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Repairing urban water governance through informality: Comparing how informality nurtures governance capacities for reparative transformation in Indian cities

Photo Narrative 7: The humane tank supervisor

In this photograph, the intersection of formal and informal practices comes to life. The tank supervisor, the central figure, sits with his essential tools—a worn register for meticulously recording the timing and destination of each water release, noting which residential society received water and which operator handled the task. His aide, quietly observing, is poised to follow instructions, ensuring the information is logged as required.
But there's another layer to this scene. The supervisor's mobile phone rests in his hand, a gateway for personal requests, complaints, and the occasional angry outburst from residents. It's a tool of a different kind—one that channels the informal, human side of his role.
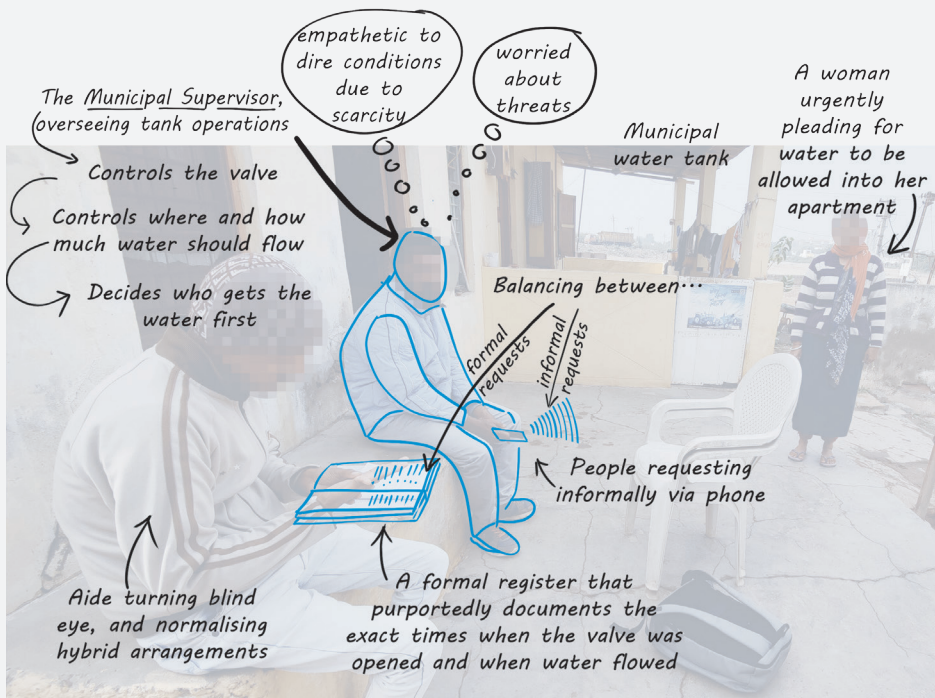
As I capture this moment, a female resident enters the frame, her expression
a mix of urgency and hope. She steps forward, making a personal plea: her
neighborhood's water supply has run out, and she's asking for help. The supervisor
listens, then turns to his aide for confirmation—when was the last time water was
sent to her area? After a brief check, he agrees to her request.
In this quiet exchange, the rigid schedule of water distribution bends. It's not the
official process that guides his decision, but rather the immediacy of her need,
perhaps tinged with the weight of her words. It's a subtle defiance of procedure,
driven by a subconscious pull—maybe altruism, maybe the pressure of her plea.
This scene is just one glimpse into the broader narrative of how informal
governance intertwines with formal systems in cities like Bhuj and Bhopal.
The upcoming chapter will explore these dynamics further, examining how
such practices have shaped, challenged, and, to an extent, contributed to the
transformative repair of governance arrangements towards sensitivity.

Abstract

Addressing water challenges in resource-constrained 'Southern' cities requires 'reparation', a transformative governance approach rooted in restorative justice. In India, formal governance often struggles to tackle social stratification and colonial legacies effectively, sometimes even reinforcing them. This study compares how informality can foster reparative transformation towards the Water Sensitive City (WSC) approach, further referred to as 'water sensitivity' in secondary cities like Bhuj and Bhopal. Our findings reveal that informal strategies foster consolidative and jugaadu (innovation within constraints) capacities, which help reveal the multifaceted nature of water problems, dismantle hierarchical power structures, promote care, and enable the improvisations crucial for reparation. However, informality also risks perpetuating existing inequalities and may overlook long-term environmental sustainability without a clear normative focus on reparation. To address this, combining informal approaches within formal regulatory frameworks mitigates the instability and lack of sustainability inherent in informality. While informal strategies provide flexibility and innovation, formal frameworks offer the necessary stability, legitimacy, and continuity, ensuring the embedding of reparative efforts in the socio-cultural fabric. In conclusion, informality is critical to reparative efforts as it facilitates the incorporation of transdisciplinary perspectives from non-experts and sustains necessary improvisations through fostering a sense of care, ultimately advancing water-sensitive governance.

Keywords
cities; Global South; governance capacities; informality; reparative transformation; water sensitive city (WSC)

Status
This paper is accepted by the *Water Policy* journal.

Fit with overall thesis
This paper fits within the broader thesis by presenting a comparative analysis of reparative urban water governance capacities in the secondary Indian cities of Bhuj and Bhopal. It directly addresses Sub RQ 2: How are capacities for reparative urban water governance mobilised through informality in secondary Indian cities? Through a comparative methodology, this study highlights how informality shapes reparative efforts in both cities, integrating marginalised perspectives and fostering a care-oriented approach to water management. By challenging entrenched technocratic norms and introducing culturally embedded values into governance practices, the paper contributes to the thesis's exploration of how informal mechanisms contest existing power structures and drive more contextually sensitive governance outcomes. The insights gained from this comparison underscore the role of informality in enabling reparation in resource-constrained urban settings.

5.1. Introduction

Cities in the Global South are increasingly adopting the Water Sensitive City (WSC) approach to address the escalating challenges of providing reliable, safe, and equitable water services (Mguni et al., 2022). These challenges are exacerbated by climate change, deteriorating infrastructure, and rapid urbanisation, which significantly strain efforts to protect ecological resources and serve marginalised communities (Bichai & Flamini, 2017). These issues are particularly pronounced in secondary cities, where infrastructure development often lags behind population growth (Marais & Cloete, 2017). In response, existing water management models, rooted in the 'modern infrastructure ideal,' tend to prioritise filling these infrastructural gaps (Bichai & Flamini, 2017). However, these technocratic and standardised solutions often remain disconnected from local ecological needs, overlook systemic issues, and fail to address deeply rooted social inequalities that influence access to water resources (Kaika, 2004).

In contrast, water sensitivity envisions a future where water resilience becomes a catalyst for societal transformation, advocating for decentralised, integrated approaches that not only meet technical needs but also require and promote social change (Bichai & Flamini, 2017). These approaches engage with the socio-political and historical injustices of the colonial past, demanding more democratic and inclusive governance (Mguni et al., 2022). However, transforming towards water sensitivity, especially in resource-constrained and socially complex settings like Indian cities, requires governance approaches that address infrastructural, cultural, and institutional shifts. This should emphasise a pragmatic approach to adapting to resource and social limitations rather than introducing entirely new structures and values that could become cumbersome and potentially cause more harm (Giordano & Shah, 2014).

Reparative governance, as we define it in this context, is a form of transformative governance crucial for addressing the socio-political inequities and historical injustices entrenched in colonial legacies that persist not only in imported infrastructures but also in institutions, perpetuating social and ecological problems that conventional approaches often overlook. By intertwining transformation with restorative justice, reparative governance actively works to rectify longstanding injustices, ensuring that the benefits of transformation are equitably distributed and sustainable across generations (Broto et al., 2021). Without such an approach, efforts to implement water-sensitive management risk falling into the trap of superficial changes—often termed greenwashing—where the root socio-political issues remain unaddressed, or even exacerbated, by reinforcing the status quo with new, exclusionary value systems (Kaika, 2004). By focusing on incremental, context-sensitive change, reparative governance aims to address the historical and socio-political inequities embedded in water governance, thereby repairing the socio-political fabric, and ensuring that the transformation is both just and enduring across generations (Wahby, 2021).

Informality serves as the empirical context within which water governance operates in Indian cities, mainly where formal structures are inadequate or disconnected from local realities

(McFarlane, 2012; Roy, 2009). Recognising how informality functions is essential for understanding how shifts toward reparative governance can be facilitated, enabling transformation in resource-constrained and socially complex settings. In settings characterised by diverse social structures, historical legacies, and cultural norms, we examine water governance in Bhuj and Bhopal to explore how informality functions as an organising logic within deliberately deregulated environments and supports reparative practices. These deregulated contexts demonstrate the strategic withdrawal of regulatory power, shaping how resources are allocated, and authority is exercised, potentially enabling the participation of non-state actors, such as local communities and informal networks (Roy, 2009).

A crucial question in advancing reparative governance is how informality can reconfigure power dynamics to enable historically marginalised groups to gain a voice in decision-making, and how this approach can promote equitable resource distribution through continuous negotiation and bargaining with rigid governance structures. Unlike traditional governance, which often relies on rigid, technocratic methods, informality fosters co-production through 'hybrid' systems that blend formal and informal practices, making governance more 'fluid' and responsive to local needs (Ahlers et al., 2014; Wahby, 2021). However, informality is not always equitable or just—it can provide adaptive solutions where formal systems fall short, but it also risks entrenching patronage, reinforcing pre-existing hierarchies, or creating new exclusions (Funder & Marani, 2015). While we acknowledge these potential pitfalls, our focus is on examining how informality's qualities can be leveraged in secondary Indian cities like Bhuj and Bhopal to balance adaptability and equity while critically engaging with the risks it poses in shaping governance outcomes. Although, the previous studies have highlighted the transformative potential of informality, less attention has been given to understanding how actors' agency within informal governance arrangements mobilises resources, facilitate participation in decision-making, and drive knowledge production and dissemination to achieve reparation. To address this gap, we assess these dynamics through the lens of governance capacity, extending the work of Hölscher, Frantzeskaki, et al. (2019) to study how informal practices are enacted—examining how and by whom informality is driven, the conditions it creates for organisation, innovation, and flexibility, and whether these conditions enable reparative outcomes by addressing socio-political inequities and historical injustices This agency-focused perspective also allows for exploring the conscious and subconscious motivations behind informal actions, enabling an assessment of whether the intentionality driving these practices aligns with the objectives of reparation. In addition to examining the underlying motivations and intentions governing actions, an agency-focused approach illuminates how individuals and groups strategically negotiate formal structures to achieve reparative outcomes within the contextual constraints of their environments (Cleaver, 2002). By investigating how informality contributes to the development of consolidative and *jugaadu* capacities, this study offers a comparative analysis of informality's potential to drive reparative governance and achieve water sensitivity in cities like Bhuj and Bhopal.

Comparing Bhuj and Bhopal—two cities facing distinct geographical and climatic challenges—allows us to assess how informality can address persistent water governance challenges to

achieve water sensitivity. Bhuj, grappling with water scarcity and salination, and Bhopal, struggling with unequal access to clean water and contamination, reflect governance structures common in other secondary cities. Despite their differences, our study explores whether hybrid formal-informal governance models can address these challenges, contributing to a broader understanding of the potential for informality in facilitating reparation towards water sensitivity.

The remainder of this paper is structured as follows: we first outline the capacities framework and how informality supports reparation, followed by our methodology. We then apply the framework to illustrate the reparative capacities in Bhopal and Bhuj, concluding with a discussion on how informality has enhanced water sensitivity in these contexts.

5.2. Reparative governance and informality

This section presents our reparative governance capacities framework mobilised by informality, aiming to investigate how informality contributes to reparative efforts towards water sensitivity. We first define *reparative governance* in relation to water sensitivity in Southern cities. The framework helps to describe how capacities are supported by informality to facilitate reparative actions, which entails *consolidation* and *jugaad* (noun form for *jugaadu*) to enable reparation for achieving water sensitivity.

5.2.1. Reparative water governance

Reparation, as a transformative approach, seeks to fundamentally reshape urban water governance systems by addressing the complex, uncertain, and contested dynamics of urban transformations while being mindful of historical injustices that should not be perpetuated (Broto et al., 2021). This approach is particularly relevant in contexts like India, where historical legacies of inequality rooted in colonial exploitation, caste discrimination, and religious divides continue to shape contemporary social and environmental challenges. In practice, reparative water governance aspires to address systemic injustices by acknowledging and including historically marginalised needs and practices by prioritising local and culturally contextual solutions. For instance, it would focus on restoring ecological integrity, creating more equitable access to water resources, and prioritising just and equitable goals in water management. Rather than merely restoring systems to their original state, reparation focuses on fostering a sensibility towards long-term healing and amendment (Bhan, 2019; Broto et al., 2021).

Reparation is especially pertinent in urban water management, particularly in the pursuit of water sensitivity, which requires managing water in an ecologically sustainable and socially equitable manner as described by Bichai & Flamini (2017). Achieving such shifts in approaches often necessitates transformative processes that can be resource-intensive, can weaken accountability, and may exacerbate social divides if not carefully managed (Giordano & Shah, 2014). For instance, initiatives aimed at greening urban areas, such as lakes, might inadvertently lead to gentrification, disproportionately affecting local indigenous populations (H. Kim & Jung, 2019). Moreover, the transplantation of urban green space concepts from developed countries

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to tropical regions in the Global South can prove unsustainable and exacerbate social divisions due to varied enforcement policies regarding access. This underscores the need to integrate sustainability with justice goals, ensuring that efforts do not result in exclusive and unequal outcomes.

Reparation emphasises healing, reconciliation, and mending of relationships, centring restorative justice as a normative foundation while pursuing sustainability goals (Broto et al., 2021). In the context of water sensitivity, it ensures that reparative water governance efforts to actively work to include marginalised voices, bring forth the subaltern frames of water challenges thereby healing the divisions caused by past injustices while drawing on cultural knowledge and local practices to ensure relevance without perpetuating harm. Care, as a critical societal practice, facilitates this process by prioritising empathetic engagement and the sustained inclusion of these voices in decision-making processes, embodying a commitment to reconfiguring the relationships that underpin water governance (Conradi, 2015). Especially in secondary cities in India, where financial constraints, social stratification, and colonial legacies create unique challenges, reparation is crucial in addressing the social inequities that hinder water sensitivity goals.

5.2.2. Capacities framework

Addressing water challenges in the Global South, particularly in India, requires a governance approach that is both adaptable and attuned to local contexts. With its inherent flexibility, informality offers a promising mechanism for advancing reparative efforts in socio-environmentally complex and resource-constrained settings. Reparation requires a governance model capable of navigating through cultural complexities and addressing historical injustices—objectives that formal governance, often constrained by rigid and lengthy bureaucratic frameworks, may struggle to achieve effectively. As Cleaver (2002) notes, formal governance structures tend to rely on technocratic solutions that overlook the socially embedded nature of local practices. Similarly, McFarlane (2012) argues that rigid distinctions between formal and informal governance can worsen inequalities, as formal systems are often inadequate for meeting the evolving and context-specific needs of resource-constrained urban environments.

However, while informality offers adaptability, it also carries risks, such as the potential to perpetuate inequalities or be co-opted by powerful actors if not carefully managed (Funder & Marani, 2015). The effectiveness of informality frequently depends on its integration with formal structures, which provide the necessary legitimacy and accountability. Scholars advocate for a hybrid governance approach, wherein informal networks operate as 'tentacles' that support and complement formal processes (Ahlers et al., 2014; Wahby, 2021). This hybrid governance model proves particularly effective in contexts where formal governance alone is insufficient to address local complexities. Ananya Roy (2009) conceptualises this strategic blending of formal and informal governance as 'calculated informality,' occurring in deregulated environments, where regulations are selectively and temporarily withdrawn. Given these dynamics, exploring how informality can genuinely support reparative efforts in India's resource-constrained secondary

cities is crucial, as it could highlight governance capacities for sensitive water management, address historical injustices, and promote long-term social healing.

We identify two key governance capacities—consolidative and *jugaadu*—as essential for enabling reparative governance, particularly in the context of informality. This framework, drawing inspiration from the transformative urban climate governance model developed by Hölscher, Frantzeskaki, et al. (2019), promises to address the specific challenges of reparative urban water governance. The governance capacity framework offers a critical lens to understand agency - how informality is enacted, the conditions it fosters, and the extent to which these conditions facilitate reparative outcomes. By analysing governance through this capacity-focused perspective, we gain insight into the mechanisms that underpin informal practices, including the ability to organise, innovate, and remain flexible.

This approach highlights how informal actors strategically navigate within formal constraints to achieve reparative outcomes, aligning their practices with broader goals of social justice and environmental sustainability. The governance practices aimed at reparation seek to amend or heal urban water systems by proposing new conditions for collaborative, democratic, and locally led solutions in resource-constrained environments. Moreover, the governance capacity framework allows us to explore the actors' agency in informal governance, revealing both conscious and subconscious motivations behind their actions (Cleaver, 2002).

By focusing on consolidative and *jugaadu* capacities, our framework connects informal actors' activities with emerging governance arrangements, offering insights into how informality can be harnessed to achieve reparative outcomes and enhance water sensitivity in resource-constrained contexts.

A. *Consolidative capacity*

Consolidative capacity manifests in the ability of actors to strengthen or develop conditions for the self-organisation of varied types of actors. This is especially notable when victims of past injustices organise with decision-makers working on long-term future goals within complex cultural and social contexts, aiming towards healing through informal governance structures and process. Consolidation hinges on merging separate entities into a cohesive whole while preserving their unique identities and balancing individual and collective roles. Building on Hölscher et al.'s (2019) concept of orchestrating capacity, Gautam Bhan (2019) further nuance consolidation, emphasising self-organisation in Southern contexts within available means and highlighting a capacity that transcends mere coordination, focusing on healing rather than just task completion. Incorporating the attribute of healing into reparation encourages sustained follow-up, holistic thinking, inclusion of marginalised voices, and the ability to understand viewpoints that have been dismissed earlier. This entails materialising restorative justice through informality.

Enhancing consolidative capacity necessitates veering directionality – aligning individualistic actions with overarching goals within institutional constraints (Dahlmann & Stubbs, 2023). Veering directionality fosters a collective sense of care and responsibility, enhancing information sharing, intrinsic motivation, and a shared sense of duty, thus cultivating a commitment that surpasses mere incentivisation and fosters emotional and intellectual collaboration (Conradi, 2015). However, in contexts marked by distrust towards authority, efforts may be perceived as individual tasks rather than part of a purposefully driven collective mission without trust rebuilding. To mend relationships and foster consolidative capacity, transparent communication, role and intent clarification, the establishment of accessible (not necessarily formal) platforms, and showcasing the rationale behind governmental efforts are crucial (Leahy & Anderson, 2008). Establishing a middle ground through pragmatic mediation creates essential frameworks, elucidating trade-offs, reinterpreting local norms, and addressing translation challenges among diverse actors. This strategy, leveraging strategically positioned brokers between communities and authorities with systemic awareness and inter-scalar connectivity, becomes vital for facilitating agreements in contexts where policies are disconnected or socially contentious (Funder & Marani, 2015).

B.   *Jugaadu capacity*

Building upon transformative and unlocking capacities as articulated by Hölscher, Frantzeskaki, et al. (2019), *jugaadu* capacity is further nuanced through the incorporation of frugality and local logic, epitomised by the term *jugaad*, loosely translating to 'innovative fix within constraints' in Hindi language. This capacity is characterised by the ability to improvise through frugal, contextually viable methodologies, ideologies, and organisational structures aiming at improvisations while dismantling colonial legacies to foster inclusivity and alternative approaches essential for addressing water challenges. While the cost-effectiveness may raise questions about the novelty of the innovation, its essence lies in prioritising timely adaptation and repurposing existing knowledge and worldviews as a conduit for reparation. Furthermore, *jugaadu* capacity encourages a flexible and adaptive approach to governance, integrating local knowledge and practices to address historical injustices, fostering long-term healing and sustainability in water management practices.

Jugaadu capacity is further evident in efforts to pluralise knowledge by challenging entrenched disciplinary, geographic, institutional, and epistemological hegemonies. It promotes engagement with diverse knowledge forms, including marginalised ones, and scrutinises their synergies and trade-offs to establish channels for transdisciplinary exchanges (Yates et al., 2017). Frugality characterises this capacity as it is manifested through efforts to create a safe space for deliberation, prioritisation, and identification of opportunities. This fosters persistent optimism and courage to face uncertainties and fear of failure while reducing reliance on external justification and using constraints as resources for reparation (Funder & Marani, 2015). Moreover, *jugaadu* capacity embeds improvisations within the socio-political fabric by leveraging organic arrangements and trial-and-error methodologies aimed at continuous adaptation -resulting in a sense of ownership towards the processes rather than just focusing on the outputs themselves.

This involves a cultural practice of collaborative decision-making, which helps to break the rigidity of unsustainable practices while critically assessing and resisting top-down approaches and creating space for more contextual approaches (Cleaver, 2002; Funder & Marani, 2015).

Governance capacity to enable repair	Dimensions	Contribution of informality
Consolidative capacity	Veering directionality	Fostering a collective sense of care and responsibility enhancing information sharing, intrinsic motivation, and a shared sense of duty, thus cultivating a commitment to align individualistic actions with overarching goals within institutional constraints.
	Rebuilding trust	Utilising transparent communication and role clarification to mend relationships, rebuilding trust towards government authorities, and nurturing a sense of community.
	Establishing Middle ground	Leveraging community-accepted brokers and creating space and frameworks to elucidate trade-offs. Interpreting local norms and addressing translation challenges for facilitating agreements (not necessarily formal) in contentious settings.
Jugaadu capacity	Pluralising knowledge	Challenging entrenched disciplinary, geographic, institutional, and epistemological hegemonies. Foster improvisation by scrutinising their synergies trade-offs to establish channels for transdisciplinary exchanges
	Creating space to identify opportunities	Fostering environments for deliberation and dissent, supporting creative problem-solving, and encouraging continuous improvement.
	Embedding	Integrating improvisations within the social and political landscape through trial-and-error and organic adaptation.

Table 6: Conceptual framework on governance capacities to enable repair

5.3. Methodology

In this section, we first introduce the water challenges and water governance in Bhuj and Bhopal. We then outline the how data was collected, and comparative analysis was conducted.

5.3.2. Water challenges and water governance in Bhuj and Bhopal

The selection of Bhuj and Bhopal as case studies allows for an in-depth examination of the role of informality in diverse physiographic settings—arid and tropical hinterlands—while highlighting the common governance challenges faced by secondary cities in India, thereby offering insights into broader patterns of informal governance.

Bhuj, a semi-arid secondary city on India's border with Pakistan, has experienced rapid population growth, nearly doubling to 188,236 by 2011, strained existing infrastructure (van der Meulen et al., 2023). Traditionally, Bhuj managed its water needs through local practices due to its unique hydrogeology. However, population growth necessitated the expansion of piped networks connected to the Narmada Canal, exacerbating issues of over-extraction and aquifer

salinity ingress (van der Meulen et al., 2023). Despite facing frequent natural disasters and limited national support, residents have demonstrated resilience by independently organising resources, including efforts to revive aquifers (Bajpai & Kothari, 2020). However, contradictory approaches by the government aiming to increase water supply from external sources underscore the complexities of governance.

In contrast, Bhopal, a significantly larger city than Bhuj and the capital of Madhya Pradesh state, is home to over 2.4 million people and boasts 18 significant water reservoirs (CAG India, 2021). While the Upper Lake provides about 25% of the city's water supply, rapid urban expansion has led to water scarcity (Everard et al., 2020). Authorities have addressed rising water demand by sourcing water from distant locations, yet the city grapples with flooding risks and grave water quality issues exacerbated by contamination from the Union Carbide pesticide plant leak (CAG India, 2021; Everard et al., 2020). Despite these challenges, there is a perceived water sufficiency in Bhopal, reflecting a lack of academic focus and public awareness of its water challenges, thereby impacting urban water policy and governance (Everard et al., 2020).

The water governance landscape in both cities mirrors the complexity of their physiographical challenges. In Bhuj, the Bhuj Nagar Palika (Municipal Council) primarily oversees water supply operations but lacks autonomy, adhering to directives from the state capital, Gandhinagar, thus perpetuating a centralised governance model (Bajpai & Kothari, 2020). Even the elected councillors prioritise party agendas over representing local people's issues, showcasing top-down decision-making (Bajpai & Kothari, 2020). Similarly, in Bhopal, despite transitioning water supply management to the Bhopal Nagar Nigam (Municipal Corporation), influence from the state's Public Health Engineering Department (PHED) complicates governance efforts, highlighting centralisation issues and limited delegation of significant responsibilities (CAG India, 2021).

Amid escalating water challenges and rigid top-down governance structures, hybrid informal water governance has emerged, fostering innovative approaches to address these issues. In Bhuj, despite formal governance, civil society organisations (CSOs) like Homes in the City (HIC) have strengthened local governance and community engagement alongside government initiatives (Bajpai & Kothari, 2020). Citizen-led efforts, operating outside formal frameworks yet widely accepted, have driven rainwater harvesting, groundwater recharge, and lake rejuvenation with tacit municipal support. Similarly, in Bhopal, NGOs have made sporadic efforts to improve water access and address contamination issues. While water supply-focused NGOs collaborate with local governments, those addressing water quality issues are marginalised and overlooked in formal policy documents like the Bhopal Master Plan and Smart City proposal, leading to a lack of recognition for the importance of water quality. Consequently, informal efforts have emerged to fill this gap and address these critical issues, highlighting growing conflicts among governance actors

The intended governance model to empower municipalities through decentralisation has frequently fallen short in practice, revealing systemic issues in water resource governance in

secondary cities. Despite efforts like establishing *Ward Samiti* (Ward Committee) to enhance citizen engagement, results have been limited, highlighting the need for greater financial autonomy and institutional support (Bajpai & Kothari, 2020). As a result, informality has increasingly filled the gaps left by formal governance, making Bhuj and Bhopal compelling case studies for exploring the dynamics of informality within the governance frameworks of secondary cities.

5.3.2. Data collection and comparative analysis

Our research employed a qualitative, comparative case study methodology, incorporating desk research, ethnographic interviews, and observation to investigate how informality informs the governance capacities for repairing water sensitivity. The desk research included analysis of policy documents across various levels (e.g., Master Plan, Smart City proposal, National Water Policy 2012, Bhopal-Blue Green Master Plan). This literature on formal policy documents provided an understanding of the prescribed governance in the cities.

Field research in 2021 and 2022 utilised multi-sited ethnographic methods, combining 64 semi-structured interviews (32 in Bhopal and 32 in Bhuj) (detailed in Table 2) characterised by detailed descriptions and 10 observational notes. We enriched this robust dataset through cross-interview triangulation, observational insights, and photographic narratives. Interviews spanned a broad spectrum of stakeholders, encompassing state and non-state actors in various capacities within the city's water management ecosystem. This included national and state government officials, municipal officers of varying seniorities, NGO representatives, private sector actors such as real estate agents and urban planning consultants, and academicians, providing a comprehensive view across scales of engagement and decision-making processes.

	Interviewees, according to sector	Interview period
Bhopal interviews – 32 **Observation notes - 7**	Local City Government – 8 (Engineers from different seniority – Commissioner to Supervisor)	09 – 12/ 2021 02-2022 06 - 2022
	National And State Government - 3	
	NGOs and CSOs - 7	
	Residents – 5	
	Educational Institute - 1	
	Private Organisations – 5 (Hotel owner + Planning Consultants + Private water service providers)	
	Politicians - 3	

Table 7: *Detailed list of interviewees*

	Interviewees, according to sector	Interview period
Bhuj interviews – 32 **Observation notes - 3**	Local City Government – 6 (Engineers from different seniority – Water supply, storm water)	12-2021 to 1-2022
	National And State Government - 3	
	NGOs and CSOs - 7	
	Residents - 5	
	Educational Institute - 1	
	Private Organisations - 4 (Developers + Private water service providers)	
	Politicians - 4	

Table 7: *Detailed list of interviewees (Continued)*

The interview settings were strategically aligned with the participants' work environments or comfort zones, ranging from conventional office spaces to more unique locations pertinent to their duties, including underwater tanks or other city locales. This approach, including adjustments for pandemic-related constraints with some online interviews, was designed to foster an atmosphere conducive to open, reflective dialogue, enabling participants to speak candidly about their roles and the realities of water management governance.

Our ethnographic methodology was underpinned by the intent to facilitate in-depth, open-ended discussions, allowing for a thorough exploration of cultural practices, beliefs, and experiences from the participants' perspectives. This was augmented by visual methods, notably photographic documentation, to capture and analyse forms of informality in governance practices. Such visual and textual ethnographic data provided a unique lens to examine the undercurrents of informality, including tacit practices, unarticulated meanings, and subconscious motivations within the governance framework.

The interviews began with participants describing their roles and challenges, typically framing water issues in a politically correct, objective manner. Subsequent questions probed deeper, exploring how they addressed these issues and re-defined their mandates and capabilities to overcome challenges. The progression of interviews from initial descriptions of roles and challenges towards more intimate explorations of governance practices and the embodiment of informality was deliberate. This methodological trajectory built trust and peeled back layers of political correctness to reveal the nuanced operations of informality in governance. Through this comparative ethnographic lens, our analysis of Bhuj and Bhopal went beyond cataloguing divergent practices; it critically examined each city's governance strategies, contrasting them against one another.

Employing ATLAS.ti software for coding and analysis, we dissected the activities to decipher informal governance arrangements and their role in shaping consolidative and *jugaadu* capacities in each city. By abductive coding, we iteratively refined themes and concepts, directly informing

the development of a conceptual framework grounded in the empirical realities of the case studies.

