

Decolonizing governance in Indian cities through reparative capacities. Case - Bhuj

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1. Introduction

Cities of India find it challenging to address the water crises in the form of scarcity, pollution, floods and unequal access (Kumar, 2018; McKenzie & Ray, 2009; Pandit & Biswas, 2019; World Bank, 1999). The complex challenges are persistent¹ (Loorbach, 2010), and more pronounced in secondary cities of India as they demonstrate a faster pace of growth, rapid population rise, migration influx, and limited financial and human resources to meet the demands (Cities Alliance, 2019; Pathirana et al., 2018; Sankhe et al., 2010). Current efforts to combat these challenges are either failing or inadequate (Kumar, 2018; McKenzie & Ray, 2009; Pandit & Biswas, 2019; World Bank, 1999), compelling a paradigm shift in water management (Mihir Shah Committee, 2016).

In this context, the Water Sensitive City (WSC) paradigm, further understood as ‘water sensitivity’, emerged as a unifying vision and provided strategic guidance towards an urban water management approach. The concept puts forth normative values of environmental protection, equity and sustainability with essential water services. It also addresses other goals, including liveability and the role of social cohesion, local communities and governance (Bettini et al., 2012; Bichai & Flamini, 2017; Wong & Brown, 2009).

Addressing the water crises and transitioning to water sensitivity in Indian secondary cities is aggravated by existing urban governance challenges in India. These challenges are further

¹ Persistent problems are highly complex and unstructured as they “are rooted in different societal domains, occur on varying levels, and involve various actors with dissimilar perspectives, norms, and values” (Loorbach, 2010, p. 164).

characterised by coloniality. India, a post-colonial site, showcases internal colonialism, which is reproduced through bureaucratic hierarchies, caste and class supremacy, continuation to use of colonial knowledge frames, planning and management methods to oppress, subordinate, dismiss and ostracise indigenous and local practices, furthering the persistence of issues (Dey, 2019; Sultana, 2023).

Repair as a transition mode invokes situated ways of knowing and meaning-making, changing old ways, and implementing new ones adorned next to the traditions that characterise the context (Frick-Trzebitzky, 2017). The iterative, incremental process manifests as an ‘assemblage of practices’. We gather two notions of repair – one connotes repair as *maintenance* (Henke, 2017); or *bringing it to its original capacity* (Houston, 2017); the other describes it as *sensibility* (Bhan, 2019) for *transformative action* (Henke, 2017). We resonate with the latter group’s understanding of being reparative (Broto et al., 2021; Cadieux et al., 2019; Durbach, 2016; Webber et al., 2022). This implies restorative practices amidst the socio-political-ecological complexities by acknowledging historical wrongdoings (Broto et al., 2021; Perry, 2020). Enabled by informality, repair leads to transformation against systemic lock-ins.

In this paper, we aim to understand how informality can contribute to developing governance capacities for reparative transitions to water sensitivity in Indian cities. Upon consulting (water) governance literature in India, we came across scholars who empathised and illustrated the informal dimension of urban water governance ((Ahlers et al., 2014; McFarlane, 2012; Roy, 2005, 2009). Informality’s organising logic aids in navigating, bypassing, or negotiating the factors leading to persistent water challenges (Anand, 2017; Burt & Ray, 2014; Funder & Marani, 2015; 2019; Randhawa & Marshall, 2014; Ranganathan, 2014). Moreover, the rootedness and reflexivity portrayed by informality reckon creativity, improvisation, constantly challenging world views and situating the local practices in contemporary scenarios (Funder & Marani, 2015; Wahby, 2021).

This made us realise that understanding opportunities and barriers to water-sensitive transitions and the governance thereof in Indian cities requires more recognition of the context-specific attributes of how water is governed informally. We acknowledge the negative traits of informality in the form of unaccountability, lack of transparency, and potentially inducing unequal access and service provision (Anand, 2011; Burt & Ray, 2014;

Ranganathan, 2014). However, informal governance also provides opportunities to navigate governance vagaries, fuzzy boundaries and multiple cultural norms by facilitating self-organisation and creativity (Ahlers et al., 2014; Funder & Marani, 2015; Wahby, 2021). The research focuses on how change is managed in the form of repair, looking at historical wrongdoing and restoring justice iteratively and through a nimbler approach.

We developed and applied an agency-based capacities framework to understand how informality facilitates transitions in the form of 'repair'. The framework aids in understanding the collective ability to organise and address a problem and structuring the conditions resulting from these activities. Governance capacities manifest in the collective abilities of actors and organisations to devise, organise, interrogate, confront, change, alter or even replace the societal structures and conditions; and in those very structural conditions that are resulted due to these same actions (Hölscher, Frantzeskaki, & Loorbach, 2019). The research also confronts the rational perspective of agency by consulting with Latour's (2007) theorisation of agency, which recognises the unintentionality behind the actions.

The following section presents the literature consulted that helped devise the framework. Later, we apply the framework to illustrate the capacities in Bhuj and whether and how they enable reparation. Later, we conclude with a discussion of how the capacities framework aid in distinguishing between repair and reparation. We also follow up on how the capacities framework helped attest to humanising of agency and pluralising and decolonising transformative governance.

