday water practices, characterized simultaneously by relative functional efficacy and profound inequality manifested through economic exploitation and multi-scalar violence, against absent public water supply and a political environment systematically unresponsive to slum residents' claims. This violence—encompassing state violence, gender-based violence (GBV), and intimate partner violence (IPV)—is structurally grounded in endemic patriarchy (Dangarembga 2022; Mama 1995; Oyěwùmí 1997). Policy reform alone cannot resolve these contradictions—top-down frameworks cannot address the situated knowledge enabling existing systems to function despite governmental absence.

Improving water access therefore requires both reforming existing arrangements and experimentally testing alternative approaches—particularly the proposed organization of women across community boundaries, which may in turn inform policy formulation. The politics of experimentation drawn on here follows Simone and Pieterse's (2017, pp. 154–155) theorization of “subtle” and “timeous” political awareness for addressing the “dramatic scale of 'developmental' requirements” in African cities, characterized by a “cumulative” and “slow-brew” approach encompassing both “policy-fix” (2017, p. 159) and the “power of micro transformation” of, by, and in the everyday (2017, p. 156). This emphasis on the everyday as site of political transformation reflects its centrality in both postcolonial urban theory (Mbembe 2001; Simone 2004) and feminist scholarship (Smith 1987), which theorize daily practices as constitutive of—not merely reactive to—larger structures. Simone and Pieterse's framework is indispensable for understanding how transformation operates in African cities—through accumulation rather than rupture, through everyday practices rather than institutional overhaul alone. Yet their theorization of “micro transformation” does not interrogate whose labor constitutes the everyday it seeks to transform: the gendered dimension—who performs the daily practices through which cities are produced, and whose bodies bear the costs of that production—remains outside their analytical frame. This is not a failure of their project but a consequence of the same absence Section 2.4.1 identifies in postcolonial urban theory more broadly: when “the everyday” is theorized without asking whose gendered labor sustains it, the most fundamental transformation—centering those

whose work already produces the city—cannot come into view. Infrastructure as dignity completes the experimentation framework by specifying that transformation is not more efficient water provision or better-designed hybrid governance, but conditions under which women's infrastructure labor generates corresponding governance rights, compensation, and political recognition.

Both pathways—policy reforms and experimental frameworks—operationalize the infrastructure as dignity framework through the same transformative logic established in Section 7.3: water systems must become sites where women's labor generates corresponding decision-making authority, compensation, and institutional legitimacy rather than sites of extraction without recognition.

These localized interventions comprise hybrid, co-productive configurations combining citizen-led initiatives with CSO or NGO technical and organizational support, implementing small-scale projects adaptable through experiential learning while maintaining loose coordination across communities. Such efforts may be accompanied—immediately or incrementally, informed by unfolding initiatives—by supportive policy frameworks providing legitimacy, resources, and protective mechanisms without imposing rigid standardization that undermines local agency and contextual responsiveness. This experimental, multi-scalar, multi-stakeholder approach aligns with the observed heterogeneity of water provision practices, acknowledging that sustainable solutions must navigate tensions between standardization and flexibility, community autonomy and external support, and immediate needs and long-term transformation.

The experimental frameworks proposed below are predominantly theoretically derived (following the evidence-status categories established in Section 7.3), with two critical exceptions providing partial empirical grounding. First, the Mafowoku solidarity model (Chapter 5) demonstrates that community-governed water provision achieving relatively equitable distribution is not merely hypothetical—it already exists, operated through CDA and traditional leadership structures that, while male-dominated, demonstrate the institutional feasibility of non-vendor-controlled provision. The question the experimental frameworks address is not whether community-governed provision is possible but what governance form it takes when theorized from women's labor rather than from existing male-dominated structures. Second, the Precious Seeds intervention (2024–2025) demonstrated that women can organize collectively for infrastructure governance within a twelve-month timeline—forming committees, developing management protocols, negotiating with local government, and securing preliminary approval for borehole implementation—before the community's December 2025 eviction destroyed the organizational infrastructure. This evidence is partial: it confirms women's capacity to organize but cannot confirm long-term sustainability, financial viability, or resistance to co-optation, all of which require the sustained empirical testing the 2026 LWC project (Section 8.2) is designed to provide. The frameworks below should be read accordingly: as analytically rigorous proposals grounded in documented patterns and demonstrated capacities, designed for empirical testing rather than presented as validated interventions.

7.4.1 Cross-Community Women's Water Networks

Conceptual Foundation

Building on Insight 7's reconceptualization of spatial frameworks and the eviction evidence developed in Section 7.4.5.2, this framework establishes female-led water distribution networks operating across community boundaries—transcending individual settlement vulnerability while reducing women's exposure to localized power dynamics. The conceptual foundation rests on a structural argument: if community-anchored organizing is vulnerable to the spatial violence the state routinely deploys through eviction, and if localized patriarchal constraints suppress organizing at household and community scales, then the organizing unit must transcend the community. Cross-community networks do not merely add scale—they change the political geometry of organizing by operating at a level that localized male retaliation cannot reach and that the destruction of any single community cannot eliminate.

Four analytical principles underpin this framework. Networks transcend place-based vulnerability: when one community faces demolition, organizing knowledge, relationships, and strategies persist across the network. Economies of scale reduce individual women's burdens through collective procurement, shared technical expertise, and coordinated advocacy. Cross-community organizing dilutes localized patriarchal constraints: women facing household retaliation in one community access support from network members elsewhere, and vendors controlling single communities cannot suppress organizing operating at network scale. LWC partnership credibility is earned through demonstrated capacity rather than claimed through institutional position: women's committees with operational track records offer what CDAs and traditional leaders have not consistently provided — accountable partners whose authority derives from competence, not lineage. Direct LWC partnerships bypass male intermediaries, positioning women's networks as legitimate infrastructure management actors in institutional relationships that do not route through vendor cartels or male-dominated CDAs.

Implementation across four phases—network formation, capacity building, infrastructure development, and LWC partnership advocacy—is detailed in Section 8.2.2, which also addresses the post-eviction research tracking former Precious Seeds committee members whose displacement provides the first empirical test of cross-community network resilience.

Relationship to Infrastructure as Dignity

Cross-community networks operationalize the infrastructure as dignity framework's normative dimension directly. Where the ethics of non-abandonment insists that infrastructure conditions required for human dignity constitute non-negotiable obligations rather than contingent grants, cross-community networks constitute the organizational form through which women assert those obligations collectively rather than individually. They do not merely access water more efficiently—they constitute moral communities affirming the dignity state infrastructure denies, extending the dividual framework Anand draws from Strathern (1988) toward collective dignity constructed through shared labor and mutual care rather than differentiated access.

7.4.2 Hybrid Water Infrastructure Financing, Implementation, and Management Models

Conceptual Foundation

Building on Insight 3's infrastructural sustainability paradox—water infrastructure cannot rely exclusively on market mechanisms given the mismatch between capital and operational costs and women's limited economic capacity—this framework integrates public, NGO, and community investment with democratic women-centered water infrastructure management. The conceptual argument has three components.

First, the financing structure must reflect who currently bears infrastructure costs. Women already allocate one-third of household income to water—effectively financing vendor profit rather than infrastructure investment. Redirecting a portion of this expenditure toward women-managed infrastructure requires capital injection (from NGO, philanthropic, and local government sources) that reduces the initial financial burden while establishing women's committees as the institutions through which ongoing operational costs flow. This is not charity but structural redirection of existing financial flows away from exploitative vendor capture and toward democratic infrastructure management.

Second, the management structure must transfer decision-making authority to those performing infrastructure labor. Women's committees managing day-to-day operations—pricing, operating hours, conflict resolution, quality monitoring—constitute the institutional form of infrastructure citizenship. The committee is not a governance add-on to an infrastructure project; it is the infrastructure project's political core.

Third, hybrid financing acknowledges that neither pure market provision (which extracts unsustainable percentages from those least able to pay) nor pure state provision (which has demonstrably not arrived and may not) addresses the crisis. The hybrid model is not a compromise between two adequate systems but a recognition that the crisis requires constructing a new system from existing resources—community savings, NGO partnerships, local government mandates, and women's organizational capacity—rather than waiting for either the market or the state to solve it.

Detailed financing mechanisms, cost structures, management composition, and operational protocols are specified in Section 8.2.2 (Phases 1 and 3).

7.4.3 Micro-Governmental Networks as Legitimate Infrastructure Providers

Conceptual Foundation

Building on the theoretical implications for co-production frameworks, this approach recognizes existing informal systems' functional capacities while addressing their exploitative dimensions—operationalizing Simone and Pieterse's (2017) call for transformative southern urban infrastructure futures that build upon rather than replace existing arrangements, and answering Schramm's (2024) demand that co-production be analytically discriminated from the exploitation of marginalized people's resources, time, and labor. The conceptual argument is that the appropriate response to vendor-dominated informal water systems is neither elimination nor

accommodation but transformation: formal recognition contingent on compliance with equity standards that women's committees determine, rather than standards imposed by external regulators who may not understand community-specific dynamics.

This framework positions vendors willing to operate equitably as legitimate infrastructure providers who gain institutional recognition and technical support in exchange for operating within women's committee-determined pricing and quality structures. It positions vendors engaging in exploitation as subjects of regulatory constraint and, where necessary, replacement. The distinction—between vendors who accept women's governance authority and those who resist it—is the organizing principle of the framework, not vendor participation versus exclusion as such.

