

Unpacking water governance dynamics and its implications for household water security in post-disaster resettlement communities in the Philippines

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Abstract

Water security is a critical issue globally for the sustainability of households, communities, and the environment. However, most studies have focused on water availability and accessibility, whereas research examining the role of power and politics in shaping water insecurity remains marginal. This study contributes to this research gap by unpacking the overlapping drivers and politics in water governance dynamics that co-produce the water insecurity of Typhoon Haiyan disaster-displaced households in resettlement villages in the Philippines. Using political ecology and water governance perspectives, we ask, *What does household water insecurity look like in post-disaster resettlement villages in the Philippines? What are its drivers and how do politics and governance dynamics impact the provision of water services to these villages?* Our findings suggest five overlapping drivers: the haphazard relocation of displaced populations to areas without access to basic facilities; the institutional disharmony and late involvement of water institutions in the resettlement processes; the influence of governance regime in the rapid but substandard housing development, including water distribution systems; the micropolitics in water district management affecting water projects; and the impact of maladaptive resettlement outcomes on households' capacity to afford water. This study demonstrates how various drivers, including power relations and contestations in water governance, lead to household water insecurity outcomes. It ends by providing brief policy recommendations to improve institutional arrangements for the better governance of water services to resettlement communities.

Keywords: *water security; politics; water governance; Typhoon Haiyan; Philippines; disaster*

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1. Introduction

The extant literature suggests that most studies on water security have traditionally focused on water availability, accessibility, affordability, and human needs (Cook & Bakker, 2016). However, a growing body of scholars has pointed out that, while they are useful for highlighting global water disparities, they tend to prioritise technocratic solutions to natural events that potentially naturalise the causes of water insecurity and obscure the role of power and politics in shaping unequal waterscapes (Loftus, 2015). Despite their focus on water availability and access, technocratic approaches to water security overlook the socio-cultural, economic, and political processes that contribute to water insecurity and the unequal distribution of water resources (Truelove, 2019). Water security issues involve complex and uncertain sociopolitical relationships in which diverse actors reorganise how water is distributed, utilised, and transformed (Empinotti et al., 2019; Jepson et al., 2017; Wang & Dai, 2021).

The complexity of water security issues and the role of power and politics is illustrated in the case of post-disaster recovery after Typhoon Haiyan (from here on called Haiyan) in 2013. Haiyan was one of the most powerful typhoons ever recorded, and more than 14 million people were affected across 44 provinces in the Philippines (NDRRMC, 2014). At least 25,000 displaced households in Tacloban City and Palo were relocated to permanent rural and peri-urban resettlement villages away from their pre-Haiyan coastal communities. Ten years after the disaster, this study is one of the few to analyse the long-term impacts of ex-situ relocation, focusing on the everyday water insecurity experiences of households in resettlement villages. This research also positions itself on a critical variant of water security scholarship by not only discussing the issues of water availability, accessibility, and affordability, but also focusing on the multiple and overlapping socio-economic, political, and institutional drivers and power relations that contribute to water insecurity in these resettlement villages.

This study was conducted in four post-disaster resettlement villages in Palo and Tacloban in Eastern Visayas, Philippines to answer the following questions: *What does everyday household water insecurity look like in post-Haiyan resettlement villages in Tacloban and Palo, Philippines? What are its drivers and how do politics and governance dynamics impact the provision of water services to post-disaster resettlement communities?* Apart from solely analysing water insecurity from the perspective of those who experience it, we also unpack how conflicting power interests and institutional dynamics in water district

management and post-disaster resettlement processes overlap and co-produce water insecurity issues in these communities.

This study comprises five major parts. The following section discusses water security in the extant literature and its relationship to human development. Section 3 discusses the analytical and methodological framework. Section 4 presents our results, and Section 5 provides brief policy recommendations.

2.1. Water security

Water security is of global significance since the UN's 2016 World Water Development Report estimated that by 2050, approximately 200 million people could be displaced because of too much or too little water from desertification, sea level rise, or increased extreme weather events (Miletto et al., 2017). While water security has gained increasing attention in academic and policy circles, different institutions have varied conceptualisations and operationalisations of what "security" entails, leading to difficulties in translating the concept into coherent policy initiatives and development programs (Cook & Bakker, 2012, 2016). Some scholars, like Cook and Bakker (2011) have synthesised how scholars study water security in four general domains: (1) human development, (2) ecological sustainability, (3) geopolitics and international relations, and (4) vulnerability and risks. Indeed, the concept has been applied in terms of perceptions, practices, and paradigms using various research approaches, objectives, and results (Malekian et al., 2017).

This study locates itself on the role of water security in human development and adopts a broad understanding of water security as "adequate, reliable, and affordable water for a healthy life" (Jepson, 2014). This is premised on Amartya Sen's capabilities approach, which argues that gaps in water reliability, accessibility, and safety could erode human functionings or various ways that enable people to live a dignified and valued life (Sen, 1999a, 1999b). In post-disaster contexts, affordable, safe, and stable water form part of fundamental human rights (UNDESA, 2010), and thus, "[it] should not be viewed as an end in themselves, but as the initiators of benefits that continue long after the projects have been handed over to the communities" (Brikké & Bredero, 2003). Water security is critical for families' long-term disaster recovery, especially those who were relocated to resettlement villages with the

promise of being provided with basic social services and infrastructure, such as water, electricity, education, and livelihoods, among others.

This study also examines the role of power and politics in shaping water insecurity. Thus, we also position this research on the critical variant of water security scholarship, which argues that while international development frameworks, such as the 2030 SDGs (Goal 6: Clean Water and Sanitation for All), are useful for highlighting global water disparities, they tend to prioritise technocratic solutions to natural events, such as droughts and floods, potentially naturalising the causes of water insecurity and obscuring the role of power and politics in shaping unequal waterscapes (Loftus, 2015). Critical analytical frameworks, like political ecology, argue that water security issues involve complex and contested social-political relationships where diverse actors and institutions reorganise how water is distributed, utilised, and transformed (Empinotti et al., 2019; Jepson et al., 2017; Wang & Dai, 2021).

2.2. Water studies in the Philippines

In the *Philippine Water Forum 2023*, former Finance Secretary Benjamin Diokno cited that the “weak and fragmented institutional set-up, competing and changing priorities of water infrastructure, lack of science-based decision support systems, and the unequal delivery of basic water and sanitation services due to inadequate funding and low technical capacities” are the causes of water insecurity in the country (Sicat, 2023). To address these problems, the current Marcos Jr. government intends to revitalise and increase water infrastructure projects, apply the principles of Integrated Water Resource Management (IWRM) under data-driven decision support systems, create two government agencies with separate but related foci (i.e. the Water Regulatory Commission and Department of Water Resources), embrace innovative financing schemes, and direct investments in climate-resilient water infrastructure projects (Sicat, 2023). The implementation of these plans will be guided by multiple policy frameworks such as the National Water Security Road Map, the National Irrigation Master Plan, the Philippine Water Supply and Sanitation Master Plan (PWSSMP), and localised Flood Master Plans for the national capital and other major river basins to “achieve universal access to safe, sufficient, affordable, and sustainable water supply, hygiene, and sanitation by 2030” (Sicat, 2023).

Water governance in the Philippines is seen as complex and contested because of the fragmented institutional mandates among national agencies with distinct goals, and between various levels of government (e.g., national, provincial, and local) (Rola et al., 2018). The majority of water projects in local government units (LGUs) and rural areas depend heavily on government subsidies, and they become politicised because of the absence of clear property rights and rules for their orderly contracting (Hall et al., 2018). In urban areas, households face challenges arising from the competing uses of water between household consumption and small-scale industries as well as the associated pollution resulting from unregulated wastewater-dumping activities (De Vera & Hall, 2018).