5.4. Illustrating role of informality in reparative capacities

This study explores the diverse manifestations of consolidative and *jugaadu* governance capacities in Bhuj and Bhopal, demonstrating how informal practices interact with formal governance structures to address complex water management issues. In both cities, consolidative capacity played a crucial role by enabling community stakeholders to participate and devise ways to mediate trust issues between authorities and citizens within existing financial and cultural means while influencing water governance processes despite scalability and recognition challenges. On the other hand, *jugaadu* capacity emphasised improvising approaches that leveraged local knowledge and actors' system awareness to navigate bureaucratic hurdles and institutionalise water-sensitive practices. The contrasting approaches in Bhuj and Bhopal's efforts to repair water governance and foster water sensitivity are underscored by the development of conditions that enable both consolidative and *jugaadu* capacities.

5.4.1. Consolidative capacity in Bhuj and Bhopal

In the comparative study of Bhuj and Bhopal, consolidative capacity was demonstrated through informal efforts encouraging self-organisation, especially those directly impacted by water issues. These efforts involved extending formal authority to informal platforms facilitating collaborative decision-making with well-known CSOs and community figures. The awareness generated motivated stakeholders to address less-prioritised water issues and participate in discussions within institutional and fiscal constraints. These efforts helped diversify their understanding of the challenges. Efforts were driven by intrinsic motivation, personal networks, past experiences, and a sense of ownership in their respective places. Personal association with the problem, led citizens and government actors to extend their roles to and undertake the roles of mediators to achieve long-term water goals. However, limitations arose due to increased time for governance processes in secondary cities where city government actors still depend on state authorities to validate the on-ground strategies.

In the absence of formal platforms for exercising holistic local governance in Bhuj, consolidative capacity was manifested through efforts by the Urban Setu organisation to lead the development of *Ward Samiti* (Ward Committees) to address water challenges democratically. These ward committees facilitated holistic discussions on local issues involving government authorities, political leaders, and community figures. These efforts have attempted to localise power to the ground, enabling marginalised actors to contribute more actively to governance processes. However, maintaining consistent participation has proven difficult. Similarly, Bhopal's efforts to form *Mohalla Samiti* (Neighbourhood Committee) in marginalised areas have struggled with

authority and effectiveness. Unlike Bhuj's cause-driven initiatives, Bhopal's NGOs often focus on project-based activities[3].

Photograph 9: *In Bhopal, the establishment of Mohalla Samitis lacks authority and effectiveness. Authorities or policy documents did not sufficiently address the protests on water contamination from the Union Carbide plant spillage, forcing victims to turn to independent platforms to voice their concerns.*

Councillors in both cities have played crucial roles as intermediaries between citizens and government authorities. In Bhuj, councillors participate in informal ward level meetings, lending formal authority to these unofficial platforms and enabling credible decision-making[4]. In Bhopal, councillors leverage their official capacities and social media platforms to promote community-oriented actions, supported by Member of Legislative Assembly (MLA) funding for swift project execution. However, they sometimes face pressures to align with party agendas, which can compromise local needs.

The role of informality in acknowledging and organising under-prioritised issues is evident in both cities. In Bhuj, CSOs have prioritised long-term initiatives like aquifer restoration, diverging from the government's[5] short-term focus on installing standalone water tanks as a solution[6] to scarcity. This collective effort has fostered solidarity networks[7], particularly among women's groups, who integrate water management with broader empowerment goals. For instance, the *Kutch Mahila Vikas Sanghathan* (KMVS) in Bhuj has made environmental sustainability central to

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3   Interview: BHO_I_15_CS, 4/10/2021; Interview BHO_I_28_CS, 3/12/2021; Interview: BHO_I_31_CS, 30/6/2022

4   Interview: BHU_I_14_PO, 22/12/2021

5   Interview: BHU_I_24_G, 11/01/2022

6   Interview: BHU_I_13_PO, 22/12/2021; Interview: BHU_I_14_PO, 22/12/2021

7   Interview: BHU_I_11_CS, 21/12/2021; Interview: BHU_I_18_CS, 4/2/2022

their mission, arguing that addressing water issues is essential for improving women's daily lives[8]. A representative from KMVS elucidated the rationale behind integrating these two focal areas[9]:

> *"...at every level, farming requires water, livestock requires water, and all are impacted. So, women understood those things properly, and wherever there were water crises in the villages, women had taken the seat in front of the administrative officers [...] So giving that importance (to water issues), somewhere it came out from the women only. When we are doing it, how to do it, so that our water will be saved, and we have our livelihood also. So, these concepts emerged because of the women only."*

In Bhopal, activists have emphasised the urgency of addressing water contamination issues, striving to elevate these concerns onto the formal policy agenda. This push has been stymied by a lack of shared vision and transformational leadership within the government and a notable reluctance to confront the legacy of water contamination from the Union Carbide plant spillage[10]. Consequently, government initiatives have been sporadic and insufficient, failing to comprehensively address the root causes of water problems[11].

Reflecting on these challenges, it becomes evident that municipal efforts to mitigate water challenges in both cities rely on technocratic solutions, such as installing standalone water tanks. Unfortunately, this approach neglects the underlying issues of water scarcity and pollution, revealing a limited consolidative capacity to tackle the complexities of water management effectively.

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8   Interview: BHU_I_11_CS, 21/12/2021; Interview: BHU_I_17_U, 23/12/2021
9   Interview: BHU_I_11_CS, 21/12/2021
10 Interview: BHO_I_23_CS, 27/11/2021; Interview: BHO_I_24_U, 27/11/2021
11 Interview: BHO_I_02_G, 16/9/2021; Interview: BHO_I_23_CS, 27/11/2021; Interview: BHU_I_13_PO 22/12/2021; Interview: BHU_I_01_CS, 8/12/2021

Photograph 10: *The Bhopal Municipal Corporation has installed standalone water tanks in areas where groundwater contamination has occurred due to the Union Carbide plant spillage. However, this is not a permanent solution, as contamination is increasing, and during s summers, when the tanks are not refilled frequently, residents out of desperation consume the contaminated water for non-drinking purposes*

Photograph 11: *The residents of Bhuj have installed water tanks at every household due to an intermittent water supply. Installing such water tanks causes uneven water consumption, impacting distribution networks and hence is not advisable, this issue is not unknown to government authorities. The municipalities in both cities are aware of such techniques employed by citizens to bridge the system inadequacies.*

In the absence of formal mediation agencies, both Bhuj and Bhopal have relied on informal mediators who use personal connections and expertise to navigate through bureaucratic obstacles and bridge divides between stakeholders. In Bhuj, respected community leaders broker solutions, fostering collaboration and aligning stakeholders with common goals. In Bhopal, senior officials act as generalists, further characterised as - 'senior person[12],' 'people person[13],' or 'trouble-shooter[14]', bridging the gap between community needs and governmental capabilities. Especially when state agency interventions often limit the autonomy of municipalities in secondary cities, necessitating senior officers' authority to implement decisions without constant state approval[15]. Despite these efforts, the informal governance arrangements in both cities have not fully manifested consolidative capacity, hampered by deep-seated distrust towards authorities and the marginalisation of vulnerable communities' voices.

5.4.2. Jugaadu capacity in Bhuj and Bhopal

This analysis investigates how informality supports the manifestation of *jugaadu* capacity in water governance, enabling reparation within the contexts of Bhuj and Bhopal. *Jugaadu* capacity involves pluralising knowledge by including marginalised knowledge frames and mobilising them to devise improvised solutions. Informality disrupted the conventional rigidity of what constitutes knowledge in water management by embracing a broader spectrum of knowledge forms, blending scientific hydrogeological water data with ancient water history. By employing scientists and non-expert residents, CSOs in Bhuj facilitated devising platforms to co-create credible and socially relevant knowledge. Additionally, the role of educational institutions in Bhuj in promoting water-sensitive practices within curricula, supplemented by community-focused activities, underscores the *jugaadu* capacity to make scientific knowledge accessible and culturally resonant, enabling reparation. In contrast, Bhopal, despite its identity as the 'City of Lakes,' remained bound by a technocratic approach led by the Central Irrigation Department, prioritising connections to distant water sources over local self-reliance on its lakes. While its water heritage was acknowledged rhetorically, governance frameworks failed to integrate wisdom on local water use, limiting adaptation and disconnecting Bhopal from the plural knowledge processes. Overall, *jugaadu* capacity in both cities reflected the ability to acknowledge local knowledge that empowered communities to become more autonomous in their water management—thriving in Bhuj through co-production of knowledge but constrained in Bhopal by technocratic dominance.

Informality has aided in pluralising water management knowledge by challenging traditional notions and embracing a broader array of knowledge forms. In Bhuj, integrating scientific research with traditional practices has led to initiatives to revitalise heritage water bodies, guided by modern hydrogeological insights and historic water narratives[16]. CSOs have strengthened

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12 Interview: BHO_I_32_U, 30/06/2022

13 Interview: BHO_I_08_G, 27/09/2021

14 Interview: BHO_I_02_G, 16/09/2021

15 Interview: BHO_I_02_G, 16/09/2021; Interview: BHO_I_08_G, 27/09/2021

16 Interview: BHU_I_03_CS, 11/12/2021

collaboration with local and international academia, creating a collective repository of ancestral wisdom and contemporary scientific data. This blending of knowledge has reinforced local citizens' ties to water heritage and enabled practical, ground-level activities, such as the *'Bhujal Jankar'* (Groundwater Knowers) initiative, which trained citizens to collect water data and document groundwater salinity issues. However, these efforts have seen diminishing engagement over time as volunteers shift towards paid opportunities[17]. Conversely, Bhopal's approach illustrates a limited manifestation of *jugaadu* capacity, primarily relying on technological knowledge as outlined in the Master Plan (2005, Draft 2031), the Climate Action Plan, and the Blue-Green Master Plan. Through the superficial designation of Bhopal as a 'city of lakes,' without a deeper engagement with its integrated lake network ecosystem and its connection to Islamic urban planning and architecture, these plans highlight a missed opportunity to leverage local culture for broader environmental goals, demonstrating constrained *jugaadu* capacity.

The mobilisation of flexible funding sources has been instrumental in Bhuj, encompassing fellowships[18] that empower citizens to steward conservation efforts and funds with non-rigid conditions, allowing their use beyond technological upgrades. This adaptability has facilitated more citizen-led water governance models that respond effectively to local needs and priorities[19]. These fellowships have empowered local communities to overcome traditional governance barriers, facilitating innovative water management solutions that are both sustainable and inclusive. In Bhopal, the involvement of an international NGO through formal partnerships with local NGOs and informal associations with the locals demonstrates how community participation in fundraising activities can increase the sense of ownership towards implementation and uptake. An NGO representative explains[20] -

> *"… (Mohalla Samiti) they used to take the responsibility and then Water Aid used to invest in it. Those kinds of systems started and how community also when we invested 5 lakhs, then 50,000 used to be the share of community […] and they used to collect the money. […] The Mohalla Samiti used to collect the money from the community, and that used to become part of the whole capital budget."*

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17   Interview: BHU_I_15_U, 23/12/2021; Interview: BHU_I_32_CS, 13/01/2022
18   Interview: BHU_I_09_CS, 20/12/2021; Interview: BHU_I_17_U, 23/12/2021
19   Interview: BHU_I_09_CS, 20/12/2021
20   Interview: BHO_I_30_CS, 18/02/2022

Photograph 12: *Rainwater harvesting tank doubling up as a performance stage in a school*

Photograph 13: *Citizens participating in water walks to enhance their awareness of their city's water heritage.*

However, sustaining these efforts over time has proven difficult, as declining volunteer participation reveals broader issues of motivation, engagement, and continuity.

Educational institutions in Bhuj have become vital in promoting water-sensitive practices, extending their role beyond traditional education. Initiatives like installing a rainwater harvesting (RWH) tank and educational programs outside of regular school hours have actively engaged students in environmental challenges[21]. These innovative first-hand experiences are enhanced

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21   Interview: BHU_I_07_U, 16/12/2021

by community activities, including water walks[22] and publishing updates on initiatives in local newsletters, which make water management practices more accessible and understandable to the public. This involvement reflects the flexibility of *jugaadu* capacity to innovate and integrate educational initiatives with broader environmental goals[23]. Furthermore, both cities showcased informal partnerships between developers and authorities encouraging the inclusion of rainwater harvesting systems in new buildings[24]. The mid-level government officers played a crucial role by informally advising citizens and developers on the proper implementation of these systems, ensuring they meet regulatory standards and contribute effectively to groundwater recharging. This involvement is key to promoting and ensuring the quality of water-sensitive practices in both cities.

Nevertheless, the path towards fully realising *jugaadu* capacity is fraught with obstacles in both cities, where bureaucratic complexities and the perceived financial burdens of transformation are formidable barriers. The administrative maze, characterised by extensive paperwork and the daunting task of persuading stakeholders, poses a significant challenge in implementing innovations[25]. While Bhuj has showcased the potential of *jugaadu* capacity through the collective efforts of a consortium of CSOs, these groups must remain open to incorporating new actors. This openness is essential in preventing the emergence of new exclusivities and ensuring a continually evolving, reparative approach to water management.

5.5. Discussion

This study examines how consolidative and *jugaadu* capacities contribute to reparative governance within secondary Indian cities such as Bhuj and Bhopal, focusing on water sensitivity objectives. Unlike primary cities with established water infrastructure and governance frameworks, secondary cities often face fragmented water management, pressing water demands, and limited institutional capacities, making standardized technocratic approaches less effective. In our analysis, we explore how informality plays a role in advancing reparative governance by leveraging these governance capacities. The findings illustrated whether and how hybrid formal-informal governance structures utilise consolidative and *jugaadu* capacities to support reparation efforts. However, many initiatives have not fully achieved their intended outcomes, prompting further examination of the hybrid governance mechanisms.

Our research highlights that informality shapes reparation efforts in Bhuj and Bhopal by attempting to incorporate marginalised issues, fostering a care-oriented approach to water management. This suggests that care, as a transformative societal practice, plays a crucial role in reparation by promoting mutual interdependence and attentiveness to marginalised

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22 Observation: BHU_O_01_CS, 19/12/2021
23 Observation: BHU_O_02_CS, 16/12/2021
24 Interview: BHU_I_19_G, 05/01/2022; Interview: BHU_I_21_PR, 06/01/2022; Interview: BHO_I_21_G, 23/11/2021; Interview: BHO_I_26_PR, 29/11/2021
25 Interview: BHU_I_10_U, 16/12/2021

voices. As a result, this approach begins to challenge conventional governance hierarchies, integrating local knowledge and relational dynamics into governance processes, leading to more contextually relevant solutions, as articulated by Conradi (2015). The shift towards more care-oriented governance challenges entrenched bureaucratic norms, allowing culturally embedded values to inform governance practices. Consequently, reparative efforts are characterised by improvisation, with informal mechanisms gradually contesting existing power structures to ensure diverse voices influence and shape more inclusive, contextually sensitive governance outcomes in these cities.

We expand on the following insights derived from the study:

Insight #1 - Recognition of the multifaceted nature of water challenges
Drawing on critiques of marginalisation embedded in urban climate responses (Broto et al., 2021) our study highlights how informality integrates varied knowledge types to address complex water challenges. The non-governmental platforms, often led by NGOs, merge hydrogeological science with historical and experiential knowledge, broadening the understanding of water governance across communities. These platforms critique the formal system's reliance on technocratic data and instead employ knowledge brokers to combine scientific insights with historical narratives, addressing both historical injustices and future water challenges.

In Bhuj, knowledge brokers connect personal stories with hydrological data, enhancing community understanding of how local landmarks relate to water issues. Similarly, in Bhopal, informal actors linked water quality insights with urban planning policies and human rights. However, despite broadening understanding, informal efforts faced challenges in gaining formal recognition, essential for sustaining their influence and integrating them into governance frameworks.

The literature indicates that informal knowledge and practices typically remain peripheral unless embedded within formal structures (Ahlers et al., 2014). In Bhuj, for instance, despite increased awareness, the multifaceted meanings of water practices are yet to be acknowledged in official policies, limiting their scalability and legitimacy. Embedding these practices within formal governance would challenge prevailing biases against non-traditional methods and ensure that diverse, integrative approaches to water governance are recognised.

Insight #2: Challenging power structures and localising decision making
The study revealed that informality has brought decision-making closer to communities through platforms such as *Mohalla* and *Ward Samiti* (neighbourhood and ward committees). In contexts where formal mediation mandates are weak or poorly enforced, councillors, NGOs (such as KMVS in Bhuj), policymakers, and community leaders played crucial roles in facilitating dialogue and decision-making, fostering greater grassroots democracy. Drawing on Ahlers et al. (2014), informality can disaggregate power structures and foster co-production by extending existing roles rather than creating new ones. By involving atypical actors such as women in Bhuj

and senior citizens in Bhopal, decision-making processes have been decentralised, bringing governance closer to those affected by water challenges.

This inclusive approach aligns with the goals of water sensitivity (Bichai and Flamini, 2017; Mguni et al., 2022), integrating sanitation, housing, and gender empowerment into water governance. Unlike traditional integrated approaches, which often advocate for new governance entities like River Basin Organizations (RBOs), this method adapts existing governance structures to facilitate coordination while respecting bureaucratic divides. This adaptation is more feasible for Indian contexts, where creating new governance bodies may not be viable (Giordano and Shah, 2014). The study illustrates how decision-making can be localised by repairing and adapting governance structures to enable holistic water governance.

Insight #3 Creating space and synchronising improvisation
Informal governance has proven adaptable, offering a mechanism to synchronise improvisations. While these often begin as informal practices, their long-term sustainability depends on synchronisation — transforming ad-hoc solutions into structured, repeatable processes within formal governance frameworks. Cleaver (2002) argues the need to carefully synchronise improvisations within social and cultural systems, allowing them to evolve into sustainable, scalable practices integrated into everyday routines.

In the Indian context, where socio-technical landscapes are deeply hierarchical, synchronising improvisation is a costly and culturally sensitive process. Informality thus serves as an incubator for trial, experimentation, and refinement. Informal spaces offer a lower-cost platform to test ideas, gather evidence, and repurpose resources, bypassing formal procedures.

Synchronising these improvisations legitimises them and routinises the effort, embedding them in everyday life (Cleaver, 2002). This process ensures improvisations transition from isolated successes to routine governance practices, shaping culturally relevant and sustainable solutions. For example, in Bhuj, efforts to institutionalise water-sensitive behaviours illustrate this process. In collaboration with research and advocacy organisations, schools developed specialised after-school curricula that bypassed lengthy reforms, demonstrating how informal initiatives can be synchronised into governance frameworks. Similarly, elected representatives informally create participatory spaces by leveraging their political networks, mediating between the state and citizens, and strategically engaging with governance structures to facilitate inclusion—though these spaces remain shaped by entrenched power dynamics (Cornwall & Coelho, 2007). In conclusion, this study underscores the potential of informality in leveraging consolidative and *jugaadu* capacities for reparative governance. However, for these practices to achieve long-term impacts, it is essential to synchronise improvisations, ensuring their sustainability and embedding them into everyday governance structures.

Insight #4: Characterising reparative governance through networks of care

Informality, characterised by networks of care, prioritises community-driven, cooperative approaches over hierarchical systems. This study illustrates how these networks, driven by intrinsic motivation, manifest in activities like water walks, after-hours teaching of water-sensitive behaviour, and mediating conflicts through personal connections. These stewards build trust and streamline decision-making within municipalities, bypassing bureaucratic processes and fostering solidarity, as Conradi (2015) discussed. Even formal municipal officers, often constrained by limited autonomy, mobilise these networks out of care for project well-being, overcoming governance challenges by leveraging personal relationships and applying local knowledge for context-specific solutions.

While informality provides flexibility and agility, it also presents risks. Over-reliance on informal mechanisms can marginalise key challenges and weaken long-term engagement. For instance, inconsistent participation in *Ward Samiti* (Ward Committee) and declining volunteer involvement exposes the vulnerabilities of informality. Additionally, state-led agendas can overshadow community-driven efforts, limiting their impact. In this context, repair offers a guiding framework to address these challenges. As Wahby (2021) suggests, repair fosters more inclusive and equitable outcomes by sustaining participation, engaging diverse actors, and countering political pressures. It helps align informality with the needs of marginalised communities, integrating the city's water identity into more meaningful water sensitive management practices.

5.6. Conclusion

Informality functions as a hybrid governance approach, providing the flexibility to develop and iterate reparative strategies. When the rigidity of formal systems hinders adaptation, the flexibility of informality acts as the necessary grease to address the resistance to change embedded in formal governance structures. It also contextualises governance mechanisms to better align with local needs and conditions. However, for this reparative potential to be fully realised, formality must step in to synchronise and sustain these changes.

Without regulatory support, the reparative gains of informal governance can easily be undermined by political instability. As Kösters, Bichai and Schwartz (2020) note, new governance approaches risk being eroded by political shifts if they are not backed by robust regulatory frameworks. This was evident in Bhopal, where informal governance practices faced challenges due to the lack of institutional reinforcement, and similar risks could threaten Bhuj if efforts to legitimise these practices were not strengthened.

While informality fills critical gaps in governance by introducing much-needed flexibility, it also runs the risk of perpetuating existing power hierarchies unless it is integrated into broader governance structures. To ensure informality contributes to lasting systemic change, it must be synchronised in a way that challenges rather than reinforces power imbalances. Our research

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further prompts a critical inquiry: how can future governance frameworks effectively synchronise informal practices while safeguarding their inclusivity and resilience in the face of political shifts?

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Nurturing transformative spaces: Leveraging informality for transitioning to water sensitive governance in Indian cities

Photo Narrative 8: The knowledge broker

In water governance, all actors are not always drawn from technical backgrounds like water engineering. For example, Mr. Vyas (name changed) is a chemist whose shop occupies a central spot in the local market, granting him significant status within the community. His role as a trusted medicine man, viewed just below a doctor, has elevated his social standing, leading to his election as a local representative. This position not only benefits the local government but also leverages his reputation as an educated and respected figure. Mr. Vyas effectively bridges the gap between complex municipal issues and the general public by communicating policies in accessible terms. His dual capacity to represent community concerns to the government and be taken seriously by officials makes him an ideal knowledge broker in the context of water governance.

Balancing two formal roles, informally
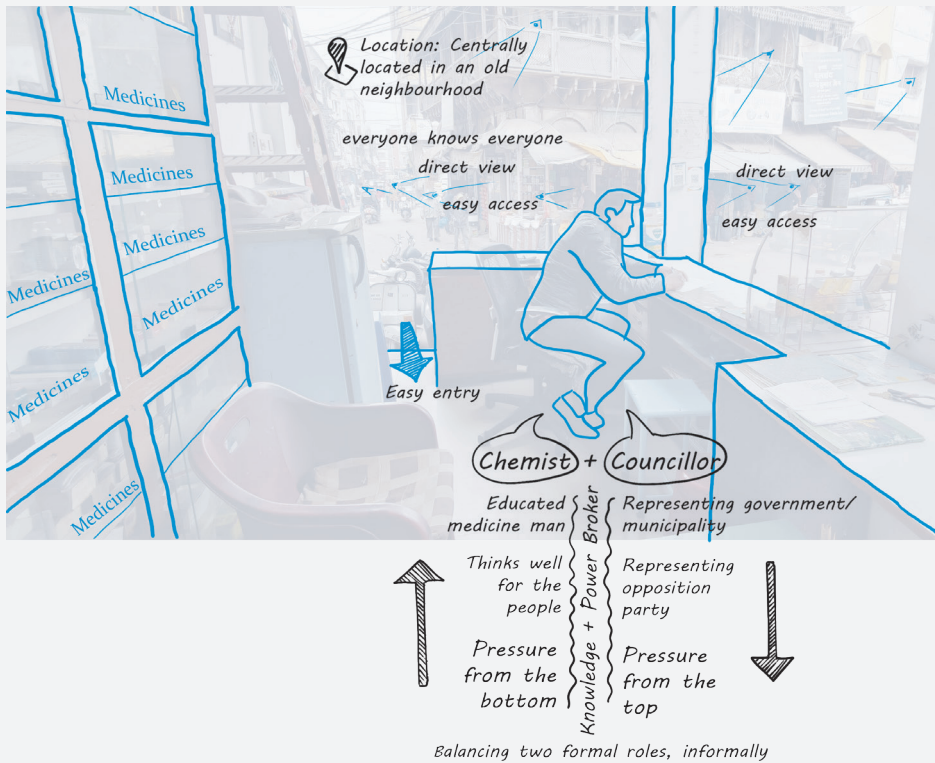
However, despite his crucial role, the participatory platforms in water governance often become exclusionary due to the dominance of technocratic jargon and hierarchical structures, which can marginalise non-technical actors like him. These barriers prevent knowledge brokers from fully engaging with engineers and other technical experts, limiting their contributions. The following chapter will discuss how creating transformative spaces incorporating informal networks can empower knowledge brokers like Mr. Vyas. By fostering environments that value diverse forms of knowledge, these spaces can enhance the participation of such brokers in urban water governance, ensuring that their valuable perspectives are not overlooked but integrated into the decision-making process.

Abstract

This paper introduces a novel approach to designing and applying transformative spaces that leverage informality—characterised by flexibility, adaptability, and creativity—along with culturally situated collaboration to promote water sensitive governance in Indian cities. These transformative spaces provide 'safe-enough' environments where diverse actors engage in experimentation, dialogue, and co-creation to address the challenges posed by India's technocratic and hierarchical water governance systems. While established methodologies like Transition Management (TM) utilise structured transition arenas, we adapt these into a broader concept of transformative spaces, tailored specifically to India's collaborative governance context. Informality, a prominent mode of governance in India, is harnessed in this framework through three core principles: cultivating confidence to challenge regressive power structures, fostering frugality and creativity, and instilling faith in the transformative spaces. These spaces are critical for navigating the complexities of hierarchical governance and enabling more inclusive, pluralistic approaches. This paper explores how transformative spaces, shaped by informality, enable actors to confront entrenched hierarchies and foster meaningful engagement towards water sensitive governance, particularly within contexts characterised by power asymmetries and technocratic dominance in Bhopal and Bhuj. Ultimately, these spaces help to advance water sensitive governance by creatively framing solutions that move beyond technocratic models and empower local actors.

Keywords
transformative Spaces, informality, water governance, water sensitive cities, Global South, workshops

Status
This paper is under review in the *Action Research* journal.

Fit with overall thesis
In this chapter, I respond to the sub-research question: *What methods facilitate the identification and nurturing of governance capacities to enable reparation?* This inquiry also advances methodological innovation within my research. While Chapter 3 introduced a visual methodology to identify governance capacities in urban settings, this chapter shifts focus to transformative spaces as a means of nurturing these capacities. I develop a framework, informed by informality, which situates transformative spaces within India's collaborative cultural context, fostering pathways for reparation and addressing entrenched governance challenges.

6.1. Introduction

This paper introduces a novel approach to designing and applying transformative spaces to address water governance challenges in Indian cities and achieve water sensitivity goals. Water sensitivity envisions a future where water resilience catalyses broader societal transformation, advocating for decentralised, integrated approaches that meet technical needs and promote social change (Bichai & Flamini, 2017). Achieving these goals requires collaborative environments that foster transformative approaches, ensuring discussions are grounded in local collaborative logic. Such spaces should facilitate meaningful engagement that enables genuine transformation. By grounding transformative spaces in informality, their inherent flexibility, adaptability, and creativity create environments where diverse actors can experiment, engage in dialogue, and co-create solutions to complex urban water governance issues.

In India, water governance is dominated by technocratic approaches that prioritise engineering solutions, concentrating decision-making power among technocrats (Mollinga, 2008). This focus on infrastructure marginalises non-technical perspectives, side-lining socio-political and ecological dimensions of water management (Hartley & Kuecker, 2021; Zwarteveen, 2017). Entrenched power hierarchies based on gender, seniority, and institutional authority further exclude local actors and alternative viewpoints (Kumar, 2018; Mollinga, 2008; Rijke et al., 2013). As a result, governance processes fail to embrace pluralistic approaches that could address India's complex water challenges more effectively, reinforcing existing power structures and limiting opportunities for inclusive dialogue and innovation.

Current participatory spaces often fail to support meaningful discussions on governance challenges due to the risks of exposing institutional weaknesses, which hampers transformation (Prasad et al., 2023). Actors are hesitant to engage openly, fearing that raising these issues may be seen as a threat to authority (Pereira et al., 2015). Consequently, these spaces tend to reinforce the status quo rather than challenge power structures. Overcoming this requires the creation of 'safe enough' spaces where open dialogue can occur without fear (Pereira et al., 2015). Leveraging informality in these spaces—by mobilising tacit knowledge, personal relationships, and non-standard procedures—can reduce actors' hesitancy in addressing governance challenges (Haapala et al., 2016). Without such approaches, technocratic dominance persists, obstructing progress toward a water-sensitive future. Therefore, adaptive, and inclusive methodologies, such as transformative spaces, are essential to normalise governance discussions and address India's complex water challenges.

Transformative spaces aim to introduce a paradigm shift by broadening participation, normalising discussion on governance challenges, and disrupting entrenched hegemonies through their flexible capacity to address power imbalances while functioning within resource constraints and including non-technical perspectives (Pereira et al., 2015, 2020). Managing transformations effectively requires systemic changes in thinking, management practices, and resource allocation (Westley et al., 2013). Transformative spaces create opportunities for sustained dialogue and

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reflection, facilitating these changes through participatory approaches and encouraging close interaction with key actors (Pereira et al., 2015, 2020). By recognising the role of human agency in governance and actively seeking perspectives that challenge dominant narratives, transformative spaces nurture the capacities needed to adapt roles and develop innovative, effective solutions for transformation (Pereira et al., 2015, 2020).