2. The need to decolonize water governance through repair (1000words)

2.1. Coloniality and the need to decolonize governance.

India marks a postcolonial site harbouring the effects to date. Even after independence from British colonial rule in 1947, India demonstrates internal colonialism that reproduces a similar exercise of political control by a few privileged elites over other groups (Dey, 2019). Internal colonisation, colloquially understood as 'colonial hangover', prioritises socio-environmental, un-friendly fast production and distinctive environmental politics favouring extractive environmental policies leading to ecological degradation (D'Souza, 2002; Sultana, 2023). Coloniality is carried forward when similar ways of resource management routines

are reproduced to secure an image of 'modernity' (Calvert, 2001; Chavez, 2011). For instance, Sultana (2023) explains how climate coloniality maintains similar power arrangements in organisational, institutional and political structures as demonstrated by the British.

D'Souza (2006) details that the British transformed the local flood rationale to English, which intended to tame the river, bend and domesticate it and suffice the colony's demands. Therefore, the logic was to avert the flooding, keep the land surge free, and continue growing the crops necessary for the economy rather than be seasonal sensitive (D'Souza, 2002). As a result, India is now facing enormous water-related crises due to these colonial-embedded logics. Coloniality also impacts knowledge frames and influences meaning-making (Gandy, 2006).

The current efforts to promote local technologies congruous with ecology and influencing habits must be revised to challenge and overturn this humongous colonial sanitation legacy. There is a need for unlearning, undoing (Asadullah, 2021) and relearning to decolonise water governance. Further inspiring our study to look at local ways of governing, study its transformative aspects and operationalise through capacities. As elaborated in the following section, we read the transformative governance in India as 'repair'.

2.2. Decolonialising transition by foregrounding repair

We look at water transition through a reparative lens that attempts the heal and acknowledges the colonial implications towards urban water governance in India. The ideological framing of 'transformative governance' stemmed from Global North literature for the domains of climate mitigation involving sectors – transport and energy. We delve differently into the water sector and inquire how the transition mode is in such a context. *Repair* as a transition mode invokes situated ways of knowing and meaning-making, changing old ways, or even implementing new ones adorned next to the traditions that characterise the context (Frick-Trzebitzky, 2017). This model is characterised by iterations and nimbler innovations resulting from contextual responses to local and global needs (Bhan, 2019; Broto et al., 2021; Ureta, 2014). The iterative, incremental process manifests as an 'assemblage of practices'.

The Indian empirical case studies demonstrate how the repair is applied as a reaction, a means of survival, to a breakdown or shortcoming (Anand, 2011; Ranganathan, 2014). Such utility discourages it from being recognised as a deliberative mode of transition practice in India. The over-routinisation, falling-back-tendency, equivocal process of application, and blind-eye acceptance of short-term strategies result in lock-in leading to persistent problems. Due to its embeddedness in contextual power dynamics, cultural practices and historical arrangements, repair becomes an unconscious method of adaptation (Bhan, 2019). This normalised trait holds the potential to navigate through local socio-political norms that resist change, exemplifying a way to decolonise the transition process.

We gather two notions of repair – one connotes repair as *maintenance* (Henke, 2017) or *bringing it to its original capacity* (Houston, 2017); the other describes it as *sensibility* (Bhan, 2019) for *transformative action* (Henke, 2017). The latter also resolves to make amends to the old colonial extractive policies for intergenerational timelines. We resonate with the latter group's understanding of being reparative (Broto et al., 2021; Cadieux et al., 2019; Durbach, 2016; Webber et al., 2022). We define (reparative) repair as a mode of incremental, iterative, urgent and timely transition towards a restorative long-term desired goal, dependent on local logic and accessible resources.

Repair of governance structures and processes is realised through the orchestration of non-state and user-led groups and state-led organisations (Wahby, 2021). Repair could be performed purposely, discreetly or sometimes unknowingly. Enabled by informality, repair leads to transformation against systemic lock-ins. We further consult the literature on how informality operates to enable repair.

2.3. Informal water governance in Indian cities

Informality's organising logic aids in navigating, bypassing, or negotiating the factors leading to persistent water challenges (Anand, 2017; Burt & Ray, 2014; Funder & Marani, 2015; 2019; Randhawa & Marshall, 2014; Ranganathan, 2014). While most literature explains informality to connote a type of housing, locality, and labour (McFarlane, 2019), we understand it as a mode of operation. In the face of breakdown, informality pulls in authority, personnel, knowledge, and all the possible faculties within the given constraints. It reorganises to circumnavigate the hindrances to address a challenge (Roy, 2005).

The governance here moves beyond the interconnected networks, which are centrally managed and (aspire to) perform uniformly. Southern cities operate through complex polymodal arrangements where every entity coordinates differentially (Jaglin, 2014). This very differential mobilisation of configuration demonstrates the ability to adapt and respond differently and adequately in different situations and contexts. For instance, when Bangalore Municipality wanted to register its waste-pickers to better its waste management, it could not do so through formal channels (Chandran et al., 2014). The caste politics and unavailability of mediums to reach out to this sporadic informal waste management system made it challenging. It was only through timely collaboration with Charitable Trust and radio stations that showcased a better reach and public acceptance that they could only do so. This introduction of different nodal agencies showcases the ability to steer and coordinate a new form of governance that demonstrates more interaction and reflection (Bang & Esmark, 2009).

These experiences shaped through liaising attest to informality's conceptualisation by McFarlane (2012) where the formal and informal relationship is mutually co-constitutive and can foster or restrict practices. The relation exudes a sense of temporality and fickleness, ironically offering a sense of security towards service production (McFarlane, 2012). This unstable tentativeness is expressed by both state and non-state actors, who turn and twist their positions and mandates and negotiate rules in hand, to enable a shared goal.