In the context of disasters, in general, and in Haiyan, in particular, limited studies have examined the water-related problems of displaced communities. They include water-related issues in Eastern Visayas following Haiyan, focusing on hydrological modelling to assess water resilience against climate change (Marteleira et al. 2018), social perception of water scarcity (Marteleira, Coelho, and Roxo 2019), water access in resettlement villages (Canta, 2022), and a rapid feasibility study on a bulk water supply project for Tacloban City (USAID, 2015). However, there remains a dearth of scholarship that problematises, consolidates, and discusses the overlapping structural, socioeconomic, and political drivers of water insecurity in resettlement communities. Specifically, no studies have yet critically examined how power asymmetries in water governance dynamics, organizational micropolitics, and post-disaster resettlement processes have co-produced water-related challenges faced by disaster-displaced households in these communities. This study aims to fill these gaps both conceptually and empirically.

2.3. Political Ecology and Water Governance

Political ecology studies the intersections and relationships between the political (broadly understood) and environmental and ecological phenomena (Minch, 2011). The main contention of political ecology is that multiple human factors (i.e. political, economic, social, and cultural) impact ecological and environmental issues. Thus, human-environmental systems are intertwined and operate in complex and dynamic relationships underpinning power asymmetries and justice implications (Minch, 2011).

As an analytical and theoretical framework, political ecology applies an interdisciplinary and intersectional lens to examine how structural forces, such as capitalism, politics, and power asymmetries, drive environmental change and natural resource challenges (Peet et al., 2011; Perreault et al., 2015; Robbins, 2020). Political ecology embraces complexity in analysing the historical and structural drivers of natural resource struggles and environmental conflicts (Escobar, 2006; Forsyth, 2003; Forsyth & Walker, 2008). It does not conform to a singular way of analysing and discussing empirical data, and does not intend to (Minch, 2011), but caters to a variety of studies that examine the nexus of environmental and social sciences with political economy (Peet, Robbins, and Watts 2011) across topics of “environmental degradation and marginalisation, environmental conflict, conservation and control, environmental identities and social movements” (Robbins, 2004, p. 14). In terms of spatial focus, political ecology has traditionally been used to examine natural resource issues in rural areas, but has expanded to interrogate human-environmental relations in urban and industrial spaces, covering the topics of environmental politics, socio-ecological relationships, and the dynamics of power and control in different contexts (Escobar, 2006; Neumann, 2009; Roberts, 2023).

Various scholars have used political ecology to present front-and-centre the politics of water (in)security in many parts of the globe. For example, Kusi-Appiah and Mkandawire (2022) used political ecology to examine how the social ties and informal institutional affiliations of urban-poor households in Malawi were vital in ensuring adequate water supply despite exorbitant tariffs from state-provided water. In South Asia, Akhter (2017) used the terms ‘absolute’ and ‘structural’ water scarcity to show how the issue of water scarcity in the Indus Basin is not only a problem of natural resource availability but is entrenched in the historical agroecological changes that have occurred in the basin since the 19th century. Truelove (2019) used an embodied approach to urban water insecurity and contextualised it with the experiences of Muslim women living in informal settlements in New Delhi to show how water security is tied to additional inequities and vulnerabilities. In northern Nicaragua, scholars examined the uneven and gendered experiences of water access and showed how these are co-shaped by conflicting interests against agricultural irrigation and domestic usage during drought (Bacon et al., 2022).

2.4. Water governance dynamics

Water security studies have also examined the dynamics of water governance (Empinotti et al., 2019; Wilson et al., 2019; Wutich et al., 2017). Water governance generally refers to the processes through which institutions- both formal (e.g. laws, policies, government agencies) and informal (community organisations, customary councils)–actors (e.g. policymakers, water managers, local chief executives, water users), and societies broadly decide on how water is to be used, by whom, and under what circumstances (Bakker, 2003; Zwarteveen et al., 2017). This study conceptualises water governance as “the range of political, social, economic and administrative systems that are in place to develop and manage water resources, and the delivery of water services, at different levels of society” (Rogers & Hall, 2003). Thus, water governance encompasses diverse factors that influence water movement, such as formal and informal institutional structures as well as daily interactions, conflicts, and resolutions between individuals and groups (Wilson et al., 2019).

Water governance dynamics include institutions and institutional arrangements. Although various conceptualisations of institutions exist, this article defines them as normative and cognitive frames, formal or informal, that concern actors in collective action (Hassenforder & Barone, 2019). Institutions may profoundly impact decisions taken in water governance by placing restrictions on water policies and influencing actions concerning water distribution and utilisation. Hence, analysing institutions and institutional arrangement is essential for researchers, policymakers, and water managers (Wilson et al., 2019; Wutich et al., 2017; Zwarteveen et al., 2017). While many definitions overlap, this study conforms to the prevailing framing in the literature by acknowledging the intersection of institutions and institutional arrangements (Hassenforder & Barone, 2019). According to the Global Water Partnership (2023), institutional arrangements are “the network of stakeholders that operate within a specific governance domain and, which are linked through sharing expertise, data, systems, tools, and stakeholder engagement mechanisms”. To establish well-functioning institutional arrangements, the UNFCCC (2020) recommends that governing bodies exercise flexibility, sustainability, and continuous and consistent information flow; facilitate national and subnational expertise engagement; and provide coordination between institutions.

International organizations bodies and think tanks have issued frameworks for good water governance in order to achieve water security. For example, the “OECD Principles on Water Governance” emphasise twelve principles systematically organised around three

central dimensions of good water governance: effectiveness, efficiency, trust, and engagement in water governance regulation (OECD, 2021). The UN Sustainable Development Goals have also issued targets and indicators for Goal 6: “Water and Sanitation for All” (UNDESA, 2015). However, scholars argue that such guidelines focus on the conceptual underpinnings of “how water governance should be envisaged”, disregarding how water governance “actually operates” between institutions and across institutional arrangements and how policies, processes, actors, and power asymmetries intersect and affect the delivery and management of water services (Loftus, 2015; Wilson et al., 2019; Zwarteveen et al., 2017).

This study demonstrates the intersectional impacts of governance dynamics, organizational micropolitics, and post-disaster processes that contribute to water insecurity. Political ecology is a fitting analytical framework for this study because we are interested in critically examining the overlapping socioeconomic and political drivers of contemporary water insecurity in post-Haiyan resettlement communities in the Philippines. By combining political ecology and water governance perspectives, this study also interrogates water (in)justice, as it aims to uncover the embedded power relations and contestations through which water resources are produced, distributed, and transformed (Savelli, 2023), including the prevailing structures and mechanisms that exclude some people’s access to water (Swyngedouw et al., 2002) in resettlement villages.

3. Research Context, Communities, and Methods

Less than a month after Haiyan, the national government imposed the No Build Zone (NBZ) policy (Figure 1) which prohibited the construction of residential dwellings within 40 m of the eastern seaboard of Eastern Visayas, except for business, livelihood, and commercial purposes (Villanueva, 2013). Although arguably well-intentioned, the national government did not release any legal or regulatory framework for the basis and implementation of the NBZ policy. The policy was impractical, anti-poor, and disproportionately impacted fisherfolks, low-income people, and informal settlers living within NBZ areas (Fitzpatrick and Compton 2019; Yee 2018). In March 2014, the Office of the Presidential Assistance on Reconstruction and Recovery (OPARR) admitted that the uniform 40-meter NBZ area was flawed. The national government revised it by ordering all Haiyan-affected LGUs to identify

“safe” and “unsafe” areas for “residential, commercial, or economic use based on hazard risk mapping” and to include restrictions on structures that could be used for such purposes.



Figure 1. A No Build Zone placard that was previously erected in Tacloban City.

The rapid identification of “safe areas” required multi-hazard risk assessments, which not all affected LGUs had the capacity to conduct. Most LGUs, especially under-resourced municipalities, “lacked the financial and technical capacity to map out safe and unsafe areas” (Thomas, 2015b). Against this backdrop, implementing the NBZ policy in 171 municipalities and cities affected by Haiyan took time and encountered new obstacles. Thomas (2015b) argues that “figuring out *who* needed to be resettled based on a proper risk assessment was only part of the problem- a far larger challenge lay in determining *where* to relocate people.” Thomas (2015) argues that the government’s target of relocating at least one million individuals across 116 municipalities was too grand considering the reality at that time. Early studies have found that the implementation of post-Haiyan resettlement has been riddled by various issues, such as poor planning, the lack of participation of affected communities, raffled strategies in housing allocation, duplication of beneficiaries, and bureaucratic delays, among others (Eadie, 2019; Ensor et al., 2021; Tuhkanen et al., 2018).

