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A Macrohistorical Geography of Rural Drinking Water Institutions in India

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Abstract

India has a long history of policies that aim to improve rural drinking water services, in part through decentralization that faces deeply rooted institutional challenges. These include debates about: the duty of the state to provide rural drinking water supply; tension over the role of central, state, and local governments; and frequent changes in policy and senior public officials that disrupt long-term implementation. Some water governance theorists have described policy-making in this context as a pragmatic process of *bricolage*, that is, of piecing together practical opportunities for improvement where possible. This paper takes a macrohistorical geographic approach to these institutional problems, with an emphasis on northern India. It shows that ancient sources dating back to the *Arthashastra* have underscored the role of the state in developing water supplies for the people. Subsequent regimes have argued for various combinations of centralized and local responsibility. We show that frequent rotation of senior public officials was systematized in the 16th century Mughal empire. Changing roles of India's five levels of center, state, district, block, and village government have a half-millennium-long history, evolving through dramatically different Mughal, Mahratta, colonial, and post-colonial contexts. Devolution policies were frequently changed in the colonial period. Independence in

1947 and a constitutional amendment in 1993 increased emphasis on devolution to Panchayati Raj Institutions at district, block, and village levels, but without resolving the functional and structural relations among them. This macrohistorical geographic perspective on water institutions offers insights into current issues and prospects for drinking water reform in India.

Keywords: institutions, devolution, rural drinking water, panchayati raj, Maharashtra, India

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Introduction

Enormous efforts have gone into formulating rural drinking water programs in India in recent decades. Most recently, the Government of India (2020) has announced the Jal Jeevan Mission (JJM) to provide functional household tap connections that deliver 55 liters per capita per day to all households in the country by 2024. Rural drinking water planning is challenging on this scale, particularly when one considers that only 19% of households had piped water supplies in 2019 (IMIS Format C36, 2020). The preceding National Rural Drinking Water Programme (NRDWP 2009-19) stipulated that “coverage means provision within a distance of 100 mts from the household or 30 minutes of time” (Government of India 2013, 39). Even by this less stringent norm, only 33% of habitations and 41% of the population were reported to have had full coverage in 2019 (IMIS, Format C30, 2020). National and state governments have financed the construction of new systems that often “slip back,” failing in physical, financial, and/or environmental terms well before their expected design life (Novellino, 2015). Multi-village schemes have had particular difficulties providing sustainable service to all of their members. The reasons are contested, but a major debate concerns charges for water consumed to cover operation, maintenance, and replacement costs. Even when water tariffs are formally in place, administrators and villagers make limited efforts to collect them. Unwillingness to charge or be charged for water is believed to be a root cause for low overall levels of water services and slip-back, while intra-village power relations affect differential water access by different social groups.

In addition to the physical challenges of ensuring safe drinking water service, it is widely recognized that many problems are institutional in nature (Biswas and Mandal 2010; Sijbesma and Van Dijk 2006; Verma, Bisht, and Cronin 2014; Sangameswaran, 2014). This paper considers three of these institutional issues. The first concerns the role of the state in providing rural water supply and sanitation. Is it a public, private, or mixed responsibility? We shall show that the answers to this question have deep historical geographic roots. The second institutional issue concerns relationships among different levels of central, state, and local drinking water governance. This is sometimes described as top-down versus bottom-up approaches, with increasing advocacy for the latter through local *panchayati raj* institutions. However, we will show that relationships among local district, block, and village *panchayats* are complex, changing frequently over time. The third institutional challenge concerns frequent changes in officer postings and policy regulations. Each new officer has two to three years to accomplish a few selected goals before being transferred to another sector and locale. Each new policy and program alters the concepts, methods and financing provisions for rural drinking water support. The resulting breaks in policy implementation are widely lamented but not historically understood.

Evaluation of these jointly material and institutional drinking water challenges have taken three broad directions that share a commitment to improving rural water services but differ as to what that means and how it is to be achieved (Hutchings et al. 2017; Schouton and Smits 2015). The first approach advanced by multilateral and national water agencies stresses the need for

institutional reforms that involve increased local and private responsibility for cost sharing, revenue collection, operations and maintenance, and asset management, which are often characterized as neoliberal reforms (World Bank 2014). They also emphasize data-driven water management through metering, tariffs, monitoring, coupled with social mobilization to increase the local ownership and capacity of operators and village water supply committees (*pani samitis*).

The second approach is critical of the first. It includes water activists who insist on the role of the state in ensuring *human rights* to safe water and sanitation for all. They decry neoliberal policies of privatization, commodification, and commercialization of water supplies, and they critically expose systemic inequalities in caste, gender, and class access to village water resources – injustices exacerbated rather than corrected by neoliberal reforms (e.g., Birkenholtz 2010, 2013; Das and Takahashi 2014; O'Reilly and Dhanju 2012, 2014; Sultana and Loftus, 2019).

A third approach is emerging between these two perspectives that emphasizes the complicated nature of drinking water reforms in practice (e.g., Sangameswaran 2014; Prasad, Mishra, and Sohoni 2014). For example, current reforms require only 10% local cost sharing for physical infrastructure, but 100% responsibility for operations and maintenance. Interestingly, economic charges espoused by the Sector Reform Program in 1999, followed by the Swajaldhara scheme, and rechristened as National Rural Drinking Water Programme all started with similar principles to ensure sustainability, but met with little success due to latent political, bureaucratic, and local government beliefs that water should be provided by the state rather than charged to domestic consumers. This complex situation has led some to question whether current programs should be characterized as “post-neoliberal,” or as yet another variant of the neoliberal reform agenda (Bakker 2013; Birkenholtz 2015). It has led others to suggest the concept of *bricolage* to describe the pragmatic formulation of water policies by patching together practical actions and economic practices from diverse approaches to make progress in a complex institutional environment (Haapal and White 2018; Merrey and Cook 2012; Sehring 2009). Sangameswaran (2014) argues that these pragmatic issues “complicate” the critique of neoliberal drinking water policy reforms (cf. also Prasad, Mishra, and Sohoni 2014).

While they differ in many ways, these three water governance approaches share an historical perspective that generally begins after India's independence in 1947. There are important exceptions. For example, there is a large and growing literature on the legacy of colonial irrigation, water, and sanitation policies (Gilmartin 2003; Halvorson and Wescoat 2020). Several studies examine precolonial and contemporary water systems (e.g., Agarwal and Narain, 1989; Mosse 2003; Ray and Maddipati 2019). However, it seems fair to say that few institutional studies delve deeply into the historical geography of drinking water policy, and few water histories that engage with contemporary water issues.

This paper shows how a macrohistorical geographic perspective can deepen our understanding of rural drinking water institutions and debates. The approach is *macrohistorical* because it extends from recent post-independence history back to colonial, medieval, and ancient texts on water governance. It is a geographical approach in its emphasis on multiple scales and regions of

water governance. We note that some historical water texts in India have claimed broad applicability while others have emerged from a specific geographic context. While there have been major breaks in governance from antiquity to the present, we show that there are interesting institutional continuities as well. The insights gained from this macrohistorical geographic perspective help explain how water institutions and institutional problems arose and how that knowledge can contribute to current policy debates.

2. Methods. The macrohistorical geographic methods employed here began with current institutional debates, and proceeded to examine their origins and references to texts in earlier periods and different regions. For example, several studies review the post-independence history of drinking water programs to establish the context for current programs (Khurana and Sen 2009). We too began with this recent policy history and re-read documents with a focus on the three main institutional problems discussed above: first, the role of the state in providing local water supplies; second, the role of different local levels of government in drinking water planning; and third, the frequent changes in officer postings and government regulations.

Second, it is increasingly well-established that current water policies in India have colonial antecedents. Several studies examine the influence of colonial policies on contemporary debates about “water use efficiency,” “waste,” and “the duty of water” in Indian water policy (Gilmartin, 1994, 2003; Wescoat, 2014). Colonial and postcolonial governments have oscillated frequently in their emphasis on devolving drinking water responsibilities to districts (*zila parishads*), in some cases, blocks (*panchayat samitis*), villages (*gram panchayats*), or even households (*ghar*) in others. Colonial governments rotated district, state, and national officers on roughly three-year appointments.