The case of Bangalore's waste management highlights how delivery configurations, with their situational morals, dynamics, and personal connections, can traverse power asymmetries. In India, the water system presents an intertwined organisation of socio-technical components that showcases a complex delivery configuration system. These power asymmetries manifest in bureaucratic, hierarchical organisations or rigid legal proceedings. Personal networks aid in bypassing these administrative hurdles to enable a smooth, timely operation. While this may serve as a good case, we caution that the same configurations entrenched in asymmetrical power relations can complicate coordination, further reproducing the inequities (de Sardan et al., 2010).

Rootedness and reflexivity portrayed by informality reckon creativity, improvisation, constantly challenging world views and situating the local practices in contemporary scenarios. Ahlers et al. (2014) discuss how the implicit power dynamics within the networks

lead to disaggregation of the water service system to enable a smooth delivery. The formation of new coalitions challenges individual rationale to coproduce new meanings through shared understandings (Ahlers et al., 2014). Through repurposing and retrofitting, informality gradually dismantles the decolonial governance structures with collectively designed novel interventions and processes.

The cases and literature have repeatedly highlighted the humane aspect of this form of governance. Informality relies on intrinsic motivations and emotional intelligence (Córdoba et al., 2021; Funder & Marani, 2015; Radjou et al., 2012) that supports the agency to collectively build on a speculative vision and sustain through the test of (McFarlane, 2012). This capability encourages the design and implementation of frugal innovation driven by individual interest (Radjou et al., 2012). We assert that intrinsic drives could be self-indulgent for personal benefits or operating out of personal vulnerability and can also be exercised altruistically.

We harvest the agency of informality to enable reparation through governance capacities. The conceptualisation of the capacity framework is detailed in the following section.

3. [Capacities to enable repair for urban water governance Global South](#)

The literature review helped relate the role of informality and how it manifests in the form of delivery configurations to enable transformative governance, further understood as repair'. However, informality has a limited study on how it can be proactively operationalised. Authors have described, illustrated and analysed this form of governance at great lengths but have not demonstrated how these attributes can be mobilised proactively to attain reparative urban water governance. Informality's interpretation in its attributes of plurality and obscurity has challenged creating a structured framing of its very agency that mobilises it (Ahlers et al., 2014). As described by Hölscher, Frantzeskaki, & Loorbach (2019), governance capacities provide an opportunity to bridge this gap by harvesting the action-oriented perspective of informality to enable repair.

Reading informality through agency-based capacities framework aid in understanding the collective ability to organise and address a problem and structuring the conditions resulting from these activities. We concur with the framing of governance capacities described by Hölscher, Frantzeskaki, & Loorbach (2019), where it manifests in the collective abilities of

actors and organisations to devise, organise, interrogate, confront, change, alter or even replace the societal structures and conditions; and in those very structural conditions that are resulted due to these same actions. Therefore, in this study, we operationalise informality through its governance capacities to understand whether and how it enables reparation.

Consulting Latour's (2007) theorisation of agency recognises the unintentionality behind the actions, preventing the capacities framework from reducing the plural complexities of informality in an attempt to fit into analytical models. Understanding that actors can have different and variable world views, interpretations, intrinsic motivations and intentions and are still able to organise and collaborate can restore the diversity of practices that informality brings forth. The non-linear relationship between agency and causality that Latour (2007) foregrounds assist in decolonising the colonial logic, knowledge frames and management ways. Decolonising this rationale unravels different meanings of water and its intentions of management.

We acknowledge that the agency and institutions are also produced by and can reproduce colonialism. The socio-political power arrangements are embedded in the everyday mundane, which can mobilise the same entrenched colonial structures by the few elite authoritative groups. The conditions supporting the capacities help distinguish between the colonial logic of repair and reparation.

We develop and apply an agency-based capacities framework to understand how informality facilitates transitions in the form of 'repair'. The framework aids in realising two interdependent capacities that perform informality by underscoring the conditions that support its "*organising logic*" (Roy, 2005) and its dexterity to change, alter, replace or navigate the incumbents to enable reparation, attaining sensitivity.

We consulted various Northern² literature on capacities that describe the role of informality in its manifestation (Bettini et al., 2012; Brown et al., 2009; Pahl-Wostl, 2009; Termeer et al., 2015). However, the conceptualisation of informality was richer when the empirical cases were situated in Southern geographies. The regional literature helped to colour these subtleties (Anand, 2017; Bhan, 2019; Giordano & Shah, 2014; Narain, 2000; Ranganathan,

² situated in Northern geographies and predominantly theorised by Northern researchers

2014; Unnikrishnan et al., 2020) —such nuanced attributes aided in coining the critical capacities and their supporting conditions.

3.1. Synergetic Capacities

Both capacities, when mobilised together, prevent the reproduction of the negative traits of informality: accountability, unequal access, lack of transparency, and short-term visioning. The purposeful and calculated informality to enable reparation is manifested by capacities that organise actor groups to consolidate in various modes (temporal, discreet, informal) to provide novel or reassert the earlier dismissed indigenous ways of water management. The capacity to repurpose and tinker within the social fabric also encourages the creation of shared platforms and places to deliberate on innovations and designs to get embedded in the same fabric, further strengthening communal bonds and showcasing resilience to enable reparation.

The conditions and their interconnectedness provide directions and distinguish repair from reparation. We also identify activities which illustrate the conditions. In the next section, we elaborate on the capacities and their supporting conditions.