Ten years after the Haiyan disaster and the implementation of its various post-disaster recovery and rehabilitation programs, this study is one of the few to investigate disaster survivors' long-term recovery. Specifically, this study is part of a larger research project that

examined the impact of the COVID-19 pandemic on the resilience and well-being of disaster-displaced communities and its implications for long-term disaster recovery from Haiyan.

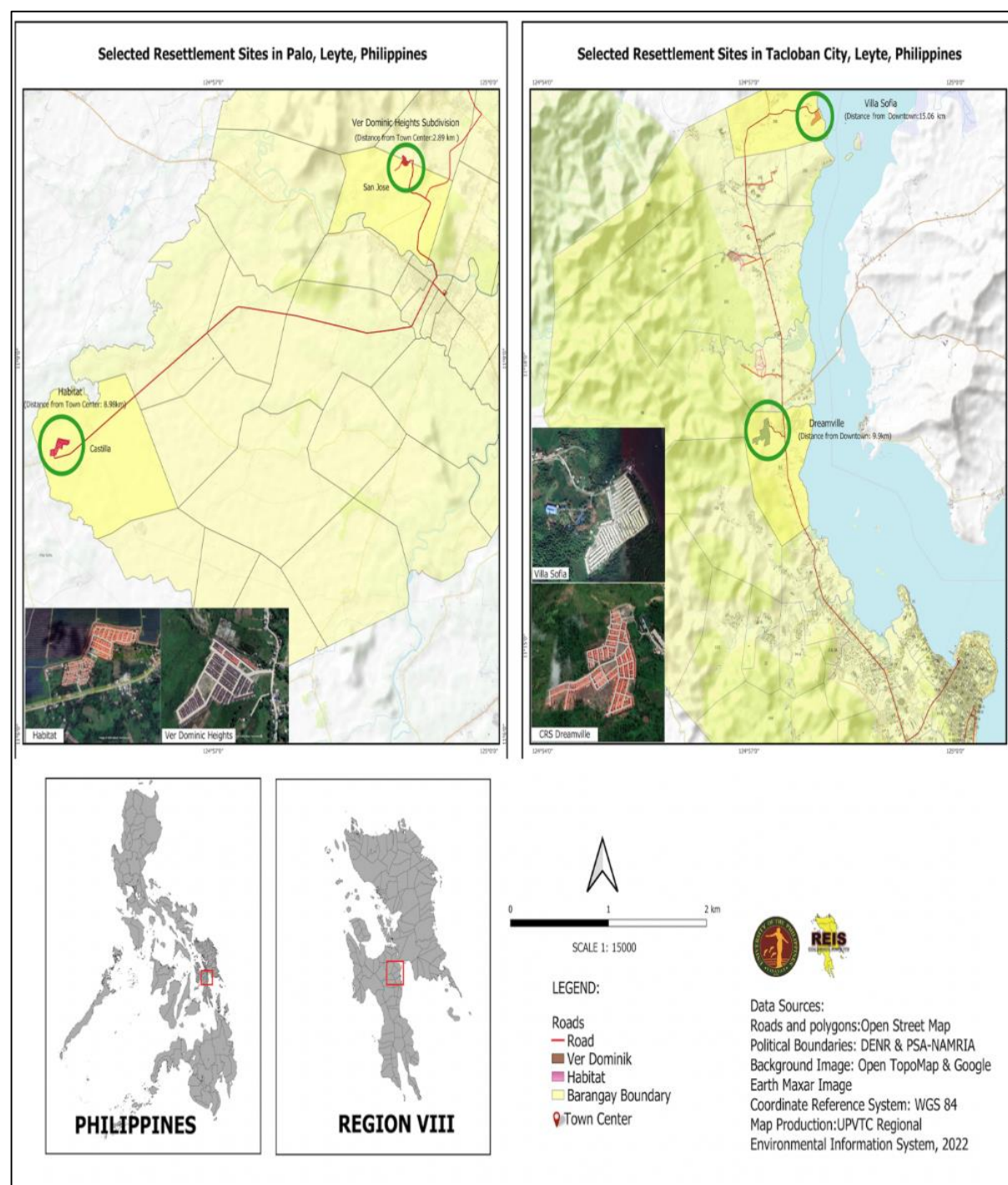


Figure 2. The map shows the four resettlement villages in Palo, Leyte, and Tacloban City, Philippines¹.

¹ Map commissioned from the Regional Environmental Information System (REIS) of the University of the Philippines Tacloban.

The fieldwork was conducted in four Haiyan permanent resettlement villages – two in Tacloban City and two in Palo, Leyte—in the Eastern Visayas region of the Philippines from June 2022 to March 2023. Tacloban is a highly urbanised city and the region’s commercial capital. It comprises 138 barangays (village-level government units), and hosts 31 resettlement villages. Palo, on the other hand, is a third-class municipality in the province of Leyte composed of 38 barangays and hosts 13 Haiyan resettlement villages. We gathered primary data from the DREAMVille and Villa Sofia subdivisions in Tacloban City and Habitat for Humanity and Ver Dominic Heights subdivisions in Palo (Figure 2).

We adopted a mixed-method research design and employed focus group discussions (FGD) (Method 1), semi-structured key informant interviews (Method 2), household surveys (Method 3), and informal conversations and community walkthroughs (Method 4) to gather primary data from June 2022-March 2023. We also conducted content analyses of secondary data (Method 5) such as government and NGO reports related to Haiyan. We explained the study’s objectives and procedures to all research participants using Waray-Waray, the local language in Eastern Visayas.

Each FGD had eight participants and lasted about 2-3 hours. We used a questionnaire guide and facilitated all FGD with the help of local research assistants. The FGD guide contains questions on the displaced households’ socio-demographic profile, daily living conditions before and during the pandemic, COVID-19’s impact on the availability and accessibility of social services and infrastructure, including water, perceptions of risks and vulnerabilities in resettlement villages, risk management and adaptation strategies, and prospects of living in resettlement villages (Appendix A). We also developed a semi-structured interview guide (Appendix B) for in-depth interviews with key informants from homeowners’ associations, city and municipal LGUs, and national government agencies. Most interviews lasted approximately 60 minutes. Upon interviewing, new insights and points of enquiry emerged; hence, the informants referred the first author to other potential key informants who could best answer the follow-up questions. A total of 51 key informants were interviewed (Appendix C).

We developed a draft survey instrument that we finalised using data gathered through Methods 1, 2, and 4. The survey questions focused on the households’ sociodemographic profile, perceptions of risks and living conditions before and after resettlement, COVID-19’s impact on the availability of social services and infrastructure, including water, perceptions of

risks and vulnerabilities, risk management and adaptation strategies, and prospects of living in the resettlement villages (Appendix D). The final survey instrument was translated into *Waray-Waray* (local language) and pilot-tested before its full deployment in the field. This ensured that our language was culturally acceptable and understandable to the survey respondents. The sample criteria of the survey respondents included the following: a) head or legal age (18 years old and above) representative of a resettled household; b) has been in the resettlement village for at least two years before the pandemic started in the Philippines (March 2020); c) identify themselves as Haiyan survivors; and d) willing to voluntarily participate in the research. Ten local enumerators were trained in ethical data collection, involving human research participants, before administering the survey using the Offline Survey app of Qualtrics. Quota sampling was used to recruit survey respondents, and 400 households—100 households from each site—were surveyed for this study. The survey lasted for 25-30 minutes, 75% of the respondents were women, 44.5% were married, and 48% attended a secondary level of education (Appendix E).