We then pushed the search back to precolonial regimes with an emphasis on ones that we and other water historians have studied closely. This analysis extended the record of investigation to precolonial precedents in the Mahratta (18th-19th c.), Mughal (16-18th c.), and Sultanate periods (12th to 16th c.), each of which had multiple regional centers with different patterns of water use and administration. The final step in this process extended the record back to major textual sources on water administration in antiquity especially the *Arthashastra* (Science of Statecraft), with an emphasis on texts that have had continuing salience for society up to the present day. That involved tracing the citation and reception of precolonial and colonial texts in post-independence sources.

We do not downplay major breaks and structural changes in the historical record and major differences across regions. However, previous research has established connections and comparability between precolonial and modern water management (Kumar, 2002; Mosse 2003, Wescoat 2013b, 2016). Even so, we take care to distinguish historical geographic comparisons that are speculative from those that are more historically firm.

After working back from present to past eras, we reverse the narrative presentation of results to begin with ancient sources and proceed to those of precolonial, colonial, and postcolonial eras. The final section of the paper indicates how this macrohistorical geographic account may help inform current drinking water debates and processes of *bricolage*.

The next section discusses ancient political texts on the role of good kings in water supply provision and compares them with sacred texts on water rituals. Section three proceeds to the multi-tiered administrative apparatus that developed in different regions of the Sultanate and Mughal empire. Section four turns to administrative policies of the Maratha confederacy that displaced the Mughal empire in the 18th century. Sections five and six examine the vacillating record of decentralization reform experiments by the East India Company and British Crown. We then revisit post-Independence rural drinking water policies in India and the case study state of Maharashtra with a deeper understanding of their origins, dynamics and prospects.

3. Ancient drinking water policies in India. Some of the earliest textual sources on water include statements about water governance the Rig Veda, Ashokan rock edicts, *Arthashastra*, and *Puranas*. The Rig Veda is one of the oldest sacred texts in India, compiled in the Kuru kingdom (one of sixteen *mahajanapada* regions of northern India between 1500 and 1200 BCE), and it remains influential in Hindu religious practice. It takes the form of hymns to the gods, some of which involved water libations and water purification rituals with healing properties. Of particular relevance here is that, “One of the responsibilities of the king was to ensure the prosperity of his subjects by providing sufficient water for animals and crops. Therefore, the divine king Varuna brings rain (V.85.3–4) and controls the waters, causing them to flow according to his commandment (II.28.4)” (Jamison and Brereton 2014, 60).

A millennium later, Ashokan rock edicts mention water provision by the king. The Major Rock Pillar Edict 2 states that, “On the road trees were planted, and wells were caused to be dug for cattle and men” (Ashoka/Hultzsch 1925, p. 29). A site-specific edict near the base of Mount Girnar in Junagadh, Gujarat, records that King Rudraman (d. 150 CE) constructed a water reservoir which still exists. Later texts document the expanding philanthropic role of rulers and nobles in providing waterworks, rest houses (*caravanserais*), and tree plantings along highways and at sacred sites.

The *Arthashastra* is the most significant ancient text on statecraft in India, said to have been compiled from diverse sources by Kautilya in west central India from 100 BCE to 100 CE (McLish and Olivelle, 2012). Of particular relevance here is its second chapter “On the activities of superintendents,” and in particular section 1 on “Settling the countryside,” which states that:

He [the king] should get reservoirs constructed, reservoirs that are fed either with naturally occurring water or with water channeled from elsewhere; or he should render assistance to others constructing them by providing land, routes, trees and implements... (Olivelle, 2013, section 2.1.20-22, p. 100)¹

These aims were pragmatic as well as beneficent. Water supply increased settlement, productivity, and state revenue. Other sections urged that those who failed to cultivate should lose their land (sec. 2.1.10). The relationship was mutual, in which a king should provide water and other resources for rural people who should produce wealth and revenue.

A second aspect of settling the countryside involved creation of villages consisting of 100 to 500 families (1.19.2). There should be a revenue collection center for every 10 villages. A provincial capital should be located in the middle of a cluster of 800 villages, a district

municipality in a cluster of 400 villages, and a county seat for every 200 villages (2.1.4). These levels of government are remarkably analogous to those of modern *panchayati raj institutions*, and while there is no direct evidence of a connection with ancient administration, hierarchical settlement structures shaped land and water management in subsequent regimes.

A brief section on the “Inspection of Officers” (2.9.35) stipulates that “he should make those who have hoarded hand it over and shuffle them among different tasks...” The rotation of officers would later become an elaborate process in ways that periodically disrupted policy implementation.

The *Arthashastra* had continuing influence on political education in the classical through early medieval periods in India, after which its influence occurred only indirectly through commentaries up through the 19th century (Olivelle, 2016). However, its modern impact revived with the discovery and translation of the manuscript in 1905. Its amoral pragmatism was criticized by political leaders like Gandhi and Nehru in the early 20th century, but its influence expanded with India’s distinctive combination of neoliberal and strong state policies from the 1980s to the present (Misra, 2015). It is widely cited in Indian management journals, for example, and a search of post-Independence case law yielded dozens of legal cases that cite sections of the *Arthashastra*, positively or negatively, from 1949 to 2020 (All India Reporter Online, 2020; and Kanoon case law online, 2020). But this is to leap ahead.

The point here is that in ancient political texts good kings, and by extension good states, provide water for their people, either as philanthropic acts or as revenue-enhancing policies. If one wonders why many in India regard the provision of water as a duty of the state (sometimes criticized today as a problematic “mindset”), these texts may help explain the origins of that view. If one wonders, by comparison, why arguments for a human right to water have had less traction in India to date, it may be in part because the provision of water has historically been regarded as a public duty rather than as an individual right, which receives little recognition in these texts. It is noteworthy that while the *Arthashastra* also mentions the layout of forts (2.3.1) and cities and (2.4.1), it says little about villages. Irrigation water is mentioned in connection with the Superintendent of Agriculture (2.24.18-19) section on revenue rates, which range from one fifth to one-third of the produce depending upon the water lifting technology employed, “except in times of adversity” (2.24.17).

The *Laws of Manu* were compiled around the 2nd c. BCE, but they had a different emphasis that revolved around purification rituals with water (Buhler, 1886). Similarly, the *Puranas* (lit. “old times”) frequently mentioned ritual and medicinal uses of water especially at holy places and sacred river crossings (*tirthas*) (e.g. Kumar’s [1983] compilation of water legends from the *Skanda Purana*). The *Agni Purana* (Dutt, 1902-03, 856, 926) states that, “A king should select for his kingdom country (watered by large rivers and) not depending upon perennial rains for its water supply...” (ibid, 856) and take care in demarcating the boundaries for, “...village wells, reservoirs of water, garden land, dwelling houses, and channels of water” (ibid, 926). It notes that encroachment of a public well on private land gives no cause for action (ibid, 128). In general, local social aspects of rural drinking water and sanitation practices, including their ritual and symbolic significance, received limited attention in these texts. It is well-known from

ethnographic research and travellers' experience in villages that offering water to a guest is much more than a polite practical action, and might be considered a householder's quasi-religious duty, akin to that of a ruler.

Archaeologically, there is proto-historical evidence of impressive brick-lined wells, channels and latrines in Harappan settlements of the Indus valley and Saurashtra regions, but their relationship to water institutions and governance remains unknown due to a lack of translated inscriptions and texts (Wright, Bryson and Schulderein, 2008). Ancient water systems in India are understood primarily through excavation, environmental dating methods, and associated settlement patterns (Chakrabarty, Badam and Paranjpye 2006; Wescoat 2013a).

4. Formation of early modern administration in the Sultanate and Mughal period. For a long period, described by some as medieval and others as early modern, India had decentralized regions where local wells and tanks were prevalent (Habib 2007, 12-13)(figure 1). An important Sanskrit treatise on agriculture the *Kasyapiyakrsisukti* compiled before the 13th century with an unspecified geographical origin and extent stipulated that:

The king ... has to manage water reservoir construction (verses 71-89); to afforest the bank of reservoirs (verses 90-105); to construct canals (verses 106-108); to have wells dug by soldiers and cultivators and set with brick inside (verses 149-163).... The king should procure water everywhere during the season and should strive to protect it (verses 178-179). (Wojtilla, 2010, 104-5)

These verses extend the responsibilities of local kings mentioned in the *Arthashastra* to specific types of water structures.