3.2. Consolidative Capacity

In her seminal works on theorising informality, Ananya Roy (2009) highlights how Indian cities function as a deregulated (and not unregulated) geography – where the actor or infrastructure or in a governance arrangement does not perform as per their prescribed roles, mandates and use. The gaps in governance arrangements furthered reinforced by the continuation of colonial logics of planning and management rendering incongruous to the context are bridged by the actors through constructing a unique assemblage of the societal institutions. Such “*calculated informality*” (Roy, 2005, p. 83) demonstrates a logic to organise power, knowledge, and human and water resources. We identify this capacity to self-organise and direct as *consolidative* - borrowing the term ‘consolidation’ from Gautam Bhan’s (2019) essay that describes the culture of practices in the Global South.

Consolidative capacity enables actors to strengthen or develop conditions through self-organisation to realise long-term goals amidst the complex cultural and social fabric. Consolidation as a terminology moves beyond an absolute collaboration and instead demonstrates a way to engage in purposeful networks that come together in various

combinations and are activated when required. In addition to formal collaborations, informal consolidative capacity enables actors to voluntarily, discreetly, and temporally form an association. Funder & Marani (2015) further illustrate that intrinsic motivations and perseverance are significant attributes of this capacity to consolidate actors' variable agencies, mandates, and vested interests.

Consolidative capacity aids in forging relationships, thereby developing or enhancing delivery configuration to realise the desired goal (Bhan, 2019; Jaglin, 2014). This peculiarity arises due to urgency, spontaneity, temporality, lucrativeness and even vulnerability (Anand, 2011; Bhan, 2019; Ranganathan, 2014). Owing to these complexities, this capacity strengthens the ability to organise and co-produce the collective purpose through polymodal arrangements that are not necessarily permanent partnership or that requires giving up their present positions to foster new ones.

The Northern literature – highlighting the conceptualisation of capacities derived from geographies of Global North, showcase similar capacities, such as – integration (Freeman et al., 2013), cooperation (Dang et al., 2016), flexibility (Termeer et al., 2015) collaboration (Ansell & Gash, 2008), orchestration (Hölscher, 2019; Hölscher, Frantzeskaki, McPhearson, et al., 2019). At the same time, *consolidation* offers more dynamic relationships, with evolving transitory partnerships formulated as required and sustained through intrinsic altruistic aspirations.

We further identified three conditions: veering directionality, pragmatic mediation and rebuilding trust. Moreover, we listed activities to support those conditions enabling the manifestation of consolidative capacity. *Veering the directionality of* individual fragmented objectives towards shared long-term goals is a lucrative vantage to converge actions, share information and take responsible decisions (Kudtarkar, 2021). The condition also refers to inner veering (getting veered) (Royle, 2011) that triggers motivation to self-organise and create a sense of ownership towards the goal as an act of solidarity and reciprocity (Córdoba et al., 2021; Kudtarkar, 2021; Zhao & Wu, 2020).

Veering is coordinated by mediators that entail interpretation, facilitation, and knowledge brokering (Brown et al., 2013; Funder & Marani, 2015; Pahl-Wostl, 2009) at opportune moments to consolidate (Huiteima & Meijerink, 2010). However, the act of mediation,

processes (making agreements and structures) (Funder & Marani, 2015) and space to mediate is considered an expensive practice (Cleaver, 2012; Giordano & Shah, 2014). Charismatic and system-aware actors, whose mandates to mediate extend from their existing technical roles to boundary spanners and knowledge brokers, can facilitate building bridges among different actors to enable co-creation (Funder & Marani, 2015; Jaglin, 2014). Sites exhibiting unequal service delivery through continued periods of distrust (seen in prolonged unsatisfactory water management) and lack of competency to improve create a sense of distrust, which can impede consolidative capacity. Working on distrust is more complicated than working on its deficit. Vulnerable groups feel victimised and are concerned about the additional disservice and abuse from the transgressors, along with feeling threatened by transgressors' growing power and untrustworthy platforms to acquire justice (Kim et al., 2009). Hence, *rebuilding trust* forms a vital component in cultivating consolidative capacity in contexts that exude distrust.

We present a table stating activities to support or enable the conditions for consolidative capacity.

Conditions	Activities to support/enable the conditions
Veering directionality	<ul style="list-style-type: none"> - Translation and veering goals of various delivery configurations to the larger mission (Huitema & Meijerink, 2013) - Inner veering that triggers motivation to self-organise and create a sense of ownership towards the goal (Folke et al., 2005; Huitema & Meijerink, 2010). - Creating situated awareness encouraging in forming alliances to mitigate a crisis collectively (Córdoba et al., 2021; Kudtarkar, 2021; Zhao & Wu, 2020)
Pragmatic mediation	<ul style="list-style-type: none"> - Extension of current mandates to support mediation in various forms, namely - boundary spanners, knowledge brokers (Pahl-Wostl, 2009), cultural mediators, (Anand, 2011; Cleaver & Whaley, 2018; Jaglin, 2014) bureaucratic and policy entrepreneurs (Hughes & McKay, 2009), along with the usual roles of leaders, champions and forerunners/frontrunners (Hurlbert & Gupta, 2016; Loorbach, 2010)