The first author supplemented the findings by conducting community walkthroughs to gather data through informal conversations, collecting pictures, and observing events and activities in resettlement villages. Apart from building rapport and trust, this method gave us direct subjective experiences of the informants' contextual situations to unpack and understand the questions of "how" and "why" they experience water (in)security. Lastly, we conducted content analyses of relevant secondary data, such as NGO reports, government policies and program reports, news reports, and press releases relevant to the post-Haiyan resettlement processes and water projects in Palo and Tacloban.

Quantitative data from household surveys were analyzed using univariate analysis such as descriptive statistics (Maravelakis, 2019). Our qualitative data were coded and analysed using an abductive (inductive and deductive) coding approach (Linneberg & Korsgaard, 2019) on MAXQDA, a software used for mixed-methods research. The first author used attribute codes (i.e. water unavailability, water inaccessibility, water politics, and water project delays) to iteratively sort, label, and connect multiple segments (Skjott Linneberg & Korsgaard, 2019) from the interviews and FGD transcripts focusing on everyday water challenges in resettlement villages and their overlapping drivers. The segments for each attribute code were further examined using thematic analysis to identify common patterns emerging from the data and their interconnectedness (Mishra & Dey, 2022). We then

developed sentence themes to capture and discuss the overlapping drivers that co-shaped and co-produced water insecurity in the case study communities.

4. Results and Discussion

4.1. Visuals and experiences of everyday water insecurity in Haiyan resettlement villages

In this section, we present selected visuals² and experiences of water issues across our case study communities. Our data reveal that most households perceive that they have water available for drinking (74%) and general household use (70%) (Table 1). However, only a few households can access the Level III water supply from LMWD/PrimeWater. At the same time, the majority rely on communal faucets, manual water pumps, and deep wells for general water use. Level III water supply in the Philippines refers to a water supply system that includes a source, reservoir, piped distribution network with an adequate treatment facility, and individual household taps, typically supplied by a water district provider, such as the Leyte Metropolitan Water District (LMWD).

Table 1. Perceived household water availability in select resettlement villages in Tacloban City and Palo, Leyte (n= 400)

Water availability	DREAMVille	Villa Sofia	Ver Dominic	Habitat	Average
Drinking water	71	85	72	69	74%
General HH Use	73	79	62	64	70%

Note: n= 100 from each resettlement village

Despite their perceived water availability, our informants shared that many households across the resettlement villages purchase drinking water from local suppliers at PHP30.00 (~USD 0.55) per jug (a jug contains four litres of water) (Figure 3). For general water use (e.g. washing dishes, bathing, and cooking), households must ration the water they purchase at PHP10.00 (~USD 0.10) per jug (Figure 4). The payment accounts for the labour cost of the local peddlers who deliver these containers to their houses (Figure 5). In other densely populated resettlement villages (i.e. Greendale and Ridgeview villages), water peddlers source water from reservoirs outside of their villages (Figure 6).

² Figures 3-6 were taken by the first author for a separate but related project on planned relocation and used with the approval of the Principal Investigator.

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382 **Figure 3. Sealed plastic containers of purified drinking water.**



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384 **Figure 4. A jerry can with water for cooking and dishwashing.**



Figure 5. A local peddler is collecting water from a water tank.



Figure 6. A peddler collecting water from a deep well near DREAMVille to be delivered and sold to households in other resettlement villages

While the water quality seems acceptable for residents, the prolonged use of jerry cans and other plastic containers as water vessels may cause disease outbreaks, especially if they are not regularly cleaned and disinfected (Mahmud et al., 2019). For example, Tacloban City declared a cholera outbreak in October 2022 after 426 suspected cases and five deaths were reported in some communities in Tacloban North (Meniano, 2022). Moreover, varying heat exposure of plastic water containers may produce microplastics that mix with the water (Ginter-Kramarczyk et al., 2022). This is a silent yet glaring issue, especially in the tropical Philippines, where the mean annual temperature is already 26.6 degrees Celsius and is expected to increase because of global warming.

Our findings also suggest a differential level of water connectivity among the resettlement villages with the LMWD, the main water district in the region that provides water services to seven municipalities and a city, including Tacloban and Palo. In Palo, the Habitat for Humanity subdivision, where displaced households started residing in 2014, only received a partial water connection from the LMWD/PrimeWater in 2020, or around six years after relocation. Partial connection means that only some subdivisions' phase/block/zone have water connections. A resident from Habitat Village shared the following:

"For example, in our area here, we don't have a line yet. Only this part and over there have water connections. So, for us here, we would still have to gather water from the water pumps."

Additionally, households in the recently completed Ver Dominic Heights subdivision, which was only awarded to beneficiaries in December 2021, had no water district connections at the time of data gathering. While the residents bore two deep wells to access water, they were too murky and unsafe, forcing them to use them to water the plants and flush the toilets (Figure 7).



Figure 7. A deep well with unsafe and murky water at the Ver Dominic Heights subdivision.

In Tacloban, while Villa Sofia is located near one of the main water sources of the water district, the subdivision only obtained a Level III water connection in 2022. Households also experience intermittent water supply interruptions because their villages are highly elevated compared with the main water pipeline. On the other hand, the DREAMVille subdivision, where displaced households started residing in 2020, has only a partial connection, with only two of its three phases (housing blocks) having a direct water supply from the water district. While DREAMVille has a water reservoir and a jet, it requires constant electricity to pump the water from the main pipe of the water district inside the distribution pipelines of the subdivision.

The Homeowners' Association officers (HOA) sought relief from Tacloban LGU officials to alleviate their water challenges. The Office of the Vice Mayor granted them financial assistance in constructing a deep well where they get their water for bathing and washing. While the water district-supplied water is properly treated³, some households perceive it as unclean since its source comes from the Cabalawan reservoir, which they think is unsanitary. Instead, they buy purified water sold by private companies per jug. Other respondents also shared that a sustained and affordable water supply is a huge driver of how they see their lives in resettlement villages in the longer run. One resident of DREAMVille shared that:

"For me, it will improve if we have a water supply because that is our primary concern. If five years come, but we still do not have a water supply, our situation will be the same."

³ Personal interview w/ key informant from LMWD, 17 January 2023, Tacloban City, Philippines

4.2. Overlapping drivers of water insecurity in Haiyan resettlement villages

In this section, we use political ecology and water governance as analytical lenses to thematically discuss the complex and overlapping drivers of water insecurity faced by disaster-displaced households in selected resettlement villages in Tacloban and Palo. In the next subsections, we demonstrate how these intersecting drivers operate, affect, and are influenced by the social, economic, political, and institutional processes and assemblages embedded in the management of water resources and the implementation of post-Haiyan resettlement processes in Eastern Visayas.

4.2.1. Haphazard relocation of displaced populations

Ten years after Haiyan, our findings suggest that the haphazard ex-situ relocation of survivors heightened their vulnerabilities and led to their continued everyday water insecurity in resettlement villages. Our findings suggest that the imposition of the NBZ policy created confusion and immense political and logistical pressure for affected LGUs regarding where to relocate thousands of informal households. This forced Tacloban and Palo to rapidly look for “safe areas” (largely based on locations unaffected by the storm surge) at the expense of properly and holistically evaluating whether these areas could adequately support the daily and long-term needs of displaced households. In other words, Tacloban and Palo were forced to identify “safe areas” in their rural/interior or peri-urban villages that did not have adequate infrastructure and services, including water, roads, electricity, and schools, just because they were far from the coast and were not reached by the storm surges.