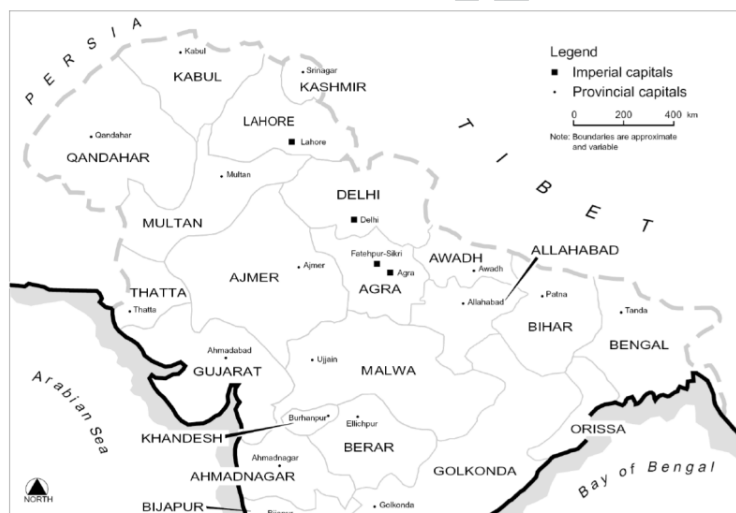


Figure 1: Map of Mughal provinces and capitals, c. 1595 (Source: Author and James Robb after Habib 1982).

Habib (2007, 57) distinguished medieval settlements from sultanate regimes of the 11th century onwards by the latter's centralizing territorial strategies that involved increasing use of money, trade, revenue administration, and urbanization. Figure 1 delineates the major provinces

(*subahs*) of the Mughal empire at the end of the 16th century, but its provinces also roughly correspond with the territorial extent of earlier regional sultanates.

Water systems developed in distinctive ways across different regions, both in technological and institutional terms. As noted above, brick-lined tanks and wells had an ancient and widespread history. The first Mughal ruler Babur (d. 1530 CE) noted the use of geared Persian wells in the Punjab (Lahore and Multan on the map). He regarded the Persian wheel as more sanitary than systems that employed ropes and buckets pulled by draft animals walking down an inclined plane to lift leather buckets (*charas*) from lined wells (Wescoat 1985). There have been debates about the origin and diffusion of this technology as well as its impact on agricultural production in medieval Punjab (Siddiqui 1986). Singh (1985) has argued that geared wheels had greater utility in areas of shallow to moderate groundwater depth compared with animal drawn buckets that he believes were more effective in areas of deeper groundwater in Punjab.

Water collection structures, storage features, and masonry wells took different forms in different region. Tanks impounded by small dams were widespread in Rajasthan (e.g., Bhadani 2012), Maharashtra (Chakrabarty, Badam and Paranjpye 2006) and even more so in southern India where they developed with varying combinations of collective action and state patronage that Mosse (2003) has traced from medieval to modern times. The Gujarat region developed sophisticated masonry stepwells, generally built for charitable purposes by local nobles and merchants, several of whom were women, rather than by state rulers (Jain-Neubauer, 1981; Shaikh, 2010, 76-80). Major stepwells that had stone epigraphs appear to have peaked in the late 14th and late 15th centuries, though numerous stepwells without inscriptions exist across Gujarat and surrounding regions where water tables are not too deep. Long-distance Persianate water channels known as *karez* or *nahar* conveyed groundwater from piedmont regions to urban centers in the Deccan sultanates (Rotzer and Sohoni, 2012; Sohoni, 2018). While some of these structures bear the inscriptions of pious donors, presumably most were constructed by local communities with collective or corvée labor.

The Delhi Sultanate adopted and adapted many of these technologies. The Tughluq dynasty, for example, built a suite of large tanks, stepwells, and canals, both in the Delhi and northern Deccan regions they occupied (Welch 1985). The 14th c. traveler Ibn Battuta reported that *maliks* and *amirs* competed with one another to patronize water wells for travelers along major roads (Siddiqui, 1986, 68). Wink (1990, 12) describes this period as one in which, “The system of taxation and fiscal extraction quickly achieved a high measure of autonomy and standardized uniformity under a bureaucracy of salaried governors who rotated throughout the empire.” The mid-15th century Afghan ruler of Delhi, Sher Shah Sur, established a systematic hierarchy of administrative units that roughly correspond to those of modern states, districts (*sarkars*), and blocks (*parganahs*) for revenue collection and judicial purposes (Aquil 2007, 133-142; Saran 1988, pp. 44-56). The *parganah* originated earlier in 13th c. Persianate institutions and generally comprised 20 to 100 villages overseen by an executive officer (*shiqdar*) and an accountant (a *chaudhuri* or *qanungo*). Sher Shah Sur was also renowned for centralizing state investment in regional roads, caravanserais, tree plantings, wells, and water provided for travelers along

highways like the Grand Trunk Road, which ultimately stretched from Bengal to Kabul (e.g., Parihar, 2008).

Mughal rulers displaced the Afghans in the mid-16th century, but adapted and extended their administration system across northern India during the reign of the third Mughal ruler, Muhammad Jalaluddin Akbar (d. 1605)(figure 1). His chronicler Abul Fazl ibn Alami (1989) described state institutions in a massive treatise titled the *Ain-i Akbari* (or Institutes of Akbar)(AiA), beginning with the viceroy (*Sipah Salar*). The viceroy's duties in the *Ain-i Akbari* echo those of the *Arthashastra* and *Kasyapiyakrsisukti* by declaring:

Let him store for himself a goodly reward in the making of reservoirs, wells, watercourses, gardens, serais and other pious foundations, and set about the repairing of what has fallen into ruin. (Abul Fazl, II, 39-40)

The *Ain-i Akbari* goes on to describe the Mughal empire as divided into provinces (*subahs*), each led by a *faujdar* (governor) whose duties as military commander were balanced by those of a chief magistrate (*qazi*) and revenue collector (*'Aml guzar*) (Abul Fazl, II, 41-50). It noted that the chief of police (*kotwal*) should, "reserve separate ferries and wells for men and women.... He should appoint persons of respectable character to supply the public watercourses..." (ibid., p. 45). It idealistically stated that the Collector, "should be a friend of the agriculturalist" (ibid., p. 46), and then went on to specify principles of revenue assessment, land classification, and tax collection that were anything but friendly, as agricultural revenue was the basis of the Mughal economy along with military booty and tribute payments. Historical texts of this period sometimes compared the state to a garden, and the ruler to a gardener, employing metaphors of cultivation and watering (Eaton 2019, 36; Koch 2007). As in earlier regimes, Mughal governors were rotated from one region or role to another frequently, on average every two to three years, a purposely disruptive practice to preclude local alliances (Ali, 1985, xxiii).

The twelve Mughal *subahs* were divided into 105 *Sarkars* (districts), and 2,737 *Qasbas* (townships). *Sarkars* were further divided into rural revenue units, variously known as *mahals* or *parganahs*. For example, the Subah of Bengal was subdivided into 24 *sarkars* consisting of 787 *mahals*, which yielded over 14 million rupees in annual revenue (ibid., 141). The main point for present purposes is that the Mughal empire was administratively divided into the now familiar:

- Subahs (states)
- Sarkars (districts)
- Parganahs (blocks)

Each *parganah* contained 20 to 100 revenue villages. However, the village was a semi-autonomous level of local government that received little attention in the *Ain-i Akbari*.

Mughal administrative units thus crystallized the precedents for today's states, districts and blocks. Its administrative gap between districts and blocks created by the state, on the one hand, and quasi-autonomous villages, on the other, helps us understand the enduring differences between local Panchayati Raj Institutions at those three levels (i.e., districts and blocks vis-à-vis

village *gram panchayats*). According to Irfan Habib (2014, 123-168), Mughal villages were largely left to themselves politically, but they were made responsible for a revenue quota by their headmen (known as a *patil* or *muqaddam*) and a local oligarchy of record-keepers (*patwaris*) and *panchayat* members. These “rich peasants” held largely hereditary positions that enabled them to shift the revenue burden to weaker villagers to meet oppressive Mughal revenue demands (see Qureshi 1966; and Saran 1988 for somewhat more beneficent views of Mughal provincial administration). Revenue collection probably varied over time, space, and irrigation, but Habib (2014) and Moosvi (2014) have estimated tax rates that amounted to roughly half of the harvest that, when coupled with unofficial local taxes and external raiding, left peasants with subsistence livelihoods at best.