	<ul style="list-style-type: none"> - need for people-friendly neutral organisations like schools, NGOs, and sports centres to provide mediation spaces (Kudtarkar, 2021) - Devising partnerships to knowledge dissemination and advocacy (e.g. between the city’s media, research organisations and educational institutes) (Brown et al., 2013). - Identifying and mediating at opportune moments to forge relationship and course-correct to align with the large goals. (Huitema & Meijerink, 2010) - supported with identification and mobilising correct contextual resources (material, knowledge, relationships) to facilitate mediation (Wolfram, 2016).
Rebuilding Trust	<ul style="list-style-type: none"> - Increasing familiarity with local staff and processes to build faith with the government/transgressors (Leahy & Anderson, 2008) - From the user’s perspective, understanding learning perspective of the transgressor (authoritative party) to help mitigate the distrust by understanding bureaucratic pressures, powerlessness, top-down management, legal discrepancies, and lack of resources (Williams, 2012). - Devising avenues to impart procedural justice such as consultation platforms, usable legal tools, means to access understandable data and safe space to talk about failures (Huitema & Meijerink, 2010; Williams, 2012). - Through publicising efforts, celebrating the success of technical skills and socio-ecological disciplines aids in regenerating belief in technical competency (Leahy & Anderson, 2008; Roorda et al., 2014) - Focussing on outreach and investigating avenues of propagating unchecked distrust (Cheung, 2013) helps develop shared interests and values (Leahy & Anderson, 2008). - Assistance and organising events to rebuild a sense of community is essential to general social trust in heterogenous mix neighbourhoods (Leahy & Anderson, 2008).

3.3. Jugaadu Capacity

The role of urban informality in advancing repair is manifested through a complementary capacity with consolidation – one that enables to do, implement, or realise to make reparation happen. This capacity manifests through the collective dexterity of actors to purposefully tinker by altering, replacing or navigating institutions, habits, activities and material logic (physical infrastructure) to enable reparation. *Creativity* here is a guiding tool to blend the gaps between the formal and the informal, statutory and accepted, and personal and communal by adapting agreements and delegation of tasks to different actors (Funder & Marani, 2015).

Focusing on getting the job done (Funder & Marani, 2015; Roy, 2011) may imply exploitative tactics (Ranganathan, 2014). There is an (almost) accepted, implicit rationale for *tinkering* with the institutional settings to make way for the crafted service modality to be operated in various degrees of (Burt & Ray, 2014; Cleaver & De Koning, 2015; Funder & Marani, 2015; Jaglin, 2014; Zwarteveen, 2015). Similar to informality, jugaad can be ‘morally ambivalent’ (Jeffrey, 2009), leading to unsustainable results. However, when this capacity is mobilised along with consolidation, it aids in keeping the desertion and creativity just, enabling reparation (Chandran et al., 2014).

The Indian word that shares this understanding is *Jugaad* (or *Jugaadu* innovations). Jugaad translates into meanings such as make-shift structures, work-around, hacks, frugal innovation, temporary measures, and low-cost ad-hoc fixes (Badami, 2018). Jugaad brings out the aspects of resilience in repair by demonstrating the capacity to work under the material, monetary, political and legal constraints (Badami, 2018). *Jugaadu*³ capacity is manifested through socio-material hybridity, agency and intrinsic motivation embedded in socio-ecological contexts (Elmqvist et al., 2018; Funder & Marani, 2015). The capacity focuses on institutionalising democratised ways of social tinkering, undoing and restructuring towards sensitivity governance goals.

We did find literature that framed similar ideation of this capacity – namely transforming (González & Healey, 2005; Hölscher, 2019), unlocking (Hölscher, 2019), connective (Bettini et al., 2016), and innovative (Furman et al., 2002) capacity. Most of these capacities link

³ Jugaad is noun, while Jugaadu is an adjective

themselves to complex adaptive systems theory (CAS) and comply with its parameters of 'complexity, non-linearity, self-organisation, diversity and emergence' (Beilin & Wilkinson, 2015). However, these capacities miss out on the Southern attributes, obscurities and dexterity of frugality, constraint, improvisation, and eternal sanguineness within the operationalisation of capacity. Many scholars and literature yield the concept of *jugaad* as the 'habitus of the dispossessed'. Instead, we urge to exercise it as an adaptable strategy performed by actors from different backgrounds to ex(in)novate in unequal landscapes.

Along with scientific data, *Jugaadu's* capacity thrives on co-constructing memory exercised through *collective ways of knowing* (Beilin et al., 2013; Goldstein et al., 2013). Collective memory aids in anticipating risk, identifying opportunities and being more informed about the efficiency of policies and mandates (Berkes, 2017; Funder & Marani, 2015; Wolfram, 2016). The ability to *tinker* with the support of spaces and resources for *unlearning* and *relearning* constitutes a primary ingredient to manifest *Jugaadu's* capacity. The embeddedness of unsustainable practices is painful to undo as it sends ripples to associated dependent practices. Platforms to deliberate and resources to take care of costs (mental and physical well-being, material, finance) incurred due to discarding, replacing, altering, or addition of new entities in the socio-ecological and socio-technological water network capacitates *tinkering* (Funder & Marani, 2015; Kudtarkar, 2021; Zhao & Wu, 2020). Challenging unsustainable regimes also comes with resistance, therefore creating a need for space to make the claims visible and garner support (Smith & Raven, 2012). Coloniality reinforces the subalternation of indigenous, feminist and modest socio-ecological practices and knowledge frames (Sultana, 2023). *Unlearning* those entrenched beliefs, habits, and frames and *relearning* new ways or reestablishing earlier dismissed indigenous practices, marshals *Jugaadu's* capacity.