The framework directly extends the hybrid governance theory strand established in Section 2.3.4: not merely state–community partnerships but women-centered networks transforming who holds power within both informal and formal systems. Effective co-production requires transferring decision-making authority to those currently performing infrastructure labor, not merely including women in governance arrangements that remain controlled by men.

Vendor integration pathways, regulatory constraints, compensation mechanisms for displaced vendors, and enforcement structures are not specified in advance; they are to be developed and tested within the 2026 LWC implementation project through the adaptive management set out in Sections 7.4.6 and 8.2.3.

7.4.4 Protective Mechanisms Addressing Gender-Based Violence Risks

Conceptual Foundation

Building on Insight 7's analysis of the multi-scalar violence trap, this framework addresses a structural problem women-centered water governance cannot avoid: transferring infrastructure control to women will generate patriarchal backlash, and any framework treating violence as crisis to respond to after the fact—rather than building protective mechanisms into its foundational design—will expose women to risk that organizational capacity alone cannot compensate for.

The conceptual argument is that GBV prevention is not peripheral to women-centered infrastructure organizing but constitutive of it. Women's committees managing water points face specific violence risks that male-dominated vendor systems do not: intimate partner violence from male household members threatened by women's economic authority; vendor retaliation against women exercising pricing and operating decisions previously controlled by men; community-level backlash from male leaders whose governance authority is displaced by women's committees. Each of these risks is predictable from the structural analysis developed across the eight insights and one methodological implication, and each requires a different protective mechanism—which means protective frameworks must be designed from structural analysis rather than derived from incident patterns after violence has already occurred.

Pre-implementation GBV risk assessment, ongoing safety monitoring through female community liaisons, rapid response protocols, economic empowerment initiatives reducing household dependence, male engagement programs, and exit strategies for women facing severe retaliation are to be designed as integral components of the 2026 project's capacity-building phase (Section 8.2.2, Phase 2) and refined through its adaptive management (Sections 7.4.6 and 8.2.3).

7.4.5 Community-Specific Implementation Examples

The following examples demonstrate how the overarching frameworks apply adaptively to two analytically distinct community types rather than proposing a one-size-fits-all approach. Otumara represents vendor-dominated, institutionally weak communities where the primary challenge is transforming exploitative market dynamics. Precious Seeds represents organized communities achieving women-centered governance whose destruction by state violence reveals the limits of community-scale organizing regardless of internal conditions. Together they demonstrate the frameworks' adaptive reach—and the second case demonstrates why cross-community networks are not optional refinements of the frameworks but their structural necessity.

7.4.5.1 The Case of Otumara: Vendor-Dominated Institutional Weakness

Otumara's water supply operates through a market-driven model wherein male vendors exercise oligopolistic control over distribution networks following the community's severance of ties with LWC in 2010 due to billing conflicts and subsequent LWC-initiated infrastructure destruction. This system is supplemented by female tank owners who possess sufficient resources to maintain private infrastructure and provide water to neighbors at reduced rates or through flexible payment arrangements, alongside water pushers who purchase from a nearby borehole and resell at retail prices. Water quality from vendor-controlled boreholes remains compromised due to the community's location beyond the saline intrusion line, requiring additional treatment for potability. Traditional and informal leadership structures demonstrate institutional weakness, lacking authority necessary for effective governance or vendor regulation (Chapters 4–5).

Analytical Application of the Frameworks

Otumara represents the community type where the micro-governmental networks framework (Section 7.4.3) faces its most demanding test: vendors are entrenched, institutional alternatives are weak, and the community's severed relationship with LWC means there is no existing formal partnership to build on. The analytical question is not whether the frameworks apply but how they apply given these constraints.

The female tank owners constitute the critical entry point. Unlike the vendor cartel—which has demonstrated both the capacity and the willingness to suppress alternatives (the Baale Kalejaiye case)—female tank owners already operate on solidarity principles, providing flexible payment arrangements and subsidized access. They are, in embryonic form, the women's committee the cross-community networks framework requires. Organizing them as a network—first within Otumara, then connecting to female infrastructure providers in other communities—would create an alternative governance structure with existing infrastructure, existing community legitimacy, and existing practice of equity-oriented provision.

The vendor cartel presents the frameworks' core tension in its sharpest form: vendors who have demonstrated willingness to use violence to suppress alternatives cannot be straightforwardly integrated through the recognition framework of Section 7.4.3 without robust regulatory constraints and protective mechanisms operating simultaneously. Multi-stakeholder mediation on pricing and service standards—CSO or NGO facilitated, with LWC representatives present to signal institutional weight—would need to occur in the context of established women's committee capacity rather than preceding it, since mediation without an organized counterparty to the vendors reproduces the existing power asymmetry under a new procedural form.

This is the adaptive principle the Otumara case illustrates: the frameworks do not prescribe a single implementation sequence but require analyzing which entry points exist, which actors are already practicing the principles the frameworks formalize, and which structural constraints must be addressed before which interventions can be productive. Otumara's female tank owners are that entry point; vendor mediation is not the first step but the third or fourth, after women's organizing capacity has been established and external institutional support has been secured.

Overarching Principle: Conflict-Sensitive Implementation

All negotiation processes and implementation measures in Otumara must employ conflict-sensitive approaches (Swisspeace 2022) that proactively identify potential tension sources including gender-based resentment of women's enhanced authority, vendor resistance to transparency requirements, and community conflicts over differential pricing. Interventions should design context-specific mitigation strategies and establish accessible monitoring systems enabling rapid identification and response to emerging conflicts before escalation into violence or organizational collapse.

7.4.5.2 The Case of Precious Seeds: When Community-Scale Organizing Meets State Violence

Intervention and Capacity Building (2021–2025)

Between 2021 and December 2025, FABULOUS URBAN partnered with Precious Seeds community on various upgrading initiatives: establishing participatory upgrading measures through The Fair Shared City Approach to Urban Community Development (2022), developing the Local Building Code Project (2023), and the Dignity in Shelter Project (2023–25). Building on these collaborative relationships and trust established through years of engagement, FABULOUS URBAN helped establish the Oworo Reality Women Group in 2024.

In 2025, informed directly by this dissertation's emerging insights about gendered water inequality documented through fieldwork in Precious Seeds and other communities (Papers 1–3, Chapters 4–6), FABULOUS URBAN initiated a water-focused intervention explicitly operationalizing feminist infrastructure principles: “Violence-free access to water for the women in Precious Seeds.” This intervention represented deliberate scholar-activism—translating research findings into practice by centering women as primary stakeholders, building their infrastructure implementation, management, and decision-making capacity, and positioning them as legitimate partners with local government for infrastructure provision.

Through 2025, FABULOUS URBAN and the Oworo Reality Women Group developed water point management plans through participatory processes centering women's priorities; negotiated with local government for borehole implementation, securing site assessment and preliminary approval; built women's capacity in infrastructure implementation, management, financial management, and advocacy; engaged male community leaders to secure support for women's infrastructure management; and created transparent management protocols for future borehole operations, including pricing structures, operating hours, and conflict resolution mechanisms. Local government officials visited the site, assessed feasibility, and verbally committed to 2025 implementation. In late 2025, local government suspended the project citing exhausted annual budget allocations, pushing implementation to the 2026 budget cycle with no confirmed timeline.

What the December 2025 Eviction Destroyed

On December 14, 2025, LSG forcibly evicted Precious Seeds residents, demolishing the entire waterfront settlement. The eviction's primary devastation was the destruction of homes, livelihoods, social networks, and the physical environment residents had built over decades—a catastrophe whose scale extends far beyond water infrastructure. What follows addresses one dimension of that larger destruction: the consequences for women's water organizing, which this dissertation analyzes not because it outweighs the loss of shelter and community but because it reveals a structural limitation of community-anchored intervention that the cross-community networks framework (Section 7.4.1) is designed to address.

The eviction dispersed the Oworo Reality Women Group's thirty trained members across Lagos, eliminating the organizational infrastructure anchored in a specific geographic location—meeting spaces, documentation, and the relationship networks built through four years of sustained engagement. It severed the institutional relationships developed with local government officials, CDA representatives, and male community allies—relationships constituting the social capital through which women had established legitimacy as infrastructure management actors. It rendered irrelevant the place-specific knowledge the group had developed about Precious Seeds' water dynamics, procurement routes, vendor exploitation patterns, and safety risks. And it interrupted the process through which women were developing governance capacity—a process that had demonstrated women's ability to organize collectively, negotiate with government, and develop operational management protocols, but that had not yet produced the infrastructure outcomes (functioning borehole, managed water points) that would have constituted its material test. What the Precious Seeds case provides, then, is evidence of organizational capacity achieved but not evidence of sustained infrastructure governance—a distinction the evidence-status framework established in Section 7.3 requires stating explicitly. The women's organizing yielded demonstrated competencies that former committee members carry as transferable knowledge, even though the institutional form through which those competencies would have been exercised no longer exists.

Why Community-Scale Organizing Proved Insufficient

The Precious Seeds intervention achieved what it set out to do: women organized collectively, developed infrastructure implementation and management capacity, secured male allies' support, negotiated with government as legitimate partners, and maintained commitment through a four-year timeline despite delayed infrastructure. Yet none of this protected against state violence operating at an entirely different scale and logic.