Although it deals with minute administrative details on many topics, the *Ain-i Akbari* has little to say about water, aside from brief comments about the major rivers running through each province. The village water supplies that viceroys were supposed to provide in principle were rarely mentioned in this Mughal gazetteer. Other Mughal chronicles and correspondence did mention wells and tanks constructed for practical, pious, and famine relief purposes, but not enough to form a statewide perspective on drinking water provision.

Mughal paintings provide another source of valuable evidence about water tanks, wells and channels, including images of villagers drawing water from them. These images include historical events, such as when the ruler Akbar actively supervised the desilting and repair of a water tank outside the walls of Nagaur Fort in Rajasthan. Figure 2 depicts the construction of the new capital at Fatehpur Sikri, which includes a Persian wheel, water channels, and water reservoir. Village artisans constructed and maintained these waterworks, e.g., “....the carpenter receiving his ‘fee for the annual repair of the Persian wheels, and the potter for the supply of earthen vessels attached to them’” (Habib 2014, 157).

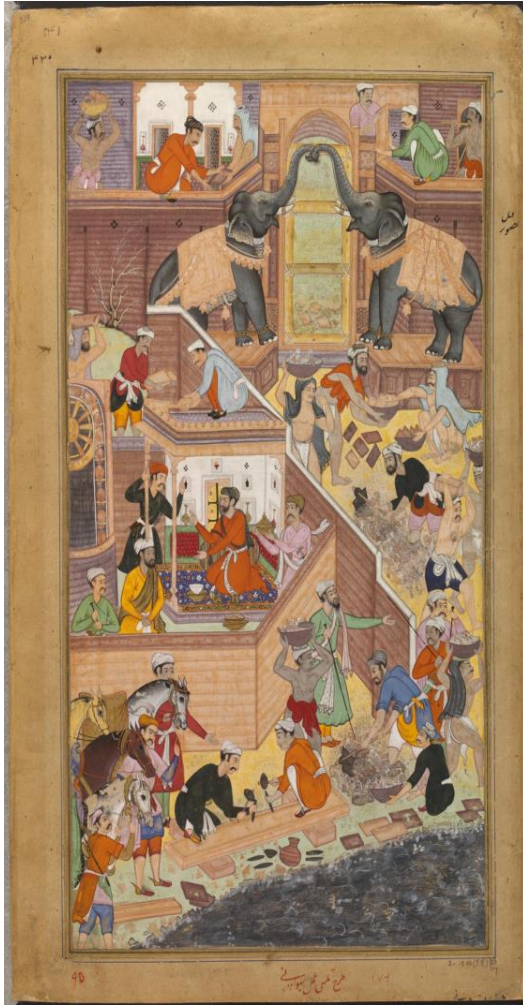


Figure 2. Painting from the *Akbarnama* depicting the building of Fatehpur Sikri. Mughal, ca. 1590-95. (Source: Courtesy of Victoria & Albert Museum. IS.2:86-1896).

The 18th century is sometimes portrayed as a period of imperial decline (Ali 2006), but it was also as one of regional redevelopment (Alam and Subramanyam 1998, 1-71). Regional empires redefined the geography of early modern India, and distinguished themselves by their cultures of leadership, military organization, water development, and administrative institutions. Mughal expansion southward into the Deccan region included encounters with an African military leader Malik Ambar of the Nizam Shahi province of Ahmednagar who, in addition to his military prowess, was renowned for commissioning water channels known as *nahars* that supplied the city of Khirki (Aurangabad INTACH 2008). Mughal armies fought with and co-opted Maratha militias for decades along the nearby Western Ghats, ultimately overextending themselves financially, militarily, and territorially. During the 18th century, the Maratha militias successfully shifted from defensive raiding in western India to territorial expansion across most of the former Mughal empire (figure 3).

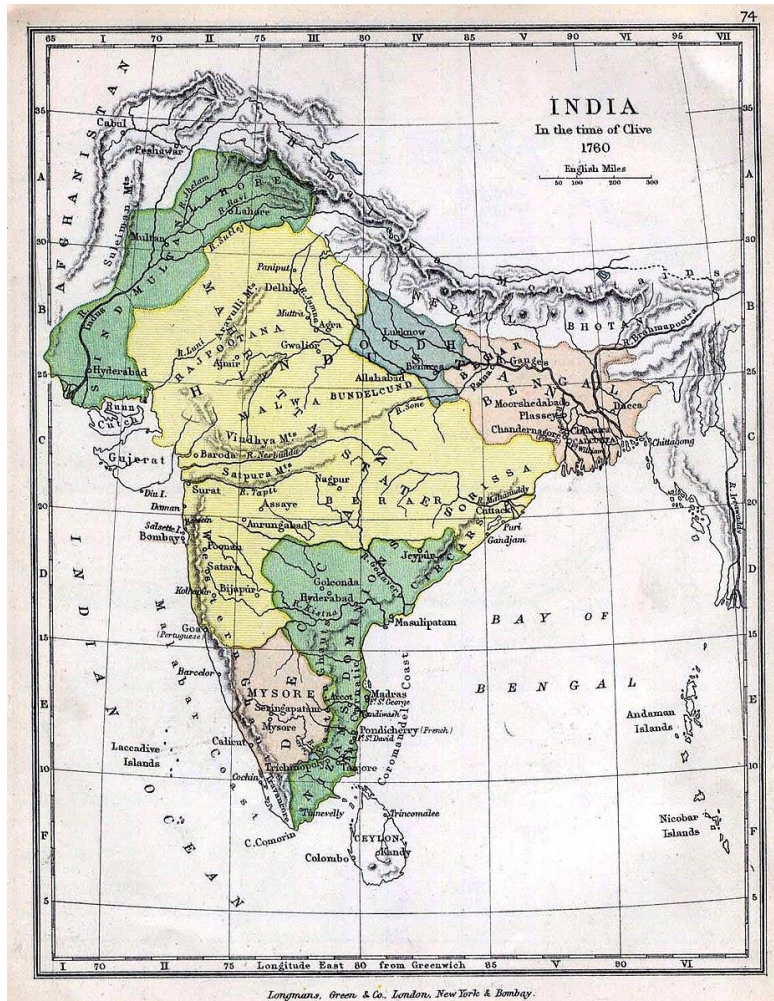


Figure 3: Territory under Maratha control in 1759 (yellow) (Source: https://commons.wikimedia.org/wiki/File:India1760_1905.jpg)

5. Maratha governance and rural waterworks. The Marathas made several important contributions to the development and administration of rural drinking water systems. Early Maratha warriors led by the charismatic leader Shivaji built high elevation defensive forts throughout the Western Ghats that harvested rainfall in rock-cut cisterns and tanks (Sohoni 2018). Coronation of Shivaji and his ideology of *swarajya* (self-rule) included a libation of water on his head from seven sacred rivers of India in a manner akin to ritual practices described in the *Agni Purana* (Dutt 1902-03, 148). The rural population on lower elevation lands excavated dug wells tens of meters deep in fractured basalt terrain (Wescoat 2018).

These hardrock conditions constrained water storage compared to the deep alluvial landscapes of northern India. Even the abundant rainfall in the Western Ghats had limited infiltration, rapid runoff, and seasonal shortages. Further east, the semi-arid central Deccan region known as

Marathwada region (“home of Maratha people”) had lower average rainfall, higher variability, frequent droughts, and devastating famines (Adamson and Nash 2014; McAlpin 1993).