Anchoring and collectively validating to ensure *credibility* of the in(ex)novation supports situating the experiment, solution, and approach to the geography. It is a channel to inform the meta-level policy narrative (Smith & Raven, 2012). Introducing an alien in(ex)novation into a system may reproduce similar colonial structures of unequal access and imposition of non-contextual meanings and practices. While *unlearning* seeks to eliminate the pre-existing knowledge and cultural practices, it is equally important to showcase a path of what gets replaced in its place to avoid asserting internal colonialism. Additionally, garnering public

acceptance while challenging an unsustainable regime also needs credibility (Raven et al., 2010). Routinising and increasing visibility are a few strategies ensuring the credibility of the (renovation), enabling its embedding in the socio-political fabric (Smith & Raven, 2012).. At the core, anchoring and credibility are rooted in the courage and emotional intelligence of the actors to know how and when to mobilise an in(ex)novation in place (Chandran et al., 2014; Kudtarkar, 2021; Zhao & Wu, 2020).

A detailed supporting list of activities enabling conditions for Jugaadu capacity is described below.

Conditions	Activities to support/enable the conditions
Collective Ways of knowing	<ul style="list-style-type: none"> - Acknowledging past events (significant or insignificant) (collect narrative) to anticipate risk, identify opportunities and be more informed about the efficiency of policies and mandates (Berkes, 2017; Funder & Marani, 2015; Wolfram, 2016). - Drawing on diverse forms of knowing (Wolfram 2016) (Ingram and Lejano 2009 in Huitema and Meijerink, 2009) - Developing collective reasoning ability and deriving relations between mandates, routines and efficacy (Wolfram, 2016).
Tinkering and relearning	<ul style="list-style-type: none"> - Safe platforms to deliberate and dissent (even failures) become critical to reflect, assess and relearn (Chattaraj, 2019). - Platforms, opportunities to celebrate local practices, boosting morale and inculcating a sense of pride (Van Borek & Abrams, 2023)
Credibility and anchoring	<ul style="list-style-type: none"> - Embedding the approach, idea or solution in the local power structures and negotiating cohesiveness (Raven et al., 2010) - Ability to translate strategies into visible actions garners support and credibility (Huitema et al. 2009). - Routinising, increasing visibility ensuring credibility of the in(ex)novation (Smith & Raven, 2012).

As summarised in Figure 1, the two capacities operationalise informality to repair. Both the capacities when mobilised together, prevents reproduction of the negative traits of informality enabling reparation.

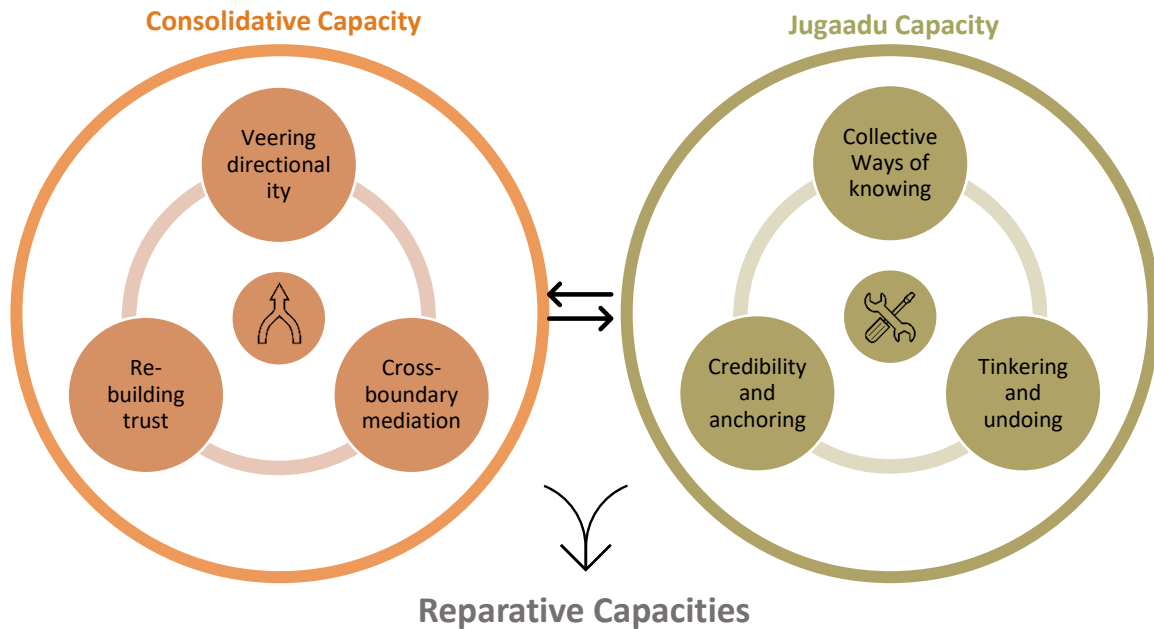


Figure 1: Capacities framework enabling Reparation

4. Methodology

We conducted qualitative case study research on how informal water governance manifests in governance capacities for repair in Bhuj, India. This section outlines the case study and our approach to data collection and analysis.

Bhuj is a secondary, semi-arid border city with a population of 188,236 in 2011 (Census, 2011). Although smaller than other secondary Indian cities, it projects a steep population rise of almost 100% in the last 20 years (Doshi et al., 2020). Fast-growing cities that attract migrant populations from the surrounding towns and villages are ascribed to the character trait of secondary cities (Krishnamurthy et al., 2016; Roberts, 2014). The rapid growth in secondary cities does not match its infrastructural supply, making city actors perform informality for urban water management.

Historically, due to its hydrogeology and saucer-shaped topography, the city successfully sustained itself through traditional water management (Iyer et al., 2022). The rapid population growth has resulted in the annexation of the water network and transporting

water by building a piped network connection to the Narmada Canal (Doshi et al., 2020). Although the region had intermittent rainfall and lacked a perennial water source, it was historically sustained through an elaborate water harvesting system (Saha & Gor, 2020).