Parallelly, existing methodologies like TM offer structured processes to tackle governance challenges by empowering diverse stakeholders and enabling long-term sustainability transitions (Frantzeskaki et al., 2019; Loorbach et al., 2017). TM's five-step process—system analysis, problem structuring and envisioning, pathways development, experimentation, and monitoring—relies on transition arenas, which serve as incubators of change (Nevens et al., 2013; Roorda et al., 2014). These arenas are typically led by local frontrunners who spearhead innovative solutions and strategic transitions. However, research suggests that TM's structured approach often struggles to engage deeply with power imbalances and hierarchies in Southern cities, thus overlooking informal governance structures and, ironically, reinforcing technocratic solutions (Nastar & Ramasar, 2012). In response, this paper adapts TM's transition arenas into a more flexible framework of transformative spaces, better suited to India's complex collaborative logic.

Rooting transformative spaces through informality holds particular promise. Informality, with its inherent flexibility, relational capacity, and adaptability, allows transformative spaces to resonate with local practices (Haapala et al., 2016; Rijke et al., 2013; Wahby, 2021). This adaptability provides the foundation to embed transformative spaces within India's socio-political landscape. Moreover, by interacting with formal structures, informality enables a hybrid governance model that allows actors to participate more flexibly and responsively (Ahlers et al., 2014; Wahby, 2021). Importantly, informality's ability to navigate hierarchical power dynamics creates the relational flexibility needed to challenge entrenched structures without directly threatening institutional authority (Jaglin, 2014; Jayaweera et al., 2023). This study examines how the design of transformative spaces can harness informality's characteristics—such as personal networks and creativity—to adapt the transformation process towards water sensitivity in India.

We apply the framework of the transformative space in Bhopal and Bhuj through workshops focused on water sensitivity goals. In these contexts, entrenched hierarchies prioritising technocratic methods hinder the shift towards water sensitivity by obstructing decentralisation and integration. While these spaces aim to nurture governance capacities, reform urban water governance, and promote water sensitivity, this paper focuses on how informality can shape their development. By offering actors space for introspection, these spaces seek to 'nurture' transformative capacities rather than 'building' externally.

The following sections outline the development of transformative spaces rooted in informality. Section 2 explores how informality shapes these spaces, Section 3 describes their application through workshops, and Section 4 analyses their adaptation to Indian collaborative logic.

Finally, Section 5 considers how this approach addresses technocratic hegemony by fostering transformative collaborative governance anchored in informality.

6.2. Leveraging informality to shape transformative spaces

In our research, the transformative spaces adapt the structured approach of *transition arenas* while situating it within the Global South context by leveraging *informality. Transition arenas*, a vital tool in TM, facilitate long-term societal transformations through structured participation. It operates through phases such as problem structuring, envisioning, backcasting transition pathways, experimenting, and monitoring, facilitated by a diverse 'transition team' (Nevens et al., 2013). In this paper, we focus on the backcasting of transition pathways. Earlier stages provided valuable time and insight to reflect on and rethink the methodology, adapting it to India's unique governance context. Transition pathways are co-created as comprehensive roadmaps integrating various policy domains and strategies (Frantzeskaki et al., 2019). While TM is effective in stable, well-resourced settings, it struggles to address the socio-political complexities and power imbalances prevalent in the Global South (Noboa et al., 2019).

In contexts like India, where hierarchical governance and significant power asymmetries dominate, TM can unintentionally perpetuate these imbalances. Originating in the Global North, its structure does not align with the informal governance practices (Noboa et al., 2019). Although TM has sought to incorporate informal governance through 'shadow processes' (Loorbach et al., 2015), these efforts remain insufficient to capture the nuanced power dynamics (Nastar & Ramasar, 2012). Consequently, TM risks becoming overly technocratic, limiting its impact beyond its immediate participants and reinforcing the very technocratic dominance present in India's urban water governance (Loorbach et al., 2015; Nastar & Ramasar, 2012). Furthermore, TM's reliance on short-term, externally funded programmes in the Global South often leads to 'projectisation,' disempowering marginalised groups and undermining sustained systemic change (Jayaweera et al., 2023).

To address these limitations, transformative spaces in our study adapt structured elements from transition arenas, such as co-creation and experimentation, but apply them with greater flexibility and sensitivity to local contexts. Unlike traditional TM, transformative spaces recognise the political nature of governance transitions and seek to address the socio-political complexities TM overlooks. These spaces create 'safe enough' environments where a broader range of actors, including those excluded from formal processes, can engage in open dialogue, and co-create solutions (Pereira et al., 2015). Transformative spaces align better with India's collaborative governance practices by leveraging informality. While retaining the structure of transition arenas to ensure direction and progress, these spaces remain adaptable, accommodating informal governance practices essential for navigating India's urban water challenges.

Achieving transformative change within governance systems, particularly in contexts like India, requires significant malleability and openness to rethinking entrenched institutional structures.

This often necessitates challenging long-standing approaches, which can be unsettling for governance frameworks that rely on formal procedures and hierarchical control. This discomfort is exacerbated by the need to acknowledge and address inherent flaws within the system itself—a daunting endeavour for authoritative figures who may perceive such challenges as a direct threat to their established power. Moreover, transformative spaces advocate for including non-experts, who bring valuable experiential insights to challenge the traditional dominance of technocratic dominance (Pereira et al., 2015). While necessary for democratising decision-making, this inclusion often faces resistance as it disrupts established power dynamics (Cornwall, 2004).

Informality plays a crucial role in this context, operating within a state of 'deregulation,' where institutional rules are often suspended or loosely applied, creating zones of exception (Roy, 2009). In these zones, actors can navigate beyond formal structures, blending experiential knowledge with rational frameworks to co-create locally relevant and sustainable solutions (Funder & Marani, 2015). When applied both proactively and reactively, informality enables governance actors to navigate the socio-political complexities, enhancing the potential for transformative water-sensitive governance outcomes (Rijke et al., 2013).

From these insights, three key parameters of informality emerge as critical for informing the design of transformative spaces in the Global South. First, informality cultivates *confidence to challenge regressive structures*. Second, it *nurtures frugality and creativity*, which are particularly important in resource-constrained settings. Third, it *instils faith in transition processes*, fostering long-term engagement. We elaborate on them below.

6.2.1. Cultivating confidence to challenge regressive structures

TM is driven by the expertise and initiative of 'front runners'—change agents—who develop long-term visions and experiments to foster sustainable change (Hölscher et al., 2018; Roorda et al., 2014). However, the structured nature of TM may inadvertently reinforce technocratic control in sectors like water management in India (Loorbach et al., 2015). Informality serves as a crucial counterbalance, amplifying marginalised voices and weaving diverse epistemologies into grassroots networks and self-organisation (Haapala et al., 2016; Mayaux et al., 2022). This inclusive approach combines expert knowledge with users' lived experiences to enrich dialogue on governance issues. Collaborative storytelling and regular gatherings in these informal settings encourage critical learning and cultural exchange, fostering solidarity and shifting the focus from technology to governance challenges (Goldstein et al., 2013). These spaces facilitate introspection and iterative discussions, easing the challenge of confronting regressive structures. Informality strives to empower critical discourse, strengthen community-led initiatives, and utilise existing hierarchies to address oppressive governance effectively (Cornwall, 2004; Frick-Trzebitzky, 2017).

6.2.2. Nurturing frugality and creativity

TM fosters creativity and innovation through transition arenas (Hölscher, Wittmayer, et al., 2019); however, in resource-constrained regions, maintaining such innovation can be challenging

(Jayaweera et al., 2023). Informality here emerges as a crucial strategy, enabling a shift from focusing on resource constraints to embracing creative problem-solving. By fostering frugality and creativity, informality encourages reimagining limitations as opportunities, making solutions feasible and practical. Cultural validations of this approach, through concepts like *Jugaad* in India or *Gehood Zateya* in Egypt, exemplify this mindset, where actors repair and innovate by mixing formal and informal tactics to make things work (Wahby, 2021). Informality capitalises on deregulated settings by reorganising resources and authority strategically (Ahlers et al., 2014; Roy, 2009), facilitating the implementation of frugal initiatives. This frugal approach emphasises the strategic use and repurposing of available resources making informality a transformative tool that turns constraints into the bedrock for innovation.

6.2.3. Instilling faith in the proposed novelties

Transition Arenas leverage transition networks to progressively engage a diverse range of societal actors in promoting and executing a transition agenda through experiments and by integrating these into broader initiatives (Hölscher et al., 2018; Roorda et al., 2014). In parallel, informal networks play a pivotal role, providing essential support and guiding stakeholders through comparable challenges. These networks are established through personal relationships, hierarchical influences, and an in-depth understanding of the socio-political landscape, which are crucial for identifying loopholes and seizing opportune opportunities. Such insights are vital for sustaining initiatives and weaving them into larger programmes by harnessing personal and professional agency, particularly in resource-limited settings. 'Safe-enough' spaces, where participants can reshape their interaction dynamics, are crucial for enhancing their influence and fortifying the network that underpins evaluating and realising their innovative proposals (Haapala et al., 2016). This organically developed methodology not only ensures alignment of local solutions with wider external trends but also significantly bolsters their acceptance. Notably, in fields like water governance where adaptability is essential due to inherent unpredictability (Dewulf et al., 2008), these strategies foster a sense of ownership and confidence in the transformative potential of the initiatives. By prioritising flexible transition mechanisms over fixed goals, informal networks underscore the importance of proactive involvement in transformation processes, thus reinforcing faith in the transformative outcomes.

6.3. Methodology

This section outlines the methodology employed during the workshop to develop transition pathways for the Water4Change (W4C) research programme.

W4C is a collaborative research initiative launched by the Government of India, co-funded by India's Department of Science and Technology (DST) and the Dutch Research Council (NWO). The programme aims to apply the Water Sensitive City (WSC) concept using the TM approach over five years (2019-2024), focusing on Bhopal and Bhuj due to their diverse geographical and socio-economic contexts. W4C collaborates with local Indian academic and research institutions in Bhopal and Bhuj as knowledge partners. These partners work to nurture capacities for water-

sensitive governance and sustain the programme's outcomes by engaging relevant stakeholders and adapting the TM approach to co-create locally sensitive solutions.

We first establish an understanding of the case studies before delving into the adaptation of transformative methodologies.

6.3.1. Case Studies: Bhopal and Bhuj

Bhopal and Bhuj each face distinct urban challenges shaped by their unique geographical and socio-economic contexts. Bhopal, the capital of Madhya Pradesh, is centrally located and known for its lakes. Despite this, official reports highlight issues with water quality and quantity (CAG India, 2021). Fieldwork further revealed that local stakeholders have a false sense of water sufficiency due to reliance on external sources, overlooking groundwater contamination, particularly by Persistent Organic Pollutants (PoPs) (Everard et al., 2020). Conversely, Bhuj, located in India's arid north-western frontier, historically benefited from unique hydrogeology and traditional water management (van der Meulen et al., 2023). However, rapid population growth has led to groundwater depletion and increased salinity (Saha & Gor, 2020). Field observations reveal conflicts between local aquifer restoration efforts by NGOs and citizen groups and government initiatives prioritising distant water sources.

Despite differing water issues, both cities face similar governance challenges exacerbated by rapid urban growth, migrant inflows, and haphazard infrastructure development. Limited resource allocation and centralised decision-making further hinder effective water management. In Bhuj, the Bhuj Nagar Palika (Bhuj Municipal Council) manages the water supply but lacks autonomy, following directives from the state capital, Gandhinagar (Bajpai & Kothari, 2020). Similarly, in Bhopal, the transition of water supply management to the Bhopal Nagar Nigam (Bhopal Municipal Corporation) is complicated by the continued influence of the state's Public Health Engineering Department (PHED), highlighting issues of centralisation and limited delegation of responsibilities (CAG India, 2021).

6.3.2. W4C workshops

The programme proposal had already set out a plan for four workshops, each aligned with the four steps of TM: problem framing, envisioning, pathway development, and city-specific adaptation. The first two workshops focused on identifying key challenges and developing a shared vision within each city. However, as we reflected on the outcomes and overall experience, it became clear that the transferred methodology of TM did not translate seamlessly into the Indian context. This highlighted the need for a more grounded and flexible approach, particularly for the third workshop on 'pathway development,' where informality emerged as a crucial element.

This realisation prompted a shift in strategy. Rather than adhering rigidly to a predefined process, we turned to informality as a means of fostering more locally relevant and transformative engagement. Consequently, this chapter explores how the third workshop was specifically

designed with informality at its core. It also examines how this shift helped address governance and procedural barriers—issues that had previously been dismissed as minor or accepted as part of the status quo.

The following sections detail the methods employed.

6.3.3. Pathways development workshop

A.   *Prior Fieldwork*
The study began with extensive fieldwork, including 64 semi-structured interviews in Bhopal and Bhuj. Using ethnographic methods (Gobo, 2008), the first author engaged with government officials, NGOs, civil society, academics, and citizens to understand the informal practices shaping water management. Visual ethnography (Pink, 2013) revealed unconscious traits influencing the actors. This fieldwork highlighted distinct repair practices in each city and how informality shaped these practices.

B.   *Venue and participants selection*
Delhi city was chosen as the workshop venue due to its national significance and accessibility, allowing the inclusion of national experts to provide insights to city stakeholders. These experts were chosen based on their approachability, diverse experience, and openness to candid discussions.

For participant selection, the team used prior workshops and fieldwork insights to identify key stakeholders crucial to each city's water management. A diverse group of 6-7 stakeholders from each city, including government officials, academics, civil society members, and citizens, was chosen by Indian and Dutch researchers. Selection criteria included relevance to ongoing projects, willingness to engage, and availability for future workshops.

While the goal was to include a balanced representation, local partners also invited influential figures resistant to change to strengthen their relationships, which risked marginalising transformative voices. To balance this, PhD researchers invited stakeholders based on research needs. This move provided a transparent view of governance dynamics, with these influential figures potentially becoming agents of change if they embraced the workshop's learning.

C.   *Training for facilitation*
Empathetic facilitation is crucial for preventing the reinforcement of hierarchies and addressing bias (Haapala et al., 2016). Experienced facilitators in the W4C programme conducted mock sessions to equip PhD researchers with the skills needed to create an environment that fosters organic discussion, respects marginalised voices, and allows for in-depth patient interactions. W4C aimed to develop researchers as knowledge brokers and change agents, skilled in resolving conflicts, bridging expert and non-expert gaps, and driving transformative change. Maintaining

a high facilitator-to-stakeholder ratio (1:2) ensured participants felt heard and motivated for sustained engagement.

6.3.4. Workshop design

Given the resource constraints, the two-day workshop was designed to adapt existing transition pathways to achieve Water Sensitive Cities (WSC) objectives. The sessions were crafted *to cultivate confidence in challenging regressive structures, encourage frugality and creativity, and instil faith* in the transformative process while respecting India's collaborative culture.

Session 1 aimed to cocreate transformation pathways while aligning them with existing projects using backcasting. The backcasting process (Robinson et al., 2011), which works backwards from a desired future to identify the steps required to achieve it, was employed iteratively. This iterative design allowed for multiple rounds of questioning the feasibility of pathways, reflecting on challenges, and providing anonymous feedback through tools like Mentimeter. The emphasis was on creating an environment that normalised reflection and course correction, supported by sensitive facilitation and strategic nudge questions to foster confidence in participants. The inclusion of multiple facilitators was intentional to ensure that the implications of suggestions were explained from different disciplinary perspectives, enabling a more comprehensive understanding.

Session 2 aimed to consult with experts and seek solutions for challenges identified in earlier sessions that could hinder the uptake of transformation pathways. Recognising that discussing governance challenges can be difficult, the session was designed to take place in a relaxed, informal setting resembling a food fair to encourage spontaneous dialogue. The use of culturally relevant snacks and informal, off-the-record discussions was deliberate, allowing participants to engage in unfiltered conversations akin to 'coffee machine chats.' This approach was meant to cultivate confidence, making it easier for participants to ask questions without the pressure of needing to sound correct or knowledgeable. The design promoted flexibility, allowing participants to engage with experts at their comfort level, fostering a more meaningful exchange of knowledge while reflecting on how to frugally address their issues. However, the design also acknowledged that some participants might face hierarchical barriers, such as seniority or gender dynamics, which could limit their willingness to engage openly. This led to the design of an additional session (Session 3) without any experts.

Session 3 was designed to facilitate peer-to-peer learning between stakeholders from different cities in addition to what they had learned from experts in the previous session. The session adopted a classroom-style format without a central authority figure to promote balanced dialogue and collaboration. Leveraging the existing hierarchy, senior participants from one city were paired with junior participants from another, fostering a mentorship dynamic. The design aimed to create a safe-enough space where participants could openly discuss 'loopholes' in their approaches, which are often avoided in formal settings. By encouraging continuous engagement and building rapport throughout the workshop, the design enabled participants to share

individual experiences and practical insights. This helped in developing long-term relationships and collaborations beyond the workshop itself. The session celebrated the identification and resolution of challenges, fostering creativity and faith in applying novel solutions within resource constraints.

Photograph 14: *Actors discussing during backcasting session. (Photograph Courtesy - Johnathan Subendran)*

6.3.5. Workshop follow up and evaluation

Post-workshop, stakeholder contributions were documented using Miro software, and the first author conducted 8 follow-up semi-structured interviews (3 in Bhopal, 2 in Bhuj, 3 with national experts). These interviews analysed using ATLAS.ti software, helped us understand the participants' learnings and examine the extent to which it facilitated achieving their respective goals. This was to comprehend how the space facilitated the nurturing of transformative capacities and to ascertain the role of informality in this process.

6.4. Results

We analysed workshop outputs and follow-up interviews to illustrate how these parameters shape transformative spaces in India. Additionally, we compared these findings with interviews conducted with the same stakeholders during the first author's earlier fieldwork to trace shifts in their governance capacities. This analysis offers insights into how the workshops and subsequent engagement contributed to nurturing the governance capacities needed to navigate entrenched hierarchies and challenge the technocratic dominance in Indian water governance.

6.4.1. Cultivating confidence to recognise dismissed issues

The workshop encouraged participants to challenge entrenched water governance structures by sharing individual experiences rather than impersonal, third-person accounts. This approach humanised the issues, emphasising the need for non-engineering solutions. At the Bhopal table, personal stories repeatedly surfaced about the lack of awareness about contamination, highlighting concerns often dismissed in formal settings. Facilitators skilfully introduced these overlooked topics, fostering an environment where participants felt validated and confident in addressing them.

These dialogues also led to a reassessment of problems, encouraging more open dialogue, and altering perceptions of experts and those initially seen as transgressors. This shift helped resolve long-standing issues, as evidenced by a stakeholder[26] who initially denied contamination problems but later acknowledged them, albeit minimally:

> *"It is correct that it is a problem, but the extent of what he was saying was that there were a lot of things that were not true."*

Tools like Mentimeter played a role in addressing overlooked topics such as institutional resistance, political bullying, and vested interests, thereby exposing hidden challenges in the system.

6.4.2. Frugality and creativity aid in broadening the proposal to seek funding

Informal settings, like food fairs as unofficial discussion spaces, fostered frugality and creativity. These organic environments encouraged candid conversations between experts and stakeholders, free from formal constraints such as recordings, strict timelines, or external judgment. This flexibility allowed stakeholders to take ownership of solutions, leading to sustained engagement.

Initially focused on technological upgrades, discussions soon shifted to addressing managing expectations and emotions in resource-constrained environments. One conversation centred on navigating funding challenges by adopting a frugal mindset. This was emphasised during expert consultation where stakeholders explored innovative strategies for securing funding. What began as a focus on technical expertise evolved into discussions on broadening the scope of funding proposals. The expert[27] remarked,

> *"...the problem is not with funding; the problem is how you propose for funding".*

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26   Interview: WS_I_06_Bhopal, 19/05/2023
27   Interview: WS_I_05_Expert, 18/05/2023

The expert advised the stakeholders to frame their projects with broader applicability, such as disaster management, thus broadening their perspectives.

Photograph 15: *Informal setting such as food-fair allowing candid conversations. (Photograph Courtesy - Johnathan Subendran)*

6.4.3. Bhopal-Bhuj instil faith by mentoring each other simultaneously

The workshop also strengthened trust in water governance strategies through cross-city mentorship. Senior stakeholders from one city mentored juniors from another, using existing hierarchical structures to foster open discussions on overcoming governance challenges. This cross-city mentorship enabled open discussions on overcoming governance challenges, transcending technical details to focus on real-life problem-solving. Senior stakeholders shared their successes and challenges, enhancing credibility and providing a balanced perspective on navigating governance obstacles. The format encouraged juniors to ask candid questions, leading to a deeper understanding of feasible solutions.

Mutual inspiration between the cities was evident, with Bhopal institutionalising a lake development authority and Bhuj focusing on community awareness. Each city offered valuable insights to the other. A stakeholder[28] from Bhuj described their experience:

> *"There was a team from Bhopal that mentioned they have a lake development committee, which we don't have here. If we had a lake development committee and a pressure group that included media, eminent citizens, and working women—people from all walks of life—it would make a significant difference. These points were particularly important for me".*

While not providing direct solutions, the informal settings were crucial in identifying the conditions for enabling repair. Discussions revealed previously unrecognised capacities for coordination, collaboration, innovation, and adaptation, even within the constraints of formal rules and limited resources. Through thoughtful facilitation in these informal settings, participants became better equipped to nurture these capacities, advancing their water sensitivity goals, and developing more sustainable solutions.

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28   Interview: WS_I_02_Bhuj, 28/04/2023

Photograph 16: Senior stakeholders from one city mentoring junior stakeholders from other cities. (Photograph Courtesy - Johnathan Subendran)

The three parameters played a key role in grounding the transformative process within the Indian context, fostering governance capacities to an extent. While not all objectives were fully realised, these parameters influenced the development of the pathways. By addressing overlooked issues such as representation, data credibility, and institutional awareness, the parameters enabled participants to move beyond technocratic approaches, contributing to more inclusive and systemic solutions. Including marginalised voices ensured that the pathways extended beyond purely technical concerns, incorporating suggestions to develop mediating bodies, community-led data management, and innovative funding strategies. Although challenges remained, the pathways became somewhat more actionable, drawing on ongoing projects and collaborative networks, and were shaped by a practical understanding of local contexts. This iterative and informal approach, while imperfect, helped transform ambitious goals into more feasible and contextually grounded outcomes, reflecting the ongoing need for adaptive, sustainable governance in India's water sector.

6.5. Discussion and conclusion

Our study explored how informality fostered transformative spaces in the Indian context. By leveraging three key parameters, these spaces nurtured governance capacities and influenced the development of new pathways. We examine how informality challenged technocratic dominance in water governance and led to nurturing governance capacities, as opposed to the external capacity-building approach often promoted by Northern-sponsored programmes. Finally, we discuss how these spaces helped situate water sensitivity within the local context, moving beyond external frameworks to adopt locally grounded approaches.

6.5.1. Addressing technocratic hegemony

The transformative spaces aimed to challenge the dominance of technocratic approaches in Indian water governance, though progress was gradual. Initially, workshops were dominated by discussions of technological upgrades and infrastructure, reflecting the entrenched preference for engineering-driven solutions. This dominance was reinforced by authoritative actors using specialised jargon, which marginalised non-technical voices and alternative perspectives. As the workshops unfolded, participants began to recognise the limitations of purely technological solutions. Broader conversations emerged around the need for governance reforms, mediation, and community engagement—topics often side-lined in technocratic discussions. This shift from focusing on 'what to do' to 'how to do it' opened discussions on democratising data, addressing governance rigidities, and fostering community involvement, all crucial for a more inclusive water management approach as discussed by Zwarteveen (2017) and Hartley & Kuecker (2021).

Informality was central to this shift. Drawing from Cornwall's (2004) concept of 'unofficial spaces,' alongside Pereira et al. (2015) idea of 'safe enough spaces,' the workshops created informal environments like food fairs and classroom-style settings that encouraged openness and creativity. Tools such as Mentimeter facilitated anonymous and off-the-record engagement, allowing participants to challenge technocratic dominance without fear of repercussions. This design helped humanise water management and fostered broader discussions, incorporating marginalised voices and non-technical perspectives. Though technocratic dominance was not entirely dismantled, these informal spaces marked a step toward questioning entrenched power structures. The spaces did not immediately produce concrete solutions but laid the groundwork for more participatory and collaborative governance approaches, demonstrating the potential of informality to challenge rigid, formal structures.

6.5.2. Spaces for nurturing capacities, not building them

The introspective processes highlighted in our study suggest that transformative efforts in the Global South do not require building new capacities but rather nurturing existing ones. While we did not focus on specific capacities in this paper, our findings indicate that transformative spaces can help programmes and projects shift from external capacity-building to an approach that acknowledges and strengthens what is already present.

The governance structures we observed were characterised by entrenched hierarchies based on gender, experience, and administrative levels, which perpetuate governance challenges. Rather than dismantling these hegemonies entirely, our framework leveraged informality—self-organisation, grassroots networks, reciprocity, and reverence-based seniority—as a means to navigate them. This locally grounded approach, often overlooked by external perspectives, holds the potential for meaningful transformation. By fostering alternative approaches that pluralise water management governance, these spaces aligned with Mormina & Istratii's (2021), argument that nurturing local capacities, rather than building external ones, leads to more sustainable, contextually rooted outcomes.

6.5.3. Situating sensitivity

The transformative spaces created through the W4C programme enabled stakeholders to explore pathways toward water sensitivity while reflecting on past and present governance challenges. Rather than adopting an external, Australian-derived approach, these spaces fostered a collective understanding of what water sensitivity could mean for India. The WSC framework emphasises integrated water cycle management, community-led governance, urban resilience, and ecological sustainability (Bichai & Flamini, 2017). In India, however, the focus shifted towards localising decision-making within resource constraints by fostering awareness, creating mediation mechanisms, and strengthening transformative capacity for community-driven governance.

The findings suggest that water sensitivity can be realised through a synergistic approach, where sectors and domains collaborate to repair existing governance arrangements rather than creating new overarching structures (Giordano & Shah, 2014). Participants could situate water sensitivity in a pragmatic, frugal, and locally relevant manner by promoting knowledge sharing, enhancing mediation, raising awareness, and democratising data.

6.5.4. Acknowledging the political position of W4C

Despite these advances, the transformative spaces created by the W4C consortium faced challenges. Supported by the central government, the consortium sometimes struggled with perceptions of bias. The Indian partners had to cautiously navigate a politically sensitive landscape, requiring careful management of professional relationships to ensure future engagement. Their established networks were crucial in engaging authoritative stakeholders, but maintaining a balance between prompting reflection and instigating change required a nuanced approach.

In response to the technocratic hegemony within the W4C research program, researchers with engineering and urban planning backgrounds expanded their roles to function as knowledge brokers across disciplines and geographies. These efforts underscore the significance of social, emotional, and relational factors in interpreting knowledge rooted in Action Research (AR), as Fazey et al. (2018) emphasised.

6.5.5. Future scope and limitations

The findings of this study are specific to the Indian context, and their generalisability is limited unless they are adapted to regions with different governance structures and cultural settings. Although informality was emphasised as a key mechanism, sustaining these transformative spaces may require support from formal institutions to ensure their long-term credibility. Furthermore, the success of these spaces is closely tied to the quality of facilitation, which can influence outcomes and introduce bias.

Because of these limitations, we advocate for expanding beyond workshops to create diverse transformative spaces such as living labs, accelerator hubs, and learning platforms. These spaces should foster collaboration in India and other post-colonial contexts rooted in local

ethics and practices. In doing so, development corporations and funding bodies must avoid a 'white saviour' mindset, as critiqued by Escobar (1995), and instead support local transformative cultures without appropriation. Likewise, local stakeholders should use Northern frameworks as inspiration rather than rigid models to validate locally grounded methodologies.

Building on Silva et al. (2024) upscaling this approach invites practitioners to reflect on their political positions and collaborative behaviours. Meaningful and honest facilitation rooted in local contexts will help define transformative spaces, contributing to more sustainable and culturally sensitive development practices.

6

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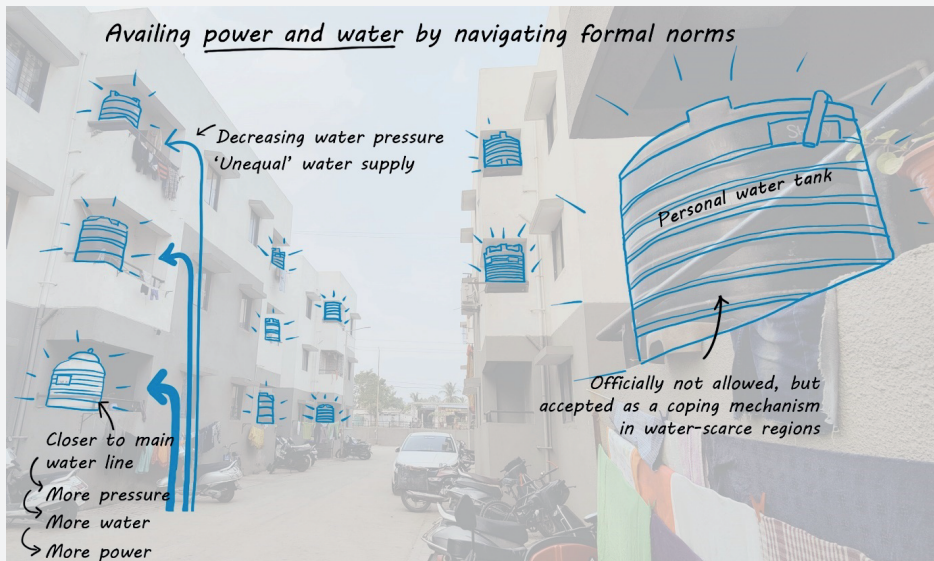
6

Intermezzo

A

Nurturing reparative
governance capacities
through transformative
spaces

Photo Narrative 9: Informal tanks- Symbols of power

Legally, owning a personal water tank violates regulations, as it can lead to water hoarding and contribute to unequal water distribution. However, water scarcity has normalised the practice in this community, making water tanks a standard feature. These tanks have become a practical necessity and a symbol of social prestige. The proximity of a tank to the primary water source or tap is particularly significant; the closer the tank, the higher the water pressure, allowing for faster filling and providing greater benefits to the owner.