Maratha military expansion from this core area in the 18th century extended to most of northern and western India (Franks 1930). Its capital in Pune developed an elaborate administrative system that resembled that of the Mughals albeit with different titles (Sen 1976), e.g.:

- State – Ruled by Maratha kings and Brahman administrators (*peshwa*)
- District (*prant*) -- led by a *kamavisdar* whose pay was a fraction of the annual *rasad* (loan to farmer), rather than a fraction of the produce.
- Block (*taluka*) -- led by a *deshmukh* (lit. “mouth of the land”) and *Deshpande* (lit. “land record keeper”)
- Village (*gaon*) -- led by a *patil* (headman) and *kulkarni* (record keeper)

As in Mughal times, and at present, the first three levels were appointed from above, while the village level was governed from within (Sen 1976). Each governmental level followed a common logic of having an executive officer and a financial record-keeper, which dated back to pre-Mughal times. Sowani (2011) traces these continuities and changes in administrative classifications and processes during Maratha times. An important difference involved local social mobility in prosperous Maratha settlements where an ambitious *patil* could become a *deshmukh*, and a *kulkarni* could become a *deshpande*.

The Maratha central administration had a long list of offices known as *karkhanas* (literally workshops) that included an *Abdar khana* to oversee drinks, though it is not clear how much of that office dealt with water compared to other types of regulated beverages. Revenue rates were heavy, with long lists of cesses in addition to the main revenue obligation. Interestingly, none of the local cesses provided specifically for rural drinking water development, which depended upon various combinations of local initiative, pious philanthropy, loans, and corvee labor. Loans for water supply improvement were common (Ludden 1999, 132). The rural revenue surplus, along with tribute and booty, enabled Maratha cities like Pune to develop better water collection reservoirs and supply channels in the mid-18th century, which bear comparison with systems built for Aurangabad in the Sultanate and Mughal period.

Wink (1986) has argued that Maratha political tactics had a highly dynamic quality which that he characterized as *fitna* (lit. “sedition”). In his account, political actors switched positions, allegiances, and alliances frequently in response to the relative strengths, weaknesses, and interests of other actors and situations. Political leaders likewise broke and forged alliances, while villagers rebelled or relocated, in periods of adversity (Gordon 1994). These political dynamics disrupted bureaucratic administration, but they were said to be so commonplace that they were anticipated and managed in Maratha governance. In the Mughal context, Wink (2020) has likewise argued that continuous political rivalries among princes, allies and enemies actually increased imperial expansion and wealth. It is important to note that other historians dispute these arguments (Ali 2006, 87). However, as a matter of speculation, there may have been a purposeful and disruptive logic behind the frequent rotation of officers in that and later periods. The Maratha regime constituted a profound break with the Mughal regime with its origins in

Persianate and Timurid Central Asian culture, to be sure, but they had a substantial geographical overlap, and comparable administrative levels that both had a bearing on the colonizing regimes that followed.

6. East India Company revenue and water policies. The Maratha and East India Company (EIC) armies collided in three wars between 1775 and 1818, which ultimately led to incorporation of the Maratha heartland into the Bombay Presidency. East India Company history dates back to the mid-17th century when trading ports were established in Calcutta, Bombay and Madras. The earliest EIC drinking water initiative focused on improving health conditions in cantonments such as Barrackpore north of Calcutta in 1765 (Halvorson and Wescoat 2020). As it gained greater territorial control, the EIC embarked on revenue extraction efforts that adapted Mughal administrative institutions and added others, such as the appointment of District Collectors in 1772. EIC corruption and scandals led to numerous “reform” acts in London. In one of those efforts, the conservative Edmund Burke (1785, pp. 67-68) contrasted the water development of indigenous rulers with oppressive EIC practices:

From these reservoirs currents are occasionally drawn over the fields, and these water-courses again call for a considerable expense to keep them properly scoured and duly leveled. Taking the district in that map as a measure, there cannot be in the Carnatic and Tanjore fewer than ten thousand of these reservoirs of the larger and middling dimensions, to say nothing of those for domestic services and the uses of religious purification. These are not the enterprises of your power, nor in a style of magnificence suited to the taste of your minister. These are the monuments of real kings, who were the fathers of their people; testators to a posterity which they embrace as their own. (Speech on the Nawab of Arcot’s debt)

Several regulating acts followed, along with reforms instituted by Cornwallis in 1793 that divided the EIC organization into revenue, judicial, and military branches. Those reforms also divided landed property into state revenue lands and *zamindari* lands, which assigned control over land revenue to an aristocratic class of *zamindar* landlords. These reforms included a regulation on water improvements (Aspinall 1931, p. 97):

XXXIII. A Regulation for repairing the embankments maintained at public expense and for encouraging the digging of tanks or reservoirs and water courses....

This regulation was deemed vital for crop production and famine prevention (Great Britain, Parliament, 1812, p. 284). Some reformers argued for further empowerment of village *panchayats* for dispute resolution and *raiya*s (peasants) for revenue collection, rather than *zamindars*, to reduce oppression by local landlords. Many colonial officials regarded villages as timelessly self-contained and self-sufficient, which was not at all historically accurate (Ludden 1999, Marriott 1955/1972, Thakur 2014, and others). For example, a report to the Madras Government Board of Revenue in 1807 stated that:

The country is divided into villages; a village, geographically, is a tract of country, comprizing some thousand acres of waste and arable lands. Considered politically, it is a little republic, or rather corporation, having its municipal officers, and corporate

artificers; its boundaries are hardly ever altered. There it stands for centuries and though occasionally injured, or even desolated, by war, famine, the same name, boundaries, interests, and perhaps even families, remain the hereditary tenants of the land for centuries (Great Britain, Parliament, 1812, p. 728).

Notwithstanding debates over the nature of village governance, the East India Company imposed harsh revenue rates and collection practices (Dalrymple 2019). The situation changed with the 1833 Charter Act, which centralized the authority of the EIC in Calcutta but took away its trading authority and reduced its scope to administrative and military duties. Each of the three EIC Presidencies (Calcutta, Bombay, Madras) prepared Survey and Settlement Manuals that set forward principles for land classification and revenue rates, including a cess for irrigated lands. When revolts took place across northern India in 1857, the British Crown took control away from the EIC along with its land revenue and related water policies.

7. Devolution policies of the British Crown. The 1860s witnessed a series of acts purporting to devolve administrative control from the central government to state and local levels of government. The first Government of India Act in 1858 called for reports from each Presidency and district to document their current conditions and “moral and material progress.” These directives gave the impression of greater British territorial control than actually existed in a territory that was divided by numerous princely states (figure 4). Here we focus on Bombay Presidency.

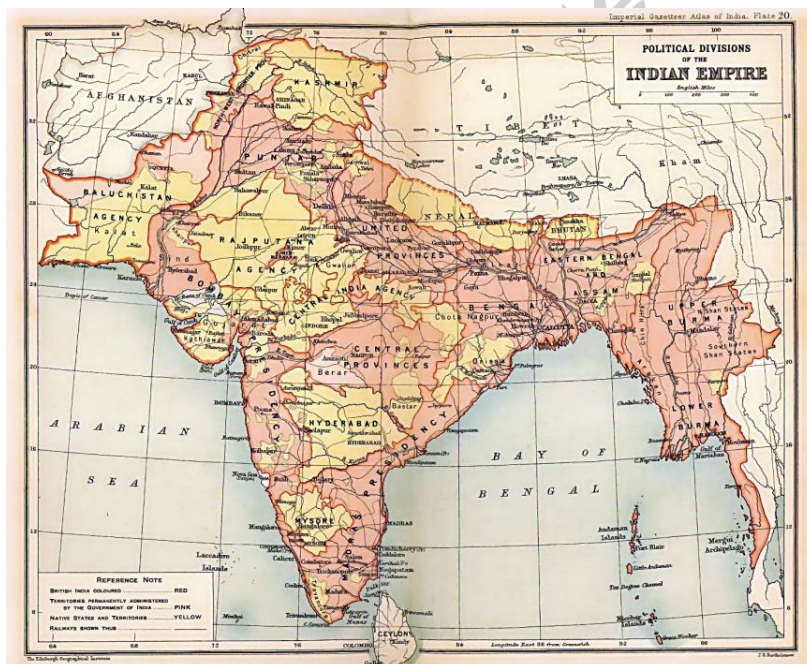


Figure 4: 1909 Map of the British India. Imperial Gazetteer of India. (Source: https://commons.wikimedia.org/wiki/File:British_Indian_Empire_1909_Imperial_Gazetteer_of_India.jpg)

The Indian Civil Service was also created in 1858 (the precursor of the post-Independence Indian Administrative Service), from which highly trained State and District Officers have been appointed over the past 160 years (Hunt and Harrison 1980). Frequent rotation of these officers is often lamented as it disrupts implementation of long-term water policies and programs. Although this practice is rightly blamed as a colonial practice, M. Athar Ali's *Apparatus of Empire* (1985, xxiii) shows that it has even deeper roots in Mughal administrative transfers. Senior officers, then as now, had about two years to make their mark on any given challenge, like water scarcity, before looking ahead to the next posting. Few water problems or policies have a short two-year timeframe, and they were often disrupted as new officers rotated in with new ideas, approaches, resources and staff.