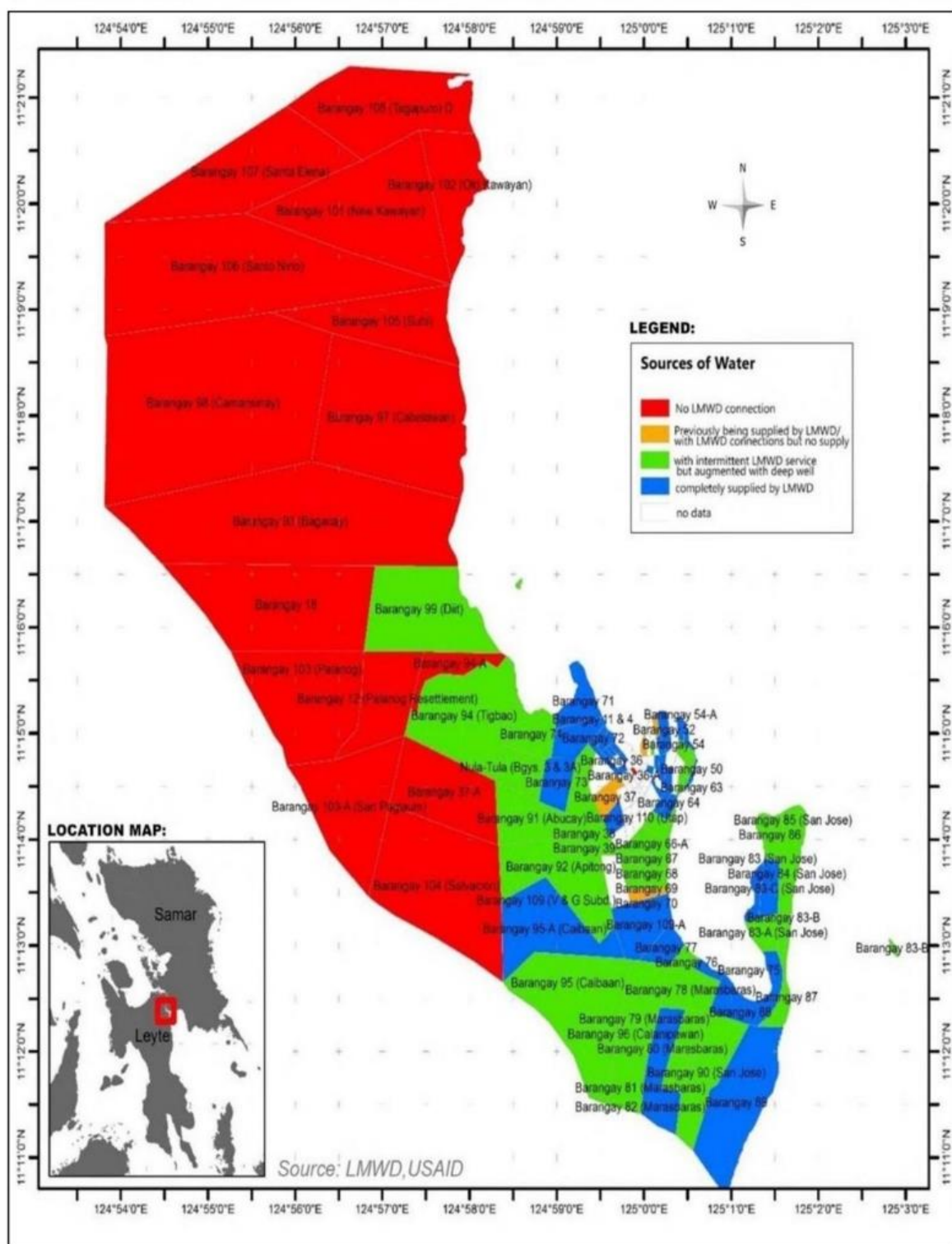


Figure 8. Tacloban Water Service Map of LMWD before Typhoon Haiyan⁴.

⁴ Map from USAID 2015 study "Tacloban City North Bulk Water Supply Project, Rapid Feasibility Study, Final Report". The red colored areas are considered Tacloban North which did not have any water connections from LMWD.

For example, Tacloban identified around 20 hectares of government-owned land in the northern part of the city- now collectively known as Tacloban North- as the only area within its jurisdiction elevated by at least 5 meters against the coast and was not reached by the storm surge⁵. However, this was located at least 15-20 km from the urban center where the livelihoods of relocates as well as social infrastructures (e.g., hospitals, water district, schools, universities, etc) are. This identified “safe area” had few household inhabitants and was mostly used for agriculture. The DRRM officer of Tacloban disclosed that Tacloban North had no water supply connections (Figure 8), limited public transportation and educational infrastructures. It was also originally envisioned to be an agri-industrial zone for the city’s future development⁶. In Palo, the municipality identified areas in their interior barangay that are considered safe based on the assessment of the LGU’s engineering and planning office⁷. Palo is mostly coastal and was heavily devastated by the storm surge, thus there was no option for them but to look for “safe” relocation areas in their interior barangays. However, these classified “safe” and “elevated” zones both towns did not have any available basic utilities such as electricity and water, which means that enormous resources, both financial, logistical, and labor, were needed for these identified resettlement areas to make it habitable⁸. At the time of writing, the majority of the resettlement villages in both LGUs did not have access to Level 3 water supply, relied on communal water sources for general water use and bought drinking water from private/business suppliers.

We argue that the excessive focus on relocating affected households to “safe areas,” compounded by the political and logistical pressure to provide immediate housing to the survivors (discussed in Section 3.2), complicated the resettlement processes and neglected the bigger humanitarian and developmental objective of ensuring the availability and accessibility of fundamental social services and infrastructures (e.g., sustainable livelihoods, electricity, and water, etc.) for survivors to live with dignity in their new communities. The imposition of the NBZ policy also rendered ex-situ relocation as the primary post-disaster recovery response despite previous studies on development-induced and climate-related displacements which show that relocation should be used as a last resort because it leads

⁵ Personal interview w/ key informant from the City Housing and Community Development Office, 27 September 2022, Tacloban City, Philippines

⁶ Personal interview w/ key informant from the City DRRM Office, 28 September 2022, Tacloban City, Philippines

⁷ Personal interview w/ key informant from the Municipal DRRM Office, 29 June 2022, Palo, Leyte, Philippines

⁸ Personal interview w/ key informant from the City Planning and Development Office, 29 September 2022, Tacloban City, Philippines

increased vulnerabilities and impoverishment of affected communities (Rogers and Wilmsen 2020; Wilmsen and Webber 2015; See and Wilmsen 2020). While the post-Haiyan relocation efforts had transformational intentions, their potential outcomes were not felt by resettled residents as its haphazard and non-participatory implementation led to their dislocation away from social support networks (further discussed in 4.2.3) and adequate infrastructures and services (Eadie, 2019; Ensor et al., 2021; Tuhkanen et al., 2018). These processes, thus, undermined the survivors' everyday necessities and diminished their capabilities to recover from the Haiyan disaster in the long term.

4.2.2. Institutional disharmony and late involvement of the water sector in the resettlement processes.

Water governance includes institutional arrangements involving multiple stakeholders, including government agencies, local authorities, communities, NGOs, and private entities, each with their roles, responsibilities, and (often conflicting) interests (Suhardiman et al., 2021; Wang & Dai, 2021; Wilson et al., 2019). In this study, we adopted institutional disharmony to illustrate the lack of coordination, collaboration, and alignment among different government bodies⁹ involved in managing water resources and services for resettlement communities after Haiyan.

Our findings support earlier studies suggesting that institutional disharmony between the national and regional government agencies and affected LGUs was rampant in the early phase of the resettlement processes (Atienza et al., 2019; Salazar, 2015). Focusing on the water sector, we found that despite permanent housing construction programs starting as early as January 2014- of which NHA reported completing 2,148 (9%) of the 23,344 units by the end of the year (NHA, 2014)- it was only in March 2015 that the LWUA and the LMWD were first invited and involved in the discussion and planning for the Haiyan recovery and resettlement efforts.