This dynamic is well understood by the municipal supervisor, who chooses not to challenge the status quo despite being a citizen of the same city and fully aware of the inequities. Instead, he seeks to maintain consumer satisfaction by ensuring that some water is supplied to each tank at least once a week. This arrangement, while imperfect, alleviates pressure on the local government by reducing the volume of complaints related to water scarcity. Over time, residents have adapted to this scarcity and the resulting unequal access, and the water tanks have taken on multiple layers of meaning.

Availing **power and water** by navigating formal norms

Decreasing water pressure
'Unequal' water supply

Personal water tank

Officially not allowed, but
accepted as a coping mechanism
in water-scarce regions

Closer to main
water line
More pressure
More water
More power

These complex and negotiated practices surrounding water management play a crucial role in the overall governance of water resources. This raises important questions about what governance capacity truly looks like in such contexts: How does it manifest, and how is it exercised within these discreet value systems?
In this intermezzo, I explore whether and how these capacities were nurtured through the transformative spaces of the W4C programme, which operates within this unique cultural context and resource-constrained environment. The reflections from the W4C workshops further illuminate the role of informality in shaping these governance capacities, providing a foundation for rethinking water management strategies in similar settings.

Intermezzo A

This intermezzo delves into the outcomes of the 'pathway development' workshops, designed to cultivate reparative capacities essential for fostering water sensitivity. The W4C workshops comprised four stages: problem framing, visioning, pathway development, and pathway detailing. The problem framing and visioning workshops took place in the cities of Bhuj and Bhopal, laying a foundation for the subsequent workshops focused on pathway development and detailing.

Upon completing my fieldwork, insights from the problem framing and visioning workshops prompted me to rethink the development of transformative spaces, particularly by adapting these spaces through informality, as discussed in the previous chapter. I modified TM's transition arenas into a more flexible framework of transformative spaces, better suited to India's complex collaborative dynamics. I developed a 'safe-enough' transformative space specifically for the 'pathway development' workshop, held at a neutral venue in Delhi, where I invited stakeholders from other cities to foster inclusive engagement.

In this intermezzo, I critically examine whether, and to what extent, the pathway development (held in Delhi) and detailing workshops (conducted in respective cities) nurtured the capacities necessary for reparative action, which are intrinsically embedded within pathways towards water sensitivity in both cities. I specifically analyse the development of reparative capacities by exploring the intended objectives of the established pathways (Section A.1) and examining observed acknowledgements, shifts, and recommendations regarding the capacities required to fulfil these pathways (Section A.2), based on on-site discussions and follow-up interviews with stakeholders and experts. This evaluation also incorporates 'table chatter'—the informal yet meaningful exchanges—and subsequent dialogues that helped integrate these insights into strategies for sustainable implementation.

The identification and nurturing of capacities emerged not solely from the two workshops but rather through a gradual process of reflection and learning. By consistently engaging the same actors across workshops and revisiting visions and pathways, participants were encouraged to reflect on whether current efforts aligned with the proposed pathways towards water sensitivity. This iterative engagement normalised discussions around obstacles and deviations, alongside solutions and the capacities needed to bring these pathways to fruition.

I examine the tangible actions observed during the workshops, illustrating how governance capacities—both consolidative and *jugaadu*—manifested in practice and contributed to advancing pathways towards water sensitivity goals. This analysis offers insights into how these capacities facilitated iterative adjustments, collaborative engagement, and refinements to the overarching goals.

A.1. Outputs: The pathways

This section presents the pathways developed as outputs from the collaborative workshops aimed at achieving water sensitivity. Pathways are comprehensive roadmaps designed with input from diverse stakeholders and crafted to encompass multiple policy domains, integrating strategies synergistically (Frantzeskaki et al., 2019). These pathways play a crucial role in enabling structural change across various societal systems, spanning socio-cultural, institutional, political, economic, technological, and ecological dimensions. Such a multifaceted approach is essential for addressing the complex challenges and aligning with the long-term goals of water-sensitive cities.

The pathways were developed iteratively through sessions that emphasised refining and validating strategies. The pathway development workshop was divided into three focused sessions: (1) Identifying roadblocks, (2) Expert consultations at a food fair, and (3) Peer-to-peer exchanges in a classroom setting. These sessions allowed participants to identify barriers, engage with experts, and collaboratively brainstorm solutions. Participants engaged in backcasting from the water sensitivity goals defined in an earlier visioning workshop to ground the pathways in a realistic trajectory. This approach (Robinson et al., 2011) works backwards from a desired future state, identifying actionable steps and intermediary goals needed to reach that future. Unlike forecasting, backcasting emphasises a desirable endpoint and strategises backwards to map feasible actions to present conditions, making it particularly effective in navigating uncertain futures where traditional projections may fall short.

The initial pathways crafted during these sessions were found to be overly ambitious and required refinement to align more closely with current efforts and constraints. Stakeholders assessed the pathways against previously identified problems, comparing them with ongoing efforts to determine alignment with water-sensitive city goals. This iterative process enabled participants to reflect on practical feasibility, using tools like Mentimeter to provide anonymous feedback and involved discussions with experts and peers to address roadblocks and make pathways more actionable. The pathways were ultimately validated and detailed further with a larger group of stakeholders at the 'pathway detailing' workshop within their respective cities.

The final pathways diagram highlights two main outputs: first, it facilitated alignment among the various pre-existing goals of stakeholders toward a unified vision of water sensitivity; second, it underscored the need for a context-specific first step for the Global South, recognising that 'soft take-offs,' often overlooked, are essential in ensuring sustained progress across diverse efforts.

For both the cities of Bhuj and Bhopal, these outputs translated into actionable steps by breaking down the overarching goal of water sensitivity into achievable sub-goals and operationalising them within the local context (represented by black circles in Figures 5 and 6). The initial round of backcasting activities to realise these goals was aligned with their immediate priorities. For example, as illustrated in Figure 5, Bhopal was already undertaking some ecological restoration

and financial sustainability efforts. However, these disparate initiatives were now unified under the broader framework of water sensitivity. Furthermore, the stakeholders identified key impediments to achieving these objectives, including the need for real-time data, increased awareness of pressing issues, and the importance of having mediators and knowledge brokers. These elements were considered essential first steps to 'repair' their ongoing efforts towards water sensitivity. By acknowledging these initial steps, the stakeholders also brought attention to previously overlooked concerns, such as water contamination and the lack of access to water quality data.

Similarly, as seen in Figure 6, the backcasting process in Bhuj, characterised by vibrant NGO activities, underscored the need to bolster existing efforts related to awareness, regulation, and knowledge repositories. However, further deliberation revealed that the activities of local government and NGOs were frequently disjointed and competitive, impeding the achievement of water sensitivity. This realisation prompted the recognition that establishing a unified local governance structure would be an essential first step. Such a governance unit could better coordinate efforts, facilitate more effective resource sharing, and align the endeavours of NGOs towards a shared objective.

These initial steps closely aligned with the principles of restorative justice, facilitating reparation by elevating historically marginalised perspectives and concerns. Furthermore, they repurpose fragmented and disjointed efforts, redirecting them towards a collective objective.

Further, I have shared the simplified pathway diagrams for both cities, which visually encapsulate these insights.
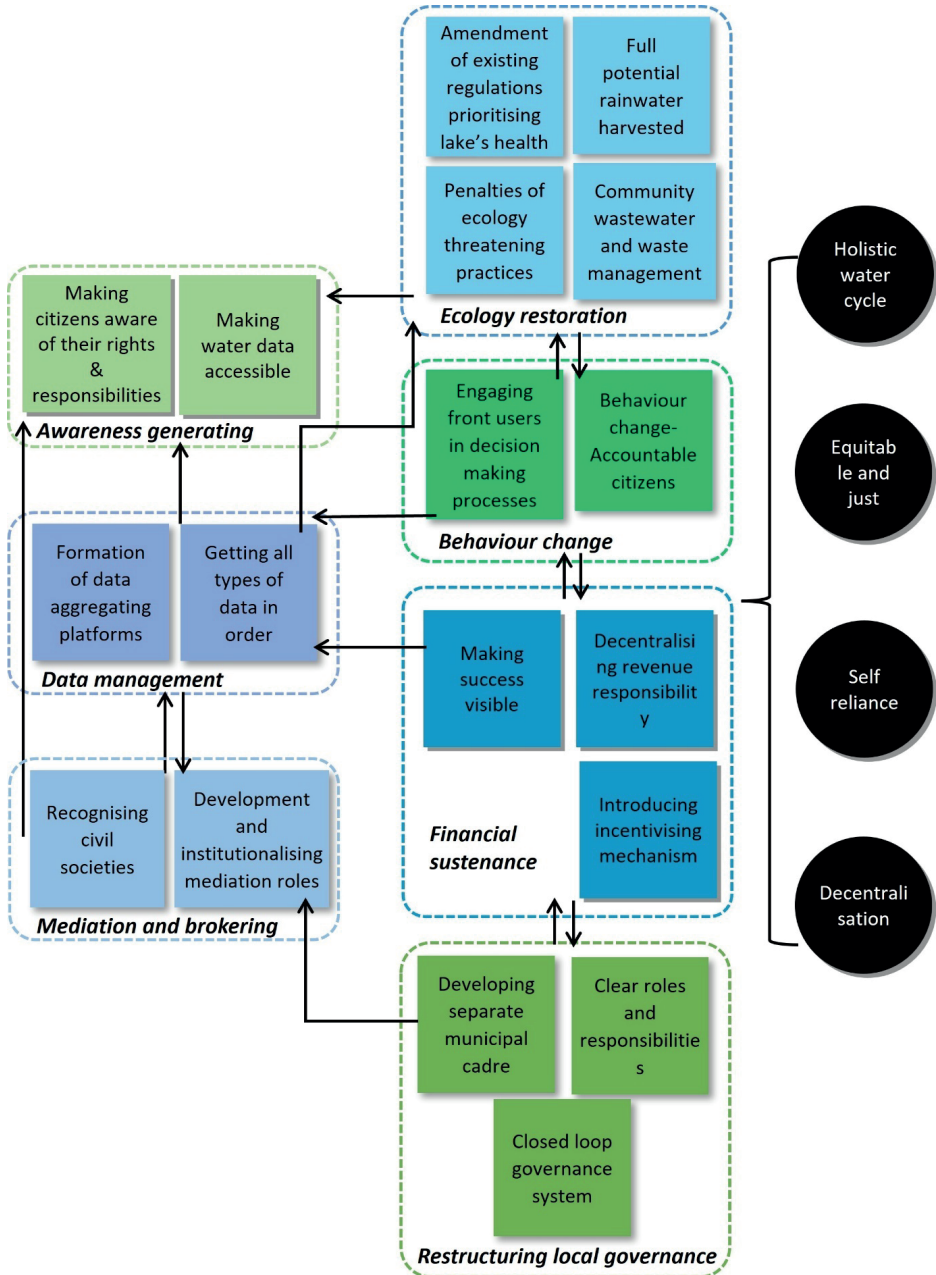
Amendment of existing regulations prioritising lake's health

Full potential rainwater harvested

Penalties of ecology threatening practices

Community wastewater and waste management

Ecology restoration

Making citizens aware of their rights & responsibilities

Making water data accessible

Awareness generating

Engaging front users in decision making processes

Behaviour change- Accountable citizens

Behaviour change

Holistic water cycle

Equitable and just

Formation of data aggregating platforms

Getting all types of data in order

Data management

Making success visible

Decentralising revenue responsibility

Self reliance

Introducing incentivising mechanism

Financial sustenance

Recognising civil societies

Development and institutionalising mediation roles

Mediation and brokering

Decentralisation

Developing separate municipal cadre

Clear roles and responsibilities

Closed loop governance system

Restructuring local governance

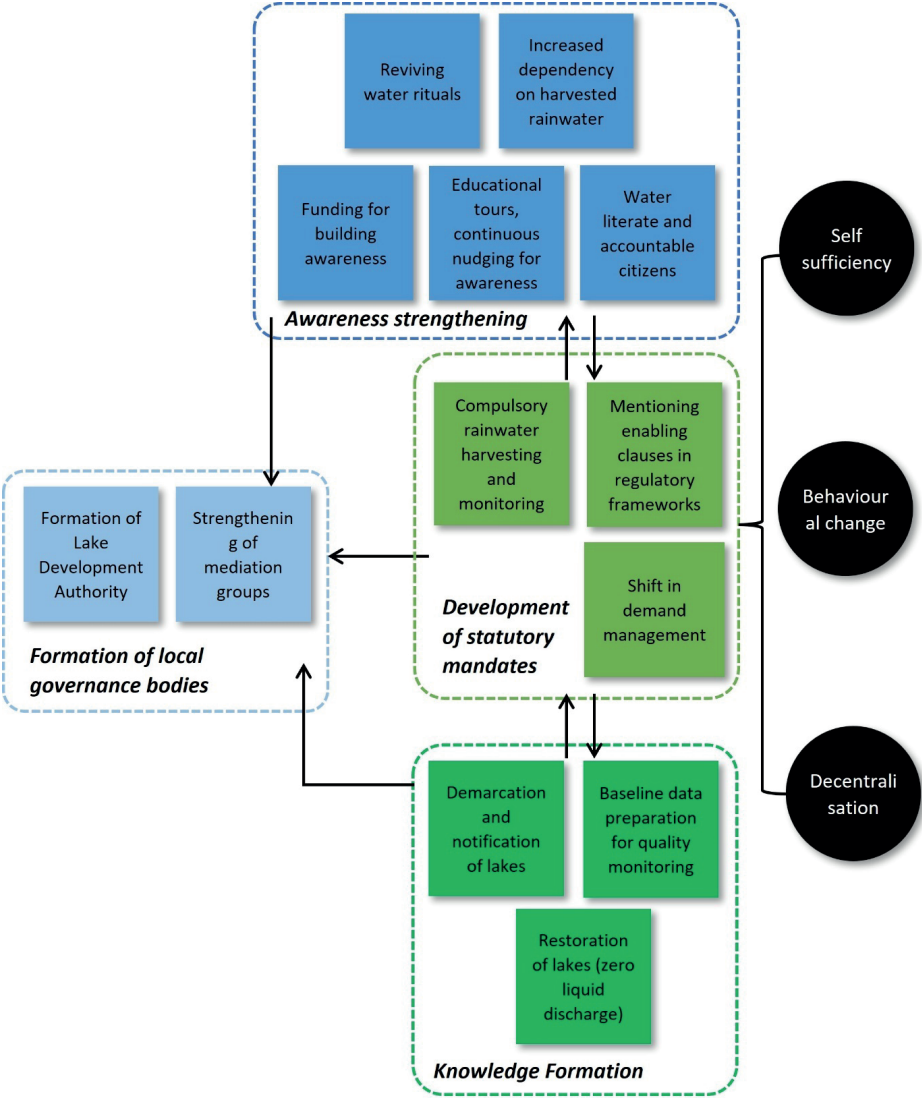**Figure 5:** *Simplified Bhopal Pathways*

Figure 6: *Simplified Bhuj Pathways*

In the following section, we elaborate on how these two capacities materialized into actionable steps towards reparation.

A.2.   Outcomes: Reparative capacities

In this section, I analyse the observed acknowledgements, shifts, and recommendations that emerged regarding the capacities needed to bring these pathways to fruition, drawing on workshop interactions and follow-up interviews with stakeholders. The shift towards recognising reparative capacities unfolded as stakeholders began reflecting on the skills and resources required to implement the pathways.

The initial discussions centred on technological upgrades, model finalisation, and the implementation of new systems. However, within the safe, unofficial space of these workshops, conversations evolved beyond technocratic solutions, encompassing governance challenges as well. As these dialogues progressed, stakeholders acknowledged that while they shared similar end goals, they had yet to fully address underlying issues that were non-technocratic. Normalising discussions around these challenges and shedding light on previously overlooked concerns led the group toward actionable steps for realising these ideas.

Throughout the exchanges, stakeholders identified latent attributes of water sensitivity within their existing work, including system connections across sectors, intergenerational aspirations, holistic water management approaches, and democratising decision-making. Although such efforts were often fragmented, this process of reflection aligned them with a collective objective. In the subsequent analysis, I explore the emergence of consolidative and *jugaadu* capacities, examining how these were nurtured within the workshops and the extent to which they facilitated progress towards the desired pathways for water sensitivity.

A.3.1. Consolidative capacity

Consolidative capacity emerged as the ability of stakeholders to strengthen or cultivate the conditions necessary for self-organisation towards a shared and long-term goal within a culturally complex, and resource-constrained environment. This capacity was nurtured through the workshops in several ways. First, by *reprioritising issues*, stakeholders could shift focus towards addressing underlying social challenges that had previously been neglected. The discussions also facilitated a *balance between universal objectives and local aspirations*, ensuring that global goals were adapted to fit the specific needs of the communities involved. Moreover, the capacity was actualised by emphasising the necessity of *devising a mediating agency* to rebuild trust and navigate complex stakeholder relationships. Finally, the workshops fostered *localising power and decision-making*, encouraging a shift towards decentralised governance that empowered local actors and brought decision-making closer to the source of the problem. Together, these actions collectively enhanced the consolidative capacity of the stakeholders, positioning them to better self-organise and address challenges in a sustainable manner.

1.   Re-prioritising issues

The workshops facilitated discussions illuminating critical issues, fostering engagement among diverse stakeholders to address their challenges. Mentimeter facilitated this process by

prompting consideration of previously overlooked or underappreciated concerns. The anonymity provided by this tool enabled participants to express sensitive sentiments openly, revealing that some core issues, such as 'unwillingness to change,' 'taken for granted', and 'sense of hopelessness', had been neglected, as illustrated in Fig. 3. Consequently, participants focused primarily on tangible, technocratic issues due to their perceived linearity and manageability.

The Mentimeter session revealed pressing concerns, such as the 'need for awareness,' 'need for data,' and 'need to repair trust.' In response to these concerns, the workshops involved stakeholders from other cities and invited experts who introduced fresh perspectives that challenged conventional approaches to some extent. The iterative nature of the discussions fostered continuous reflection on the complex, multifaceted nature of water-related problems. Stakeholders acknowledged that addressing these issues through a purely techno-managerial lens was inadequate and, in some cases, exacerbated the challenges.

This broadened the scope of discussions, allowing social issues to be considered alongside technical ones. The discussions cultivated confidence, and participants recognised that these social challenges were not only significant but also addressable. As a result, city stakeholders began to acknowledge the need for a more interdisciplinary approach, including new actors and perspectives beyond traditional engineering solutions.

Therefore, the informal nature of the workshops facilitated a departure from the rigid, colonial-influenced governance models typically employed in Bhuj and Bhopal. This shift encouraged a more open exploration of governance challenges from various disciplinary angles.

Despite the shift towards a more open exploration of governance challenges, government stakeholders in Bhopal maintained a rigid stance. They asserted that the concerns raised were not novel and claimed that they had never been disregarded in the first place. Furthermore, they contended that even if the issues had been overlooked, it was beyond their capacities to address them, contradicting the claims made by citizens and civil society organisations. However, these same government employees subsequently acknowledged the problems privately, though they could not admit them publicly as official government representatives[29].
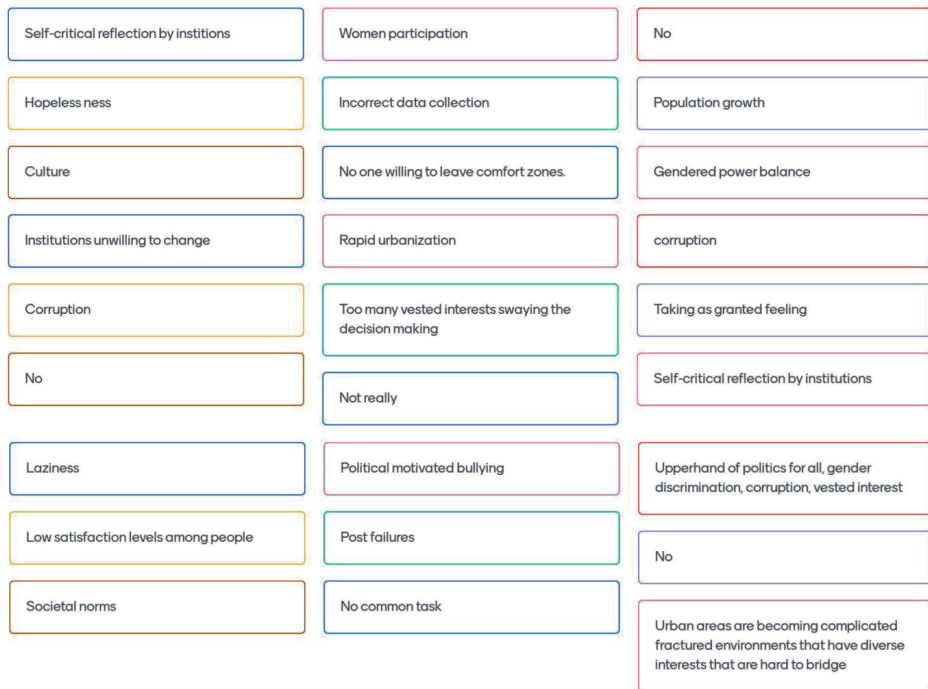
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29   Interview: WS_I_06_Bhopal, 19/05/2023

Figure 7: *Mentimeter results*

I

2. *Balancing between universal goals and local goals*

The workshop discussions underscored a tension between universal goals and local objectives. Government representatives[30], often aligned with international funding bodies, emphasised global sustainability objectives such as SDG 6 or the continuous provision of water services as overarching goals[31]. These were viewed as essential for sustaining long-term development. However, local citizens and CSO representatives perceived these goals as distant and abstract, leading them to focus on more immediate, localised objectives.

In Bhopal, for instance, sustainability was redefined to prioritise the health of local water bodies by addressing contamination issues. This reinterpretation helped bridge the gap between broad, high-level objectives and the practical needs of the community, highlighting the disconnect between policy goals and their actual implementation. Conversely, stakeholders in Bhuj recognised the importance of integrating water management goals with broader climate adaptation efforts. This approach fostered a sense of interconnectedness and unveiled new

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30 Interview: WS_I_06_Bhopal, 19/05/2023
31 Interview: WS_I_06_Bhopal, 19/05/2023, Interview: WS_I_07_Bhopal, 19/05/2023

funding opportunities[32], demonstrating how local and global objectives can be aligned to achieve more meaningful outcomes.

3.   Devising a mediating agency

A notable outcome of the workshops was the recognised need for a mediating agency to facilitate collaborative problem-solving among stakeholders. This need was identified in the pathway diagram (Fig. 2) and reinforced through follow-up interview[33], which highlighted the importance of mediation. The introduction of a third-party actor was proposed to address trust issues, develop familiarity among stakeholders to understand the capabilities and limitations of municipal processes[34], foster familiarity among stakeholders, and facilitate difficult discussions. This would enhance collaborative governance and enable the effective implementation of water management initiatives.

Rebuilding trust was explicitly highlighted by a government official[35] from Bhopal, who acknowledged the negative perception held by citizens towards the government. The official remarked,

> *"The biggest issue is that the people who we work for, don't trust us, but then we are working for their own good; this is the major drawback in the government or the municipal sector. Because the people who you work for don't feel that you their well-wisher"*

This sentiment underscored the necessity of mediation to resolve these trust deficits and ensure the successful consolidation of efforts.

In Bhuj (as seen in Fig. 3), the third-party mediator's role was envisioned as crucial for maintaining current initiatives, including coordination, fundraising, behavioural change, and strengthening awareness. The establishment of such mediating bodies was a direct response to the palpable mistrust towards governmental agencies. These bodies aim to foster transparency, equitable decision-making, and trust-building among all stakeholders.

Additionally, further discussions resulted in proposals for dedicated governance entities, including the 'People's Commission' in Bhopal and the '*Samiti*' (committee) in Bhuj. In Bhopal, the discourse transitioned from a primarily technology-centric approach to incorporating more facilitative roles within governance. Concurrently, a participant[36] from Bhuj advocated for establishing a 'pressure group' to monitor and ensure the implementation of proposed initiatives through

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32 Interview: WS_I_02_Bhuj, 28/04/2023
33 Interview: WS_I_01_Bhopal, 28/04/2023
34 Interview: WS_I_06_Bhopal, 19/05/2023
35 Interview: WS_I_07_Bhopal, 19/05/2023
36 Interview: WS_I_02_Bhuj, 28/04/2023

persistent follow-up. These new entities were conceptualised as neutral platforms to facilitate dialogue, clarify roles, and foster mutual understanding among citizens, experts, and authorities.

However, the lack of substantive government participation in the final workshops resulted in ambitious proposals that lacked the practicality required for prompt implementation. This highlights the necessity for sustained dialogue and exploring these initiatives across diverse forums to refine and effectively nurture consolidative capacity.

4.   *Localising power and decision-making*
Decentralisation emerged as a core theme in the workshops, highlighting the need to distribute authority across new governance structures to reduce governmental dominance in decision-making. This shift towards a hybrid, decentralised model was intended to restore trust, enhance accountability, and ensure effective monitoring by involving citizens and third-party entities.

By engaging a range of actors—including NGO actors, active citizens, and (non-engineering) subject matter experts—the workshops demonstrated how incorporating less powerful stakeholders could reshape governance dynamics and help prevent the replication of hegemonic power structures. For instance, the proposal for a third-party mediator in Bhopal stemmed from a lack of trust in municipal authorities and aimed to reduce the strain on overburdened stakeholders.

The workshops' informal format revealed how traditional power dynamics could be reconfigured, promoting more dynamic interactions and new ways of disaggregating power. Their extended duration and casual setting also fostered personal relationships, which proved essential for building trust and collaboration among participants. These connections enabled in-depth discussions on practical challenges, empowering stakeholders to explore governance arrangements that are more responsive to local needs.

A.3.2. *Jugaadu* capacity
Jugaadu capacity refers to the ability to improvise through frugal, contextually viable methodologies, ideologies, and organisational structures. This capacity aims to foster inclusivity and alternative approaches essential for addressing water challenges in resource-constrained environments. This capacity was manifested through delineating strategies, empowered stakeholders with the insight to ingeniously reconfigure institutions and material frameworks, heralding 'social tinkering' as a pathway to remediation. This capacity was nurtured in several ways during the workshops. First, the sessions facilitated an *evolution in the understanding of knowledge,* shifting the focus from linear techno-managerial approaches to a more systemic approach that values diverse perspectives and governance challenges as essential knowledge. Additionally, the *ability to leverage constraints* was cultivated as stakeholders began to view previously insurmountable challenges as manageable opportunities, drawing inspiration from successful examples in similar contexts. Finally, the workshops were instrumental in *cultivating a sense of care and ownership* among participants, fostering a commitment to sustaining efforts

beyond the workshop despite the challenges of embedding such transformative thinking into existing frameworks. Together, these activities collectively enhanced the *jugaadu* capacity of the stakeholders, enabling them to address challenges within their resource-constrained environments creatively. However, the uptake of this capacity was significantly hampered by the absence of stewards capable of integrating these interventions into the socio-political context.

1.   Evolution of understanding 'knowledge'

Throughout the workshops, a significant evolution in the understanding of knowledge was observed, paralleling the shift in problem framing. Initially, participants viewed knowledge as a set of ready-made solutions transferable across contexts, focusing mainly on technological and financial aspects, with minimal attention to governance. However, as the workshops progressed, particularly through peer-to-peer sessions, participants began recognising governance challenges as a critical form of knowledge. This realisation promoted a more systemic approach to problem-solving, acknowledging the value of diverse perspectives. The shift from a narrow focus to a holistic view[37] of knowledge was evident in pre- and post-workshop interviews[38], highlighting the growing appreciation for alternative approaches to addressing challenges.

A pertinent example of this evolving understanding is seen in the urban planning officer's[39] shifting perspective on water contamination in Bhopal. Initially, the officer regarded contamination as an 'othered' issue, restricted to a specific, less significant area, thus marginalising its impact. In a pre-workshop interview, the officer stated,

> *"Well, it is not much. Ok, in that area specifically yes. But not here,"*

effectively framing the issue as peripheral. However, after engaging with an NGO activist who advocates on behalf of affected communities, the officer's stance softened, moving from outright dismissal to reluctant acknowledgment. In a post-workshop reflection, the officer remarked,

> *"It will take some time; it will take a long time. In some area there was pollution, and the ground water was polluted there is no doubt about it. On the district government's instructions, the hand pumps that are in that area, Municipal Corporation has said that this water is not good. They have put up boards that it is to be closed."*

Although the officer's response remains cautious, the shift illustrates an opening for accountability and highlights how informal interactions within the workshops broadened his understanding of governance knowledge. This evolving awareness underscores the workshops' role in promoting

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37 Interview: WS_I_02_Bhuj, 28/04/2023, Interview: WS_I_08_Bhuj, 09/06/2023

38 Fieldwork Interview: BHO_I_02_G, 16/09/2021; Fieldwork Interview: BHO_I_06_A, 23/09/2021; Interview: WS_I_06_Bhopal, 19/05/2023; Interview: WS_I_07_Bhopal, 19/05/2023

39 Fieldwork Interview: BHO_I_02_G, 16/09/2021; Interview: WS_I_06_Bhopal, 19/05/2023

alternative perspectives and reveals how informal spaces can subtly challenge entrenched views, gradually integrating complex social and environmental dimensions into official narratives.