Early imperial water legislation extended from its limited focus on cantonment water supply and sanitation to improvements civilian areas in 1864. Parallel legislation was passed in each of the three presidencies. For example, the Bombay Sanitary Commission Act of 1864 and Bombay Local Funds Act of 1869 provided for “local public utility and improvement” through funding that could be received from the state or raised through local taxation for water supply and sanitation. Some of these policies reflected debates among liberals, conservatives, utilitarians and others in Britain as well as India.

For example, the Lord Mayo Resolution of 1870 ushered in two decades of liberal devolution policies, beginning with financial devolution of funds and taxation powers to local governments to improve water, sanitation, education, and other services. Soon after the reforms began, however, India was stricken in 1876-77 by a terrible drought and famine episode (Adamson and Nash 2014). Rigid British revenue collection coupled with liberal opposition to state intervention in markets and poor state preparedness greatly aggravated the suffering (Hall-Matthews 2005). Famine reports criticized the presidency governments (Digby, 1878), which responded with famine codes and an Irrigation Act in Bombay in 1879 to mitigate crop failures, but severe famines continued through the late-19th century.

Lord Ripon's 1882 Local Self Government Resolution introduced another round of liberal reforms to reverse the centralizing policies of his immediate predecessor. This Resolution called for political and administrative devolution through District and Local Boards, in which the latter had responsibility for water supply and sanitation. In 1884, for example, Bombay Presidency passed a Village Sanitation Act and Local Boards Act, which created District Local Boards and Taluka Local Boards, whose duties included “construction and repair of public tanks, wells and waterworks” (Bombay Act No. 1 of 1884, sec. 30 c). These acts institutionalized responsibility for sanitation at the village level, and for drinking water at the district and *taluka* levels. They did not reduce the exacting revenue policies or devastating famines of the late-19th century. McAlpin (1983) has argued that devolution, infrastructure investment, and economic diversification contributed to a decline in famines during the early 20th century Maharashtra region, though this view is criticized by Hall-Matthews 2005.

The pace of devolutionary reforms increased during the first two decades of the 20th century. The Royal Commission on Decentralisation (Great Britain 1908, 736) emphasized block level governance for water supply and drainage:

We think that sub-district [block] boards should be universally established, and that they should be the principal agencies in rural board administration. Ordinarily, a sub-district board should be established for each taluka or tehsil, ... We do not, however, propose to abolish district boards or to make them mere councils of delegates from the sub-district boards for the settlement of matters of common interest. Nor, on the other hand, do we desire to place sub-district boards entirely under the control of the board for the whole district. We suggest a scheme under which the sub-district boards will have independent resources, separate spheres of duty, and larger responsibilities within these, while the district board, beside undertaking some direct functions for which it seems specially fitted, will possess coordinating and financial powers in respect of the district as a whole.

Some misguided experiments were rejected, such as Morley-Minto Reforms (1909) that among other things recommended local councils for different religious groups. Others had more lasting effect. The Montague-Chelmsford Reforms, for example, called for “dyarchy” between the states and central government, which anticipated the later federal structure of the Government of India. These reforms “reserved” irrigation as a state subject, and they “transferred” water supply to local governments, a logic that institutionalized *de facto* historical practice. However, this concept of reserved and transferred subjects differs significantly from other federal systems like the United States where states have presumptive authority over all subjects *except* those that are explicitly reserved by the federal government. That is, state authority over water does not depend upon transfer or devolution from the national government.

Within Bombay Presidency, the Village Panchayats Act (1933) modeled village administration after various aspects of municipal government. The 1935 Government of India Act devolved further powers to the states, including explicit authority over water resources. This vacillating trend toward liberal devolution of water governance in colonial India, had a continuing legacy in liberalization movements that followed Independence in 1947.

8. From Agrarian Revenue to Neoliberal Investment in Independent India.

Following independence India adopted a federal system of government in which, with the exception of national and international waterways, water is deemed a state subject (figure 5). The states in turn variously adopted *de jure* policies for devolving drinking water and sanitation to subsidiary levels of districts, blocks, and village *gram panchayats*, though the centre and states have retained major roles in deciding principles, standards, and financing mechanisms for those policies.

Early nationalist leaders in India had profoundly different views about local governance (Jodhka 2002). Mahatma Gandhi held a spiritual belief in villages as the heart of Indian culture, which resonates with but differs fundamentally from 19th century romantic views of villages as unchanging communities (Phand and Arya 2007). Gandhi held a belief in the democratic potential of village and national *swaraj* defined as progressive self-rule (which bears comparison with the earlier Maratha concept of *swarajya*), and he viewed sanitation and related domestic water services as vehicles for local social reform. While Jawaharlal Nehru also regarded villages as the bulwark of democratic socialism in India, he believed their backward material conditions

required modernization through centralized social investment, planning, and finance. Dr. B.R. Ambedkar, a prominent Dalit jurist who chaired the Constitution Drafting Committee, by contrast, viewed village societies as the source of India's systemic structural inequalities and oppression, and as a result they were not emphasized in the initial Constitution of India. None of these early national leaders supported the liberal ideology of colonial political and economic reforms.

The Constitution of India, drafted with Ambedkar's leadership in 1949, gave limited authority to village governments in a single article:

Article 40. the State shall take steps to organise village panchayats and endow them with such powers and authority as may be necessary to enable them to function as units of self-government.

In addition, the Constitution prohibited laws that would tax water and electricity production, storage, and distribution from interstate rivers (Article 288). As in the pre-Independence period, the central government reserved its primacy over inter-state and international river valleys (Article 262), and assumed broad powers over water development in general.

Thus, in many respects, the Nehruvian vision of a strong central state and development planning prevailed. From adoption of the Constitution until the present BJP government was elected in 2014, a central Planning Commission prepared 5-year plans that included the water sector. The 5-year plans called for district plans and specified how they were to be prepared. The central drinking water and sanitation department issued detailed specifications for the planning and financing rural drinking water projects, even after the adoption of liberal policy reforms (e.g., in National Rural Water Development Programme in 2013 and the current Jal Jeevan Mission in 2020). But this is to leap ahead, as the second half of the 20th century witnessed numerous attempts to guide what devolution meant in rural India.

The first of these efforts was the Balwant Rai Mehta Committee, which recommended drinking water planning at the village, block and district levels in 1957:

11. The compulsory duties of the village panchayats should include among others provision of water supply, sanitation, lighting, maintenance of roads, land management, collection and maintenance of records and other statistics and the welfare of backward classes.

As in the colonial period, national and state legislation closely paralleled one another, as may be illustrated with a case study of Maharashtra, which has been one of the leading states in rural drinking water development. For example, one year after the Balwant Rai Mehta Committee report, Bombay State passed the Bombay Village Panchayats Act, which provided for a Village Water Supply Fund (section 132B), and power for the state to take action if panchayats defaulted on maintaining rural drinking water supply schemes (section 144A). Bombay State was formally separated into the states of Maharashtra and Gujarat by the Bombay Reorganization Act of 1960. The following year, Maharashtra passed its Zilla Parishads and Panchayat Samitis Act of 1961 (figure 5), which provided for district and block level planning, and for a local water cess. The

same year the Naik Committee at the central government level recommended strengthening *gram panchayats* vis-à-vis blocks and districts.



Figure 5: Census of India 2010 map of States and Districts highlighting Maharashtra. Authors.

These policy experiments signaled the continuing historical tension between district and block level administration, on the one hand, and that of *gram panchayats*, on the other. In 1978, the national Ashok Mehta Committee emphasized district level planning, while the 1977 Dantwala Committee constituted a Working Group on Block Level Planning that included water. These post-independence debates on the relative merits of district and block planning, conducted under strong state and national control, continued the earlier debates on this subject in the era of colonial reforms.