The eviction reveals three structural limitations of community-scale organizing that the cross-community networks framework directly addresses. Community-anchored interventions assume spatial stability—when LSG determined waterfront land more valuable without residents as part of a broader megacity development agenda, community organizing became irrelevant because the community itself ceased to exist. Single-community organizing lacks political weight necessary to challenge state development priorities: the Precious Seeds women's committee could negotiate with local government officials for borehole provision but could not contest LSG's waterfront land politics. And when communities evict, organizing knowledge disappears entirely: former committee members scattered across Lagos lack mechanisms for staying connected, sharing learning with other communities, or continuing advocacy.

Orisunmibare's February 2024 eviction and Precious Seeds' December 2025 eviction both resulted from LSG's political economy prioritizing elite development over slum residents' spatial claims. These evictions demonstrate that community-scale organizing, whether absent (Orisunmibare) or successfully established through women-centered intervention (Precious Seeds), operates at insufficient scale to challenge state violence driven by land value politics. Both forced eviction without resettlement provision and denial of water supply constitute gross violations of human rights, yet LSG perpetrates both simultaneously—demolishing homes while systematically neglecting water infrastructure provision in remaining slum settlements. This is not policy failure or bureaucratic dysfunction but, as Roy (2017) demonstrates, constitutive logic of urban development under racial capitalism where Black, poor, and female bodies remain disposable when land becomes valuable for capital accumulation. This logic sets a realistic ceiling for trust-building between women's committees and state partners: the credible commitment mechanisms proposed in Section 7.3.1 remain necessary because women's committees address institutional mistrust without addressing its sovereign dimension.

The cross-community network framework responds to this structural limitation not by preventing evictions—state power operates at scales networks cannot match—but by ensuring that organizing knowledge, relationships, and capacity survive displacement. When Precious Seeds disappeared, its organizational infrastructure disappeared with it because it was spatially bound to a community the state deemed expendable. Had the Oworo Reality Women Group been embedded within a cross-community network from the outset, the eviction would still have destroyed Precious Seeds physically but could not have destroyed the network: trained women would remain network members capable of contributing to water organizing in their new locations, documentation would persist at network level rather than in individuals' heads, and advocacy capacity would continue at a scale matching state decision-making power rather than collapsing when a single settlement vanished.

7.4.6 Limitations of Experimental Approaches

The proposed experimental frameworks carry inherent risks and tensions that warrant explicit acknowledgment—both because the empirical evidence demands intellectual honesty about what remains unresolved, and because sustainable transformation requires clear-eyed assessment of the conditions under which these frameworks might fail.

The emphasis on women-led organizations may inadvertently increase women's unpaid labor burdens under the guise of empowerment, particularly if resource constraints prevent adequate compensation for expanded responsibilities in water infrastructure implementation, management, and decision-making. This risk is not hypothetical: feminist development scholarship documents extensively how “participation” and “empowerment” frameworks have historically extracted additional unpaid work from women while rebranding exploitation as agency (Mohanty 2003; Federici 2012). The frameworks proposed here attempt to address this through compensation mechanisms and hybrid financing models, but whether these prove sufficient in practice requires empirical testing.

The proposal for cross-community organizing assumes that shared gender-based experiences create sufficient solidarity to overcome potential divisions based on ownership status, tenancy arrangements, neighborhood identity, competing economic interests, and intra-household power struggles that may result in intimate partner violence. Communities are not unified actors—as the

dissertation's analysis of how “community” obscures internal patriarchal hierarchies has established at length—and women's networks are equally susceptible to internal stratification, elite capture, and the reproduction of exclusions they were designed to address. The evidence-status differentiation established in Section 7.3—distinguishing empirically grounded findings from theoretically derived proposals and normative commitments—applies with particular force to the experimental frameworks, where the gap between analytical coherence and operational validation remains widest and where the 2026 LWC implementation project (Section 8.2) constitutes the first systematic attempt to close it. The presumption that women-led organizations would automatically prove more democratic or less susceptible to corruption than existing institutions may overlook how patriarchal structures can reproduce themselves through new institutional forms.

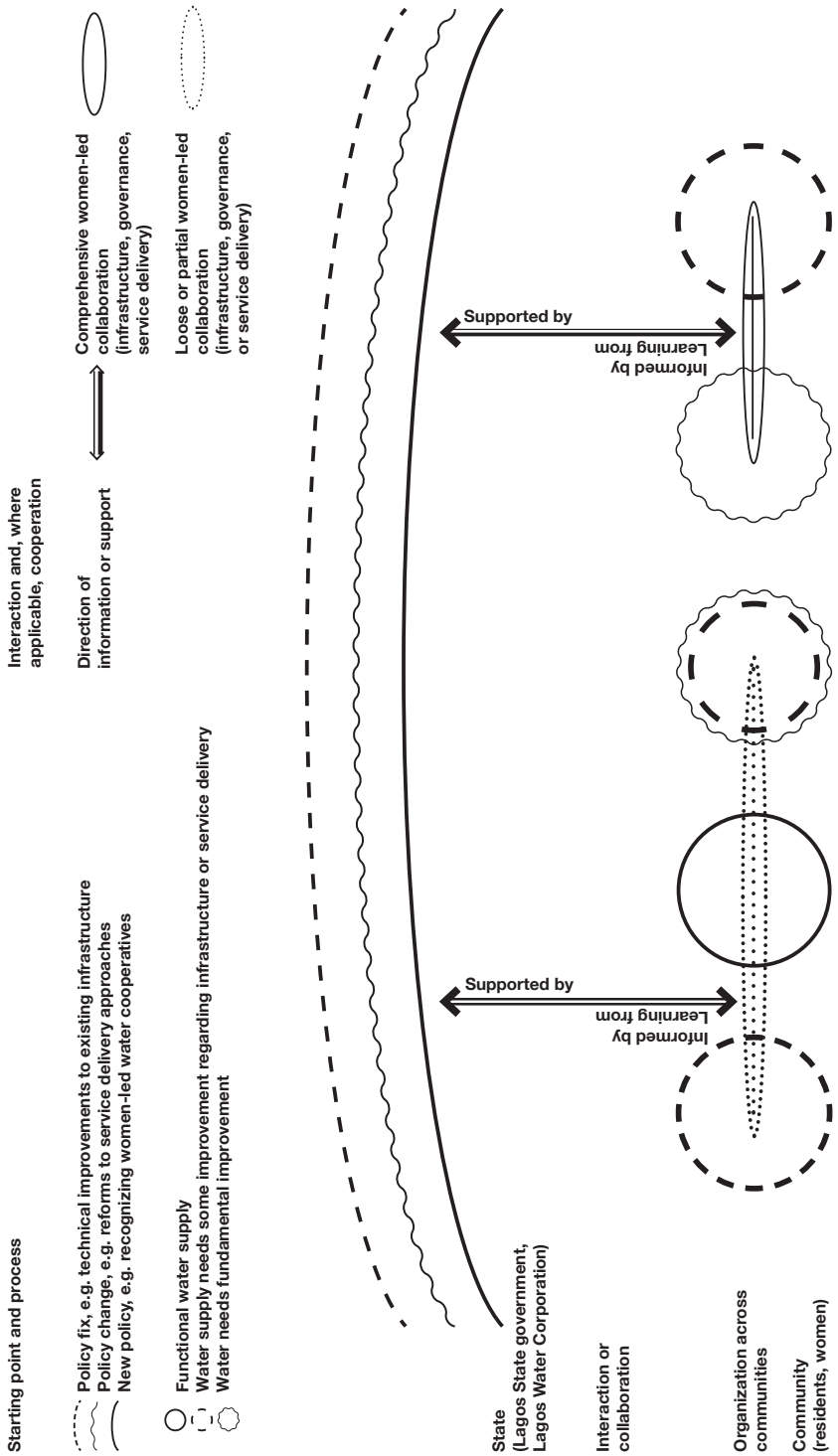
The reliance on CSO and NGO support raises questions about long-term sustainability following the conclusion of external funding and the potential for CSO and NGO agendas to shape initiatives in ways misaligned with community priorities. These are not theoretical concerns but documented patterns: the EKO-UP initiative and LMDGP both demonstrate how external funding and agenda-setting can reproduce rather than challenge structural inequalities when accountability flows upward to funders rather than downward to participants.

Entrenched patriarchal power structures will likely resist gender-responsive reforms through both overt opposition and subtle undermining tactics, particularly regarding traditional leadership democratization threatening existing male privilege. Economic constraints affecting governmental fiscal capacity and household affordability fundamentally limit intervention scope, while embedded corruption networks possess both motivation and capacity to actively sabotage reform efforts threatening established profit-sharing arrangements.

The pronounced diversity of community contexts requires flexible rather than standardized frameworks, which complicates implementation across Lagos's heterogeneous slum settlements. The proposal to transcend community-based organizing may also underestimate the importance of local knowledge, social networks, and place-based solidarity that have enabled existing water systems to function—cross-community networks introduce coordination costs and governance complexities that single-community approaches do not face.

These limitations suggest that while experimental approaches offer promising directions grounded in rigorous empirical analysis and practice engagement, they require continuous critical evaluation and adjustment based on emerging evidence of their effects on the most marginalized participants. The 2026 LWC implementation project (Section 8.2) is designed as an iterative learning process precisely because these limitations cannot be resolved in advance—they must be encountered, documented, and addressed through adaptive management rather than predetermined protocols.