2.   *Leveraging constraints*

A fundamental change during the third workshop was the burgeoning belief in the feasibility of change, driven by inter-city peer discussions. These discussions fostered confidence and belief in proposed solutions, shifting the focus from a perceived deficit in resources to navigating bureaucratic obstacles and aligning public expectations. Previously insurmountable constraints were now viewed as manageable, with the workshop environment fostering a respectful acknowledgement of these challenges. Strategies were celebrated for their ingenuity across cities, encouraging a shift from resentment towards constructive acknowledgement and efforts to overcome these challenges[40].

For instance, one participant[41], rather than attributing the limited success of the 'Sathisangini' – women empowerment initiative to insufficient funding, sought inspiration from counterparts in Kozhikode who achieved success under similar financial constraints.

> *"But where is the gap? How they are running Kudumbashree so perfectly and why our Sathisangini is not working so effectively"*

In response, an expert[42] demonstrated that the real issue did not lie in the availability of funding but rather in the approach to utilising those resources. He suggested that adopting a more strategic and creative perspective could unlock new opportunities to address the challenges at hand:

> *"the problem is not with funding, the problem is how you propose for funding… There are number of financing channels which are there, which can be used for different projects and all. If you look at the fundamental things, what I suggested to them to use, there are different mechanisms. SDMG State Disaster Mitigation Grant, National Disaster Mitigation Grant, then there are grant in health sector. For different sectors there are different sectors of funding, which are to be there."*

3.   *Cultivating sense of care and ownership to sustain efforts*

The workshops tried to foster sense of care and ownership among stakeholders, which was crucial for sustaining efforts beyond the workshop's duration. This was evident in how local partners communicated the programme's intent to local stakeholders, emphasising the importance of long-term commitment not just for fulfilling project mandates but also out of

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40   Interview: WS_I_06_Bhopal, 19/05/2023; Interview: WS_I_02_Bhuj, 28/04/2023; Interview: WS_I_07_ Bhopal, 19/05/2023

41   Interview: WS_I_02_Bhuj, 28/04/2023

42   Interview: WS_I_05_Expert, 18/05/2023

genuine care and altruism towards the issues and communities involved. In Kozhikode (this case city is outside the scope of this study), this sense of ownership was institutionalised through the 'Water Folks' platform, serving as a model for inclusive dialogue. However, Bhuj and Bhopal struggled to embed similar transformative thinking. In Bhuj, a 'living lab' was proposed but remained a suggestion. At the same time, Bhopal faced difficulties finding an organisation to lead, primarily due to a lack of trust in authoritative bodies. The absence of solid stewardship to integrate these efforts into existing frameworks highlighted a critical gap in sustaining the momentum generated during the workshops.

Presenting below a summary of the results:

Capacity	Manifestation	Description
Consolidative Capacity	Re-prioritising Issues	Shifted focus from technocratic solutions to addressing underlying social challenges, fostering interdisciplinary approaches
	Balancing universal and local goals	Adapting global sustainability goals to fit local needs, bridging the gap between high-level objectives and practical implementation
	Devising a mediating agency	Proposed a third-party mediator to rebuild trust and facilitate collaborative governance, addressing trust deficits
	Localising power and decision-making	Decentralised governance, reconfiguring power dynamics to empower local actors and bring decision-making closer to the problem source.
Jugaadu Capacity	Evolution of Understanding Knowledge	Shifted from viewing knowledge as ready-made solutions to recognising the value of diverse perspectives
	Leveraging Constraints	Reinterpreted constraints as manageable opportunities, drawing on successful examples and strategic approaches to funding
	Cultivating a Sense of Care and Ownership	Fostered long-term commitment among stakeholders, despite challenges in embedding transformative thinking into existing frameworks

Table 8: *Results summary*

A.3. Reflection

The Water4Change workshops highlighted the importance of informality in cultivating transformative capacities, particularly within complex, culturally diverse, and resource-constrained urban environments like Bhuj and Bhopal. This reflection delves into how informality contributed to reshaping governance approaches, fostering iterative learning, and nurturing existing capacities to achieve long-term water sensitivity goals.

A.3.1. Role of informal transformative spaces to nurture capacities

Although the limited duration of the workshops was insufficient for tangible outcomes, these informal, temporary spaces provided a crucial platform for exploring 'what if' scenarios and deliberating on alternatives. The scarcity of resources and the urgency of interventions often leave little room for experimentation or innovative thinking. However, the informality of the workshops created the much-needed space to consider alternative approaches, especially in the face of constraints.

This setting revealed that governance structures, while often perceived as rigid, are, in fact, malleable. Although the workshops did not culminate in final governance measures, visions, or pathways, they initiated and offered a preview of how reconfigured power dynamics might look and how initial steps in repairing pathways, particularly in the social sector, could unfold. Informal interactions encouraged stakeholders to view the governance system as an evolving framework, capable of adaptation and modification, facilitating deeper engagement with all actors in the system—regardless of their perceived influence—and broadening the scope for collaboration and innovation.

Moreover, the workshops were instrumental in identifying the key conditions that foster the nurturing of consolidative and *jugaadu* capacities, where stakeholders could consolidate efforts or adopt improvisational approaches to promote water sensitivity through reparative actions. The informal environment played a vital role, demonstrating how stakeholders could unite to devise solutions that formal regulations might otherwise constrain. While regulations ensure order and accountability, they can also impose rigidity, limiting the questioning of existing structures or the development of innovative alternatives (Molle, 2004). Informal spaces provided the flexibility needed to challenge these entrenched systems, allowing stakeholders to experiment with new ideas and approaches that might not fit within the strict confines of formal governance (Mayaux et al., 2022).

Through this deregulated (not unregulated) setting (Roy, 2009), the workshops showcased how informal interactions could nurture capacities for restorative justice through reparation. They underscored the significance of identifying and addressing these nuanced conditions by fostering an environment where seemingly less prominent issues and marginalised perspectives could be acknowledged and elevated.

A.3.2. Normalising discussions of governance challenges

The informal workshop setting helped normalise discussions about governance challenges, often side-lined in more formal contexts. The relaxed atmosphere encouraged participants to confront and discuss governance issues openly, acknowledging them as critical forms of knowledge rather than peripheral concerns. This shift allowed stakeholders to recognise that water governance challenges are central to effective water management and planning, aligning with the OECD's (2011) assessment that the water crisis is primarily a governance crisis.

A.3.3. Promoting iterative and organic approaches

The informal setup of the workshops encouraged iterative learning and organic strategies, building on the learning described by Haapala et al. (2016). This enabled stakeholders to continuously revisit and reassess their strategies, using tools like the problem tree to incorporate new perspectives and refine their approaches. This iterative process, enriched by the engagement with experts and peers from other cities, led to the reprioritisation of issues and the recognition of the limitations of existing mandates. For example, acknowledging the need for mediators in Bhopal emerged after multiple revisions of pathways through fluid and informal discussions.

The relaxed atmosphere of the workshops, characterised by a food fair, unsupervised classroom arrangement, and flexible durations, contributed to less formal engagement conducive to open dialogue and collaborative problem-solving. This setting allowed for an extension of session times and reorganisation of discussions, fostering a sense of ownership among city stakeholders and leading to a reprioritisation of issues based on collective insights. The approach was crucial in reconciling different problem framings and fostering a deeper understanding of the complexities involved.

A.4. Limitations and recommendations

The workshops demonstrated several limitations, notably the need for a consistent, authoritative presence to maintain stakeholder engagement and translate discussions into concrete actions. Although government representatives in Bhopal privately acknowledged water contamination issues, this did not result in public actions addressing the problem. Future initiatives should strive to integrate a hybrid approach, blending the innovative flexibility of informal structures with the procedural accountability of formal governance, as suggested by Kösters et al. (2020). Furthermore, these workshops were interventions conducted within a limited timeframe. Sustained, meaningful engagement incorporating both formal and informal elements will ensure progress and guarantee that all stakeholder perspectives are heard and valued within the governance process.

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7

Discussion, conclusion, and future direction

Photo Narrative 10: Informal acts of compassion on contaminated lands

Policy decisions are typically grounded in rational frameworks, yet when the objective is to ensure equitable access to water, human compassion and altruistic values often become the unseen drivers of impactful choices, as demonstrated in this study.

I spent a day with a water tanker driver and his helper, observing their daily journey along dusty roads, each stop marked by the urgent need for water. The driver's official route included only those residents who had submitted formal requests and held government-issued receipts. Yet, as we approached a neighbourhood perched on a slope above a contaminated aquifer, he made an unrecorded stop. The people here—a marginalised community, primarily from minority backgrounds—lived on land poisoned decades ago by a catastrophic chemical spill from the Union Carbide Plant. Their groundwater was irreparably contaminated, a lasting consequence of an industrial disaster they did not cause. The tanker was their only reliable water source, but official allocations were persistently insufficient.
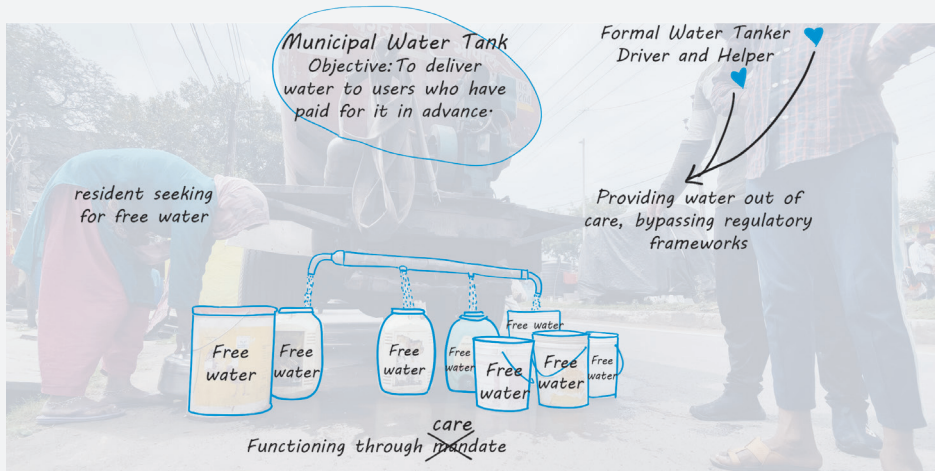
Aware of this, the driver did what he could: he retained portions of water from other deliveries, conserving enough to return to these residents with what remained. In this quiet act of defiance, he took on the role of a contemporary Robin Hood, filling their containers with an unspoken promise—an assurance that, even if the system overlooked them, someone saw their plight.

Here, formal actors extend their roles informally, guided by values no policy can mandate. While these small, unofficial gestures may not directly address the systemic injustices underlying this crisis, they offer an immediate respite to those otherwise rendered invisible. These residents, forced to subsist on land contaminated by corporate negligence, depend on the driver's quiet defiance for their survival. Meanwhile, formal policies remain indifferent, slow to acknowledge and respond to this enduring legacy of contamination. And so, through these informal channels of compassion, water continues to flow to those left unseen by official structures.

The core of this research was to explore how informality could contribute to reparative urban water governance. In this thesis, I developed a conceptual framework to evaluate both the potential and the extent to which informality can support reparative governance capacities. This study has illuminated the meaning of water sensitivity and how water-sensitive futures can be achieved through reparative governance capacities shaped by informality. More specifically, it contextualises transformative governance through the lens of 'reparation.' This mode of transformation is incremental, iterative, and contextually grounded, complementing the often-ambiguous goals of water governance, especially those related to adaptation.

In developing the conceptual framework, I drew extensively on scholarship (Ahlers et al., 2014; Cawood et al., 2022; McFarlane, 2019; Misra, 2014; Roy, 2005, 2009; K. Schwartz et al., 2015; Wahby, 2021) that reconceptualises informality not merely as a reactive response to formal governance gaps but as an active, co-constitutive force within governance arrangements. This perspective positions informality and formality as interdependent, hybrid arrangements that function beyond conventional binaries. The lens of governance capacities allowed me to understand how these hybrid arrangements enable reparation.

My research further revealed that merely identifying transformative capacities through informality was insufficient. Such approaches might address local or domain-specific issues while inadvertently perpetuating social injustices. Within this context, the concept of reparation emerged as a normative foundation, guiding the direction of transformation, and situating water sensitivity more appropriately for secondary cities in India. The precarity and ambiguity of water governance, the urgency showcased by these secondary cities, and the governance capacities stemming from informality to enable reparation are key areas my research seeks to understand and explore.

In this chapter, I revisit the research questions and synthesise the findings and insights from my study. I also reflect on my positionality, interpreting the results within the broader context of contemporary discussions on transformative water governance, particularly from a Global South perspective. This involves analysing the research through the lenses of decolonisation, informality, and reparation studies. Additionally, I aim to identify future research directions on how reparation can be further contextualised and how intersecting various forms of justice with transformative governance might foster diverse forms of transformation, better suited to specific geographies and contexts. of water sensitivity and how water-sensitive futures can be achieved through reparative governance capacities shaped by informality. More specifically, it contextualises transformative governance through the lens of 'reparation.' This mode of transformation is incremental, iterative, and contextually grounded, complementing the often-ambiguous goals of water governance, especially those related to adaptation.

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7.1. Revisiting the research questions

This section revisits the sub research questions to assess - To **what extent and in what ways can informality contribute to the development of governance capacities that can facilitate reparation to achieve water sensitivity in secondary Indian cities?** By addressing each sub-question, I unpack the findings, examining how informality functions as a mechanism for reparative governance in these contexts.

7.1.1. Sub research question 1 – How can capacities for reparative urban water governance, supported by informality, be conceptualised?

Persistent water challenges have been attributed to the limitations of formal local governance structures, which frequently rely on technocratic, quick-fix solutions (Enqvist & Ziervogel, 2019). Typically devised through missions, programs, and projects by local municipal and development authorities, these responses tend to be sporadic, episodic, and lacking in transformative potential. A transformative approach involves addressing the underlying root causes of issues, cultivating collaborations and learning across multiple stakeholders, sectors, and scales (Rink et al., 2018). This transformative perspective highlights the complex dynamics, deep uncertainties, disruptions, and contested nature of the radical changes stemming from climate change and

other pressing social, economic, and environmental risks and pressures (IPCC, 2018; Wise et al., 2014).

However, in contexts like India, simply adopting a transformative governance perspective to achieve goals such as water sensitivity is insufficient. Such approaches might not result into just and equitable goals, raising important questions: transformation for whom? And at what cost? Hence, resilience, sustainability, or sensitivity goals often need to be more clearly defined. Historical injustices due to colonial exploitation, caste, and religious divides necessitate a reparative approach to avoid perpetuating existing injustices. Reparation as a mode of transformation suggests addressing past issues to heal towards a more just future, centring on restorative justice as a normative foundation (Gibbs, 2009; Kim, 2021; Zhang, 2018).

Studies have shown that novel transformative governance arrangements facilitated through water management ideals (such as IWRM) can sometimes harm existing financial and cultural governance fabrics (Denby et al., 2016; Giordano & Shah, 2014; Shah & van Koppen, 2016). However, this is where existing informal arrangements have demonstrated potential, reminiscent of reparative governance approaches, to tackle urgent and persistent water crises (Cawood et al., 2022; Mayaux et al., 2022; Wahby, 2021). Therefore, in this study, I conceptually explore whether informality in secondary cities with impending water crises, limited resources, and complex cultural contexts has created capacities for reparative urban water governance to achieve goals such as water sensitivity.

Reparation provides a nuanced orientation to transforming urban water governance by acknowledging the complex, uncertain, and contested dynamics of urban transformations across scales and sectors. This perspective helps identify and address the structural root causes of persistent water challenges, including issues of scarcity, excess, contamination, and unequal distribution. Further, this thesis has shown that informality has the potential to fundamentally alter urban governance arrangements by including unconventional actors, considering cultural norms and resource-constraint vulnerabilities, and comprehending the complex nature and contested dynamics of urban water transformations. Informality demonstrated the potential to gracefully transform the existing urban water governance structures and processes through iterative and context-sensitive processes.

In addressing persistent water issues, scholars such as Misra (2014) and McFarlane (2019) highlight the hybrid nature of informality, describing it as a symbiotic relationship with formal systems. This involves recognising the limitations of formal structures, selectively disaggregating specific service delivery mechanisms, and collaboratively creating new, co-produced entities (Ahlers et al., 2014). Such hybrid arrangement integrates a wide array of actors, actions, and strategies deeply rooted in the local context, showcasing its capacity for reparative governance arrangements. While some studies indicate that informality can perpetuate injustice and inequality, other cases highlight its potential to address and overturn these issues, manifesting

as reparation effectively. The challenge is therefore to understand how informality addresses the need for reparation.

Focusing specifically on India's rapidly growing secondary cities, reparation as a transformative approach holds particular relevance, as these urban centres attract migrant populations from nearby towns and villages (Krishnamurthy et al., 2016; Roberts, 2014). However, this rapid urban expansion outpaces infrastructural development, leading city actors to rely on informality to manage urban water needs. Globally, secondary cities are recognised for their potential to alleviate pressures on primary urban centres by integrating into a broader urban network (Cities Alliance, 2019; Kalwar et al., 2020; Marais & Cloete, 2017). Yet, governance challenges in these cities are intensified by a system that often disempowers local governments, restricting their capacity to effectively address critical issues (Jacob, 2019). Although the 74th CAA aimed to increase autonomy and institutional support for cities, its implementation has fallen short; the intended powers and institutions remain largely underdeveloped, limiting their impact on urban management (Jha & Vaidya, 2011). This systemic gap complicates resource management, especially for water. Consequently, secondary cities rely heavily on state agencies for governance and service delivery (Bajpai & Kothari, 2020; BMC, 2009; Jha & Vaidya, 2011; KPMG, 2018). This dependency is evident in the operations of the PHED and the State Irrigation Department in Bhopal, as well as the GWSSB in Bhuj, positioning secondary cities as ancillary service providers with limited autonomy and flexibility in governance.

My study explored how informality can address these limitations in secondary cities of India by enhancing the efficiency of decision-making processes and harnessing local knowledge for tailor-made solutions. For instance, initiatives such as Urban Setu in Bhuj, or the collaborative efforts in Bhopal between Water Aid and local NGOs exemplify the potential of local governance frameworks to enable reparation. The involvement of elected officials and municipal staff in these platforms promotes immediate and reparative interactions at the local scale, changing the hindering governance mechanisms sensitively.

I conceptualised reparative governance capacities emerging from such informality in my study for which I drew extensively from a substantial body of literature on governance capacities such as integration (Freeman et al., 2013), cooperation (Dang et al., 2016), collaboration (Ansell & Gash, 2008), connective (Bettini et al., 2016), orchestration & transformative (Hölscher et al., 2019) and flexibility (Termeer et al., 2015). The conceptualisation of these capacities served as a guiding template to identify the reparative characteristics within informality. The literature provided a guiding light to understand how governance characteristics such as coordination, collaboration, innovation, and doing *jugaad* can enable reparation.

While the existing literature provided a foundational understanding, I needed help finding pertinent research on how informality demonstrate reparative potential, particularly in the water sector. This limitation stemmed from a dearth of scholarship from the Global South and a tendency within academia to marginalise such governance forms as anomalous, peripheral,

or dysfunctional (Ahlers et al., 2014). To support this endeavour, the seminal works of scholars such as Ananya Roy (2005, 2009), Naura Wahby (Cawood et al., 2022; Wahby, 2021), Gautam Bhan (2019), Ahlers et al. (2014), Michelle Kooy (2014), and Sahana Chattaraj (2019) and Thomas Elmqvist et al. (2018); have been crucial in conceptualising the significant presence of informal governance mechanisms and employing precise terminologies that retain their nuanced, contextually embedded meanings.

Drawing from the scholarship on governance capacities, the works of Gautam Bhan on informal governance in the Global South have further nuanced the characteristics, moving away from terms like integration, coordination, and collaboration. The study revealed that actors with different roles and mandates do not always coalesce cohesively due to professional insecurities, political tensions, and institutional vulnerabilities. By acknowledging these contextual nuances through a restorative justice approach, I conceptualised the capacity for consolidation. Similarly, I characterised the capacity to innovate and adapt as *jugaadu*, a term grounded in the Indian conditions of being innovative within resource-constrained contexts.

Jugaad views such constraints not as hindrances but as contexts that shape capacities aligned with Indian sensibilities and socio-economic realities. Both consolidative and *jugaadu* capacities demonstrate a reparative' organising logic', where water services are disaggregated and co-produced using locally accessible resources and rationale to enable repair. Hence, I identified two reparative capacities stemming from informality: consolidative and *jugaadu. Consolidative capacity* entails the amalgamation and self-organisation of individuals, ideas, and practices. Meanwhile, *jugaadu capacity* refers to the adeptness in devising innovations and exnovations, embodying the frugal acumen to navigate and improvise within constraints—bureaucratic, cultural, financial, and behavioural obstacles—while achieving long-term objectives.

By developing a framework centred on consolidative and *jugaadu* capacities, this study demonstrates how informality mobilises reparation. These capacities—through their focus on bridging gaps, fostering self-organisation, and innovating within constraints—highlight how informality can reshape reparative urban water governance. Ultimately, this conceptualisation provides a nuanced understanding of how reparative capacities arising from informality can counteract the limitations of conventional governance, paving the way for just and sustainable urban water sensitive futures in India's secondary cities.

7.1.2. Sub research question 2: How are capacities for reparative urban water governance mobilised through informality in secondary Indian cities?

In exploring how informality contributes to reparative governance capacities for water sensitivity are mobilised in secondary Indian cities, I draw on my field experiences (analytical findings) and insights from workshops (action research findings) in Bhuj and Bhopal. This discussion delves into how informality, leveraged through governance capacities, enables reparation within these urban contexts. While not all governance initiatives culminate in reparation, my focus is on how these capacities, observed in both the field and the workshops, contribute to reparation

and to what extent. Additionally, I highlight how reparation aids in contextualising the goal of water sensitivity, grounding it in restorative justice, especially considering the persistent water challenges faced by secondary Indian cities. I also identify the gaps and limitations of these capacities, beginning with a comparative assessment of urban water governance and its challenges in Bhopal and Bhuj.

Bhuj and Bhopal, each with unique water management challenges and similar governance structures, offer valuable insights into how informality may enable reparation toward water sensitivity. Bhopal, the capital of Madhya Pradesh and home to over 2.4 million residents, relies on 18 major water reservoirs but faces persistent water quality issues, flooding risks, and contamination from the Union Carbide disaster (CAG India, 2021; Everard et al., 2020). In contrast, semi-arid Bhuj, with a population nearly doubled to 188,236 by 2011, has relied on traditional water practices but is now straining its resources due to reliance on the Narmada Canal, leading to over-extraction and aquifer salinity (Sheth & Iyer, 2021; van der Meulen et al., 2023). Both cities illustrate challenges of India's secondary cities, where rapid growth and centrally-reliant governance structures hinder local decision-making, restricting quick and contextual responses to pressing water needs (Bajpai & Kothari, 2020).

This is where hybrid formal-informal governance comes into play, supporting formal arrangements and potentially optimising services or enabling repair to address persistent water challenges. My fieldwork sought to illuminate the extent and manner in which capacities emerging from informal governance structures and processes contributed towards reparative outcomes that lead to water sensitivity. Additionally, findings from workshops highlight the extent to which these capacities can be strengthened to foster water sensitivity.

7

Reparative water governance aims to amend or heal urban water governance systems by proposing conditions for collaborative, democratic, locally led, innovative, and flexible approaches to addressing persistent challenges. Hybrid formal-informal governance arrangements aim to support reparation by developing conditions for the self-organisation of varied types of actors (consolidative capacity). This is particularly notable when victims of past injustices organise with decision-makers working on long-term future goals within complex cultural and social contexts, aiming towards healing through informal governance structures and processes. Supporting this, *jugaadu* capacity emerges, manifested through conditions that enable improvisations via frugal, contextually viable methodologies, ideologies, and organisational structures, while dismantling colonial legacies to foster inclusivity and alternative approaches essential for addressing water challenges in resource-constrained environments. Informality encourages a flexible and adaptive approach to governance, integrating local knowledge and practices to address historical injustices, fostering long-term healing and sustainability in water management practices.

Through these conditions, I identified four key insights that mobilise repair to some extent from both analytical and action research in the field and workshops: recognition of the multifaceted nature of water issues, dismantling traditional power hierarchies and including unconventional actors, governance based on networks of care, and flexibility for improvisation.

Insight 1: Recognising multifaceted nature of water issues

Drawing on Cadieux et al.'s (2019) critique of populist resource management and Broto et al.'s (2021) call for engaging with diverse knowledge forms and urban material histories, my fieldwork highlighted how informality helped combine varied knowledge types, unravelling the complex nature of water challenges over time. Non-governmental platforms, frequently orchestrated by NGOs in both cities, were pivotal in synthesising hydrogeological science with historical knowledge to broaden the comprehension of water-related challenges across diverse communities and temporal scales. These platforms subtly critiqued the limitations inherent in formal governance and policy frameworks that focus solely on technocratic issues which involved engineering domain-specific actors while missing out on integrating actors from different domains.

To fill the gaps, NGOs utilised knowledge brokers to integrate scientific insights with experiential and historical narratives, enriching the discourse around water issues and addressing historical injustices and future implications. For example, in Bhuj, NGO workers engaged in water conservation acted as knowledge brokers, leveraging personal narratives and historical interactions to interpret hydrological data and connect the significance of local landmarks to overarching water concerns. This approach enhanced community members' understanding of the interplay between daily life, water quality, and geological features. Similarly, in Bhopal, NGO workers focused on human rights served as brokers, linking insights on water quality with urban planning and human rights concerns. Examining water issues through a human rights lens in both cases led to varied forms of consolidation, aiming for repair through restorative justice. In both Bhuj and Bhopal, NGO actors pluralised knowledge by integrating personal experiences, geological data, and historical narratives, thereby enriching the understanding of water-related challenges and enhancing efforts to address them. These initiatives went beyond the scope of traditional formal policy documents, such as Master Plans or Climate Action Plans, which often overlook the social, cultural, and lived dimensions of water issues. By employing participatory platforms that extended beyond conventional governmental frameworks, these actors facilitated the exchange of vital information, particularly in contexts where official channels were either inaccessible or insufficient.

The capacities encouraged marginalised voices, bringing attention to overlooked practices and acknowledging concerns to a certain degree. However, these efforts did not always culminate in tangible outcomes. Rather than achieving comprehensive recognition, they often amounted to awareness-raising exercises, as formal authorities have not yet fully embraced these diverse perspectives, relegating them to the periphery. This concern aligns with the observation made

by Kösters et al. (2020), who note that these pressing and pertinent hybrid forms of governance risk being overshadowed by political shifts unless bolstered by regulatory frameworks.

The workshops facilitated a rich exchange of perspectives by inviting a diverse range of participants, including those with experiential knowledge rather than just domain expertise, and employing sensitive facilitation. This process enabled introspection on the root causes of the issues, revealing connections to non-technocratic domains such as behaviour. The queries and requests for clarification from non-experts reflected and deepened understanding of municipal processes and the limitations of governmental responsibilities. For instance, the suggestion of needing a third-party mediator for Bhopal arose from a distrust of municipal authorities and as a means to alleviate the burden on already overburdened actors. However, the decision-makers were not equipped to address the multifaceted nature of the persistent problems and lacked the authority to modify formal structures to acknowledge the complexity of the issues. Consequently, the workshop as a temporary platform was insufficient to achieve reparation.

Insight 2: Challenging traditional power hierarchies and localising decision making
The capacities, leveraged through informality have shown potential in reshaping conventional urban water governance by challenging the engineering hegemony and centralised power structures prevalent in secondary cities of India. In my fieldwork, I discovered how these informal mechanisms foster a democratic and participatory model of water management, attempting to include marginalised actors.

My fieldwork revealed how informality challenged power hierarchies in Bhuj and Bhopal by allowing actors to step beyond their formal mandates and engage in collaborative decision-making. I observed that policymakers, NGO representatives, educators, and engaged senior citizens extended their traditional roles to also do mediation and brokering. In contexts where formal governance structures were limited and had a restricted impact, informal platforms like *ward samiti,* as seen in Bhuj, became vital spaces for community engagement. These platforms enabled diverse stakeholders to voice their concerns and participate in the decision-making process, thereby undermining existing power dynamics.

For example, in Bhopal, despite facing challenges such as inadequate support, instances of reparative leadership emerged as these informal spaces empowered previously marginalised actors—like women and senior citizens—to contribute to discussions that directly affected their lives. By including unconventional participants such as housing developers and community members in local deliberations, the process disrupted traditional hierarchies that often sidelined these voices. This approach not only aligned with broader water management objectives but also integrated critical issues such as sanitation, housing, and gender empowerment into the water governance narrative, effectively challenging the established order and promoting a more equitable distribution of power.

7

My research also showcased how the holistic governance arrangements could look like which integrated water management approaches like water sensitivity advocates. Unlike integrated approaches, which often advocate for new governance entities like River Basin Organisations (RBOs), the study demonstrates the adaptation of existing governance structures to facilitate coordination while respecting bureaucratic divides. This approach avoids the cumbersome and costly process of forming a homogenous governance unit by fostering synergistic connections across distinct domains and sectors, enabling them to function cohesively without necessitating complete integration.

The findings from my fieldwork echo the critiques by Giordano & Shah (2014), Denby et al. (2016), and Shah & van Koppen (2016), who warn against the 'packaged' approach of Northern integrated water management models. These models often suggest adapting existing structures to fit their frameworks, rather than empowering local ones. While I recognise the risks of perpetuating existing hierarchies, dismantling them entirely can sometimes cause more harm than good. Hence, IWRM and similar models need to serve more as inspirational tools for assessing existing mixes, rather than rigid templates. Informality demonstrated the strength of current agglomerations of actors and the potential for unconventional combinations to navigate social hierarchies. However, sustaining these mixed groups that challenge traditional hierarchies remains a challenge. New groups formed out of necessity, but without ancillary support mechanisms, they lack the authority and autonomy to continue their work.