The rapid rise in water demand manifested in a growing dependency on groundwater resulting in its over-extraction and salinity ingress in the aquifer (Keesari et al., 2014; Saha & Gor, 2020). This city also faces frequent natural disasters (earthquakes, droughts, floods). The secondary nature of this city made it less prominent to receive aid from the national government. This led the locals to self-organise knowledge, financial and human resources showcasing resilience (Sheth & Iyer, 2017). Bhuj exudes well-networked NGOs, research institutes and civil society organisations working towards implementing local urban governance (Bajpai & Kothari, 2020; Sheth & Iyer, 2021).

In response to complex water challenges, the Government of India (GoI), in collaboration with Dutch Research Council (NWO), funded a program -Water4Change (W4C), to understand, frame and then co-create pathways to transition into Water Sensitive Cities (WSC) in three secondary cities in India. This study is part of this programme and focuses on Bhuj city. Transitioning to water-sensitive governance in post-colonial geographies requires a nuanced investigation of daily routines and challenges with corresponding research methods (Ghosh et al., 2021).

The first author performed qualitative research, which included the visual ethnography method (Pink, 2013). She conducted 29 ethnographic semi-structured interviews with thick ethnographic descriptions (Ponterotto, 2006), visually and textually. She also made two long observations, noting two episodes – a water heritage walk and observing the teaching of water-sensitive behaviour at school. The author triangulated the information with cross-interviews (textual data with ethnographic observation), observations (textual data with ethnographic observation) and photographic (documentary photography) narratives. The textual, ethnographic method assisted in elucidating the translations, appropriations of formal mandates and accepted practices (Peck, 2001). These ethnographic notes described what actors did to manage scarce resources. We realised that demystifying unconscious traits and conditions that shaped their action would also require support from visual methods. The textual notes were vetted by assessing photographs and capturing the gestures and physical signs that illustrated the intentions behind the actor's actions. The

photographic documentation supported by textual narrative unmasked distinctive forms of repair.

Ethnography is a self-reflective process that aids analysis by formulating many reference points of non-normative critiques from the observations (Riemann, 2011). The conceptual framework devised before the fieldwork provided a direction for the analysis. The framework was designed using secondary literature. The theories provide a loose guiding path for the fieldwork to take place. Later, the surprising novelties that spurted from the field helped fine-tune the framework appropriately, making a case for abductive analysis (Timmermans & Tavory, 2012). The recursiveness and iterative nature of the analysis brought nuanced corrections in the framework, lead decolonising the process and the conceptual output.

We further illustrate the governance capacities in Bhuj and assess whether and how they enabled reparation.

5. Governance Capacities to mobilize repair in Bhuj

Our field observations illustrated the contradiction in approaches and contestation of efforts among the city municipality, urban local bodies (ULBs), state government and civil society organisations to combat water scarcity and salinity ingress. The city municipality focused on quick-fix measures to mitigate scarcity and hyper-salination issues by connecting to an external water network outside the city. This was supported by constructing additional artificial storage for such external water sources. On the contrary, local civil society actors aimed to strengthen the aquifer's water retention capacity and dilute the salinity ingress by aquifer restoration measures. Thus, the city municipality demonstrated repair by unequal delivery to continue the water supply, resulting in unequal access. By mobilising conservation practices rooted in the city's historical and cultural locals to work on aquifer restoration, the local civil society actors demonstrated capacities for reparative repair. We validate this observation by analysing how consolidative and jugaadu capacities were mobilised to enable repair. Later we also distinguish which activities further resulted in reparation.

5.1. Consolidative capacity in Bhuj

Consolidative capacity influences the type of coalitions formed, their maintenance and what output is enabled. It is vital in building social capital and mobilising it to a shared goal.

Consolidative capacity is manifested by vast scientific and experiential knowledge about water-sensitive practices and the impending climate crisis. Additionally, this capacity is manifested through personality traits of charisma and earnestness, acting as grease to mobilise social inertia. Teachers, especially school principals, are revered in Indian society. In Bhuj, we saw how a group of principals who were part of a larger civic advocacy group - *Jalstrot Sneh Sanvardhan Samiti (JSSS)*⁴, were able to come to a consensus to make water conservation a part of the school curriculum to enable awareness and behaviour change. They could evoke a sense of urgency among the students, which made them stay after school and attend the extra class.

This capacity is also dependent on the societal position of the mediators. While resources were allocated to slum representatives to broker information between the authorities, NGOs and the locals, along with conducting periodic meetings, the locals felt foul play involved. Over time, people began to lose trust and interest in the mediator, and the resources and motivation to mediate also failed to advance, weakening the capacity.

Recurring disasters in Bhuj city have made citizens resolve towards strengthening communal resilience. This includes rebuilding lost trust among citizens from different communities and elected representatives. A specific NGO that establishes platforms to realise local governance performs the role of arbitrator to iron out any differences. However, this is not a long-term solution, and the goal of local governance is far from its implementation.

We acknowledge the role of consolidative capacity in several community-building activities and strengthening awareness to implement better participation in the city; however, it faced many shortcomings. First, the capacity aided in developing several new mixed groups but restrained from developing cohesiveness among existing competing actors. This fails to veer the directionality of all the concerned actors in the city. The organising logic showcased by consolidation aid in implementing projects within a closed society, therefore working

⁴ Jalstrot Sneh Sanvardhan Samiti (JSSS) is a citizen led group aiming towards democratic water resource conservation and management

with only like-minded stakeholders to realise the project. Secondly, it fails to maintain the inertia of the already functioning groups towards the long-term goal. Lack of resources and consistent platforms leads to fizzling out of cohesion. Third, since all citizens are affected (albeit to different degrees) by scarcity and salinity ingress, this developed a sense of urgency to initiate discussions and small-scale efforts to contain these issues.