An anonymized key informant highly involved in post-Haiyan water projects shared that:

“After Haiyan, the national government actually overlooked the need or the involvement of the water industry or water utility in resettlement villages despite its

⁹ Such as national and regional government agencies, the Local Water Utilities Administration (LWUA), LMWD, NHA, and LGUs

521 *importance. They were conducting meetings with different agencies to relocate*
522 *people, but they did not consider the water sector. There was no budget for water. It*
523 *is unclear why the LWUA and the LMWD were not included in the planning process.*
524 *Only in March 2015 that [the LMWD] was called to attend a meeting in the NEDA*
525 *central office. It was only then did they realize that the resettlement sites badly needed*
526 *water supply and services.”*

527
528 In 2016, the LWUA allocated at least PHP 635,561,996.00 (~USD 11.08 million) for the
529 provision and rehabilitation of water systems for NHA-built Haiyan projects- three of which
530 were already completed while the remaining were reported to be under construction as of
531 November 2022 (Appendix F). Six Water Districts implemented them across 35 resettlement
532 villages to benefit at least 25,039 Haiyan survivor households (LWUA, 2022b). Most of the
533 funds, 88.89%, (PHP 565 million or ~USD 9.96 million) were allocated to the LMWD, which
534 was higher compared to the initial PHP 273.98 million (~USD 4.83 million) estimated overall
535 requirement of the sector identified in the post-disaster needs assessment (NEDA, 2014). The
536 LMWD projects commenced in December 2018 and were targeted to be completed in two
537 years or by December 2020 (LWUA, 2022a). According to LWUA’s website, they are still under
538 construction due to multiple constraints¹⁰ (Figure 9), including unworkable site conditions,
539 leaks in the water distribution pipelines, underground obstructions, and COVID-induced
540 logistics and construction bottlenecks.



¹⁰ The first author requested for a copy of progress reports on water projects intended for Typhoon Haiyan resettlement villages through e-mail on 18 January 2023, but the LMWD management declined the request. A text correspondence received by the first author from its representative on 07 February 2023 stipulated that “all water supply system projects [of the LMWD] are already being implemented by PrimeWater” and that their “water system project for the relocation villages in Tacloban North is already energized or operational”.

Figure 9. Ground excavation and laying of uPVC pipe towards Villa Diana Subdivision, Barangay 101, Tacloban City.

Source: Adopted from the LWUA official public website, accessed 18 November 2022.

Yet, our findings indicate that these are only some of the material constraints for the delay in implementing and completing water projects intended for resettlement villages. We found two overlapping drivers of delay. First is at the level of institutional dynamics between the Tacloban LGU and the LWUA- the national government agency overseeing the project; and second is at the level of organizational micropolitics over political influence and management control of the LMWD between Tacloban LGU and the Leyte provincial LGU, two levels of government that are historically monopolized by two distinct political clans in the region (further discussed in Section 4.2.4).

Regarding the institutional disharmony between the Tacloban LGU and the LWUA, our anonymized key informant disclosed that administrative delay hampered the implementation of water projects in resettlement villages. For instance, at least two project biddings have failed from 2014-2018. The Regional Development Council then elevated the longstanding water problem at the resettlement villages to the office of then-Pres. Duterte. Duterte later ordered the LWUA to download the funds to LMWD and to conduct all project bidding and materials procurement processes at the local level. Because of this delay, it was only in December 2018 that water projects commenced despite the availability of funds since 2015 and the signing of a Memorandum of Agreement for the water projects in 2016. These findings complement earlier studies which point to bureaucratic delays as among various institutional constraints in implementing post-Haiyan resettlement projects, which decreased the livability of these villages for disaster-displaced families (Thomas 2015a; Tuhkanen et al. 2018; Ensor et al. 2021; Palagi and Javernick-Will 2020; Palagi and Javernick-Will 2019).

The country's Commission on Audit (COA) had admonished the LWUA for the delay in implementing water projects worth more than PHP664 million (~USD11.9 million) intended for calamity- and conflict-affected communities. In its *2021 Annual Audit Report*, the COA stated that "[t]he slow implementation of the identified Disaster Risk Reduction and Management (DRRM) Funded projects for the Yolanda [Haiyan] affected areas and Zamboanga and Marawi City siege defeats the State's policies of R.A. No. 10121... thus delaying the government's response to the immediate needs of the recipients that would

have lessen the impact of the disaster and restore the normal supply of potable water” (COA, 2022, p. 104). The report further stated that “[the] delay of seven years deprived the beneficiaries [of] the much-needed assistance. It was not consistent with [the] policy of the state to lessen the impact of calamity and help the communities affected by the typhoon to rebuild and go back to their normal lives” (COA, 2022, p. 105).

4.2.3. Change in governance regime, militarized & haphazard housing construction, and disaster profiteering.

In this section, we discuss the compounding effects of changes in governance regimes, militarised and haphazard implementation of the post-Haiyan housing projects, and disaster profiteering on water insecurity in resettlement villages.

The beginning of the post-Haiyan resettlement processes can be traced back to the development of the *Reconstruction Assistance on Yolanda: Build Back Better (RAY)*, the Philippine government’s strategic guide for the recovery and reconstruction of the economy, lives, and livelihoods in the affected areas (Iuchi & Mutter, 2020). Through the RAY, the country’s legislators provided additional funding of around USD 2.9 billion for the post-Haiyan recovery and rehabilitation efforts (ADB, 2014). The government also established the Office of Presidential Assistance on Rehabilitation and Reconstruction (OPARR) to liaise and monitor the implementation of RAY and to lead the development of the *Typhoon Haiyan Comprehensive Rehabilitation and Recovery Plan (CRRP)* (Iuchi & Mutter, 2020). The RAY and the CRRP policy documents emphasized the need for relocation, especially in elevated areas (Iuchi & Mutter, 2020). To implement this, the government formed the Yolanda Permanent Housing Program (YPHP), led by the National Housing Authority (NHA), one of the country’s five key shelter agencies and the sole government entity mandated to engage in housing production for low-income families. The YPHP “aims to build houses and create livable, thriving, and disaster-resilient communities under a township approach where resettlement sites shall be provided not only with the necessities of water and electricity but also with social infrastructures such as daycare centers, health centers, and school buildings within or near the housing project sites.”

At the regional level, the National Economic Development Authority (NEDA), with the guidance and collaboration of the Regional DRRM Council and the Regional Development Council, published *SULHOG: The Eastern Visayas Yolanda Reconstruction Plan*. The SULHOG

consolidated the proposed interventions and expected key results along shelter, infrastructure, and livelihood clusters of the post-Haiyan recovery and rehabilitation programs, projects, and activities (NEDA, 2014). Our findings, however, indicate that these were not followed in the actual resettlement planning and implementation. Instead, our data suggest that the politics, institutional arrangements, and governance dynamics of early post-Haiyan resettlement processes were marred with policy confusion, institutional disharmony, and late coordination with key water agencies at the national and regional levels of government.

First, the change in the governance regime significantly affected the post-Haiyan resettlement processes and outcomes (Iuchi & Mutter, 2020). Under the Aquino administration (2010-2016), the LGUs established Local Inter-Agency Committees (LIACs) composed of representatives from multiple levels of government departments and private sectors to work on sustainable relocation to permanent resettlement villages guided by the principles of community participation to Build Back Better (NEDA, 2014). Contrary to this original mechanism, the resettlement process was expedited under the Duterte government (2016-2022) (Iuchi & Mutter, 2020), leading to less desirable outcomes. Even before his ascension to power, then-President Rodrigo Duterte capitalized on the challenges in post-Haiyan resettlement for his populist political rhetoric and electoral narratives (Yee 2022), promising that urgent actions would be delivered to survivors (Ranada, 2016). After he won the national election through a landslide victory in 2016, he attended the *3rd Yolanda Commemoration* in Eastern Visayas, where he publicly expressed his dissatisfaction with the arduous and delayed construction of resettlement villages and the relocation of survivors (Faith, 2016). He also gave an ultimatum for government executives to complete the housing construction by March 2017 (Gabieta 2017a), which was eventually unmet by the NHA (Gabieta 2017b).