Figure 7.1: Proposed Experimental, Multi-Scalar, Multi-Stakeholder Framework. Informed by Simone and Pieterse's (2017, 155–159) Theorization Of Experimentations. *Source: Author.*



7.5 Methodological Reflections: From Practice to Research to Practice

7.5.1 Cumulative Format as Intellectual Journey

The three papers document genuine intellectual evolution: from game theory capturing material hierarchies (Chapter 4) through comparative analysis revealing governance heterogeneity (Chapter 5) to feminist ethnography exposing gender as mediating all inequalities (Chapter 6). This progression represents methodological deepening, not contradiction. The insights synthesized in Section 7.2 could only emerge through this multi-method approach—game theory rendered visible the strategic dynamics of state–community non-cooperation that comparative analysis then contextualized across four communities, and both were necessary preconditions for feminist ethnography's demonstration that gender constitutes the organizing inequality mediating everything the earlier papers documented without being able to fully explain.

7.5.2 Practitioner-Researcher Trajectory's Contributions and Limitations

The failed biogas and MDDT projects (Chapter 1) generated questions that practice alone could not answer, necessitating doctoral inquiry. Conversely, the Precious Seeds women's water committee implementation demonstrated practice-based testing of research findings. This reciprocal relationship—practice failures generating research questions, research insights informing practice interventions—enabled the dual-pathway framework developed in this chapter.

However, the practitioner lens created blind spots: initial gender-blind framing (Chapters 4–5) reflected professional training to engage “community leadership” without questioning why leadership was exclusively male. Only sustained feminist engagement—through reading, fieldwork focused on women's accounts, and confronting project failures—enabled the analytical reframing documented in Chapter 6.

The Precious Seeds intervention (2024–2025) warrants the same reflexive scrutiny applied to earlier practice failures—not only because its external destruction demands analytical response (Section 7.4.5.2) but because its internal dynamics reveal tensions the scholar-activist position generates. Two deserve acknowledgment.

First, the dependency question. FABULOUS URBAN provided organizational infrastructure, facilitation capacity, and institutional access (local government engagement, advocacy support) that the Oworo Reality Women Group did not develop independently. Whether the women's committee would have sustained its organizational form, management protocols, and government engagement without FABULOUS URBAN's continued involvement remains an open question the eviction prevented from being answered. The cross-community network framework (Section 7.4.1) must address this risk explicitly: networks that depend on external CSO facilitation for their cohesion reproduce the dependency problem at a larger scale. The 2026 project's capacity-building phase (Section 8.2.2) is designed to build autonomous committee competence precisely because the Precious Seeds experience could not demonstrate whether this was achieved.

Second, the male engagement gap. While the intervention engaged male community leaders to "secure support" for women's infrastructure management, this engagement operated instrumentally—securing men's acquiescence rather than transforming their understanding of why women's governance authority is necessary. Whether this instrumental approach would have generated backlash over time, as men perceived the intervention as having bypassed rather than engaged them, cannot be known. The GBV protective mechanisms proposed in Section 7.4.4 address this risk prospectively, but the Precious Seeds intervention did not implement them—another gap the eviction prevented from becoming visible but that intellectual honesty requires naming.

These are not reasons to abandon scholar-activism but conditions shaping its honest practice. The 2026 LWC project inherits these unresolved tensions and must design for them rather than assuming the Precious Seeds model can be replicated without confronting its internal limitations alongside its external destruction.

7.5.3 Positionality's Influence on Insights

The eight insights and one methodological implication are shaped by positionality as white European woman researcher-practitioner (Chapter 1, Section 1.2). Access to government officials enabled documentation of state neglect; being female facilitated access to women's spaces revealing embodied experiences; practitioner background generated insights about implementation barriers. Yet this same positionality risks imposing Western feminist frameworks on African women's realities—a tension navigated through centering women's own narratives while applying theoretical tools situating Lagos within broader patterns of postcolonial urban inequality. The African feminist theoretical tradition (Section 2.4.3) provides the corrective to this risk: infrastructure as dignity does not apply external frameworks to African data but emerges from African women's material conditions as its generative ground.

7.6 Theoretical Contributions

7.6.1 Women as Infrastructure Providers: What the Empirical Findings Revealed

The theoretical framework predicted that women function as water infrastructure through embodied daily labor (Section 2.4.5), extending Simone's (2004b) "people as infrastructure" through feminist political ecology's labor reframing. The empirical findings confirmed this claim across all five communities—but they also revealed three dimensions the framework could not have specified in advance.

First, the gendered difference in infrastructure ownership practice. Papers 1 and 2 (Chapters 4–5) documented that the few female infrastructure owners operate through solidarity-based sharing—subsidized pricing, installment payments, flexible arrangements—where male vendors in identical market positions extract maximum rents. This pattern held across communities with entirely different governance configurations (solidarity-dominant Mafowoku, vendor-cartel Otumara, mixed Amukoko-Mosafejo). The framework predicted that women's infrastructure labor would differ from men's infrastructure control; it could not have predicted that even where women attain the ownership position typically held by men, they operate through a structurally

different relational logic. This finding provides the empirical grounding for Segato's (2018) theorization of women's relational forms operating outside the mandato de masculinidad (Section 2.4.3)—evidence that the relational alternative is not aspirational but already practiced within existing systems.

Second, the technical-governance inseparability. Chapter 3's infrastructure documentation revealed that seemingly neutral technical specifications—water point placement, borehole depth, pipe routing, operating hours—are not background conditions but active governance decisions determining whose bodies bear what costs. A vendor who places a borehole to maximize his customer catchment area makes a different spatial decision than a women's committee placing a water point to minimize compound-level procurement distance. The framework theorized this inseparability abstractly (Section 2.4.5); the empirical findings specified how it operates through concrete engineering parameters—the technical-governance interface developed in Section 7.3.5.

Third, the compounding rather than merely additive character of multi-scalar exclusion. The framework predicted that exclusions at household, community, and state scales would interact (Section 2.4.2). The empirical findings revealed that the interaction is recursive: household-level time poverty does not merely coexist with community-level governance exclusion—it directly constrains women's capacity to participate in governance, which prevents advocacy for infrastructure configurations that would reduce household-level time poverty. This recursive compounding, documented across Insights 4–8, means that interventions targeting any single scale reproduce exclusion at the others—a finding with direct implications for the multi-scalar intervention design proposed in Sections 7.3–7.4.

7.6.2 Integrating Postcolonial Urbanism and Feminist Political Ecology: What the Evictions Revealed

The theoretical framework established that postcolonial urbanism and feminist political ecology require integration—each tradition seeing what the other cannot (Section 2.4.5). The paired evictions of Orisunmibare (February 2024) and Precious Seeds (December 2025) provided an empirical test the framework did not anticipate: a natural experiment revealing what happens when state violence meets two communities with vastly different internal water governance conditions.

The finding is structurally significant. Orisunmibare operated through vendor cartel control with no women's organizing; Precious Seeds had achieved women-centered infrastructure governance through a year of deliberate intervention. Both were evicted for identical reasons—land value under LSG's megacity development agenda—and both evictions destroyed water infrastructure along with everything else. Postcolonial urbanism explains the eviction logic: Roy's (2017) racial banishment operating through the political economy of land. Feminist political ecology reveals what that logic specifically destroys: not merely physical infrastructure but the gendered social infrastructure—women's committees, procurement knowledge networks, mutual aid arrangements—through which survival under state abandonment had been organized. Neither tradition alone accounts for this: postcolonial urbanism sees dispossession but not the gendered labor it erases; feminist political ecology sees embodied suffering but not the sovereign violence producing it. The integration this dissertation enacts is therefore not merely theoretical complementarity but empirical necessity—forced by findings that neither framework could interpret on its own.

7.6.3 Reconceptualizing Hybrid Infrastructure Implementation and Management Through Feminist Lens: What the Vendor Integration Failures Revealed

The theoretical framework predicted that hybrid governance arrangements failing to address patriarchal structures would reproduce gendered exploitation through new institutional forms (Section 2.4.4). The empirical findings confirmed this prediction—and specified the mechanism through which reproduction operates.

The canceled USAID water ATM project provides the clearest illustration: proposed installation of digital payment technology at existing vendor-controlled water points would have modernized the transaction mechanism without altering who controlled infrastructure, who set pricing, or who bore procurement costs. Women would have tapped smart cards instead of paying cash—and vendor cartels would have operated through a technologically upgraded extraction system. This is not a hypothetical failure scenario but the documented logic of an actual project, demonstrating that technology-focused interventions reproduce gendered exploitation precisely because they treat the vendor-customer relationship as neutral infrastructure delivery rather than as a power relation structured by the mandato de masculinidad (Section 2.4.3).

More significantly, Paper 2's comparative analysis (Chapter 5) revealed something the hybrid governance literature does not theorize: that the same community can contain both solidarity-based and vendor-controlled provision operating simultaneously (the mixed model of Amukoko-Mosafejo in Chapter 5, and of Precious Seeds in Chapters 3 and 6), and that which model predominates at any given moment depends on institutional configurations that are themselves gendered. CDAs and traditional leaders willing to provide free or subsidized access coexist with vendors extracting maximum rents—and women navigate between them daily, choosing sources based on cost, distance, quality, and safety in a decision-making calculus whose sophistication the hybrid governance literature's binary framing of "formal versus informal" cannot capture. The reconceptualization this dissertation proposes—women-centered networks determining who operates within their governance structures rather than being inserted into existing ones—emerges from this empirical complexity rather than from theoretical deduction alone.