For the action-research part of my study, the workshops facilitated the creation of safe spaces to openly discuss and challenge existing power hierarchies. Techniques such as using anonymous voting tools (e.g., Mentimeter) enabled stakeholders to voice concerns about detrimental power structures without fear of repercussion. Additionally, repeated meetings fostered the development of personal networks, empowering participants to propose and consider governance arrangements better suited to local needs. The peer-to-peer discussions allowed stakeholders facing similar challenges to move beyond common complaints and openly examine uncomfortable truths about the complexities of power dynamics. While these mechanisms demonstrated the potential to counter hierarchies by fostering new collaborative arrangements, the conversations did not fully address strategies for dismantling the existing centralised structures. Although the capacities highlighted the necessity of challenging dominant hegemonies, they did not articulate detailed plans for how to do so effectively. Suggestions of protest and continuous negotiation with authorities were made but not elaborated upon, indicating a need for further exploration in this area.

The findings from this research suggest that while capacities mobilised through informality demonstrate potential for disrupting traditional power structures in water governance, substantial challenges persist. The path towards reparative urban water governance remains an ongoing endeavour, necessitating sustained efforts to integrate diverse viewpoints and dismantle deeply entrenched power dynamics.

Insight 3: Networks of care enabling repair

The findings from this study emphasise the reparative potential of governance capacities stemming from networks of care, particularly in Indian contexts where challenging the unsustainable status quo poses significant risks. These networks serve as crucial channels for navigating complex challenges and enabling repair by fostering trust, streamlining decision-making, and aligning solidarity practices.

In contexts where calling out or challenging the unsustainable status quo is risky and culturally discouraged, networks of care offer an essential mechanism for addressing these challenges. Scholars like Sultana (2022) and Williams (2017) highlight the intentional nature of care, recognising its limitations while exploring possibilities through challenges without naivety. Care is also inherently political (Sultana, 2022), and self-care can act as resistance against neoliberal capitalism and coloniality that devalues life (Conradi, 2015). This care politics centralises the addressing of interlocking oppressions by creating coalitions against intersectional harms (Lugones, 2010).

Fieldwork results show that stewards are motivated by care and engage in activities such as hosting water walks, teaching water-sensitive behaviours, and mediating conflicts between state agencies through personal connections. These individuals build trust and streamline decision-making processes within municipalities, bypassing bureaucratic procedures and aligning solidarity practices, as Córdoba et al. (2021) discussed in their case study in the Andean region in South America.

Formal municipal officers, whose autonomy is often restricted, mobilised networks out of care and concern for project well-being. Dominance by state agencies, such as the PHED in Bhopal and the GWSSB in Bhuj, limits municipalities' autonomy and agility in governance (Bajpai & Kothari, 2020; BMC, 2009). However, the study shows that governance capacities aided in overcoming these constraints by speeding up decision-making and applying local knowledge for context-specific decisions. Ethnographic insights revealed how mid-level municipal authorities leveraged personal connections to navigate bureaucratic impediments swiftly.

This analysis, therefore, demonstrated how informality, spearheaded by non-state actors with the support of state entities, can enable swift, trust-based engagement and decision-making, thus facilitating repair to an extent. However, reliance on informality also carries the risk of subalternating challenges. Therefore, the transformative potential of repair grounded in restorative justice seeks to provide an ethical framework, guiding informal processes to re-evaluate their intentions and political stances continuously. By integrating care and care ethics, these informal governance structures not only address immediate issues but also hold the potential to revitalise revolutionary possibilities in the face of systemic violence, particularly those linked to climate coloniality (Sultana, 2022). This holistic approach can contribute significantly to the realisation of reparation.

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Further, the W4C workshop findings indicated that the session's extended duration and informal nature facilitated the development of personal relationships, which is crucial for fostering trust and collaboration among stakeholders. These personal connections enabled deeper discussions about practical challenges, such as budget approvals, which are often difficult to acknowledge and address in more formal settings. Seyla Benhabib's (1986, 1992) work on the care network's ability to reshape models of deliberation supports this view, as these networks foster inclusive and equitable decision-making processes.

These interactions underscored the significance of care networks, highlighting how care encompasses long-term, future-oriented processes (Tschakert et al., 2021). Furthermore, stakeholders from the same secondary cities demonstrated a shared commitment, empathising with one another rather than competing over their respective outputs. This aligns with Lawson's (2007) scholarship, which suggests that care work, despite its challenges, becomes more actionable when grounded in shared experiences and a common sense of injustice, particularly in solidarities rooted in specific places and contexts.

Informal care networks have the potential to provide effective support, but their sustainability often falters when issues are neither immediate nor personal. The *Bhujal Jankars* (groundwater knowers) programme, which empowered locals to manage groundwater data, gradually declined due to the lack of financial compensation. As a result, participants—residents who initially led the initiative—lost their connection to the cause. In contrast, in Bhopal and Bhuj, local champions with deep community ties approached the work as a personal, almost spiritual journey to give back to the earth. This comparison underscores that when a cause lacks personal resonance, participants may join out of solidarity but struggle to maintain ownership and commitment. This challenge is particularly pronounced in resource-constrained contexts, where the absence of financial support further limits long-term engagement.

Insight #4 Synchronising improvisation
The identified governance capacities have been manifested through highly adaptive mechanisms that support improvisation while also enabling its synchronisation within formal institutional landscapes. These improvisations can be synchronised through trial and error and social tinkering within complex socio-political and socio-technical landscapes, as discussed by Kemerink-Seyoum et al. (2019), Elmqvist et al. (2018) and Mayaux et al. (2022). In Global South contexts, for instance, developing and synchronising innovation is often expensive and culturally sensitive, leading to exclusionary practices that perpetuate marginalisation (Mariano & Casey, 2015; Onsongo & Knorringa, 2020; Patiño-Valencia et al., 2022). Informality provides a crucial temporary space to test new ideas, gather evidence, and repurpose existing resources frugally. The concept of 'improvisation' reflects the flexible nature of this innovation, allowing for rapid adaptation and experimentation to address complex challenges (Liu et al., 2018). By providing this flexible and accessible platform, governance capacities can foster more responsive improvisations to resource-constrained and culturally sensitive contexts, ultimately enabling reparation efforts.

In Bhuj, efforts to nurture water-sensitive behaviour exemplify this process. Collaborations between schools, research institutions, and advocacy organisations led to the developing of specialised after-school curricula, circumventing the typically lengthy processes of overhauling educational systems. Furthermore, the installation of rainwater harvesting tanks in the schools enabled communities to observe and replicate the technology within their means, facilitating the gradual synchronisation of innovative approaches. In societies with rigid social hierarchies, critical discussions are often stifled. Informality helps create platforms for such reflections. For example, public spaces in Bhopal were used for protests and exhibitions, and grey literature disseminated information on water contamination. These activities reclaimed space for collective reflection, illustrating how informality fosters the synchronisation of innovative practices through inclusive and participatory avenues.

Similarly, in workshops, iterative learning and organic strategies emerged, reinforcing the kind of learning described by Haapala et al. (2016). This iterative process normalised corrections and improvisations. Participants were encouraged to assess the feasibility of pathways using the problem tree method, incorporating new perspectives introduced by experts and stakeholders from other cities. This back-and-forth engagement compelled participants to confront and reconcile their problem framings with those of others. This critique prompted city stakeholders to reconsider their priorities without compromising their institutional standing or perceived competence. It also prompted them to recognise the limitations of their mandates and the need for interdisciplinary approaches, as evidenced by the acknowledgement of the requirement for mediators in Bhopal. The realisation of the constraints of technocratic approaches emerged after multiple revisions of the same pathways through diverse, dynamic engagements. Furthermore, the critiques emphasised the necessity of diverse disciplines, underscoring the need for mediation and collaborative problem-solving.

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While the research demonstrated significant potential in promoting and supporting improvisation that facilitates reparation, its impact was limited by the presence of rigid platforms and hegemonic terminologies within existing governance structures. These platforms often fail to acknowledge and recognise such efforts as significant contributions to urban water governance because they do not conform to traditional engineering indicators.

	Description	*In field*	*In workshop*	*Limitations*
1. Recognising multifaceted nature of water issues	Informality helped combine varied knowledge types, unravelling the complex nature of water challenges over time	NGOs acted as knowledge brokers, integrating scientific and experiential knowledge.	The workshops facilitated exchange of perspectives including those with experiential knowledge rather than just domain expertise	Limited tangible outcomes as formal authorities often overlook diverse perspectives.
2. Challenging traditional power hierarchies	Capacities have demonstrated potential in reshaping traditional water governance by challenging the engineering hegemony and centralised power structures to include othered voices	Participatory platforms incorporated unconventional actors, including senior citizens, and housing developers, in local deliberations and actions, challenging the dominance of formally imposed groupings (RBOs, WUAs etc.)	The workshops facilitated the creation of safe-enough spaces to openly discuss and challenge existing power hierarchies. Peer-to-peer discussions allowed stakeholders facing similar challenges to move beyond common complaints and openly examine uncomfortable truths about the complexities of power dynamics.	Difficulty in dismantling centralised structures and sustaining new groups without formal support.
3. Networks of care	Care networks are intentional and political, which navigate challenges by fostering trust, streamlining decisions, and aligning solidarity practices.	Municipal officers in Bhuj and Bhopal used personal connections to expedite decisions and apply local knowledge.	Extended duration and informal nature facilitated the development of personal relationships, which is crucial for fostering trust and collaboration among stakeholders. These personal connections enabled deeper discussions about practical challenges, such as budget approvals, which are often difficult to acknowledge and address in more formal settings.	Limited recognition and maintenance of care networks; governance networks based on social trust remain fragile and vulnerable to shifts in political will, leadership changes, and financial constraints.

Table 9: Summary explaining to what extent capacities enabled reparation

	Description	In field	In workshop	Limitations
4. Synchronising improvisation	The capacities have demonstrated high adaptability, creating mechanisms to support improvisation that enable reparation. These improvisations can be validated through trial-and-error method within resource constrained and culturally sensitive environments.	Bhuj's collaborations for after-school curricula and leading through example by building rainwater harvesting tanks in school exemplify this.	Iterative learning and dynamic engagements prompted stakeholders to reassess priorities, normalising going back and forth.	Rigid platforms and hegemonic terminologies hinder recognition and integration of othered efforts.

Table 9: Summary explaining to what extent capacities enabled reparation (Continued)

7.1.3. Sub research question 3: What methods facilitate the identification and nurturing of governance capacities to enable reparation?

The previous research questions explored how to conceptualise governance capacities to enable reparation, its mobilisation and effectiveness, and the hindrances involved. This third question delves deeper into the complexities of recognising and nurturing these capacities, mainly when they aim to facilitate reparation.

Hybrid formal-informal governance approaches acknowledge the limitations of formal structures and involve dismantling existing service delivery mechanisms to collaboratively establish new, co-produced entities (Ahlers et al., 2014). This integrated approach, which draws on a diverse range of locally embedded actors, actions, and strategies, demonstrates the potential for developing reparative governance arrangements. However, in contexts marked by hierarchical tendencies influenced by factors such as age, seniority, and gender, like Indian urban water governance (Kumar, 2007), it becomes increasingly challenging to highlight system discrepancies and inefficiencies openly. Recognising the need for informality necessitates discreetly acknowledging flaws in the formal system, as overt criticism could pose risks to state and non-state actors by challenging the authoritative powers. Additionally, in resource-constrained environments, openly acknowledging the need for reparation may be a sensitive issue, and efforts to address it could perpetuate this sensitivity, resonating with concerns raised by Pereira et al. (2015) regarding the need for safe engagement platforms.

In light of the highly precarious governance landscape, I developed sensitive methodologies for my fieldwork and workshops to identify capacities leveraged through informality and explore the manifestation of reparation. The ubiquitous and ambiguous nature of the capacities makes them

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challenging to identify and strengthen. Additionally, assessing whether these capacities possess reparative value presents a significant obstacle, necessitating a departure from conventional epistemic boundaries and considering more contextually relevant methods for identifying and evaluating these reparative capacities.

When examining urban water governance challenges in Global South locales, most informal governance activities get obscured due to over-normalisation, making them difficult to observe. Given that the resource in question is water, the actors involved included not just authoritative figures and NGO actors but also everyday residents. Ghosh et al. (2021) aptly refer to these challenges as 'everyday struggles,' shedding light on their emancipatory value for reparation. These authors highlight the persistence of coloniality within formal structures and how capacities mobilised through informality underscore struggles through protest, negotiation, and bypassing imposing formal structures to strive towards reparation, especially in the context of restorative justice. However, the same formal structures often frame hybrid extensions to formal processes as 'not-so-formal,' presenting me with three dilemmas in mapping informality in the field: 1) documenting transient oral narratives; 2) discrepancies between verbal accounts and observed practices, and 3) ethical concerns associated with documenting illicit activities.

To address these dilemmas, I combined ethnographic approaches with photographic methods. Ethnography provided reflection, clarity, and a documented record, although it introduced a delay in capturing observations (Adhikari, 2018). Photographic methods compensated for this by offering an immediate visual record and facilitating live analysis alongside textual notes. The ethnographic notes aimed to capture the real execution of formal mandates, highlighting the actual roles of actors, and identifying gaps between their actions and prescribed responsibilities. By examining the decision chain of actors at different hierarchical levels, I sought insights into their vulnerabilities and intentions in adopting informal practices. This holistic approach deepened my understanding of informality. As elaborated in Chapter 3, I outlined five routines of conducting visual ethnography applied in the cities of Bhopal and Bhuj to shed light on how various actors enact informality in addressing gaps within urban water governance. These five routines helped me to address the three dilemmas. I further explain how these routines helped to illustrate whether and how capacities leveraged through informality result in reparation.

The first dilemma, ensuring the accuracy of oral accounts, was addressed by employing visual ethnography sensorially. This approach proved decisive for understanding intentions. Oral accounts, while indicative, often left much to interpretation. However, visual cues enabled a comprehensive interpretation of unspoken markers when decoded using the routines.

The second dilemma, resolving discrepancies between oral accounts and actions, was addressed through triangulation and cross-verification of accounts with other actors in the governance landscape. This process highlighted inconsistencies and revealed the complexities inherent in the system. Additionally, the visual perspective often uncovered overlooked elements, emphasising the significance of personal relationships within informal systems.

Addressing the third ethical dilemma of documenting illicit activities involved two ethnographic approaches: *immersive presence* (Roncoli et al., 2009) and maintaining distance using the *rear-mirror technique* (Wamsiedel, 2017). Immersion fostered trust and understanding of interviewees' vulnerabilities, capturing implicit cues, and adding meaning to photographs. Conversely, the rear-mirror technique maintained a critical distance from illicit activities, allowing reflection on biases and influence, ensuring ethical integrity and respect for participants' confidentiality.

These routines served as a photographic praxis that allowed me to critically engage with both human and non-human actors in these locales. Through these routines, I examined whether capacities informed by informality, resulted in reparation. The routines also revealed that reparation is not an absolute value but rather a spectrum. In this case, regional languages like Hindi helped expand the nuanced meanings of repair, with terms such *as Marammat* (returning to the original), *Rafu karna* (bolstering the old with the new), *Dosh rahit* (emphasising faultless repair), and *Sudharna* (seeking betterment for the future). These vocabularies provide a heuristic map for the multifaceted approaches to repair within the given constraints and opportunities through informal means.

My doctoral study also involves action research, where I examine established approaches like the TM to address persistent challenges in water governance (Brown et al., 2013; Frantzeskaki et al., 2018; Loorbach, 2010). TM nurtures stakeholder innovation and empowerment by providing an integrated mental, social, and physical setting to foster the creation of new ideas, a unified vocabulary, and shared objectives (Loorbach et al., 2015; Nevens et al., 2013). Within TM, *transition arenas* emerge as a process tool to apply the framework within political systems, serving as platforms for diverse actors to overcome structural injustices and collaboratively develop capacities for repair. Research suggests that TM's structured approach through the arenas often struggles to engage deeply with power imbalances and hierarchies in Southern cities, thus overlooking informal governance structures and, ironically, reinforcing technocratic solutions (Nastar & Ramasar, 2012). In response, this study adapts TM's transition arenas into a more flexible approach of *transformative spaces*, better suited to India's complex collaborative logic.

To understand the context in which these transformative spaces are situated, I also studied the Indian governance system, its challenges, and how informality can aid in addressing them. The Indian governance context is characterised by deeply entrenched social and political hierarchies (McFarlane, 2008). In this context, informality plays a crucial role in countering the dominant technocratic hegemony that permeates water management. This hegemony, firmly grounded in 'rationalist perspectives' and 'engineering-focused approaches', often overlooks the interconnectedness with broader ecological, political, and economic systems (Hartley & Kuecker, 2021). These technocratic approaches, rooted in colonial legacies, have influenced urban infrastructure planning and management, instilled a strong sense of urban identity and perpetuated elitist development models that marginalise vulnerable groups (McFarlane, 2008; Mollinga, 2008; Unnikrishnan et al., 2020). Consequently, these models have systematically

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disregarded the critical dependence on natural ecosystems, exacerbating environmental disconnection (Unnikrishnan et al., 2020).

In the given context, informality serves as a strategic alternative. Characterised by innate networks (Jaglin, 2014), flexibility, adaptability, and innovativeness (Ahlers et al., 2014; Simone, 2008), and culturally situated collaboration methods (Chattaraj, 2019; Wahby, 2021), informality attempted to facilitate the creation of 'safe-enough' spaces, as framed by Pereira et al. (2015) within established structures. By leveraging informality, I employed its faculties to integrate experiential knowledge alongside rational knowledge frameworks, as Funder & Marani (2015) discussed while explaining the work of bricoleurs. This approach holds the potential to generate transformative applicable solutions while catalysing local collaboration logic for sustainable integration. This resonates with Ghosh et al.'s (2021) suggestion to explore more meaningful and participatory research methods that empower actors by reducing reliance on external knowledge and aid. Consequently, it became imperative for me to reconsider the design of these spaces, with greater sensitivity towards the precarious and hierarchical governance contexts prevalent in secondary Indian cities.

Drawing on these insights, informality provided three key parameters to guide the design of transformative spaces that nurture capacities for reparation within the complex socio-political and socio-cultural contexts of the Global South. They encompassed: 1) fostering confidence to challenge regressive structures; 2) nurturing frugality and creativity, and 3) instilling belief in transition processes. These parameters were intended to motivate actors to engage meaningfully and consistently over an extended period.

The adapted transformative spaces *cultivated confidence* among participants, persuading authoritative powers to acknowledge previously dismissed issues in water governance. While the actors who had earlier denied or were unaware of the issues showed some temporal acknowledgement, this did not lead to formal recognition or informal acceptance. This necessitates support from institutional frameworks to scale up the recognition of the issues, which would then embolden marginalised actors to speak more openly in such spaces. During the workshops, this temporary confidence manifested through forming informal networks, bringing together individuals facing similar challenges.

The encouragement to *mobilise frugality and creativity* led stakeholders to expand their systemic understanding of water management. This resulted in recognising overlooked domains, such as brokering, liaising, generating awareness, training, creating sustainable financial innovations, and qualitative monitoring, thereby humanising the water management sector. These innovations integrated domains like social psychology and management, previously eclipsed by centralised water management approaches.

The workshops leveraged hierarchical structures based on experience *to instil belief and credibility* in the transition processes. The spaces made senior mentors open up and share their

honest experiences, allowing junior mentees to realise that the goals were achievable. The emphasis on organic session designs and storytelling proved more effective than rigid, well-documented structures, fostering a sense of community and belief in the goals. The organic design of these interactions, where stakeholders had control over the duration and nature, empowered them, leading to sustained engagement and ownership of the solutions. Mutual inspiration among cities was evident, as seen in Bhopal's establishment of a Lake Development Authority (LDA) and Bhuj's focus on community awareness, each offering valuable insights to the other. While the organic design was a significant advantage, it could also be challenging to replicate in the same way. Designing in-situ engagement designs that provide a sense of ownership to the participants may become too customised if the facilitation actors have to do it at many other places, as seen in development projects with limited time and financial resources, challenging its feasibility to replicate.

Developing a sensitive 'facilitator cohort' was equally crucial in devising transformative spaces. Facilitators skilfully brought dismissed topics to the table, fostering respectful and careful discussions. The transformative spaces showcased the impact of qualitative facilitation. Documenting details, maintaining a high facilitator-to-stakeholder ratio, and adopting a non-imposing approach enhanced participants' sense of being heard and encouraged further engagement. Methods such as food fairs and classroom discussions facilitated comparisons and empathy with the proposals, resonating with Pereira et al.'s (2015) conceptualisation of such spaces. However, this process was full of internal politics. The Indian partners in the W4C consortium found themselves in a politically sensitive position. Maintaining professional relationships with stakeholders for future engagements required a tactful approach. Although their established networks proved advantageous in engaging with authoritative stakeholders, the process demanded a careful balance in their assertiveness to prompt reflection and instigate change. Therefore, the aim was not to make facilitation an apolitical process but rather a politically aware one, as (Wittmayer et al., 2024) discussed. Consequently, I concur with referring to these spaces as safe-enough rather than entirely safe, given the presence of internal politics and prevailing tensions.

Furthermore, I also reflect on my positionality as a field researcher and facilitator in the workshops.

Positionality

As a researcher, my positionality was integral to shaping the methods used to identify and nurture governance capacities for reparation. My Indian background provided an insider perspective, facilitating trust and deeper engagement with stakeholders in Bhuj and Bhopal. This enabled me to employ culturally sensitive methodologies, such as ethnography and informality supported workshop formats inspired by bazaar-like settings, which created 'safe-enough' spaces for open dialogue and reflection. Recognising the actors' discomfort in discussing governance challenges, I adapted these formats to navigate hierarchical barriers and foster meaningful participation.

My affiliation with a Dutch institution introduced power differentials, which I managed through techniques like the 'rear-mirror' approach (Wamsiedel, 2017) and maintaining a humble, respectful demeanour. Balancing Dutch ethical standards with local norms, I employed methods that respected cultural sensitivities while enabling the collection of rich, context-specific narratives. Familiarity with Indian social norms and languages allowed me to decipher unspoken markers, further enriching the data and deepening my understanding of governance capacities.

By critically reflecting on my positionality, I navigated power dynamics, cultural nuances, and ethical dilemmas, ensuring that the methods were contextually relevant and effective. Integrating decolonial perspectives (Datta, 2018; Ghosh & Arora, 2021; Sultana, 2023), I prioritised local knowledge systems and practices, recognising their value in fostering reparative governance. This reflexive approach strengthened the integrity of my research, demonstrating how positionality can inform methods that identify and nurture governance capacities in complex, resource-constrained contexts.

7.2.   Summarising the main contributions

This thesis contributes to the field of urban water governance, particularly within post-colonial geographies of the Global South, by examining the dynamics of informality and the processes of repair.

7.2.1. Theoretical contributions

This thesis makes a significant theoretical contribution by advancing the understanding of transformative processes within the socio-political contexts of the Global South, particularly in secondary cities in India. The research innovatively positions reparation as a transformative approach in urban water governance while addressing the complex, uncertain, and contested dynamics of urban transformations across various scales and sectors. It incorporates historical injustices into the transformation discourse, ensuring that these injustices are acknowledged and addressed rather than perpetuated.

By integrating the concept of reparation within post-colonial contexts, this research seeks to address and prevent the recurrence of historical harms, providing a more nuanced understanding of transformation (Bhan, 2019; Broto et al., 2021; Cadieux et al., 2019; Wahby, 2021; Webber et al., 2022). This approach advances the discourse on transformative and transition research by intersecting it with justice elements, thus clarifying the goals of transformation, in this case – reparation (T. Forsyth & McDermott, 2022; McCauley & Heffron, 2018; Thomas & Twyman, 2005). This particular approach is well-suited for water transitions, where the goal-setting processes are more complex and ambiguous than other sectors, and intermediate endpoints play an essential role (Dewulf et al., 2008; Huitema & Meijerink, 2009).

A pivotal aspect of this thesis is the centring of reparation within the elements of restorative justice. It provides a normative goal of determining the reparative goal and why reparation

is necessary in the first place. I engaged with scholarships that focus on just transformation, reparation, and environmental governance that enriched this perspective while emphasising the importance of restorative justice (M. Forsyth et al., 2022; Gibbs, 2009; Kim, 2021; McCauley & Heffron, 2018; Vasilescu, 2022).

Moreover, the thesis builds on informality literature to highlight its reparative potential, particularly in the Indian context. This challenges the traditional view of informal governance as merely a survival strategy for the poor, instead framing it as an organised, transformative, and resilient approach to governance (Cawood et al., 2022; Chattaraj, 2019; Elmqvist et al., 2018; Funder & Marani, 2015; Mayaux et al., 2022; Wahby, 2021). By leveraging conditions stemming from informality, I developed a capacities framework that further aims to enable reparation. The development of the capacities framework furthers the scholarship established by Bettini et al. (2016), Hölscher et al. (2019), Koop et al. (2017), and Wolfram (2016).

7.2.2. Empirical contributions

This thesis makes an empirical contribution by shifting the focus of urban water governance research from India's primary cities to its lesser-studied secondary cities, specifically Bhuj and Bhopal. While existing literature on informality has predominantly focused on larger, primary cities (McFarlane, 2012; Ranganathan, 2014; Wahby, 2021), this study innovatively examines transformative urban water governance approaches within these secondary cities, providing insights into their unique governance landscapes.

The research highlights unconventional actors, lesser-known practices, and under-acknowledged water issues, thereby supporting and extending critical scholarship (Bajpai & Kothari, 2020; Everard et al., 2020; van der Meulen et al., 2023). By closely examining governance practices in the two cities, the study uncovers how the distinctive socio-political and ecological characteristics of secondary cities shape governance traits and present water-specific challenges. This study not only identifies the capacities required for reparative water governance but also pinpoints capacity gaps critical to achieving water sensitivity, underscoring that secondary cities govern differently from primary cities and require tailored governance approaches.

Additionally, this research deepens the empirical understanding of urban water governance by providing a detailed account of governance practices and capacities in Bhuj and Bhopal. Through descriptive narratives and visual documentation, the study builds on existing knowledge of governance in these cities, offering a comprehensive picture of the unique ways in which they navigate water-related issues. This contribution further enriches the literature on governance in secondary cities, as discussed by Haysom (2022) and Kalwar et al. (2019), and underscores the importance of contextualised governance strategies that address the distinct challenges and opportunities these cities face.

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7.2.3. Methodological contributions

I developed a nuanced visual methodology for my thesis to complement the conceptual innovation. Building on the visual ethnography and documentary photography scholarship of Becker (1995), Brace-Govan (2007), Pink (2013a, 2015a) and D. Schwartz (1989), my research outlines five routines for conducting visual ethnography in Bhopal and Bhuj. These routines, functioning as a form of photographic praxis, enable critical engagement with human and non-human actors, illustrating how informality can facilitate reparative processes.

As an action researcher, I further contribute by adapting transformative spaces through parameters drawn from informality. This involves co-producing goals for water-sensitive governance and challenging entrenched technocratic hierarchies. Emerging scholarship on developing transformative spaces in various forms—such as workshops, living labs, and accelerator hubs—particularly in the Global South (Bulkeley et al., 2016; Drimie et al., 2018; Gustafsson & Lidskog, 2018; Hebinck et al., 2023; McCrory et al., 2020; Pereira et al., 2020) has informed this aspect of my research. By evaluating the outcomes of transformative spaces adapted through informality and discussing how these spaces manifest in secondary cities of India, my study contributes to this growing body of scholarship.

Furthermore, the thesis has led to the development of a 'Repair Manual,' (not part of this thesis) a practical guide for establishing transformative arenas in the complex geographies of the Global South. With its clear and actionable steps for implementing transformative spaces, this manual significantly enhances the adaptable methodological guide available to researchers and practitioners operating in similar contexts.

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Photo Narrative 11: De facto water

In the previous photo narrative, we observed how communities situated above a contaminated aquifer must rely on external water sources, which are frequently inadequate. These areas don't benefit from regular 'Robin Hood' deliveries of free water, and in times of severe shortage, residents must resort to more desperate means.

At the heart of this system lies a rusted metal box, holding the key to a valve that directs water flow to each neighbourhood in turn. Officially, an engineer stationed at a distant office has calculated precise timings for each area, aiming to ensure equitable distribution. However, these centrally determined schedules often overlook the complex, lived realities of local politics. Here in Bhopal, close to the Union Carbide site where groundwater is irreversibly poisoned, this system takes on a distinctly informal twist.