Second, after President Duterte's marching order, the Office of the Presidential Assistance for the Visayas tapped the iron fist of the Philippine Army's Engineering Brigade to supervise the housing construction. The NHA, the agency that initially led and was supposed to lead until the completion of the housing construction projects, became under the command of the Army. A key informant who wished to be anonymized out of fear of management reprisal disclosed that the NHA was instructed to finish at least 2000 housing

units weekly, yielding ~8000 units built monthly. The swift construction of houses may be considered a triumph in terms of quantity. However, it resulted in various negative consequences such as insufficient land development, disregard for development permits and building licenses, unsystematic work outcomes, and premature allocation of residences to unverified beneficiaries, resulting in duplication and conflicts among potential beneficiaries, local government units, and national government agencies.

Our findings suggest that one of the primary obstacles hindering the achievement of providing direct water connection to each housing unit is neither due to the pandemic nor the speed of LMWD's construction, but because of the inevitable cessation of linking the primary water pipes to the distribution pipelines within some NHA-built resettlement subdivisions. This is because some of the water pipes utilized by the NHA contractors were either old/damaged or made of inadequate/substandard materials that disregard the typical material specifications used in constructing water systems.

In terms of institutional arrangements, our findings suggest that the issue originated partly from the centralized implementation of water projects for NHA-built resettlement villages. The NHA granted project contracts to big construction firms or developers in Metro Manila since the bidding process was conducted at the national office of the LWUA. The initial budget for each housing unit, which included the materials for the water system, was only PHP 290,000.00 (~USD 5,000.00). Over the years, it incrementally increased to PHP 450,000.00 (~USD 7,850.00) due to inflation and price escalation. However, since the contractors were not locally based, they subcontracted some of the projects to local contractors in Eastern Visayas, and each sub-contractor received a profit cut, which ultimately reduced the actual amount used for constructing houses. This disaster profiteering and profit-maximizing dynamics eventually led to using sub-standard materials and deviation from the agreed work plans.

The City Planning and Development Coordinator of Tacloban expounded by saying:

"The contractors that won in Manila then subcontracted these projects until the third or fourth subcontractors based in the region implemented them. Construction quality was compromised. Each contractor has a chunk of that money, and they want profits... When the contractors built the houses and the subdivision, [some of] the pipes they used were non-compliant with the specifications of the water district."

4.2.4. The micropolitics in Leyte Metropolitan Water District

We adopted an organizational theory definition of micropolitics as those “activities taken within organizations to acquire, develop, and use power and other resources to obtain one's preferred outcomes in a situation in which there is uncertainty or dissent” (Pfeffer, 1981, p. 7). The micropolitics of organizations is, therefore, generally characterized by diverse goals and unclear areas of influence, actors who behave to pursue and protect their own interests, and formal and informal institutions that interact with strategic and often conflicting intentions to define and (re)structure organizational resources (Altrichter, 2001). In this study, we use micropolitics as a concept to capture and discuss the historical power struggles between political elites from Tacloban LGU and the provincial LGU of Leyte in gaining political appointment and management control over the Leyte Metropolitan Water District (LMWD), even before Haiyan, and how these power struggles contributed to the delay in implementing water projects at resettlement villages.

The LMWD operates as a Government-Owned and -Controlled Corporation (GOCC) and has been an autonomous and quasi-public corporation since 1975. For over a decade, the LMWD was managed by a Board of Directors (BOD) appointed and politically influenced by the Leyte provincial LGU as legally mandated by the Provincial Water Utilities Act of 1973 (PD No. 198) However, previous reports indicate that the province-appointed BOD members have been surrounded by controversies over alleged corruption and lack of accountability and transparency in managing the LMWD for years (ADB, 2010; WNP, 2004). Allegations about intentionally manipulating the number of registered water concessionaries in Tacloban to maintain its low number (less than 75%) of registered active water users have happened even before Haiyan. For example, Marteleira (2019, p. 79) reported that “LMWD did not have a single meter per customer in some areas of the city, but rather one meter per subdivision serving more than 200 households”. Our anonymized key informant shared that this was also allegedly the main reason why there was no significant expansion or infrastructural development of water pipes in Tacloban North before Haiyan because doing so would inadvertently increase the number of water concessionaries and then shift the BOD-appointing authority from the province to the city LGU.

After Haiyan, significant political and legal developments at the national level and a shift of power at the local level occurred, directly impacting LMWD operations. Specifically, G.R. No. 197146, a Supreme Court landmark ruling, stipulated that the 75% threshold of PD

No. 198 is inapplicable to Highly Urbanized Cities/HUCs (like Tacloban) and concludes that the mayor of an HUC with the majority (50% + 1) of the total active service connections of the local water district within its area should be the appointing authority of the BOD Members of such water district. In 2016, the then-mayor of Tacloban, Cristina Romualdez, sought the political endorsement and approval of then Pres. Duterte to implement the same decision in LMWD (Marteleira 2019), citing that its official 2014 report indicated that 67.5% of its total active users were in Tacloban (Canta, 2022). The said endorsement was granted on 11 December 2017. Available data from LMWD as of March 2022 indicate that Tacloban is home to 58.5% (26,809) of the total 45,270 active connections across the water district.

In January 2018, the Tacloban LGU appointed a new set of BOD members, which resulted in a management deadlock and standoff against former province-appointed BOD members (Nicolas, 2018). While the tenured employees and the previous General Manager of LMWD supported the Tacloban-appointed BOD members (Desacada, 2018), the province-appointed BOD members defied this move, which resulted in confusion among water concessionaries and temporary disruption of the water services (i.e., bill collection and payment) to at least 36,000 families (Meniano, 2018), including delays in implementing water projects in resettlement villages. Specifically, this power struggle spanned from early 2018 to late 2019, which significantly delayed the implementation of water projects for resettlement villages (Canta, 2022).

Eventually, the province-appointed BOD members conceded, and the LMWD is currently under the full management of the Tacloban-appointed BOD and General Manager. In this new governance arrangement, development priorities have shifted, and the water district has become semi-privatized. Under the Public-Private Partnership (PPP) program endorsed by the Duterte administration, the LMWD entered into a contractual Joint Venture Agreement (JVA) with the PrimeWater Infrastructure Corporation¹¹ on 02 July 2019 for the "Financing, Development, Rehabilitation, Expansion, Improvement, Operation and Maintenance of the Water Supply and Septage Management Systems of Leyte Metropolitan Water District". According to its former General Manager, this JVA aimed to realize LMWD's expensive "development plans" (Gabieta, 2017). It became effective in September 2019,

¹¹ The first author gave an official letter dated 08 February 2023 requesting an interview from a representative of PrimeWater. However, no response was received.

providing LMWD strategic control (policy and regulatory functions) while PrimeWater manages the water district's daily operations. Under this JVA, new water sources and treatment plant facilities are expected to be constructed before 2030¹².

While efforts to privatize water services in the country started in the 1970s at the time of the Marcos Sr. regime, evidence suggests it hasn't been successful before in LMWD partly because of the strong opposition both by its employees' association, its consumers, and civil society groups who formed grassroots coalitions to mobilize peaceful rallies and advocate against it (WNP, 2004). Apart from the overarching argument that privatizing the water district will increase water bills and add an economic burden to water concessionaries despite poor services (Gabieta, 2017), the LMWDEA feared that it would jeopardize the jobs of its employees. This fear became a reality under the JVA of PrimeWater and LMWD as the subsequent organizational restructuring resulted in a massive employee layoff from 300 personnel down to 38 (Canta, 2022).

4.2.5. Maladaptation in relocation: Water unaffordability for household concessionaries

Maladaptation refers to the processes through which people become more vulnerable as a consequence of DRR and climate adaptation interventions (Sarkar et al., 2024; Schaer, 2015; Schipper, 2020), such as relocation. The forced relocation of households in resettlement villages has led to various maladaptation outcomes, such as reduced income sources, strained social bonds (due to separation from their coastal neighbors, relatives, and friends), absence or lack of health facilities and services in resettlement villages and inability to afford water access.