7.6.4 Infrastructure as Dignity: What the Empirical Findings Add to the Framework

The three contributions above demonstrate infrastructure as dignity in operation across seven years of fieldwork—confirming, specifying, and in one case complicating the framework as theorized in Section 2.4.5.

The framework was confirmed in its core claim: women's infrastructure labor produces the actually existing water system for Lagos's slum population while patriarchal structures deny them corresponding governance authority. This claim, derived theoretically from the Mbembe-through-Segato reading (Section 2.4.5), held across all five communities regardless of governance configuration—solidarity, vendor cartel, or mixed provision. The framework was specified empirically through findings it could not have generated theoretically: the solidarity-based relational logic of female infrastructure owners (Section 7.6.1), the recursive rather than additive character of multi-scalar exclusion (Section 7.6.1), and the specific mechanisms through which

hybrid governance reproduces gendered exploitation (Section 7.6.3). These specifications transform the framework from a theoretical architecture into an empirically calibrated analytical tool with predictive capacity for similar contexts.

The framework required operationalization in one dimension its theoretical articulation did not specify: the role of technical infrastructure parameters as governance instruments. The access-control-governance vocabulary established in Section 2.4.5 names the analytical distinctions; the empirical findings—particularly Chapter 3's infrastructure documentation of borehole placement, pipe routing, operating hours, and water point density—revealed that these technical specifications constitute the material medium through which governance decisions become bodily consequences. A vendor's decision to site a borehole for maximum customer catchment is simultaneously a technical and a governance decision whose consequence is measured in meters women walk and liters per person per day they receive. This recognition generated the technical infrastructure standards proposed in Section 7.3.5, establishing that the infrastructure as dignity framework's normative claim—those whose labor produces infrastructure deserve corresponding governance authority—requires engineering specification to be operationalizable. The technical dimension did not complicate the framework; it emerged through the discussion chapter's engagement with empirical infrastructure data as the material form through which the framework's governance claims become practically achievable.

The positioning of infrastructure as dignity relative to adjacent normative frameworks—Nussbaum's capabilities approach, human rights frameworks, feminist care ethics—is established in Section 2.4.5 and does not require restatement here. What the discussion chapter adds is the empirical demonstration that the framework's distinctive analytical move—theorizing dignity as a material condition already being produced through labor rather than a condition requiring state guarantee—holds when tested against 194 interviews, five communities, and seven years of fieldwork. The organizing frameworks proposed in Sections 7.3–7.4 operationalize this empirically tested synthesis. Together, they constitute the practical architecture of an ethics of non-abandonment.

7.7 Limitations

7.7.1 Case Study Transferability

The five Lagos communities provide depth but limited geographic breadth. The frameworks proposed in Section 7.4 require testing across different African cities with varying political economies, cultural contexts, and infrastructure conditions. Comparative research with Nairobi and Dakar—where active research partnerships exist—and Addis Abeba and Abuja—where established institutional connections provide access—would strengthen transferability claims and reveal which elements of infrastructure as dignity prove specific to Lagos's postcolonial political economy versus which hold across diverse African urban contexts.

7.7.2 Longitudinal Data Gaps

The Precious Seeds intervention (2021–2025) provided four years of data, but the community's eviction prevents observing long-term outcomes. The planned post-eviction fieldwork tracking

former committee members will address this partially, but understanding how women's networks function over decades requires sustained commitment impossible within doctoral timelines. This limitation is not merely practical but theoretical: the cross-community networks framework proposes organizational forms whose resilience under conditions of persistent spatial precarity remains empirically untested at the scale and duration the framework's claims require.

7.7.3 Male Perspectives Underexplored

While centering women's experiences was methodologically essential, the doctoral research inadequately explores how men might become allies in transforming patriarchal water governance. Future research should examine under what conditions men support women's water leadership; how to design male engagement programs that do not reproduce paternalism wherein men “allow” women authority rather than recognizing women's inherent rights; and whether younger men demonstrate different gender attitudes enabling generational transformation. Understanding male allyship proves essential for sustainable transformation—women-centered organizing generating perpetual violent male backlash cannot achieve long-term stability regardless of organizational design.

7.7.4 Economic Viability Questions

The hybrid financing models (Section 7.4.2) require empirical testing. Whether community savings groups can generate sufficient capital for infrastructure maintenance over time, what percentage of households can afford user fees even on sliding scales, how financing mechanisms interact with Nigeria's ongoing currency devaluation, and whether women-centered hybrid models prove more or less cost-effective than traditional vendor systems when full lifecycle costs are calculated—these financial questions determine whether proposed frameworks constitute sustainable alternatives or temporary interventions requiring perpetual external subsidy. The 2026 LWC implementation project (Section 8.2) is designed in part to generate the empirical data these questions require.

7.7.5 Scaling Complexities

Moving from single-community interventions to cross-community networks to city-wide transformation involves coordination challenges this doctoral research has not fully addressed. Future research must examine optimal network size balancing coordination efficiency and inclusive representation; governance structures preventing elite capture within women's networks; and mechanisms ensuring network benefits reach the most marginalized women rather than only those with existing organizational capacity. The Precious Seeds case demonstrates that community-scale organizing can achieve genuine capacity building—the scaling question is whether cross-community networks can sustain that quality of organizing at larger scales without reproducing the hierarchical structures that marginalize the most vulnerable participants.

7.8 Chapter Conclusion: From Insights to Action

This chapter has synthesized eight insights and one methodological implication from multi-scalar analysis into two complementary intervention pathways: comprehensive policy reforms (essential but politically uncertain) and experimental multi-stakeholder frameworks (operable regardless of state receptivity). Together they address the foundational challenge revealed across all three papers, established in Section 7.1: technical or institutional interventions failing to transform gendered power relations will inevitably reproduce existing inequalities through new arrangements.

The doctoral research documents in detail the severity of Lagos's prolonged water crisis, resulting from a combination of historical trajectories, contemporary neoliberal policies, inadequate and decaying infrastructure, and an urban fabric consisting largely of underserved or unserved slum settlements. These conditions are not reducible to administrative failure. Mbembe's (2001) analysis of postcolonial power—the mutual performance of domination and subversion rendering both the seemingly powerful and the seemingly subordinate impotent, producing political dynamics that consume energy without generating functional governance—describes precisely the trajectory through which colonial violence has continued into postcolonial governance, including water infrastructure provision: a state whose development model treats slum populations as obstacles to elite urbanization rather than citizens deserving services (Section 2.3.3), and whose oscillation between neglect and eviction constitutes the sovereign dimension of the crisis this dissertation documents. Yet communities have built water systems in the state's absence. The empirical evidence across all five case study communities demonstrates that residents—through vendor networks, CDA management, traditional leadership provision, and above all women's daily procurement labor—have produced the actually existing water coverage for 12–16 million people. These systems function, however imperfectly. What they reproduce is gendered inequality: vendor cartels extracting from women who cannot exit the market, inadequate coverage forcing procurement distances that translate directly into bodily exhaustion, and patriarchal governance denying women authority over infrastructure their labor sustains. Transformation must therefore originate where infrastructure is already being produced—in the communities whose everyday practices constitute Lagos's water system, and specifically through the women whose labor is its material foundation.

This is why organizing at single-community scale proves insufficient despite communities' demonstrated capacity—for two reasons the empirical findings establish. First, gender-based violence operates most intensely at household and community scales precisely where women's organizing might emerge (Insight 7, Section 7.2): intimate partner violence triggered by water spending, vendor retaliation against women asserting pricing authority, and male leadership suppression of women's governance claims trap organizing capacity at the very scales where patriarchal power is most concentrated. Second, state violence through eviction destroys place-anchored organizing regardless of its internal quality—the Orisunmibare and Precious Seeds cases demonstrate that when government determines land is more valuable without residents, community-level infrastructure and organizing disappear simultaneously (Section 7.4.5.2). Cross-community women's networks (Section 7.4.1) respond to both constraints by operating at a scale localized patriarchal violence cannot reach and individual settlement destruction cannot eliminate.

Policy reform cannot drive this transformation—the postcolonial political dynamic Mbembe describes, where the state's relationship to slum communities oscillates between neglect and

violence, provides no basis for expecting state-initiated reform to center women's governance authority. Yet policy reform remains essential as the institutional framework within which community-driven transformation can be sustained, protected, and scaled. The problem is not primarily LWC intransigence—officials have expressed openness to slum provision when methodologies and funding are identified (Expert interviews 1, 5, 14), constrained by overarching state policies and a position low in the governmental hierarchy (Section 2.3.3). Institutions and governments are not homogeneous (Watson 2014): officials and perspectives open to gendered, pro-poor reform exist alongside the dominant neoliberal development agenda. The combination of citizen-based transformation—women organizing across communities, building infrastructure, developing governance capacity—and supportive policy frameworks providing institutional legitimacy, regulatory protection, and financial resources is what contexts such as Lagos's water supply require.

This approach of mixed measures and blurred boundaries between formality and informality can be described as experimental, following Simone and Pieterse's (2017) theorization: integrating competing narratives that serve as indicators of fault lines or antagonisms between different groups—between government and CSOs, between NGOs and social movements, between government and slum communities, or within government itself. The critical asymmetry is that the experimental pathway proceeds regardless of whether policy reform materializes—it is operable without state receptivity, as Section 7.1 establishes—while policy reform without citizen-based transformation lacks the organizing foundation from which institutional change can be demanded, monitored, and sustained.