In an unofficial yet widely accepted practice, the municipal supervisor has handed over control of the valve to the local champion, a political representative familiar with the needs of these marginalised communities. This quiet transfer of authority sidesteps formal processes, with the supervisor trusting the local champion's knowledge to make more context-sensitive decisions. Though technically unauthorised, this informal arrangement has become the de facto norm, allowing the champion to adjust the water flow according to immediate needs, rather than rigid, distant schedules. In the photograph, we see him turning the valve, an act of localised power that directly determines who receives water and when.
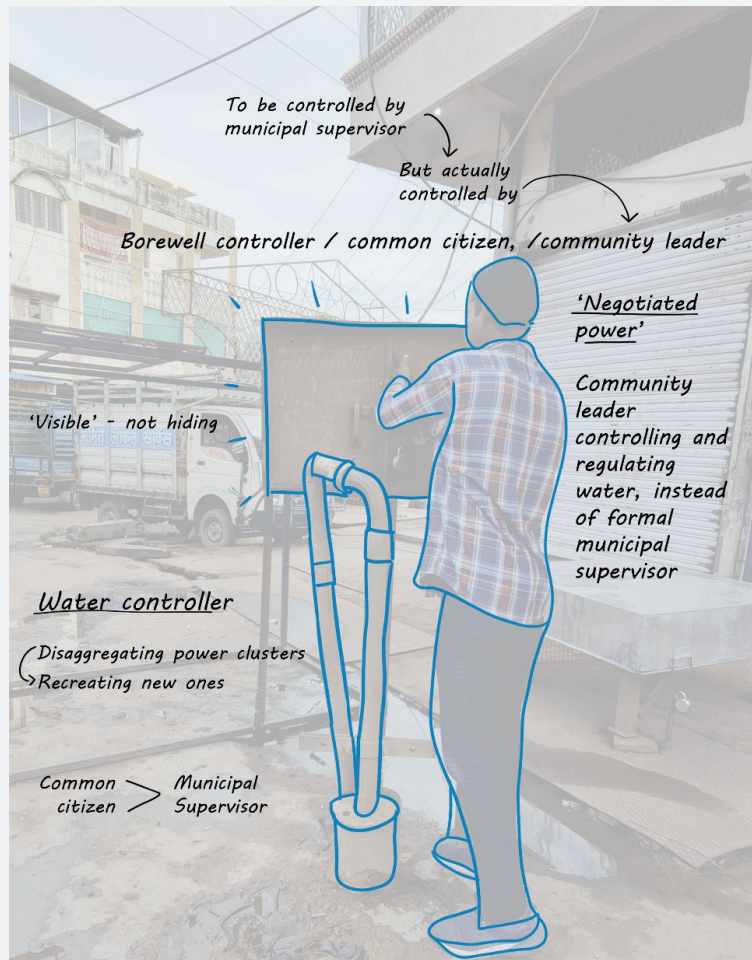
What's striking is the complete absence of oversight or formalised checks on water quality, and there are no official complaints about this shift in authority. This photograph captures the nuanced and deregulated dynamics that drive water distribution in the community. The local regulators defend this unofficial system as a more practical approach to equity, arguing that it better addresses the immediate needs of residents than a detached administrative process could.
In this way, informal authority fills a crucial void, delivering water through flexible, unofficial mechanisms that stand in stark contrast to the detached calculations of centralised planners. The photograph encapsulates how informal power dynamics operate in a deeply unequal landscape, providing essential services where formal systems fall short, and allowing water to reach those left behind by official allocations.

7.3. Final reflections and key takeaways

The study demonstrated whether and to what extent informality can enable reparation towards water sensitivity. Informality mobilises a hybrid governance approach, providing the flexibility to develop and iterate reparative strategies. When the rigidity of formal systems hinders adaptation, the flexibility of informality acts as the necessary grease to address the resistance to change embedded in formal governance structures. It also contextualises governance mechanisms to better align with local needs and conditions. However, for this reparative potential to be fully realised, it is essential to recognise the *alternative mechanisms and dismissed practices* put forth by informality—not to formalise informality itself, but to ensure these innovative approaches are validated, sustained, and synchronised into governance arrangements. Without synchronisation, these alternatives risk being forgotten, leaving the governance landscape to revert to its rigid, technocratic defaults.

Additionally, in absence of regulatory support, the reparative gains of informality can easily be undermined by political instability. As Kösters et al. (2020) note, new governance approaches risk being eroded by political shifts if they are not backed by robust regulatory frameworks. This was evident in Bhopal, where informal governance practices faced challenges due to the lack of institutional support, and similar risks could threaten Bhuj if efforts to normalise these practices were not strengthened.

In concluding this dissertation, I highlight three significant insights that have emerged from my research. These pertain to 1) the role of governance capacities in shaping how reparation manifests in urban water governance, 2) the practical approaches to operationalising decolonisation within water governance frameworks, and 3) the extent to which reparative efforts contribute to advancing water sensitivity. Together, these insights underscore the importance of contextually embedded, inclusive, and adaptive strategies for addressing historical injustices and fostering sustainable water governance practices.

7.3.1. Insights from the capacities framework for reparative urban water governance

The development of the capacities' framework has yielded five insights into my research on reparative water governance. The insights build on the findings generated by Hölscher's (2019) capacities framework for transformative climate governance. Firstly, the reparative capacities framework facilitates an *intergenerational perspective* on reparative water governance. The intersecting literature on informality and reparation provides a comprehensive and intergenerational viewpoint, as outlined in chapters 01, 03, and Interlude A. This literature review reveals how an understanding of urban water governance extends beyond periodic, sectoral, and disciplinary confines. The literature introduces an intergenerational dimension to urban water governance by incorporating non-experts, and indigenous practices and addressing historical injustices. The principle of restorative justice serves as a normative foundation, illuminating synergies and exposing trade-offs among competing sectoral and disciplinary objectives (McCauley & Heffron, 2018).

Secondly, the governance capacities perspective offers an *agency-based understanding,* highlighting the actors and processes through which urban water governance is enacted. This perspective is enriched by the informality literature, which underscores the role of intrinsic motivation (Misra, 2014) —which Bruno Latour (2007) describes as agency extending beyond mere intentionality. The framework aids in understanding the logical reasoning behind the enactment of urban water governance and the subconscious aspects of repair, acknowledging the complexity and multifaceted nature of repair processes. This approach humanises capacities and supports a pluralised application, respecting contextual subtleties and affirming indigenous beliefs and practices previously marginalised by conventional and colonial resource management strategies (Balazs & Lubell, 2014). This unintended attribute of agency stemming from subconscious motivations also connects to intrinsic values of water that go beyond physical consumption, concurring with the sensitivity values highlighted by Wong & Brown (2009).

Thirdly, the framework serves as a tool for *recognising and validating* conditions stemming from *informality*, encouraging a governance approach that works with these informal dynamics rather than against them. By embracing informality, the framework offers a fresh perspective, countering the common critique that informality leads only to adverse, unequal outcomes (Ahlers et al., 2014). This tendency to reject informality also has roots in colonial legacies (Olajide, 2023). It advocates for a decolonisation process characterised by unlearning, undoing, and relearning (Asadullah, 2021). Highlighting indigenous methods and embracing informality, the framework critiques and transcends traditional institutionalised practices, thereby decolonising the operationalisation of agency and capacities literature with nuanced terminologies reflective of India's cultural logic. For instance, by using nuanced terminologies such as 'pragmatic' mediation, veering, and *jugaad*, the framework situates the capacities within the cultural logic of India, helping to operationalise informality through capacities more effectively.

Fourthly, the framework elucidates the *interconnected nature of consolidative and jugaadu capacities,* demonstrating their cumulative reparative potential. *Jugaadu* capacity, characterised by opportunistic ingenuity, facilitates institutional and material reformulation, serving as a mechanism for social reparation. It informs consolidative capacity, enabling reassessment of coalitions and realignment with long-term perspectives, thereby ensuring restorative justice. Conversely, the coalitions empowered by consolidative capacity also provide capital and aid in pluralising and offering multiple perspectives to the *jugaadu* capacity, thus providing a contextual reference. This interplay between consolidative and *jugaadu* capacities underscores the framework's goal towards reparation.

Finally, the *identification of capacity gaps* enables the assessment of whether efforts are genuinely reparative or merely reactive, shedding light on the cultural relevance and feasibility of reparative initiatives. These gaps also reveal how organisational priorities can either help or hinder these efforts, affecting whether they support or challenge the current situation.

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Insights	Description	Examples from the case studies
Intergenerational understanding	The reparative informality capacities framework engenders a comprehensive view of water governance, transcending sectoral boundaries and incorporating intergenerational and non-expert knowledge.	In Bhopal, there is ongoing contestation regarding the recognition of water issues, particularly when these issues are framed by victims consuming contaminated groundwater resulting from the Union Carbide spill. Similarly, in Bhuj, CSO and NGO actors employ ancient water conservation practices to revive communal groundwater restoration.
Agency-based Understanding	The framework accentuates the roles and processes of actors in urban water governance, highlighting the importance of subconscious motivations in governance enactment.	Activities such as water walks, local governance strengthening initiatives, pilot projects, and annual protest marches establish fundamental conditions for developing reparative urban water governance capacities.
Recognition of informality	Informality is validated as a means to confront and challenge colonial legacies, advocating for a decolonisation process that embraces indigenous methods and critiques institutionalised practices.	Routinising activities such as water walks and developing councils, even where it is not yet constitutionally mandated (as in Bhuj) or highlighting the importance of acknowledging diverse types of knowledge—beyond just academic publications or government documents—in decision-making. These 'othered' means of making decisions are crucial for reparative urban water governance.
Interrelations between capacities	The framework clarifies the dynamic interplay between consolidative and *jugaadu* capacities, emphasising their combined potential for reparation.	To disseminate knowledge and sensitise the public on water-sensitive practices, involving teachers in Bhuj showcases the adeptness of *jugaadu* capacity. This approach provides new perspectives that influence and enhance consolidative efforts.
Capacity gaps	Identifies and assesses the capacity gaps in governance efforts, distinguishing between reparative and reactive approaches and highlighting the influence of institutional contexts.	Using the framework to critically assess the situation allowed for the identification of barriers to including mediators and stewards who do not fit the conventional role of water experts. These individuals are crucial for implementing local governance arrangements that can facilitate repair.

Table 10: Insights generated by the capacities framework and their application in examining the governance processes in Bhopal and Bhuj cities.

7.3.2. Operationalising decolonisation in water governance

The literature on decolonisation reveals that water is not merely a resource but an entity interwoven with culture, nature, and the everyday lived experiences of people. Recognising this multifaceted nature aligns with the inherently Indian understanding of water as sacred and relational, rather than commodified. This perspective is critical for achieving water sensitive governance goals without reinforcing exclusionary practices such as casteism, patriarchy, and

technocratic elitism, which often marginalise communities. Decolonisation in urban water governance, as demonstrated in this research, involves reclaiming spaces for alternative and dismissed practices, resisting hegemonic knowledge framings, and nurturing reparative rituals of care. These elements challenge entrenched colonial legacies and reframed urban water governance as a collective, inclusive process rooted in local realities.

A key contribution of this work is its focus on reparation as an everyday transformative practice, rather than an abstract policy ideal confined to institutional discourse. By engaging with transformative water governance at the scale of everyday struggles, by underpinning restorative justice, this research illuminates how local actors actively negotiate and address inequities through informal, context-sensitive actions to enable reparation. For example, in Bhuj and Bhopal, informal networks emerged as vital mechanisms for addressing water scarcity and contamination. These networks fostered collective problem-solving and leveraged local knowledge, embodying a form of transformative water governance capable of navigating and challenging the rigidity of formal systems—a continuation of colonial modes of governance. This alternative approach was both flexible and culturally resonant. Reparation, therefore, becomes rooted in the lived realities of communities, addressing immediate needs while laying the foundation for longer-term systemic change.

Moreover, the lens of decolonisation has enabled this study to centre small acts of care and resistance as powerful tools for transformative governance. Drawing from scholars such as Ghosh et al. (2021) and Sultana (2022, 2023), the research highlights how rituals of care— such as collective maintenance of water infrastructure or community-led education on water conservation—serve as acts of resistance against systemic neglect and exploitation. These practices not only sustain essential water services but also reclaim the dignity and agency of marginalised communities. They challenge the technocratic knowledge dominance that often characterises formal water governance by privileging relational, community-based approaches that are deeply rooted in place and culture.

In operationalising decolonisation, this research also seeks to reclaim decision-making spaces traditionally dominated by formal and elite actors. By creating transformative spaces that acknowledges previously dismissed voices — such as women, indigenous groups, and non-experts— this research highlights the critical importance of inclusivity in urban water governance. These platforms provide space for diverse perspectives and lived experiences to actively inform decision-making processes, challenging entrenched hierarchies and fostering more equitable and contextually relevant governance practices. In Bhuj, for instance, women's groups leveraged their local knowledge and social networks to advocate for the restoration of traditional water bodies, bridging the gap between formal policies and everyday realities. Similarly, in Bhopal, human rights actors brought forth heath angle of water challenges, which was earlier considered less urgent and significant by traditional governance platforms.

Through these insights, this study contributes to a deeper understanding of decolonisation in water governance, advocating for a shift from rigid, technocratic solutions to contextually embedded, relational, and inclusive practices. By centring everyday struggles and emphasising the agency of local actors, this work aims to inspire further reflection and action towards decolonial governance models in diverse contexts.

7.3.3. Advancing water sensitivity through reparation

Reparation fosters a synergistic approach to water governance, emphasising coexistence and collective action over the rigid consolidation often associated with top-down integration. While 'integration' typically implies a structured, hierarchical merging of elements into a unified whole, 'synergy' captures the collaborative interplay of diverse actors, practices, and systems, allowing them to retain their distinctiveness. This concept aligns with the ethos of reparative governance, which values coexistence, mutual reinforcement, and the adaptability of diverse contributions rather than enforcing uniformity.

Addressing critiques that integrated water management approaches are overly unrealistic or top-down (Denby et al., 2016; Giordano & Shah, 2014; Shah & van Koppen, 2016), this research highlights how informal collaborations between institutions and marginalised communities can support coexistence and collective action within feasible means, shaping urban water governance goals like sensitivity. The research also critiques the formation for new governance entities like RBOs or WUAs as advocated by conventional integrated water management approach (Giordano & Shah, 2014; Mguni et al., 2015). These models frequently impose standardised structures that fail to address the unique socio-political and ecological contexts of specific regions. Instead, reparation focuses on repurposing and adapting existing governance mechanisms, such as *Ward Samitis* (Ward Committees) and *Mohalla Samitis* (neighbourhood groups), to incorporate water sensitivity objectives alongside their traditional roles. This approach avoids the resource intensiveness of creating new institutions, instead leveraging local knowledge, cultural practices, and grassroots leadership to integrate critical issues like sanitation, housing, and gender empowerment into water governance.

Reparation, as explored in this study, emerges as an iterative and adaptive process marked by incremental, nonlinear progress, akin to a two-steps-forward, one-step-back dynamic (Bhan, 2019). It involves acknowledging and addressing historical injustices while continuously recalibrating strategies to meet emerging challenges (Durbach, 2016). Fieldwork and workshops have illuminated how reparation takes on different meanings in different contexts, even among secondary cities with similar governance challenges.

For instance, in Bhopal, reparation involves recognising and addressing historical and ongoing water contamination to restore reliance on local water sources such as lakes, reducing dependence on the River Narmada. This effort includes not only experts but also citizens, especially those affected by past water contamination. Conversely, in Bhuj, reparation was highlighted through institutionalising water conservation efforts by non-mainstream actors

and preserving historical knowledge of water management to enhance resilience against scarcity and salinity ingress. This approach, though slower, offers long-term benefits compared to the quick fixes favoured by mainstream actors.

The linguistic nuances of the Hindi language further enrich these examples, capturing the diversity of reparative practices. In Bhuj, efforts are described as *rafu karna* (bolstering the old with the new), symbolising the integration of traditional practices with innovative solutions. In Bhopal, *sudharana* (seeking betterment for the future) and *dosh rahit* (emphasising faultless repair) reflect the city's dual focus on immediate remediation and long-term improvement. These terms highlight the cultural specificity of reparation, urging academics and practitioners to adopt a pluralistic approach that respects local traditions and knowledge systems.

7.4. Future research directions

Future research should explore how informality can encourage transformation or reparation by undoing existing institutional frameworks and fostering reparative governance that remains flexible, context-sensitive, and inclusive. Rather than fully institutionalising informality, the focus should be on preserving space for informal practices that adapt to local needs while challenging rigid, hierarchical structures. While informality supports formal governance by introducing much-needed flexibility, it also runs the risk of perpetuating existing power hierarchies unless integrated thoughtfully into broader governance structures. To ensure informality contributes to lasting systemic change, it must be supported by institutional mechanisms that challenge, rather than reinforce, power imbalances. This research further prompts a critical inquiry: how can future governance frameworks effectively recognise and synchronise informality while safeguarding their inclusivity and resilience in the face of political shifts?

Additionally, further research should expand the concept of reparation across varied geographical contexts, integrating it with diverse justice principles. This expansion involves adapting the concept to different socio-political landscapes and intertwining it with different forms of justice. By doing so, reparation can address a broader spectrum of historical and contemporary injustices, offering tailored solutions that resonate with local realities. Researchers and practitioners are encouraged to delve deeper into how reparation can be pluralised and contextualised, ensuring that different communities' unique needs and challenges are met with appropriate and effective strategies.

Moreover, it is essential to adopt a proactive approach to understanding transformative and reparative informality, particularly recognising its various manifestations and degrees within the geographies of the Global North. Informality is often viewed through a narrow lens with a negative connotation, predominantly associated with the Global South. Doing so overlooks the humane and subconscious rationale for governance processes and structures prevalent in all kinds of geographies. Acknowledging and studying the informal processes and practices in the Global North can provide valuable insights into alternative governance and management

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models. This broader understanding can reveal the hidden dynamics of urban resilience, resource management, and community engagement, fostering more inclusive and adaptable governance frameworks that accommodate diverse societal needs and practices.

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Appendices

Appendix: Interview and observation guides

A.   Semi-structured interview guiding template

Background	
Type of Stakeholder:	Government (G) | Civil Society/Advisory (CS)| Academic (A)| Private Service Provider (P)| User (U) | Others (O)
Interview No.:	I_L/CS/A/P/U/O_01
Date and Day:	
Start and End Time:	
Is this Interview in relation to any observation? Is yes, then state the Observation No.	O_L/S_01
Interviewee Name:	
Description of the Interviewee	
Relation between interviewer and interviewee	*How was the interviewee introduced to the interviewer?* *How was the meeting followed up?*
Anything interesting about the day:	Friday…weekend starts… Monday…start of the weekday. Work pressure March…year ending…pressure to finish work Rainy days/Drought days Night… In an enclosed office, with no one to pry Daytime…husband not home…safe to discuss
Place of conducting interview:	
Thick description of the place:	*Physical description:* *(Value)How does the place influence the interview, what is the value addition:*
How is the observer feeling?	*Pressured? Intimidated? Safe? Trustworthy?*
How is the interviewee feeling? Through observational signs.	*Hesitation, comfortable, rowdy, overconfident*
Is the interviewee alone? If not, then who else is present?	
Reason of the interviewing them	
How does it relate to transformative informality - consolidative/*jugaadu* capacity	

Interview
These are generic questions. For appropriated questions as per the stakeholder, refer excel.   **Introductory Questions:**   What was the different projects you are currently involved with? Could you explain your role in those projects? How long are you involved in them?   *Research Specific Questions:*   1) *Who are the key stakeholders for your projects?*   2) *How does their role at a state + city level mediate in this collaboration and coordination?*   3) *What encourages actors from within and beyond sectors and department to consolidate; and align their sectoral goals to larger mission?*   4) *How are different and potentially conflicting goals accommodated? How are conflicting goals of different sector prioritized, resolved, and aligned to water goals?*   5) *Who mediates the different interests, positions, and motivations of actors in regard to disaster management? How?*   6) *What makes this collaboration sustain?*   7) *What are the spaces and ways to assess opportunities, gaps, and challenges around the challenges that hinders the collaboration?*   8) How do you aid in translation the goal of this larger objective to each of the actor's individual goals? Do you have specific case-based examples?   9) How does institutional / social landscape support of hinder this adaptation and translation?   10) How do you facilitate and officiate innovative solutions during complex situations? Could you state some examples of difficult complex situations? and the solutions facilitated?
Photographs:
Post Interview notes
Follow up

B. Observation template

Background	
Type of Observation:	Short (Day/Meeting) | Long
Observation No.:	O_L/S_01
Date and Day:	
Start and End Time:	
Is this observation in relation to any interview? Is yes, then state the Interview No.	I_L/CS/A/P/U/O_01
Anything interesting about the day:	*Friday…weekend starts…* *Monday…start of the weekday. Work pressure* *March…year ending…pressure to finish work* *Rainy days/Drought days* *Night…* *In an enclosed office, with no one to pry* *Daytime…husband not home…safe to discuss*
Place:	
Thick description of the place:	*Physical description:* *(Value) How does the place influence the observation, what is the value addition:*
Observational Event: *What is under observation?*	Meeting (L) – One of many episodes. Episode No -
	Meeting (S) – Exclusively one
	Practice (L) – Consistently covering a practice
	Practice (S) – Exclusively one
What is the role of the observer: Reason:	□ Complete participant *Facilitate a workshop with the objective to enable consolidation/ jugaad and then reflect on your actions.* □ Participant as observer *I facilitate few introductions and then accompany an actor to a meeting to observe how they are leading. Convene focussed group meetings + workshops and observe what the actors frame as water challenges and their suggestive measures and reasons behind challenges in first place.* *Observe how the user negotiates, while disclosing you are from the user side.*

	□ Observer as participant *Accompany the consortium actors or to a meeting/workshops/daily spaces of practice to observe how the rest of the actors are able to perform consolidation/jugaadu.* □ Marginal Participant/Complete observer *Shadowing the last mile actors, to document their everyday. Map the mandates in relation to the activities undertaken to achieve their daily goals. Observe when the meetings happen, who leads and why? And who doesn't? What are everyone's position and roles in the meeting.*
How is the observer feeling?	Pressured? Intimidated? Safe? Trustworthy?
Who is (are) the participant(s)	Name 1: Description 1: Name 2: Description 2:
Reason of observing them/their practice/meeting?	
How does it relate to transformative informality - consolidative/jugaadu capacity	
OBSERVATIONS	
Textual Observation:	
Quick Sketch: How are people seated in the meeting? How is the practice maneuvered in the space?	
Photographs:	
Post Observation Notes	
Follow up	

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Summary

Indian cities, particularly secondary cities, face persistent water governance challenges shaped by rapid urbanisation, infrastructural deficits, and socio-political inequities. These challenges manifest in water scarcity, contamination, and flooding, exacerbated by governance structures favouring top-down, technocratic, and compartmentalised approaches. Despite the proliferation of policy frameworks advocating integrated water management, urban governance remains largely entrenched in a legacy of rigid, hierarchical structures prioritising infrastructural fixes over systemic, inclusive transformation. The result is a constant disjuncture between policy aspirations and on-the-ground realities, particularly in cities with limited governance capacity and financial resources.

This thesis investigates the potential of reparative governance as a transformative approach to addressing these governance challenges. I conceptualise reparative governance as transformative governance that explicitly confronts historical injustices and socio-political inequities embedded in colonial-era infrastructures and institutions. These injustices continue to shape access to water resources, reinforcing vulnerabilities that conventional governance approaches fail to address. By integrating principles of restorative justice, reparative governance seeks to rectify these historical disparities while fostering equitable, inclusive, and context-sensitive transformations in urban water governance. Without such an approach, water-sensitive governance risks being superficial, perpetuating the status quo through new exclusionary structures rather than genuinely addressing socio-political inequities.

This research examines how the capacities of reparative governance can be used to analyse the role of informality in shaping water governance in Indian secondary cities. In many urban contexts, informal governance arrangements emerged in response to formal governance deficits, operating as a pragmatic mechanism for service delivery, resource mobilisation, and negotiation of authority. Informality does not exist in isolation but instead interacts with formal governance structures, forming a hybrid system of governance that shapes access to water and decision-making processes.

This thesis was guided by the central question: **To what extent and in what ways could informality contribute to the development of governance capacities that facilitated reparation to achieve water sensitivity in secondary Indian cities?** This overarching inquiry was broken down into three sub-questions:

1. How could capacities for reparative urban water governance, supported by informality, be conceptualised?

2. How were capacities for reparative urban water governance mobilised through informality in secondary Indian cities?

3.   What methods facilitated the identification and nurturing of governance capacities to enable reparation?

The study was anchored in a comparative analysis of Bhuj and Bhopal, two Indian secondary cities with distinct water governance challenges. Bhuj, grappling with water scarcity and salination, and Bhopal, contending with water contamination and unequal access, presented contrasting yet interrelated governance dilemmas. By examining how informal actors, networks, and practices shaped governance capacities in these cities, this research sought to uncover the mechanisms through which informality fostered adaptive, inclusive, and reparative governance outcomes.

A key contribution of this research is the conceptualisation of reparative governance capacities emerging from informality. These capacities illustrate how governance actors navigate formal-informal intersections, mobilise resources, and challenge entrenched power structures to advance water-sensitive governance. Through an agency-focused perspective, this thesis examines how actors within informal governance arrangements facilitated participation in decision-making, drive knowledge co-production, and negotiate governance outcomes in ways that aligned with reparative objectives.

Ultimately, this thesis contributes to broader debates on transformative urban water governance by situating informality as a critical, yet often overlooked, component in enabling reparative governance. It challenges conventional assumptions that framed informality as a barrier to effective governance, instead demonstrating its potential as an organising logic that fosters governance adaptability and resilience in resource-constrained urban contexts. By shedding light on the interplay between informality and reparative governance capacities, this research advances a more nuanced understanding of how Indian secondary cities could navigate the transition towards water sensitivity.

Reparative governance: A transformative perspective on urban water governance

To situate the reparative potential of informality, this study conceptualises reparative governance as a distinct yet complementary mode of transformative governance. Transformative governance frameworks focus on institutional and structural shifts that facilitate sustainability transitions. However, in contexts shaped by colonial legacies, caste hierarchies, and socio-economic stratification, transitions must engage with the deeper social and political injustices that continue to shape governance processes and power relations.

This study therefore employed a decolonial lens to water governance, critically interrogating the Eurocentric, technocratic, and depoliticised governance models that continue to shape urban water governance. The lens further aided in reframing water governance by examining water-human relations beyond technocratic framings. The postcolonial legacy of governance in India, particularly in urban planning and water management, has led to the entrenchment of top-down

bureaucratic structures that often overlook, marginalise, or dismiss local and Indigenous water knowledge systems. Decolonisation in this context is not merely a critique of historical injustices but an active effort to dismantle dominant epistemologies that marginalise informality and alternative governance practices. By foregrounding informality as an organising logic, this study challenged mainstream governance paradigms that position non-state governance as deficient, instead framing it as a reparative mechanism within urban governance landscapes.

By centring around restorative justice, I advance the approach of reparative governance that foregrounded the need to address historical and systemic injustices, restore agency to marginalised actors, and cultivate more inclusive, flexible, and context-sensitive transformative governance practices. Without such an approach, governance transitions risked perpetuating exclusionary structures, reinforcing entrenched inequalities under the guise of sustainability.

Reparative governance calls for iterative processes explicitly acknowledging past harms, prioritising historically marginalised voices, and facilitating pluralistic decision-making attuned to local socio-political dynamics. It emphasises reconfiguring governance arrangements to create institutional space for actors and knowledge systems that have been traditionally sidelined.

Furthermore, informality is crucial in enabling reparative governance, especially in postcolonial Global South context, serving as an organising logic through which alternative governance arrangements emerge. Informal governance practices often provide avenues for marginalised communities to exercise agency, negotiate access to resources, and build resilience in ways that formal governance structures fail to accommodate. Informality fosters social trust, sustains alternative knowledge systems, and enables adaptive governance responses that are more reflective of lived realities. However, informality is not inherently reparative—its transformative potential depends on the ways in which it is mobilised and the extent to which it disrupts rather than reinforces existing power asymmetries.

This thesis contributes to critical debates on justice and the politics of urban water transformation by situating reparative governance within broader discussions on transformative governance. It challenges dominant paradigms that frame transformative governance in purely technocratic terms and instead advocate for a reparative approach that is historically informed, socially embedded, and attuned to the complexities of urban governance in the Global South.

A governance capacity lens: Understanding informality as a reparative mechanism

To explain how reparative governance was enabled, this research adopted a governance capacity perspective. Governance capacity refers to the ability of governance actors — state and non-state—to mobilise resources, foster networks, and create institutional conditions that support reparation. This study identifies two key capacities: consolidative capacity and *jugaadu* capacity, which emerge from informality.

Consolidative Capacity**:** *Consolidative capacity* reflects the ability of actors to strengthen or develop conditions that facilitate the self-organisation of diverse groups. It facilitates social cohesion, trust-mending, and the alignment of diverse interests towards a shared vision. Drawing on Hölscher et al.'s (2019) concept of orchestrating capacity, consolidative capacity in the Global South extends beyond coordination, emphasising healing and voluntary and temporary collaboration. By fostering networks of trust and shared responsibility, governance actors can bridge institutional gaps and reconfigure decision-making spaces to be more inclusive.

Jugaadu Capacity: *Jugaadu* capacity reflects the ability to improvise through contextually appropriate methods, ideologies, and organisational structures, dismantling colonial legacies while fostering inclusivity in resource-constrained environments. It challenges rigid bureaucratic norms, promotes localised decision-making, and seeks to repurpose existing knowledge and practices to address historical injustices. Rooted in frugality and local ingenuity, *jugaadu* capacity enables actors to experiment with governance practices that prioritise participation and flexibility, ensuring governance remains responsive to shifting socio-political realities.

Together, these capacities highlight the potential of informality to drive reparative governance, enabling more context-sensitive, inclusive, and adaptive governance approaches in Indian secondary cities.

Methods - Visual ethnography and action research to study reparation

To examine reparative governance, this research integrates analytical and action research components. The analytical component employs visual ethnography to document the lived experiences of communities engaging with water infrastructures. Photography, annotations, and participatory mapping serve as tools to capture the socio-political, material, and affective dimensions of governance, enabling a richer understanding of informal governance practices that cannot be fully articulated through text-based methodologies alone. These visual methods enabled the documentation of tacit, sensory, and spatial dimensions of governance, amplifying subaltern perspectives that challenge dominant narratives. By integrating (visual) ethnographic inquiry, this study advanced a more situated, participatory, and embodied understanding of reparative governance in urban India.

The action research component engages with local actors to co-produce knowledge and experiment with governance interventions. This study facilitates governance experiments through interactive workshops, allowing real-time learning and adaptation. These participatory methods enabled through transformative 'safe-enough' spaces enabled a reflexive approach to governance. The action research component fosters horizontal knowledge exchange and iterative governance innovations by engaging with actors across different scales—community members, government officials, and civil society groups.