The Regional Development Council (RDC) of Eastern Visayas expected that water connectivity at resettlement villages would improve because of better and faster management from the LMWD and PrimeWater JVA. However, this did not materialize. It is estimated that the proportion of Tacloban North's resettled population with Level III water connectivity is only at 35% as of March 2022¹³. Two factors primarily drive this low water uptake: 1) the availability of Level II and I water supply in the resettlement villages and 2) the unaffordability of monthly water bills.

¹² Personal interview w/ a key informant from LMWD, 17 January 2023, Tacloban City, Philippines.

¹³ Personal interview w/ the City Planning and Development Coordinator of Tacloban, 29 September 2022, Tacloban City, Philippines.

During the Duterte administration, communal faucets were installed to provide Level II water supply (water source with general distribution pipes) to some water-deprived resettlement villages. This was augmented by Level I water sources such as deep wells (water sources with no distribution networks). The LMWD, with the help of the Department of Public Works and Highways (DPWH), also delivered and stored water in tanks in these resettlement villages on a weekly basis (Figure 10). These were the main water sources for many households in resettlement villages at the time of data gathering.



Figure 10. Residents in a resettlement village in Tacloban North during water delivery to their community during the COVID-19 pandemic.

Source: Photo taken by Ara Joy Pacoma in June 2021.

On the other hand, in villages where Level III water supply is available, it was first believed that the costly and lengthy application process for water connection was the main hindrance for them to get connected. However, the RDC members later discovered that the main reason for the low uptake was the unaffordability of water bills for many post-disaster resettled consumers.

According to the Planning and Development Coordinator of Tacloban:

“Despite the advocacy campaigns and assistance given by PrimeWater for resettled households to encourage them to avail water services, they still chose not to because of the cost. Another thing that the PrimeWater observed is even if the concessionaires get their houses connected, this would only last for a couple of months.”

The lack of sustainable livelihoods and income sources continue to be glaring issues in our case study communities. A daily wage earner from Villa Sofia and a participant in the FGD July 16, 2022, shared that:

“Our wage is highly insufficient [in supporting us]. Of course, we must pay for the fare and buy food. Nothing remains. That’s why it would be nice to have jobs nearby our village because the fuel prices are high nowadays.”

These insights validate the results from our survey data, which indicate that even before the pandemic, most households earned less than PHP15,000.00 (<US\$270.00) per month, and those with no income doubled during COVID-19. While most households have 5-6 average members, the majority of them only have one member who has a job, at least at the time of data gathering. They are mostly daily job earners (41.25%) or venturing into micro enterprises (i.e., sari-sari store owners) (16%), while 26% of them were jobless. Participants from all FGDs noted that two of the evident issues they faced upon relocation were the inability to cover their daily food needs and the absence of stable livelihoods and income opportunities at resettlement villages (Sarkar et al., 2024; Schaer, 2015; Schipper, 2020). This reinforces the conclusions of previous studies, that show that the relocation of Haiyan survivors have dislocated them from their primary sources of food and income (i.e., fisherfolks) and social support networks (Eadie et al., 2020; Ensor et al., 2021; Su & Dé, 2020; Tran et al., 2023).

5. Conclusion and Policy Implications

Through a combined political ecology and water governance lens, this article examines five overlapping factors that have contributed to the long-term water insecurity issues experienced by Haiyan-displaced households residing in four permanent resettlement villages in Tacloban City and Palo, Philippines.

The first factor pertains to the imposition of the No Build Zone policy which resulted in the haphazard and disorganized resettlement of displaced populations to areas without access to basic facilities and resources. The second factor relates to the institutional disharmony among government resettlement program implementers and water management agencies, resulting in the late involvement of the water sector in the resettlement process and the delayed implementation of water projects. The third factor is the radical change in post-disaster resettlement processes and procedures due to the change

in governance regime and the Duterte administration's marching order to expedite housing construction. This led to militaristic style and haphazard outputs of resettlement housing construction, alongside private contractors' disaster profiteering schemes, resulting in substandard materials used, including those for the water system in resettlement villages. The fourth factor stems from the micropolitics in LMWD, specifically the local political elites' power struggle to control management appointments and secure political influence in water governance, which delayed the implementation of water projects. Finally, the fifth factor points to displaced households' lack of sustainable livelihoods and income opportunities as maladaptive outcomes of the relocation process, resulting in economic water scarcity.

Overall, this study adds to the important body of critical water literature by underscoring that water insecurity is not only a natural resource problem but a socio-economically and politically generated crisis. As this study shows, water security, or lack thereof, involves not only the physical distribution of water but also the social, institutional, political, and economic relations or contestations that enable or obstruct individuals' and households' access and control over water (Jepson et al., 2017; Loftus, 2015; Truelove, 2019; Wutich et al., 2017).

To effectively address water insecurity issues in Haiyan resettlement villages, policymakers, chief executives, and water managers need to comprehensively understand the complex power relations, institutional dynamics, and socio-economic factors that contribute to water insecurity challenges for household concessionaires. To minimize delays, they should prioritize institutional, policy, and project implementation reforms that promote collaboration, efficiency, and accountability among different agencies. This is particularly important when the beneficiaries of these projects are disaster survivors who may suffer more from the prolonged lack of access to safe and affordable water than from the actual hazard itself. Although we acknowledge that enhancing institutional arrangements for water governance is not a simple task, we contend that it is achievable and can be accomplished by clearly delineating and allocating roles and responsibilities for those involved in managing water services and infrastructures, including policymaking, policy implementation, operational management, and regulation (OECD, 2021).

Resettlement must be implemented with careful navigation of often conflicting community expectations, government plans and programs, and shifts in national and local political economy for it to potentially produce transformative adaptation outcomes (Dale &

Ajibade, 2024; Ensor et al., 2021). As this study demonstrates, key water governance institutions and actors must be immediately and actively involved in the planning processes to ensure that water services are adequately funded and integrated into all resettlement programs. In the long term, there needs to be enhanced coordination among government institutions and household concessionaires to ensure that the progress and issues of water projects in resettlement communities is consistently monitored and addressed. Most importantly, these institutional arrangements must have sufficient autonomy to remain effective and operational regardless of political leadership and government administration changes to ensure water projects' continuity in resettlement communities. As previous studies have shown, resettlement as a post-disaster policy response can be contentious, multi-pronged, and non-linear with both outcomes of resilience or maladaptation (Atienza et al., 2019; Barnett & O'Neill, 2010; Eadie, 2019; Opdyke et al., 2017; Schaer, 2015; Schipper, 2020). Thus, policymakers and government officials must regard resettlement as a long-term process (Davis, 1978), not a one-time, project-based commitment to resettled households. They must evaluate how the post-disaster plans and narratives to build back better (Atienza et al., 2019; Su & Dé, 2020; Thomalla et al., 2018) in resettlement villages have been realized over the years, starting, for example, with examining the water insecurity situations in these communities.

Lastly, as we discussed in Section 3, this study is part of a large research project that examines the impacts of COVID-19 on disaster-displaced communities and its implications for their long-term disaster recovery from Haiyan. Future studies should critically examine other issues such as housing and land tenure, livelihoods, and social welfare, that are pertinent to the long-term disaster recovery of disaster-displaced households.

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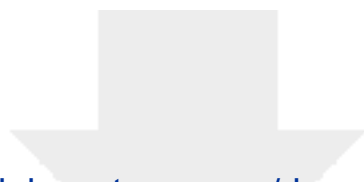
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Highlights

- Unpacks the water-related challenges in resettlement communities ten years after super Typhoon Haiyan.
- Examines the drivers and politics of water security of disaster-displaced households.
- Analyzes the socio-political relations embedded in water governance dynamics.
- Illustrates how power relations in governance dynamics impact household water insecurity.

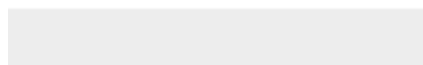
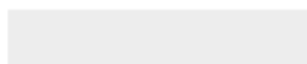
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CRedit authorship contribution statement

Ginbert Permejo CUATON: Conceptualization; Data curation; Formal analysis; Funding acquisition; Investigation; Methodology; Project administration; Validation; Writing - original draft; and Writing - review & editing.

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