The Precious Seeds and Orisunmibare evictions underscore why both pathways matter simultaneously: policy reform alone cannot proceed when communities disappear; experimental frameworks alone cannot protect against state violence. Yet together, they offer the possibility of transformation operating at multiple scales—household organizing challenging patriarchal resource allocation, cross-community networks building collective power resilient to individual settlement erasure, LWC partnerships providing institutional legitimacy, and state policy reforms ensuring long-term sustainability. Chapter 8 develops these pathways into the 2026 LWC implementation project attempting to integrate both while operationalizing the framework's core premise, and reflects on the possibilities, limits, and accountability of the scholar-activist commitment sustaining this work.

Chapter 8: Conclusion - From Analysis to Action

8.1 Answering the Research Questions

This dissertation asked how gendered power relations structure water infrastructure access and control in Lagos slums where women function as de facto infrastructure providers yet remain systematically excluded from infrastructure decision-making, implementation, and management—and what forms of women-centered hybrid water infrastructure systems might transform these patriarchal arrangements while addressing infrastructure deficits (primary research question, Section 2.5). The cumulative dissertation answered this question progressively through three papers employing distinct methodologies, synthesized through eight insights and one methodological implication (Section 7.2) and developed into two complementary intervention pathways (Sections 7.3–7.4). This section traces how each sub-question was answered and what the cumulative sequence revealed that no individual paper could see on its own.

Sub-question 1 (Paper 1, Chapter 4): How do power dynamics between Lagos State government and slum communities shape water infrastructure provision and control, what mechanisms perpetuate non-cooperative equilibria, and how do property relations structure water access?

Paper 1 demonstrated that following the 2010 severance of Otumara's LWC connection, vendor cartels filled the institutional vacuum through oligopolistic infrastructure control, while mutual distrust between state and community perpetuated non-cooperation despite potential welfare gains. Property relations between landowners and tenants emerged as the primary structuring axis of water access—vendors functioning as "veto players" capable of suppressing solidarity alternatives. Critically, Paper 1 documented a gendered pattern it did not yet center analytically: male vendors operated profit-maximizing businesses while the few female infrastructure owners provided subsidized access through solidarity-based sharing arrangements. This observation, noted peripherally at the time, became foundational for Paper 3's argument.

Sub-question 2 (Paper 2, Chapter 5): How do different community contexts produce diverse water provisioning systems, and what distinguishes "free-market" vendor-dominated models from "solidarity" approaches?

Paper 2's comparative analysis across four communities revealed that institutional configuration—not technical infrastructure alone—determines water access equity. Solidarity-dominant communities (Mafowoku) achieve relatively equitable distribution through CDA-managed and traditional-leader-provided free access points, while vendor-cartel communities (Orisunmibare, Otumara) produce systematic exploitation through oligopolistic pricing and documented violence. Yet across all community types, regardless of governance model, women remained excluded from infrastructure decision-making while bearing complete procurement responsibility—the transversal pattern that Paper 3 would theorize.

Sub-question 3 (Paper 3, Chapter 6): How do women experience water infrastructure access and procurement labor, and how does gender mediate all other inequalities structuring water provision?

Paper 3 centered what Papers 1 and 2 had documented without foregrounding: women's embodied experiences of water procurement—rising at 4 AM, allocating one-third of household income to water, carrying 25-liter containers, accessing water last within households—constitute the actually existing municipal water coverage for Lagos's slum population. Applying the WHO service level classification (Howard et al. 2020) to all five communities revealed that procurement distances translate directly into inadequate water quantity per person per day—a technical finding with immediate health consequences falling specifically on women's bodies. Gender emerged not as one variable among others but as the transversal inequality operating within every social group: even among the poorest male tenants sharing identical class position and spatial marginalization, gender hierarchy determined who fetched water, who paid, who drank first, and who sacrificed personal hygiene.

What the cumulative sequence revealed: The progressive analytical deepening—from game theory (Chapter 4) through comparative institutional analysis (Chapter 5) to feminist ethnography (Chapter 6)—generated an insight no single paper could produce: that the technical configurations documented in Chapter 3, the strategic interactions analyzed in Chapter 4, the governance heterogeneity mapped in Chapter 5, and the embodied experiences centered in Chapter 6 are not separate dimensions of a water crisis but co-constitutive elements of a single gendered infrastructure system. This system operates through patriarchal structures determining who controls infrastructure, who performs procurement labor, and who is denied governance authority—and it operates at scales from household water allocation through community vendor control to state-level policy neglect and eviction violence. The forced evictions of Orisunmibare (February 2024) and Precious Seeds (December 2025)—despite vastly different internal conditions—confirmed that community-scale organizing, whether absent or successfully established, operates at insufficient scale to challenge state violence, validating the cross-community network framework developed in Section 7.4.1.

The infrastructure as dignity framework (Section 2.4.5) emerged from this cumulative process as a theoretical synthesis exceeding what any individual paper could articulate: a framework demonstrating that women have already produced the infrastructure the state has not provided, and that the systematic extraction of their labor without corresponding governance authority constitutes the foundational injustice—not the absence of infrastructure but the denial of recognition to those who produce it. Chapter 7 developed the empirical, theoretical, and technical implications of this finding into two complementary intervention pathways: comprehensive policy reforms (Section 7.3) and experimental multi-scalar frameworks (Section 7.4), including the technical infrastructure standards for compound-level water point distribution (Section 7.3.5) required to translate governance reform into material change. Section 8.2 below details the 2026 LWC implementation project that attempts to integrate both pathways.

8.2 The 2026 LWC Implementation Project: Scholar-Activism in Practice

8.2.1 Project Rationale and Theoretical Grounding

Following Paper 3's 2025 publication explicitly recommending women-centered water infrastructure decision-making and control, FABULOUS URBAN will approach LWC in 2026 proposing pilot implementation of doctoral research findings. This timing is strategic: dissertation completion provides comprehensive evidence base; LWC officials interviewed 2018–2025 expressed openness to slum provision if methodologies and funding identified; and the Precious Seeds eviction demonstrates urgency—communities cannot wait for perfect political conditions. The project integrates both intervention pathways developed in Chapter 7, operationalizing infrastructure as dignity (Section 2.4.5) through the intervention frameworks developed in Chapter 7.

8.2.2 Post-Eviction Research and Cross-Community Network Formation (2026)

A critical ethical and methodological imperative involves tracking former Oworo Reality Women Group members post-eviction to understand what happens to organizing when its spatial foundation disappears. The group's thirty members had developed water infrastructure decision-making capacity in Precious Seeds before the December 2025 eviction, addressing a significant gap in eviction scholarship that typically ends at demolition. These displaced members constitute the first empirical test of the cross-community network rationale developed in Section 7.4.1: had they been embedded in a network from the outset, their organizing capacity would have survived the eviction even as Precious Seeds did not. Building on this fieldwork, the project will establish cross-community women's water networks across five to fifteen waterfront and inland communities identified through existing organizational relationships, progressive CDAs, and active women's savings groups.

Phase 1: Network Formation (6–12 months)

Operationalizing Insight 7's argument that organizing must transcend the community scale where patriarchal violence suppresses it, each participating community forms a local women's water committee through participatory process, with cross-community network formation establishing shared principles, coordination mechanisms, and collective advocacy agenda. Committee formation ensures mandatory inclusion of tenants, single mothers, physically disabled women, and age diversity through transparent selection processes community women determine.

Phase 2: Capacity Building (12–18 months)

Translating infrastructure as dignity into institutional competence, training operates at local committee level (technical infrastructure management, financial management, conflict resolution, democratic decision-making, advocacy) and network level (cross-community coordination, collective LWC/LSG advocacy, documentation systems). Male engagement and gender-based violence (GBV) protective mechanisms are integral components, operationalizing the frameworks developed in Section 7.4.4.

Phase 3: Infrastructure Development (18–36 months)

Redirecting existing financial flows from vendor extraction toward democratic women-centered management, hybrid financing combines NGO and philanthropic grants (40–50 percent of borehole costs), local government funding (40–50 percent), and community savings groups (10 percent plus emergency reserves)—proportions derived from existing funding patterns across comparable community water projects in sub-Saharan Africa (Danert et al. 2014) and calibrated to Lagos's institutional landscape, where local government has demonstrated willingness to fund borehole installation through LCDA budgets (documented in the Precious Seeds case, Section 7.4.5.2) but lacks capacity for full financing, and where NGO and philanthropic co-funding is established practice for community-scale water infrastructure. Borehole capital costs of 800,000–1,200,000 NGN (500–750 USD at 2026 exchange rates) reflect market prices for borehole drilling and equipping in Lagos, with variation depending on depth, geological conditions, and pump specifications (Section 7.3.5). These proportions are indicative targets for the pilot phase; the 2026 project's monitoring framework (Section 8.2.3) will generate empirical data on actual cost distribution enabling calibration for subsequent phases. Women's committees manage day-to-day operations including pricing structures on ability-to-pay sliding scales (20–50 NGN per 25-liter container)—a range set below current vendor pricing documented in Chapter 3 while covering projected operational costs (fuel or solar system maintenance, minor repairs, committee compensation), with the lower bound ensuring affordability for the poorest households and the upper bound reflecting willingness-to-pay levels documented through Chapter 6's household expenditure data showing women currently allocate 8,000–30,000 NGN monthly to water.