5.2. Jugaadu Capacity in Bhuj

Jugaadu's capacity is manifested through socio-material hybridity that seeks to institutionalise democratised ways of social tinkering, undoing, and restructuring towards sensitivity governance goals. Intrinsic motivation and emotional intelligence aid in shaping the capacity. Jugaadu's capacity in Bhuj focuses mainly on making knowledge accessible and translatable democratically without portraying it as propaganda literature. Despite progress in mobilising citizens to build infrastructure for groundwater charging, jugaadu capacity is curtailed by politicians from the leading party.

The NGOs recruited social scientists to train citizens to implement participatory aquifer mapping programmes and make citizens aware of hurdles in water management by conducting a water heritage walk. These social scientists used their scientific knowledge and experiences of being Bhuj residents to make information accessible and relatable. Such platforms help to identify the value embeddedness in the practices, making trainers sensitive to the language and proposition.

Water heritage artefacts (lake, stepwell) reinforced the ability to tinker towards rebuilding aquifer infrastructure, manifesting jugaadu capacity collectively. Bhuj citizens showcased immense pride towards their traditional water heritage, becoming part of many water rituals. The notions of care and honour encouraged citizens to increase awareness of such water structures, therefore, participating in conservation activities at their own cost.

National and international scientific communities revere the NGOs in Bhuj. This asserts a sense of credibility and responsibility for their work. Scientific conferences also become a stage to showcase their efforts, strengthening their resolve to do jugaad. Consistent publication of results in the local newsletter in the Gujarati language, creating knowhow, demonstrating transparency in attaining credibility and further cultivating jugaadu capacity.

However, this capacity did not manifest at the same degrees in different coalitions. Marginalised and poor actors felt such efforts and knowledge were too privileged and exercising jugaadu capacity might be considered an act against the government. This demonstrated a sporadic demonstration of this capacity. While jugaadu capacity did aid in getting locals to participate in water conservation practices, it manifested in the area of least resistance. Government actors who believed more in quick fixes exercised the jugaadu capacity to maintain the unsustainable infrastructure.

6. Discussion

Bhuj exemplified both forms of repair under different conditions and contexts. We discuss the two outputs below.

6.1. Whether repair or reparation?

In many instances, Bhuj demonstrated weak consolidative and jugaadu capacity in different situations. The loss of faith in mediation fizzled the manifestation of consolidative capacity. Also, selective mobilisation of this capacity strengthened the contestation among the actor groups. The NGO circle and government authorities mobilised consolidative capacity for different intentions – one looked at aquifer conservation, while the other looked at constructing more artificial reservoirs. Similarly, Jugaadu capacity enabled the local water operators to supply water to make specific group avail water for a longer duration. This case showcased a clear functioning of weak capacity mobilised in an isolated manner, illustrating the performance of informality enabling repair.

While Bhuj predominantly showcased repair, a tight-knit NGO circle demonstrated reparation. The NGO actors mobilised both the capacity harmoniously. Consolidative capacity demonstrated strength and confidence in its manifestation, encouraging mobilising of Jugaadu capacity for the long term. The jugaadu capacity also motivated consolidative capacity in its expansion of boundaries, furthering the creation of new mixes and confidence to collaborate with competing actors.

The well-networked NGO circle proposed and embedded many innovative interventions. This transdisciplinary group, endowed with resources and space, could experiment, study and further present their ideas and tools to achieve the goal of sensitivity. The strong relations among the NGO groups cemented with shared funding and scientific

collaborations, yielded a safety net to test new ideas. The innovations used water heritage as a common denominator to permeate among various actor groups, getting information and purpose across.

The situatedness of both capacities identified the potential to use local values and norms to execute the efforts towards water sensitivity and also receive traction and acceptance while at it. While the coloniality relies on Eurocentric knowledge frames, the capacities not just benefited by also strengthened the value of the heritage, furthering strengthening placemaking and communal cohesiveness. This further kept a check on informality and its application.

6.2. Humanizing and decolonizing mode of transition

The conceptualisation of repair as a mode of transition affirmatively supports Bruno Latour's (2007) framing of agency as being beyond intentionality, highlighting how decisions and actions are taken and played for governing water. Hence, the heuristic framework does not necessarily provide a clear pathway; instead provides handles to understand how the repair is being conducted and why.

The humanisation of capacities leading towards pluralised application respects the context. It affirms the rooted beliefs and practices dismissed by the (contemporary and colonial) governmental tools managing resources and changes through authoritative documents signed by rational engineers and planners.

The framework provides a way to decolonise governance in India. It informs transformative governance, making it suited for the Global South context and the water sector. Colonial frames manifested through quotidian forms of planning, management and governance, performed by Indian actors under British methods, are difficult to rectify, mitigate and heal. The process to decolonise therefore becomes a way to unlearn, undo and relearn, as asserted by the framework. The capacities framework foregrounds indigenous and ingenious methods by putting informality to good use by developing different modes of governing and managing the water resources enabling reparation towards sensitivity.

The conceptualisation of repair as a mode of transition affirmatively supports Bruno Latour's framing of agency as being beyond intentionality, highlighting how decisions and actions are taken and played for governing water. Therefore, the heuristic framework does not

necessarily provide a clear pathway; instead provides handles to understand how repair is being conducted and why, rationally and subconsciously.

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