A main difference in the 1970s was the escalating national funding for rural drinking water projects that began with the Accelerated Rural Water Supply Program (1972) and Minimum Needs Programme (1974). States like Maharashtra responded quickly by creating Public Health Engineering Departments to plan and implement projects (1972). Maharashtra passed the Water Supply and Sewerage Board Act (1976), which later established the state's Maharashtra Water Supply and Sanitation Department. These policies reinforced India's dramatic shift in economic policy from agrarian revenue administration toward integrated rural development investment planning of the sort that Nehru had envisioned.

Rural drinking water planning intensified in the 1980s, spurred in part by the International Drinking Water Supply and Sanitation Decade, which ambitiously promised safe water and sanitation for all by 1990. India's first National Water Policy in 1987 made drinking water the top national water priority, which has nominally been sustained notwithstanding much larger

scale investments in the irrigation and power subsectors. In 1984, the Planning Commission and blue-ribbon G.V.K. Rao Committee argued for the district as the appropriate level for rural water planning and the block for project implementation, as did the P.K. Thoongan Committee in 1988 (Rao 1989). States varied in this regard. For example, Maharashtra has historically emphasized districts for planning purposes (Maddick 1970). In 1986, the year in which a new National Drinking Mission was launched, the L.M. Singhvi committee report recommended further devolution all the way down to the *gram sabha* level, a policy that was tried in the National Rural Drinking Water Programme (World Bank 2000, 21).

The context for devolution policies changed dramatically with passage of the 73rd Amendment to the Constitution of India in 1992, which empowered Panchayati Raj Institutions. The timing of the Amendment coincided with a general movement toward liberalization in Government of India policies, driven in part by financial stress and external banking pressures, on the one hand, and internal political and business pressures, on the other (Nadkarni, Sivanna, and Suresh 2017; Raghunandan 2017). It coincided with the 1992 Dublin Statement on Water and Environment, which put forward the principle of subsidiarity, which posited that water issues should be addressed at the most local level of competent authority possible. Table 1 lists the major national and state water policies that followed the 73rd Amendment.

Table 1. Selected National and State Drinking Water and Devolution Policies from 1992-2020

Government of India Policies	Government of Maharashtra Policies
<p>1992 -- 73rd Amendment on PRIs, District Planning, and water as a State topic.</p> <p>1999 -- Department of Drinking Water Supply created in the Ministry of Rural Development.</p> <p>1999 -- Start of devolution process through the Sector Reforms Project (in 62 districts)</p> <p>2002 -- National Water Policy Act prioritizes drinking water supply.</p> <p>2002 -- Swajaldhara drinking water program, with an emphasis on Gram Panchayats.</p> <p>2004 -- Ministry of Panchayati Raj created</p> <p>2005 -- Bharat Nirman for 55,000 villages not covered or slipped back.</p> <p>2006 -- National Rural Drinking Water Quality Monitoring and Surveillance</p>	<p>1993 -- Maharashtra Ground Water Regulation (for Drinking Water Purposes) Act</p> <p>1994 -- Maharashtra District Planning and Metropolitan Planning Committees Act. Water Supply and Saanitation Board renamed Maharashtra Jeevan Pradikaran (MJP)</p> <p>1996 -- Maharashtra Water Supply and Sanitation Department (WSSD) established</p> <p>1998 -- Maharashtra District Planning Committees Act. Amended 2012. Not limited to water.</p> <p>1999 -- Sukhtankar Committee recommendations led to devolution of rural water supply and sanitation to PRIs, limiting the role of MJP to only larger schemes.</p> <p>2000 -- Water Conservation Corporation Act, Maharashtra</p>

<p>2008 -- Planning Commission <i>Manual for Integrated District Planning</i>.</p> <p>2009 -- National Rural Drinking Water Programme (NRDWP)</p> <p>2010 -- Department of DWS becomes a Ministry; Ten-year <i>Strategic Plan</i>; NRDWP provides for Block Resource Centres (BRC). Also Devolution Management Index used to measure extent of devolution in each state.</p> <p>2012 -- National Water Policy</p> <p>2013 -- Detailed NRDWP <i>Guidelines</i> published with emphasis on the Gram Panchayat level.</p> <p>2013 -- GoI Planning Commission abolished.</p> <p>2016 -- Reduction of GoI funding to States, due to 14th Finance Comm and emphasis on Swachh Bharat Mission (sanitation).</p> <p>2018 -- Launch of Swajal Yojana for 115 "Aspirational Districts".</p> <p>2020 -- Jal Jeevan Mission launched for FHTC and PWS for every home by 2024. Detailed specifications for Village, District and State Action Plans.</p>	<p>2002 -- Shivkalin Pani Sathvan Yojana program promotes rooftop rainwater harvesting inspired by Shivaji's waterworks</p> <p>2003 -- Maharashtra State Water Policy Act gives priority to drinking water, followed by agricultural and industrial uses</p> <p>2005 -- Maharashtra Water Resources Regulatory Authority Act (MWRRA) & establishment of the Maharashtra Water Resources Regulatory Authority (MWRRA)</p> <p>2003-9 -- Jalswarajya I World Bank Rural Drinking Water Loan to Government of Maharashtra.</p> <p>2011 -- Amendments to State Water Policy</p> <p>2014-20 -- Jalswarajya 2 -- World Bank Rural Drinking Water Loan to Government of Maharashtra.</p> <p>2016 -- Devolution of GoI NRDWP funding to the State level.</p> <p>2016 -- MMRDP State Drinking Water funding increased with emphasis on the District level. Formalized in 2018 G.R.</p> <p>2017 -- Resumption of project funding under in NRDWP</p> <p>2018 GoM MWRRA Draft Rules. GoM G.R. March 9 2018.</p> <p>2019 Maharashtra State Water Policy.</p> <p>2020 -- Rapid State adjustments to implement Jal Jeevan Mission and secure funding.</p>
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In 1999, the Government of India created a Department of Drinking Water Supply (1999), and made it a Ministry in 2010. Maharashtra had already created its Department of Water Supply and Sanitation in 1996, along with the position of Executive Engineer for Rural Water Supply within each Zilla Parishad (District government) to secure funds, build projects, and strengthen the devolution process. At the *gram panchayat* level, Village Water Supply and Sanitation Committees were institutionalized through amendments to the state Gram Panchayat Act. These moves reflected increasing national and international funding available for rural drinking water supply, first through the Swajaldhara program (2002), then the Bharat Nirman program (2005), and National Drinking Water Surveillance Programme (2006). These programs sought to

empower the *gram panchayat* level of water governance, a policy that was reinforced by the large-scale National Rural Drinking Water Programme in 2009 (Government of India 2013). Each State developed implementation plans, using prescribed formats, to secure national funding under the NRDWP program (i.e., local devolution policy continued to be centrally administered).

Maharashtra introduced its own reforms to promote devolution of drinking water project operations and maintenance, based on recommendations of the Sukthankar Committee (Government of Maharashtra 2001). The state also launched the Sant Gadge Baba Campaign in 2002 to reward *gram panchayats* that made exemplary improvements in water and sanitation services. The best performing *gram panchayats* were given awards every year, which encouraged others to improve their performance.

In addition, the State of Maharashtra pursued its own external loans for rural drinking water investment and sector reforms from the World Bank (2014) called the Jalswarajya Project. Jalswarajya literally means “water self-rule,” which consciously resonates with the *swarajya* ideology of Shivaji’s Maratha self-rule movement. International, national, and state funds have been generous, but they have come with specific expectations of village operation and maintenance, accountability, and fiscal reforms through metering, monitoring, and planning (Bassi et al. 2014; Sangameswaran 2014; Singh et al. 2019). Jalswarajya also follows a new World Bank financing instrument called Program for Results (P4R), in which disbursements are made upon pre-agreed results documented by an Independent Verification Agency. The main aim of the P4R financing instrument is to ensure planned economic outcomes, which include but extend beyond physical outputs. When the Government of India reduced NRDWP funding in 2016, the State stepped in with its Mukhyamantri Rural Drinking Water Programme (MRDWP) program, which shifted project management authority back from the *gram panchayat* level up to the district level. The Maharashtra State Water Policy of 2019 took a further step toward integrating rural drinking water planning within a broader multi-sector water framework, as did the national government when it grouped diverse water agencies under a single Jal Shakti Ministry.