Phase 4: LWC Partnership Advocacy (Ongoing from 2026)

Testing the credible commitment argument of Section 7.3.1, presentation to LWC leadership draws on seven years of empirical documentation, evidence of vendor extraction, and Precious Seeds organizing capacity, requesting technical partnership, financial subsidies, institutional recognition of women's committees, and protective policy support. Realistic expectations acknowledge LWC's limited resources and political vulnerability—full partnership proves unlikely initially, with pilots limited to three to five communities.

8.2.3 Monitoring, Documentation, and Adaptive Management

Monitoring combines quantitative indicators—women's time savings, household income allocated to water, infrastructure functionality, and participation metrics—with qualitative assessment of decision-making participation, male resistance patterns, empowerment narratives, and governance quality. Documentation serves dual purposes: internal adaptive management and external advocacy, building evidence base for scaling and future LWC negotiation.

Adaptive management operates through monthly community reflection meetings, quarterly cross-community network sessions, and annual comprehensive evaluations—treating implementation as learning process rather than protocol execution. The frameworks developed in Chapter 7 provide analytical scaffolding, but operational translation requires continuous adaptation. Precious Seeds taught that even successful organizing faces unforeseen challenges; the 2026 project embeds this epistemological humility into its design.

8.2.4 Transferability Across Contexts

Practice-research experience across Lagos, Nairobi, Dadaab, and Dakar demonstrates that core organizing principles transfer effectively: women as primary stakeholders, cross-community networks transcending spatial vulnerability, hybrid financing, GBV protective mechanisms, and direct state utility partnerships bypassing male intermediaries. MDDT implementation across contexts—now exclusively with women following lessons from earlier male-dominated projects—confirms that gender-responsive WASH interventions transfer when explicitly centering women's decision-making authority.

Cultural, religious, and historical differences require context-specific adaptation while maintaining core feminist commitments. Nairobi's stronger civil society and Dakar's francophone Islamic governance produce distinct institutional arrangements; the Lagos frameworks provide analytical foundation while operational translation attends to how patriarchal structures and women's organizing capacities vary across postcolonial political economies.

8.3 Reflections on Scholar-Activism: Possibilities, Limits, Accountability

8.3.1 Ethical Tensions: Documentation, Surveillance, and Erasure

Scholar-activism generates profound ethical tensions without clear resolutions. The December 2025 Precious Seeds eviction (detailed in Section 7.4.5.2) demonstrates a fundamental limitation of scholar-activism: comprehensive documentation and successful women-centered organizing could not protect against state violence when eviction served larger political-economic interests.

Yet documentation constitutes refusal against erasure: when communities disappear physically, their social worlds and residents' agency persist in academic record, potentially informing future organizing and challenging official narratives portraying slums as spaces deserving demolition. Researchers cannot prevent state violence through scholarship alone, but scholarship chooses whether erased communities persist in historical record or disappear entirely. This dissertation ensures Orisunmibare’s gendered everyday water practices and Precious Seeds’s women's water organizing remains documented even as physical communities vanished—incomplete justice, but better than total erasure.

The privilege-reciprocity paradox persists despite implementation commitments (Section 1.2): the 2026 LWC partnership channels research toward participants' benefit but does not eliminate the fundamental asymmetries structuring knowledge production in postcolonial contexts. These tensions lack clear resolutions—but the alternative, not attempting transformation, perpetuates erasure without even the possibility of intervention.

8.3.2 What Research Cannot Do

Intellectual honesty demands acknowledging research's limits alongside contributions. Seven years of rigorous doctoral research and feminist methodology could not prevent evictions, demonstrating that scholarly analysis cannot protect against state violence when political economy prioritizes elite development over slum residents' spatial claims. Feminist research

makes visible what policy ignores and proposes women-centered alternatives, but cannot eliminate the structural violence producing daily suffering throughout and beyond the research process.

Policy recommendations cannot compel adoption. This dissertation proposes comprehensive reforms (Sections 7.3–7.4) that LSG may ignore, LWC may decline, or male vendors and leaders may violently suppress. Even successful pilot implementation does not guarantee scaling when recommendations challenge powerful economic interests. Interventions remain fragile within postcolonial neoliberal political economies valuing slums only as obstacles to elite development—transformation at water infrastructure scale does not automatically transform broader systems of gendered, racialized, class-based exploitation producing urban inequality.

8.3.3 Why We Persist: Scholar-Activist Accountability

Acknowledging these constraints does not mean abandoning scholar-activism but clarifies the ethical position sustaining it: not optimism, but non-complicity. The obligations this commitment generates are developed in Section 8.6.2.

8.4 Contributions to Knowledge and Practice

This dissertation's contributions operate across four registers—theoretical, methodological, policy, and practice—each developed in full across Chapters 2 and 7. What follows identifies the contributions and their locations rather than restating the arguments sustaining them, with one exception: the methodological contribution of long-durational practice-research as epistemology, which this section theorizes explicitly because it provides the foundational condition from which all other contributions become possible.

8.4.1 Theoretical Contributions

The infrastructure as dignity framework (Section 2.4.5, empirically demonstrated across Sections 7.6.1–7.6.4) constitutes this dissertation's primary theoretical contribution. Its core claim—that women's infrastructure labor has already produced what the state has not provided, and that the systematic extraction of that labor without corresponding governance authority constitutes the foundational injustice—emerged cumulatively from the three papers rather than preceding them as an applied analytical lens. The framework shifts normative ground from a politics of recognition to an ethics of non-abandonment and establishes the inclusion-versus-transformation distinction (Section 2.4.3) with direct implications for the 2026 LWC implementation project (Section 8.2), where the choice between routing governance through existing male-dominated structures versus building women's committees as primary infrastructure authorities operationalizes this distinction in institutional design.

The framework generates contributions to six adjacent scholarly fields: extending Graham and Marvin's (2001) splintering urbanism through gender; extending Truelove's (2011) feminist water inequality framework from observational to intervention methodology; reconceptualizing hybrid governance theory by demonstrating that formal–informal partnerships reproduce gendered

exploitation absent patriarchal transformation (Section 7.6.3); establishing multi-scalar compounding of patriarchal exclusion as recursive rather than additive (Insights 4–8, Section 7.2); documenting gender as constitutive inequality operating within every social group (Insight 8, Section 7.2); and extending Roy's (2017) displacement theory by revealing eviction's specifically gendered destruction of women's infrastructure organizing (Section 7.4.5.2).

8.4.2 Methodological Contributions

Four methodological contributions establish new approaches for feminist infrastructure studies in postcolonial contexts: the cumulative dissertation format as intellectual journey documenting genuine analytical evolution rather than imposing false consistency (Section 7.5.1); strategic methodological pluralism deploying game theory, comparative institutional analysis, and feminist ethnography as complementary rather than competing approaches (Section 7.5.1); reflexive positionality navigation developing specific approaches for white European researcher engagement in postcolonial African contexts (Section 1.2, Section 7.5.3); and postcolonial research engagement refusing colonial knowledge extraction through sustained practice-based reciprocity (Section 1.2.3).

A fifth contribution—long-durational practice-research as epistemology—provides the foundational condition from which the other four become possible and warrants explicit theorization here. Drawing on McKittrick's (2021) methodological framework for practice-based research honoring participants' knowledge as authoritative rather than requiring external validation, this dissertation demonstrates how building infrastructure alongside communities generates knowledge unavailable through conventional fieldwork timelines or observational methodologies. Women shared knowledge about intimate partner violence, vendor retaliation fears, and political exclusion because relationship depth built through sustained practice generated trust that conventional fieldwork cannot achieve. Crucially, long-durational engagement produced knowledge through failure as much as success. Short-term research cannot fail in ways that teach because projects remain hypothetical rather than materially implemented. The Orisunmibare and Precious Seeds evictions produced knowledge through traumatic experience rather than detached observation—witnessing four years of women's organizing destroyed in hours generated analytical understanding qualitatively different from conclusions derived from literature review or comparative case analysis.

This methodological contribution positions long-durational practice-research as rigorous scholarly epistemology requiring specific conditions: sustained organizational presence enabling trust-building beyond researcher-subject relations; material implementation of interventions allowing failure analysis; reflexive documentation treating practice failures as analytical data; commitment to reciprocity through ongoing presence; and willingness to confront how researcher privilege shapes what becomes visible. The approach carries distinct limitations—privilege enabling sustained engagement, risks of false familiarity, potential for practitioner commitments to override analytical objectivity—that do not invalidate the epistemology but specify its conditions and constraints, establishing long-durational practice-research as methodological choice appropriate for certain questions rather than universal approach (Section 2.6, Section 7.5.2).

8.4.3 Policy and Practice Contributions

The dissertation develops comprehensive gender-responsive policy frameworks for LWC institutional transformation, positioning women's committees as legitimate infrastructure decision-making actors through direct collaboration bypassing male intermediaries (Section 7.3.1–7.3.2). Regulatory frameworks constrain vendor exploitation through pricing controls, quality standards, and enforcement mechanisms (Section 7.3.3). Anti-corruption and inter-agency coordination protocols address contract inflation and the destruction of water infrastructure during eviction operations (Section 7.3.4). Technical infrastructure standards for compound-level water point distribution—specifying borehole-to-standpipe system design, the 75-liter-per-person-per-day target, and engineering parameters for Lagos's settlement conditions—translate governance reform into material change (Section 7.3.5).