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This methodological approach ensured that reparative governance leveraged through informality is theoretically conceptualised and empirically illustrated.

Empirical insights: Comparative case studies - Bhuj and Bhopal

To empirically examine the role of informality in reparative water governance, this study focuses on Bhuj and Bhopal—two secondary Indian cities that exhibit distinct governance challenges while also sharing common structural constraints.

- **Bhuj**: Located in a semi-arid region, Bhuj has long relied on traditional water management practices, including community-managed reservoirs and rainwater harvesting systems. However, increasing dependence on large-scale infrastructure projects, such as the Narmada Canal, has altered governance arrangements, reducing local autonomy over water resources. This research investigated how state and non-state actors, including grassroots organisations and civil society groups, have mobilised consolidative and *jugaadu* capacities to restore community engagement in water governance.

- **Bhopal**: As a centrally governed state capital, Bhopal faces challenges related to bureaucratic control, fragmented governance responsibilities, and severe groundwater contamination issues linked to a historic industrial accident. Despite the dominance of state-led planning processes, informal governance mechanisms have emerged in response to persistent governance failures. This study examined how actors, including NGOs and community-led initiatives, navigated governance constraints to facilitate more inclusive decision-making and adaptive governance practices.

By comparing these two cases, this research highlighted how informality interacts with formal governance structures, enabling reparation through social networks, local knowledge, and improvisations.

Analysis, discussion and future directions

This study found that informality enabled reparative governance by fostering four key processes: (1) recognising water governance as a multifaceted issue, (2) dismantling traditional power hierarchies to include unconventional actors, (3) cultivating governance networks of care, and (4) synchronising improvisations for adaptive governance. Informal governance practices proved instrumental in enabling historically marginalised communities to participate in decision-making processes and negotiate power within rigid governance structures to an extent. However, these processes were not without limitations.

Recognising water governance as a multifaceted issue required shifting away from reductionist, technocratic approaches that framed water management as a purely infrastructural or technical problem. Informality provided a lens through which governance challenges could be

viewed holistically, allowing for more nuanced and context-sensitive interventions. However, recognising complexity did not necessarily lead to resolution— as while informality facilitated the identification of diverse perspectives, the actors were often not equipped to address these variations due to their limited agency.

Challenging traditional power hierarchies to include unconventional actors was crucial in advancing reparative governance. This study illustrated the potential for reshaping traditional water governance by challenging engineering hegemony and centralised power structures to include marginalised voices. However, the cases examined did not demonstrate sustained efforts to continue challenging traditional power hierarchies beyond initial interventions.

Cultivating governance networks of care highlighted the importance of trust, reciprocity, and long-term relationship-building in governance processes. These networks extended beyond traditional institutional mechanisms, offering an alternative form of governance that was relational rather than bureaucratic. However, governance networks based on social trust were also fragile and susceptible to shifts in financial constraints. Without structural support, these networks struggled to sustain long-term transformations, particularly when actors lacked the resources or recognition needed to institutionalise their initiatives in ways that resisted co-optation.

Synchronising improvisations for adaptive governance underscored the role of informality in fostering governance approaches that were dynamic, flexible, and responsive to local needs. Actors relied on adaptive strategies that combined local ingenuity, collective learning, and iterative experimentation to address governance challenges. By synchronising fragmented governance improvisations, actors created coherence within existing governance processes, ensuring that small-scale innovations were connected and sustained over time. However, existing rigid platforms and hegemonic terminologies were inadequate to address systemic injustices, and the improvisations were often normalised as stop-gap measures that substituted rather than challenged state inaction.

While these findings highlighted the potential of informality in enabling reparative governance, they also exposed critical tensions and failures. Informality was not inherently just or transformative—its capacity for reparation depended on how it was mobilised, by whom, and for what ends. Additionally, while informality provided space for experimentation and adaptation, its lack of synchronisation meant that many promising governance practices remained vulnerable to shifts in political priorities or funding cycles.

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Future directions

Future research should explore how informal governance structures can be expanded to address intergenerational and ecological justice concerns, ensuring that reparative governance addresses past injustices and builds resilience for the future. Additionally, research should investigate how reparative governance could be scaled and adapted to different urban contexts, particularly in cities facing intersecting environmental and socio-political crises. Understanding how informal governance networks interacted with global governance trends, climate adaptation policies, and transnational advocacy efforts would be critical for advancing more just and sustainable urban water governance models.

By positioning and reflecting on informality as a mechanism that can shape the mobilisation of reparative governance, this research contributed to broader conversations on urban governance, justice, and sustainability transitions. It challenged conventional governance paradigms that prioritised formality and technical expertise, advocating instead for governance approaches that were historically aware, socially embedded, and responsive to local complexities.

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Samenvatting

Indiase steden, met name secundaire steden, kampen met persistente uitdagingen in waterbeheer, die worden gevormd door snelle verstedelijking, infrastructurele tekorten en sociaal-politieke ongelijkheden. Deze uitdagingen uiten zich in waterschaarste, vervuiling en overstromingen en worden verergerd door beheerstructuren die top-down, technocratische en gesegmenteerde benaderingen bevoordelen. Ondanks de opkomst van beleidskaders die pleiten voor geïntegreerd waterbeheer, blijft stedelijk bestuur grotendeels verankerd in een erfenis van rigide, hiërarchische structuren die infrastructurele oplossingen verkiezen boven systemische en inclusieve transformatie. Dit leidt tot een voortdurende kloof tussen beleidsambities en de praktijk, met name in steden met beperkte bestuurlijke capaciteit en financiële middelen.

Deze thesis onderzocht het potentieel van reparatieve *governance* als een transformatieve benadering om deze uitdagingen in waterbeheer te adresseren.[43] Ik conceptualiseerde reparatieve *governance* als een vorm van transformatieve *governance* die expliciet werkt aan historische onrechtvaardigheden en sociaal-politieke ongelijkheden, zoals ingebed in infrastructuur en instituties uit de koloniale periode. Deze onrechtvaardigheden blijven de toegang tot waterbronnen beïnvloeden, waardoor kwetsbaarheden worden versterkt die conventionele bestuursbenaderingen niet weten te adresseren. Door principes van rechtvaardigheid door herstel te integreren, streeft reparatieve *governance* naar het corrigeren van deze historische ongelijkheden, terwijl het gelijktijdig bijdraagt aan rechtvaardige, inclusieve en contextgevoelige transformaties in stedelijk waterbeheer. Zonder een dergelijke aanpak riskeert water-sensitieve *governance* oppervlakkig te blijven, waarbij het bestaande systeem in stand wordt gehouden door nieuwe uitsluitingsmechanismen te creëren in plaats van sociaal-politieke ongelijkheden daadwerkelijk te bestrijden.

Dit onderzoek onderzoekt hoe de capaciteiten van reparatieve *governance* kunnen worden gebruikt om de rol van informaliteit in de vormgeving van waterbeheer in secundaire steden in India te analyseren. In veel stedelijke contexten ontstonden informele *governance*-arrangementen als reactie op tekortkomingen in formeel bestuur, waarbij deze functioneerden als een pragmatisch mechanisme voor dienstverlening, middelenmobilisatie en machtsbemiddeling. Informaliteit bestond niet op zichzelf, maar werkte samen met formele bestuursstructuren, waardoor een hybride systeem ontstond dat toegang tot water en besluitvormingsprocessen vormgaf.

Deze thesis werd geleid door de centrale vraag:

In welke mate en op welke manieren kan informaliteit bijdragen aan de ontwikkeling van *governance*-capaciteiten die repareren mogelijk maken om water sensitief beheer in secundaire Indiase steden te realiseren?

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43   Governance is een lastig te vertalen term die raakt aan Nederlandse termen als bestuur en beheer.

Deze overkoepelende vraag werd verder opgesplitst in drie deelvragen:

1. Hoe kunnen capaciteiten voor reparatieve stedelijke water *governance,* ondersteund door informaliteit, worden geconceptualiseerd?

2. Hoe werden capaciteiten voor reparatieve stedelijke water *governance* gemobiliseerd via informaliteit in secundaire Indiase steden?

3. Welke methoden faciliteerden de identificatie en versterking van *governance*-capaciteiten om repareren mogelijk te maken?

Het onderzoek was gebaseerd op een vergelijkende analyse van Bhuj en Bhopal, twee secundaire Indiase steden met uiteenlopende uitdagingen in water *governance.* Bhuj, dat kampt met waterschaarste en verzilting, en Bhopal, dat te maken heeft met waterverontreiniging en ongelijke toegang, boden contrasterende maar onderling verbonden *governance*-dilemma's. Door te onderzoeken hoe informele actoren, netwerken en praktijken *governance*-capaciteiten in deze steden vormgaven, beoogde dit onderzoek de mechanismen bloot te leggen waarmee informaliteit bijdroeg aan adaptieve, inclusieve en reparatieve *governance*-uitkomsten.

Een belangrijke bijdrage van dit onderzoek was de conceptualisering van reparatieve *governance*-capaciteiten die voortkomen uit informaliteit. Deze capaciteiten illustreerden hoe *governance*-actoren formeel-informele interacties navigeerden, middelen mobiliseerden en gevestigde machtsstructuren uitdaagden om water-sensitieve *governance* te bevorderen. Vanuit een agency-perspectief onderzocht deze thesis hoe actoren binnen informele *governance*-arrangementen participatie in besluitvorming faciliteerden, kennis co-creëerden en *governance*-uitkomsten onderhandelden op manieren die aansloten bij reparatieve doelstellingen.

Deze thesis droeg bij aan bredere debatten over transformatieve stedelijke water *governance* door informaliteit te positioneren als een cruciale, maar vaak over het hoofd geziene factor in het mogelijk maken van reparatieve *governance*. Het onderzoek daagde conventionele aannames uit die informaliteit beschouwen als een belemmering voor effectief beheer, en toonde in plaats daarvan aan dat het een organiserende logica kan zijn die aanpassingsvermogen en veerkracht van *governance* bevordert in contexten met beperkte middelen. Door het samenspel tussen informaliteit en reparatieve *governance*-capaciteiten te belichten, droeg dit onderzoek bij aan een genuanceerder begrip van hoe secundaire Indiase steden de transitie naar water sensitief beheer kunnen navigeren.

Reparatieve governance: Een transformatief perspectief op stedelijk waterbeheer

Om het reparatieve potentieel van informaliteit te duiden, conceptualiseert deze studie reparatieve *governance* als een onderscheidende maar complementaire vorm van transformatieve

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governance. Kaders voor transformatieve *governance* richten zich op institutionele en structurele veranderingen die duurzaamheidstransities mogelijk maken. Echter, in contexten die gevormd zijn door koloniale erfenissen, kastehiërarchieën en sociaal-economische stratificatie, moeten transities ook de diepere sociale en politieke onrechtvaardigheden adresseren die *governance* processen en machtsverhoudingen blijven beïnvloeden.

Dit onderzoek hanteerde een decoloniale lens op water *governance,* waarbij het Eurocentrische, technocratische en gedepolitiseerde bestuursmodellen die stedelijk waterbeheer blijven vormgeven kritisch bevroeg. Deze lens hielp daarnaast bij het herdefiniëren van waterbeheer door water-mensrelaties te bestuderen buiten technocratische kaders. De postkoloniale erfenis van bestuur in India, met name in stedelijke planning en waterbeheer, heeft geleid tot de institutionalisering van top-down bureaucratische structuren die vaak lokale en inheemse waterkennis marginaliseren, negeren of verwerpen. In deze context is decolonisatie niet slechts een kritiek op historische onrechtvaardigheden, maar een actieve poging om dominante epistemologieën die informaliteit en alternatieve praktijken van beheer marginaliseren te ontmantelen. Door informaliteit als organiserende logica naar de voorgrond te brengen, daagde dit onderzoek gangbare *governance*-paradigma's uit die niet-statelijk beheer als inadequaat beschouwen, en kaderde dit in plaats daarvan als een reparatief mechanisme binnen stedelijke *governance*-dynamieken.

Door rechtvaardigheid door herstel als uitgangspunt te nemen, ontwikkelde ik een benadering van reparatieve *governance* die de noodzaak benadrukt om historische en systemische onrechtvaardigheden aan te pakken, de handelingsruimte van gemarginaliseerde actoren te herstellen en inclusieve, flexibele en contextgevoelige transformatieve *governance* praktijken te cultiveren. Zonder een dergelijke aanpak riskeren *governance*-transities nieuwe uitsluitingsmechanismen te creëren en bestaande ongelijkheden te bestendigen onder het mom van duurzaamheid.

Reparatieve *governance* vereist iteratieve processen die expliciet eerdere schade erkennen, historisch gemarginaliseerde stemmen prioriteren en pluralistische besluitvorming faciliteren, afgestemd op lokale sociaal-politieke dynamieken. Het richt zich op het herconfigureren van *governance*-arrangementen om institutionele ruimte te creëren voor actoren en kennissystemen die traditioneel zijn gemarginaliseerd.

Daarnaast speelt informaliteit een cruciale rol in het mogelijk maken van reparatieve *governance,* vooral in de postkoloniale context van de Global South, doordat het functioneert als een organiserende logica waarbinnen alternatieve vormen van beheer kunnen ontstaan. Informele *governance* praktijken kunnen wegen bieden voor gemarginaliseerde gemeenschappen om hun handelingsruimte te vergroten, toegang tot hulpbronnen te onderhandelen en veerkracht op te bouwen op manieren die formele beheerstructuren niet kunnen faciliteren. Informaliteit bevordert sociaal vertrouwen, ondersteunt alternatieve kennissystemen en maakt adaptieve *governance*-reacties mogelijk die beter aansluiten bij geleefde realiteiten. Echter, informaliteit

is niet inherent reparatief—het transformatief potentieel hangt af van de manier waarop het wordt gemobiliseerd en de mate waarin het bestaande machts-asymmetrieën doorbreekt in plaats van versterkt.

Deze thesis draagt bij aan kritische debatten over rechtvaardigheid en de politiek van stedelijke watertransformatie door reparatieve *governance* te positioneren binnen bredere discussies over transformatieve *governance*. Het daagt dominante paradigma's uit die transformatieve *governance* enkel in technocratische termen framen en pleit in plaats daarvan voor een reparatieve benadering die zich kenmerkt door historische onderbouwing, sociale inbedding en afstemming op de complexiteiten van stedelijke *governance* in de Global South.

Een governance-capaciteitlens: Het begrijpen van informaliteit als een reparatief mechanisme

Om uit te leggen hoe reparatieve *governance* mogelijk werd gemaakt, hanteerde dit onderzoek een *governance*-capaciteitenperspectief. *Governance*-capaciteit verwijst naar het vermogen van *governance*-actoren—zowel statelijke als niet-statelijke—om middelen te mobiliseren, netwerken te versterken en institutionele voorwaarden te creëren die repareren ondersteunen. Deze studie identificeert twee kerncapaciteiten die voortkomen uit informaliteit: *consolidative* capaciteit en *jugaadu* capaciteit.

Consolidative capaciteit: *Consolidative* capaciteit weerspiegelt het vermogen van actoren om condities te versterken of te ontwikkelen die zelforganisatie van diverse groepen vergemakkelijken. Het bevordert sociale cohesie, het herstel van vertrouwen en de afstemming van uiteenlopende belangen op een gedeelde visie. Voortbouwend op het concept van orkestrerende capaciteit van Hölscher et al. (2019), gaat *consolidative* capaciteit in de Global South verder dan enkel coördinatie, en legt de nadruk op herstel, vrijwillige samenwerking en tijdelijke collectieve actie. Door netwerken van vertrouwen en gedeelde verantwoordelijkheid te cultiveren, kunnen *governance*-actoren institutionele leemtes overbruggen en besluitvormingsruimtes herconfigureren naar meer inclusieve structuren.

Jugaadu capaciteit: *Jugaadu* capaciteit weerspiegelt het vermogen om te improviseren via contextueel passende methoden, ideologieën en organisatievormen, waarbij koloniale erfenissen worden ontmanteld en inclusiviteit wordt bevorderd in omgevingen met beperkte middelen. Het daagt rigide bureaucratische normen uit, stimuleert gedecentraliseerde besluitvorming en benut bestaande kennis en praktijken om historische onrechtvaardigheden aan te pakken. Geworteld in zuinigheid en lokale vindingrijkheid stelt *jugaadu* capaciteit actoren in staat te experimenteren met *governance*-praktijken die participatie en flexibiliteit prioriteren, waardoor *governance* responsief blijft ten aanzien van veranderende sociaal-politieke realiteiten.

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Gezamenlijk onderstrepen deze capaciteiten het potentieel van informaliteit om reparatieve *governance* te stimuleren, en zo meer contextgevoelige, inclusieve en adaptieve *governance*-benaderingen mogelijk te maken in secundaire Indiase steden.

Methoden – Visuele etnografie en actieonderzoek om reparatie te bestuderen.

Om reparatieve *governance* te onderzoeken, combineerde dit onderzoek analytische en actiegerichte onderzoeksmethoden. De analytische component gebruikte visuele etnografie om de geleefde ervaringen van gemeenschappen die zich verhouden tot waterinfrastructuren te documenteren. Fotografie, annotaties en participatieve cartografie dienden als instrumenten om de sociaal-politieke, materiële en affectieve dimensies van *governance* vast te leggen. Deze methoden boden een rijkere interpretatie van informele *governance*-praktijken, die niet volledig kunnen worden uitgedrukt via tekstuele benaderingen. De visuele methoden maakten het mogelijk om impliciete, zintuiglijke en ruimtelijke dimensies van *governance* te documenteren, waarbij onderdrukte perspectieven werden versterkt die dominante narratieven uitdagen. Door (visuele) etnografische methoden te integreren, ontwikkelde deze studie een meer gesitueerd, participatief en belichaamd begrip van reparatieve *governance* in stedelijk India.

Het actieonderzoek werkte met lokale actoren bij het co-produceren van kennis en het experimenteren met *governance*-interventies. Dit onderzoek faciliteerde *governance*-experimenten door interactieve workshops, waardoor real-time leren en aanpassing mogelijk werden. Deze participatieve methoden, mogelijk gemaakt via transformatieve 'voldoende veilige' ruimtes, stelden een reflexieve benadering van *governance* centraal. Door actoren op verschillende bestuursniveaus—gemeenschapsleden, overheidsfunctionarissen en maatschappelijke organisaties—te betrekken, bevorderde het actieonderzoek horizontale kennisuitwisseling en iteratieve *governance*-innovaties.

Deze methodologische benadering zorgde ervoor dat reparatieve *governance* via informaliteit zowel theoretisch werd geconceptualiseerd als empirisch werd geïllustreerd.

Empirische inzichten: Vergelijkende casestudies – Bhuj en Bhopal

Om de rol van informaliteit in reparatieve water *governance* empirisch te onderzoeken, richtte deze studie zich op Bhuj en Bhopal—twee secundaire Indiase steden met uiteenlopende *governance*-uitdagingen, maar ook gedeelde structurele beperkingen.

- **Bhuj:** Gelegen in een semi-aride regio, heeft Bhuj lange tijd vertrouwd op traditionele waterbeheerpraktijken, waaronder gemeenschapsbeheer van reservoirs en regenwateropvangsystemen. Echter, de toenemende afhankelijkheid van grootschalige infrastructuurprojecten, zoals het Narmada-kanaal, heeft *governance*-arrangementen veranderd en de lokale autonomie over waterbronnen verkleind. Dit onderzoek

analyseerde hoe statelijke en niet-statelijke actoren, waaronder grassroots-organisaties en maatschappelijke groeperingen, consoliderende en *jugaadu* capaciteiten hebben gemobiliseerd om de betrokkenheid van de gemeenschap bij water *governance* te herstellen.

- **Bhopal:** Als centraal bestuurde deelstaathoofdstad kampt Bhopal met uitdagingen op het gebied van bureaucratische controle, gefragmenteerde *governance*-verantwoordelijkheden en ernstige grondwatervervuiling als gevolg van een historische industriële ramp. Ondanks de dominantie van door de staat geleide planningsprocessen zijn er informele *governance*-mechanismen ontstaan als reactie op persistente *governance*-falen. Dit onderzoek onderzocht hoe actoren, waaronder NGO's en door de gemeenschap geleide initiatieven, zich binnen *governance*-beperkingen bewogen om inclusievere besluitvorming en adaptieve *governance*-praktijken mogelijk te maken.

Door deze twee casestudies te vergelijken, toonde dit onderzoek aan hoe informaliteit en formele *governance*-structuren met elkaar interageren, en hoe sociale netwerken, lokale kennis en improvisatie bijdragen aan reparatie binnen stedelijk waterbeheer.

Analyse, discussie en toekomstige richtingen

Dit onderzoek heeft aangetoond dat informaliteit reparatieve *governance* mogelijk maakte door vier sleutelprocessen te bevorderen: (1) erkennen dat water *governance* een meerledige uitdaging is, (2) doorbreken van traditionele machtsstructuren om niet-conventionele actoren te betrekken, (3) cultiveren van *governance*-netwerken van zorg en (4) synchroniseren van improvisaties voor adaptieve *governance.* Informele *governance*-praktijken bleken van essentieel belang om historisch gemarginaliseerde gemeenschappen in staat te stellen deel te nemen aan besluitvormingsprocessen en binnen rigide bestuursstructuren machtsverhoudingen te onderhandelen. Echter, deze processen waren niet zonder beperkingen.

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Het erkennen van water *governance* als een meerledige uitdaging vereiste een verschuiving weg van reductionistische, technocratische benaderingen die waterbeheer enkel als infrastructureel of technisch probleem beschouwen. Informaliteit bood een lens om *governance*-uitdagingen holistisch te benaderen, waardoor meer genuanceerde en contextgevoelige interventies mogelijk werden. Echter, het erkennen van complexiteit leidde niet per definitie tot oplossingen. Hoewel informaliteit hielp bij het blootleggen van diverse perspectieven, waren de betrokken actoren vaak niet uitgerust om met deze diversiteit om te gaan vanwege hun beperkte handelingsruimte.

Het uitdagen van traditionele machtsstructuren en het betrekken van niet-conventionele actoren was cruciaal voor het bevorderen van reparatieve *governance.* Dit onderzoek toonde aan dat water *governance* getransformeerd kon worden door de hegemonie van ingenieursdisciplines en gecentraliseerde macht te doorbreken, zodat gemarginaliseerde stemmen werden gehoord. Echter, de casestudies lieten zien dat deze inspanningen vaak niet verder gingen dan de initiële

interventies en dat er weinig structurele mechanismen waren om deze machtsverhoudingen blijvend te herschikken.

Het belang van vertrouwen, reciprociteit en langdurige relatievorming in *governance*-processen werd benadrukt door het cultiveren van *governance*-netwerken van zorg. Deze netwerken functioneerden buiten traditionele institutionele mechanismen en boden een alternatieve vorm van *governance* die relationeel in plaats van bureaucratisch was. Echter, *governance*-netwerken gebaseerd op sociaal vertrouwen bleken ook kwetsbaar, met name door financiële beperkingen. Zonder structurele ondersteuning hadden deze netwerken moeite om langdurige transformaties te realiseren, vooral wanneer actoren niet beschikten over de middelen of erkenning om hun initiatieven te institutionaliseren op een manier die coöptatie tegengaat.

Het synchroniseren van improvisaties (improvisations) binnen adaptieve *governance* toonde aan hoe informaliteit *governance* benaderingen dynamischer, flexibeler en responsiever maakte ten aanzien van lokale behoeften. Actoren maakten gebruik van adaptieve strategieën die lokale vindingrijkheid, collectief leren en iteratieve experimenten combineerden om *governance*-uitdagingen aan te pakken. Door gefragmenteerde *governance*-improvisaties te synchroniseren, creëerden actoren samenhang binnen bestaande *governance*-processen, waardoor kleinschalige innovaties werden verbonden en over tijd werden behouden. Echter, bestaande rigide platforms en hegemonische terminologieën bleken ontoereikend om structurele onrechtvaardigheden aan te pakken. Bovendien werden deze improvisaties vaak genormaliseerd als tijdelijke noodoplossingen die staatsfalen compenseerden in plaats van uitdaagden.

Hoewel deze bevindingen het potentieel van informaliteit voor reparatieve *governance* bevestigden, legden ze ook kritische spanningen en tekortkomingen bloot. Informaliteit was niet per definitie rechtvaardig of transformatief—het vermogen ervan om bij te dragen aan repareren hing af van hoe het werd gemobiliseerd, door wie en met welk doel. Daarnaast bood informaliteit weliswaar ruimte voor experimentatie en adaptatie, maar het gebrek aan synchronisatie betekende dat veelbelovende *governance*-praktijken kwetsbaar bleven voor verschuivende politieke prioriteiten en veranderende financieringsstructuren.

Toekomstige richtingen

Toekomstig onderzoek zou moeten verkennen hoe informele *governance*-structuren kunnen worden uitgebreid om intergenerationele en ecologische rechtvaardigheidsvraagstukken te adresseren, zodat reparatieve *governance* niet alleen eerdere onrechtvaardigheden aanpakt, maar ook veerkracht opbouwt voor de toekomst. Daarnaast zou onderzoek zich moeten richten op hoe reparatieve *governance* kan worden opgeschaald en aangepast aan verschillende stedelijke contexten, met name in steden die te maken hebben met overlappende milieuproblemen en sociaal-politieke crises. Inzicht in hoe informele *governance*-netwerken *interacteren* met mondiale *governance*-trends, klimaatadaptatiebeleid en transnationale belangenbehartiging

is essentieel om rechtvaardigere en duurzamere stedelijke water *governance*-modellen te ontwikkelen.

Door informaliteit te positioneren en te reflecteren op hoe het als een mechanisme de mobilisatie van reparatieve *governance* kan beïnvloeden, droeg dit onderzoek bij aan bredere debatten over stedelijke *governance,* rechtvaardigheid en duurzaamheidstransities. Het daagde conventionele *governance*-paradigma's uit die formele structuren en technische expertise vooropstellen en pleitte in plaats daarvan voor *governance*-benaderingen die historisch bewust, sociaal ingebed en responsief zijn voor lokale complexiteiten.

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PhD Portfolio

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PhD Project:	Water4Change (The Dutch Research Council (Nederlandse Organisatie voor Wetenschappelijk Onderzoek - NWO) under Grant W 07.7019.103 and the Indian Government Department of Science & Technology (DST) under Grant DST-1429-WRC.)
PhD period:	01/2020 – 03/2024

PhD Courses

Duration	Title of the course	ECTS
28/09/2020-05/11/2020	Philosophy of the Humanities and social sciences	2.5
7/10/2020 – 7/10/2020	Searching and managing your literature	1.0
15/12/2020 – 15/12/2020	Shut up and write	1
29/04/2020 – 12/05/2021	STRN/NEST Methodology School 2021, Lund University	2
12/5/2021 – 12/05/2021	Professionalism and Integrity in Research	1.5
08/11/2021-08/1//2021	Qualitative coding with ATLAS.ti	1.5
07/03/2022-8/-5/2022	Academic Writing in English	2.5
13/04/2022 – 11/05/2022	Doing ethnography	2.5

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Designing and orchestrating workshops

Water4Change Upscaling Learnings Workshop (Jan 2025) – Co-led the design of the workshop in Kozhikode, guiding participants in identifying pathways to scale their learnings towards water sensitivity using the Compass tool.

Water4Change Detailing Pathways Workshop (Mar 2023) – Led the design of the workshops in Bhopal, Bhuj, and Kozhikode to help participants map out pathways towards water sensitivity in urban planning.

Water4Change Repairing Pathways Workshop (Feb 2023) – Developed and organized a unique workshop in Delhi, using a food-fair format to encourage open dialogue on governance challenges, with the goal of nurturing reparative pathways for water sensitivity.

Water4Change Repairing Visions Workshop (Jun 2022) – Led the design of the workshops in Bhopal, Bhuj, and Kozhikode, guiding participants to reflect on existing programs and create a cohesive vision for water-sensitive urban governance.

Water4Change Problem Framing Workshop (Feb 2022) – Co-organized the workshops to help stakeholders in Bhopal, Bhuj, and Kozhikode identify key water governance challenges in their cities.

EU Shared Green Deal (Oct 2022) – Facilitated and organized group discussions within the Mobility group to collaboratively develop pathways for sustainable transport solutions.

ACT Berlin Eye-Opening Workshop (Jan-Mar 2021) – Co-designed and contributed to designing of the workshop focused on fostering ownership and clarifying participant roles in broader urban change missions.

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Appendices

About the author

Neha Mungekar (b. 1986) works at the intersection of urban water governance and justice. My (formal) journey into water governance began at IHE Delft, where we studied water as a vital, finite, and fugitive resource—yes, *fugitive*. That word stayed with me. Working on governance challenges for a resource that refuses to be contained, while bringing a justice lens to the discussion, has since become a personal commitment. This dissertation is but one small yet meaningful chapter in that ongoing pursuit.

Before joining the Dutch Research Institute for Transitions (DRIFT), I worked across disciplines—trained as an architect and urban designer, I taught urban planning, practised environmental photojournalism, and searched for purpose in my work. Some days felt like an endless blur of AutoCAD commands, disconnected from the larger questions I wanted to explore. Seeking something more, I spent six years at the World Resources Institute (WRI) India, facilitating dialogues between actors with competing perspectives, building consensus in complex governance settings. I honed these skills in India, Zambia, the Netherlands, Germany, and Ecuador—unaware at the time that they would all eventually converge in this research.

My academic transition has been anything but linear—shifting from a quantitative planner designing solutions to a qualitative researcher using visual inquiry at Erasmus School of Social and Behavioural Sciences. Moving between spatial thinking, journalistic storytelling, and academic research, I have come to realise that there is still so much to learn—about governance, about justice, and about this ever-elusive, fugitive resource we call water.

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