These institutional dynamics are likely to continue in the 2020 Jal Jeevan Mission, which promises Functional Household Tap Connections (FHTC) for all homes in India by 2024. These post-1992 policies and programs are sometimes characterized or criticized as “neoliberal”. And there is some basis for that assessment. International, national, and state programs have increasingly emphasized piped water supplies to individual households with neoliberal expectations of water pricing and revenue recovery. But these policies apply mainly to operations and maintenance costs to ensure sustainable service delivery, reflecting the historical and cultural view that providing water to people is a noble cause that should not be commodified. Thus, government continues to finance physical infrastructure costs, water quality monitoring, capacity building programs, and emergency tanker supplies for drought and water quality affected villages.

The suite of state policies is sometimes counterposed to arguments that drinking water is a human right, which seek to remedy systemic inequalities of access and service provision for marginalized members of society, oppressed by caste, class, and gender power relations (see

Sultana and Loftus 2019). The water as a human right movement bears comparison with liberal and neoliberal policies. They confront socially unjust state and community practices, and inequitable access to natural and financial resources. At the same time, they sometimes emphasize liberal principles of individual rights, equal treatment and protection. While nominally addressed in policies requiring gender and caste representation in different levels of government, inequities in gender, caste, and caste access to water services remain prevalent (Birkenholtz 2013; O'Reilly and Dhanju 2014).

With this macrohistorical geographic perspective in mind, we are in a better position to understand the origins of liberal reforms in late-19th century colonial policies, their continuous evolution, and active debates surrounding them, then and now. Many of today's institutional reform debates have long histories. They highlight the contradictions in devolutionary policies that originate in and remain overly prescribed by national and state policies and procedures. Conversely, the well-funded Government of India drinking water initiatives of recent decades would seem to exemplify the vision of a beneficent state that has even deeper historical roots. When commingled, these seemingly divergent statist and neoliberal policies seem complicated, as some have argued, but that have long-term historical geographic precedents and a logic that make them more understandable.

9. Conclusion: Beyond Bricolage?

Early in this paper, we mentioned the view of some water governance theorists that the eclectic nature of modern water policies may be understood as a process of *bricolage*, i.e., of assembling disparate ideas, information, methods to address current challenges in ways that seem good enough to those who are making the decisions if not to others who supervise them or still others who are affected by them. *Bricolage* seems a fancy way to describe practical action that does not follow a single coherent set of ideas and methods. However, its development to date has not helped explain where its partial pragmatic solutions come from, let alone their prospects for success.

To address these challenges, this paper employed a macrohistorical geographic approach. It identified the historical origins and development of drinking water institutions at different levels of government, and the dynamic relationships among them, to help explain the complexity of the current situation. We briefly review the main findings of this approach to consider how these findings might serve as guides for future water policy design and evaluation.

The first finding is that from the earliest treatise on statecraft to the most recent Jal Jeevan Mission in India, many have deemed it to be a fundamental duty of the state to provide water for its citizens. This principle has been repeated for over 2,000 years. One may call attention to the gap between historical ideals and realities on the ground, but that does not change the deeply ingrained strand of social thought in India that the state should have that duty. In a related vein, it is important to recognize that the historical sources cited have presented this ideal as a *duty* of the state, rather than as a human *right* of individuals or communities, which is a liberal construct grounded in the more recent history of Article 21 of the Constitution of India, the Government of Maharashtra State Water Policy (2019, 6-7), and others. The language and culture of duty is

deeply rooted in Indian history and culture (Olivelle 2016). If correct, the progressive development of duties may provide a productive focus for future drinking water activism, institutions, and administrative practice.

A second major finding is that India has had roughly five main levels of government over the past five centuries or more. These are the central state, major provincial states, districts, blocks, and villages. These have had different names in different periods and regions. Different regimes have added or subtracted layers at various times (e.g., intermediate *chiklis* during the Maratha period). There are also myriad smaller habitations (e.g., *wadis*). The dynamics among these local village levels of settlement have also been complex (Wescoat et al. 2019). In general, this paper shows that they have had a strongly hierarchical structure, though history records significant instances of scale-jumping, as for example when the central state sought to connect directly with *gram panchayats* in the NRDWP. This finding is doubly significant because the village *gram panchayat* is the only level of government that was not originally a creation of a national or state government. The district and block, by comparison, were created by rulers in the medieval period, or earlier, and governed by larger provinces (*subahs*). That has changed over time as elected bodies developed at the village, block and district levels, which were institutionally strengthened by the 1993 Panchayati Raj Institutions amendment to the Constitution of India. With this historical perspective in mind, it should not come as too much of a surprise when block and district water officers complain of “political interference” by locally elected officials, instead of regarding their principal duty as a lateral one to these electorates and their representatives. Strengthening the authority and capacity of local governments and administration staff has made progress, but true devolution has much greater potential.

A third finding showed that the disruption caused by frequent rotation of senior administrative officers also has deep historical roots. As noted above, the roughly 3-year rotation of central, state, district, and block development officers roughly matches the average appointment period of Mughal *subahdars* and British Collectors. Even the *Arthashastra* mentioned the transfer of poorly performing officers. What is perhaps less widely recognized is that historical exceptions that involved longer appointments, e.g., of the Mughal governors Wazir Khan in Lahore and Khankhanan Abdur Rahim in Burhanpur, led to enduring infrastructure benefits for those cities (Hirsch, 2020; Wescoat 1996). Every project and program is affected by frequent staff transfers, which bring new ideas and methods and a desire to distinguish themselves from previous efforts. In a related vein, our analysis in table 1 showed that devolution policies have been revisited with surprising frequency at the national and state levels. They have debated the relative merits and relationships between district and block administration from colonial times to the present. In political terms, few studies, policies or programs have lasted longer than an election cycle.

This combination of frequent, asynchronous, political and administrative cycling would appear to work against the long-term planning and efficient implementation of rural drinking water programs. But that conclusion raises interesting questions about the relationship between politics and efficiency in water governance. Efficiency is the gospel of liberal reform, and it too has a long history of more than 150 years in India, which includes a strong emphasis on the ways, means, and meanings of devolution. Early reforms sought to redress corrupt and

inefficient East India Company behaviors of the late-18th century. A century later, reforms involved various combinations of paternalistic and utilitarian principles, mandating water use efficiency from above, ostensibly for the good of the villages, blocks, and districts below, who purportedly lacked the capacity to achieve it on their own (Raghunandan 2017). Incentives in the way of funding and physical infrastructure required compliance with the ideas, methods, and metrics of the sponsors.

What appear to be administrative inefficiencies, as interpreted by liberal reformers over the past 150 years, may have political logics that deserve closer study and more creative intervention. Non-adoption has often been criticized in similarly paternalistic and utilitarian terms, (or as *fitna*), when in fact it may have a different social rationale (as noted in Wiser et al. 2001). The three main attitudes toward Panchayati Raj Institutions at the time of Independence -- of Gandhi, Nehru, and Ambedkar -- appear to have operated in various combinations with one another in the drinking water initiatives of different places and times. Thus, the politics of water governance can and must anticipate, manage, and creatively transform processes of disruption. The historical role of politics whether it be the *fitna* theory of historian Andre Wink or other models of alliance, conflict and change constitutes an important topic for future research. Equally important is the record of countless, yet uncounted, local water governance innovations that have occurred across India. Some of them are held up as exemplars but are often attributed to a charismatic individual or a unique community and or place-based condition, rather than as successful local politics that can be emulated, adapted, and scaled up in other places and regions.

Thus, it seems reasonable to complicate the interpretation of drinking water reforms as Sangameswaran (2014) suggests and to engage further in *bricolage* that works. Success may be neoliberal in some ways, places, and times, but it may also be statist, socialist, or even anarchic in others (Shah 2008). By understanding the macrohistorical geographic processes of water governance in India, one arguably has greater prospect for using that understanding in principled, practical, productive, and equitable ways. That is, by historicizing water institutions, societies might envision strategies for moving toward a longer and more complex trajectory toward universal rural drinking water access and services.

Declarations

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