Beyond formal policy, operational frameworks for civil society organizations, NGOs, and women's groups enable organizing independently of state receptivity: cross-community women's water networks transcending spatial vulnerability (Section 7.4.1), hybrid financing models (Section 7.4.2), micro-governmental networks integrating vendors within women's committee governance (Section 7.4.3), and GBV protective mechanisms constitutive of—not supplementary to—women-centered infrastructure organizing (Section 7.4.4). Community-specific implementation examples demonstrate adaptive application across vendor-dominated and organized community types (Section 7.4.5). The 2026 LWC implementation project (Section 8.2) constitutes the first systematic attempt to operationalize these frameworks.

8.5 Future Research Directions

The limitations identified in Section 7.7—case study transferability, longitudinal data gaps, underexplored male perspectives, economic viability questions, and scaling complexities—generate specific research agendas extending beyond what this dissertation or the 2026 LWC implementation project can address. The following directions prioritize questions the doctoral research surfaced but whose investigation requires sustained academic commitment beyond doctoral timelines.

Comparative Longitudinal Analysis Across Cities

The 2026 LWC project will track outcomes within Lagos communities, but the infrastructure as dignity framework's transferability claims require comparative testing across political economies. Active research partnerships in Nairobi and Dakar, and established institutional connections in Addis Abeba and Abuja, provide access for research examining which organizing strategies transfer across varying state capacities and colonial legacies, what institutional arrangements enable women's committees to survive political transitions and founder generation aging, and whether the framework's analytical vocabulary—access, control, governance—proves adequate to contexts with significantly different state-community relationships than Lagos's near-total abandonment.

Theorizing Adaptive Replication

This dissertation proposes adaptive replication wherein communities receive context-specific interventions while connecting through networks (Section 7.4), departing from conventional standardized “scaling up” models. Yet theoretical frameworks explaining when, how, and why

adaptive approaches outperform standardized models remain underdeveloped. Academic research should develop conceptual apparatus distinguishing which elements require standardization for efficiency (financing structures, GBV protective mechanisms) versus which demand adaptation to local power dynamics (vendor engagement strategies, CDA relationships), how cross-community networks maintain coordination without imposing uniformity, and whether adaptive replication proves more resource-intensive initially but more sustainable long-term.

Post-Eviction Trajectories and Organizing Resilience

The planned post-eviction fieldwork addresses immediate aftermath, but sustained academic research tracking displaced residents years after eviction would reveal longer-term organizing trajectories. Does eviction destroy organizing capacity permanently? Do some displaced members join or form organizing in communities where they relocate, transferring knowledge and skills across space? Do former committee members maintain informal support networks enabling mutual aid despite spatial fragmentation? What protective mechanisms might enable organizing to survive displacement—documented knowledge systems accessible remotely, portable skill sets, cross-community networks persisting beyond individual settlement destruction? This research proves critical for contexts where eviction constitutes routine state practice.

Intersectional Infrastructural Labor Beyond Gender

This dissertation centers gender as constitutive inequality structuring water access and control, yet water pushers—predominantly young male migrants from northern Nigeria or Niger—perform essential distribution labor under precarious conditions. The decision to foreground gender reflects analytical necessity: gender emerged as the organizing inequality mediating all dynamics across Papers 1–3, while water pushers' precarity stemmed primarily from migrant status and youth rather than systematic exclusion from infrastructure decision-making. Future research integrating migration studies, labor precarity, and feminist infrastructure theory should examine how race, ethnicity, migration status, age, and class intersect to structure who performs which infrastructure work under what conditions.

8.6 Infrastructure as Dignity: Reclaiming the Framework as Commitment

8.6.1 Completing Postcolonial Urban Theory Through Feminist Analysis

Postcolonial urban theory provided this dissertation's foundational analytical framework: Mbembe's (2001) analysis of power in the postcolony, Simone's (2004b) theorization of people as infrastructure, and Simone and Pieterse's (2017) vision of transformative southern urbanism made possible the refusal of deficit-based approaches, the centering of everyday practices as city-making, and the insistence that Lagos slums constitute sites of urban production. This debt is real and acknowledged throughout.

What this dissertation adds is the feminist analysis that postcolonial urban theory structurally cannot produce from within its own analytical commitments—an argument Section 2.4.5

develops in full through the Mbembe-through-Segato reading and the African feminist tradition (Oyěwùmí 1997; Mama 1995; Tamale 2011; Dangarembga 2022) grounding the framework's normative force. The result is not critique but completion: infrastructure analysis cannot account for how cities actually function without feminist analysis, and feminist analysis in postcolonial African contexts cannot proceed without the historical formations Mbembe and Simone illuminate. Infrastructure as dignity names the synthesis—and the 2026 LWC implementation project (Section 8.2) constitutes the first attempt to enact it.

8.6.2 From Framework to Commitment

Infrastructure as dignity is not only a theoretical lens for analyzing what exists—it is a normative framework generating obligations. The 2026 LWC implementation project (Section 8.2), the cross-community women's water networks (Section 7.4.1), the technical infrastructure standards for compound-level water distribution (Section 7.3.5), and the protective mechanisms addressing gender-based violence (Section 7.4.4) are not applications of the framework to practice. They are the framework enacted—each translating the ethics of non-abandonment into institutional design, engineering specification, or organizing strategy. Scholar-activism, in the tradition this dissertation inherits from the African feminist scholars whose work grounds it, means that analysis and action are not separate phases but continuous dimensions of the same commitment to transformation.

8.7 Closing: Infrastructure as Dignity as Scholarly Commitment and Lived Practice

The framework's claims are established in Section 2.4.5, demonstrated empirically in Chapters 4–6, and developed into intervention frameworks in Chapter 7. What remains is the forward movement: from analysis to commitment, from framework to practice, from degree conferral to what comes next.

This dissertation was written from a particular position: a white European woman, a tenured professor, a researcher with a passport and mobility that Lagos slum women do not have. That asymmetry does not disqualify the analysis—but it generates an obligation. The 194 women and men who shared accounts of exhaustion, exploitation, fear, and survival did so in the expectation that something might change. Infrastructure as dignity is offered, in the first instance, as answer to that expectation: a framework that makes their invisible labor visible, names their systematic exclusion as injustice, and proposes conditions—practical, institutional, political—under which infrastructure might become what it should always have been: not a site where dignity is denied, but the material form through which it is expressed and sustained.

The work continues.

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FIELD WORK

Expert interview 1 (23 August 2019).
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Expert interview 4 (27 August 2019).
Expert interview 5 (28 August 2019).
Expert interview 6 (29 August 2019).
Expert interview 7 (12 September 2019).
Expert interview 8 (12 September 2019).
Expert interview 9 (16 September 2019).
Expert interview 10 (18 September 2019).
Expert interview 11 (19 September 2019).
Expert interview 12 (19 September 2019).
Expert interview 13 (20 September 2019).
Expert interview 14 (29 January 2025).
Expert interview 15 (25 September 2025).
Expert interview A (23 August 2018).

Focus group discussion 1 (7 August 2019).
Focus group discussion 2 (20 August 2019).
Focus group discussion 3 (24 August 2019).
Focus group discussion 4 (27 August 2019).
Focus group discussion 5 (11 September 2019).
Focus group discussion 6 (11 September 2019).
Focus group discussion 7 (1 May 2024).
Focus group discussion 8 (1 May 2024).
Focus group discussion 9 (2 May 2024).

Focus group discussion 10 (3 May 2024).

Field notes Amukoko-Mosafejo (February, March, August, September 2019; May, August 2023; January 2025).
Field notes Mafowoku (February, March, August, September 2019; May, August 2023; January 2025).
Field notes Orisunmibare (February, March, August, September 2019; May, August 2023).
Field notes Otumara (February, March, August, September 2019; May, August 2023).
Field notes Precious Seeds (May 2024; January 2025).

Anlage zur Dissertation von Fabienne Hoelzel
Annex to the Dissertation of Fabienne Hoelzel

Eidesstattliche Versicherung
Statutory Declaration

Hiermit erkläre ich eidesstattlich, die vorliegende Arbeit selbständig und ohne fremde Hilfe verfasst und nur unter Verwendung der angegebenen Hilfsmittel und Quellen angefertigt zu haben. Die den genutzten Werken wörtlich oder inhaltlich entnommenen Stellen, habe ich als solche kenntlich gemacht.

Ich erkläre darüber hinaus, dass die vorliegende Arbeit nicht in der gegenwärtigen oder in einer anderen Fassung oder in Teilen an der Technischen Universität Dortmund oder an einer anderen Hochschule im Zusammenhang mit einer staatlichen oder akademischen Prüfung, weder in der vorliegenden noch einer anderen Sprache, bereits vorgelegt worden ist.

I hereby declare in lieu of an oath that I have written the present work independently and without outside help, and that I have used only the aids and sources indicated. Passages taken from the works used, whether verbatim or in substance, I have marked as such.

I further declare that the present work has not, in its current or any other version, in whole or in part, already been submitted at the Technical University of Dortmund or at any other institution of higher education in connection with a state or academic examination, whether in the present language or any other.

Dortmund, den 1. Juni 2026
Dortmund, June 1, 2026

Unterschrift
Signature _____