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COMMENTARY

Revisiting periurban water (in)security in South Asia

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Abstract

The Sixth Assessment Report (AR6) of the Intergovernmental Panel on Climate Change (IPCC) has identified periurban development as one of the major drivers of climate risk on vulnerable communities. At the same time, 'grand challenges' such as the Covid pandemic and urban–rural contestations create a new imperative for renewed attention to issues of periurban water insecurity by drawing attention to living conditions in periurban spaces where people live in crowded and often informal settlements with inadequate access to safe water. Understanding periurban water insecurity requires paying attention to the dynamic processes of change characterising periurban spaces that make access to water in periurban spaces uncertain and fluctuating. Rather than focus on quantitative indicators of periurban water insecurity or assume that reclassification of jurisdiction status will improve periurban water security, action research with robust partnerships across academia, government and civil society organisations should inform approaches to improve water governance in periurban spaces.

Keywords: Governance, South Asia, Periurban, Water access, Water (in)security

1. Periurban water (in)security

'Periurban' is an umbrella term conceptualised differently to denote a place, concept or a process (Follmann, 2022; Narain & Nischal, 2007). While the most simplistic connotation of the term is as a space at the peripheries of the city, the framing of the periurban itself has been widely questioned. It has been argued that institutional contexts define periurban (Iaquinta & Drescher, 2000), that periurban is a sociological phenomenon (Shrestha, 2019)

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and that if periurban denotes the co-existence of the rural and the urban, this co-existence could exist even in the heart of the city, and not just at its periphery (Singh & Narain, 2020). Periurbanisation is a multi-dimensional transformation process, from primarily rural to a mix of rural and urban landscapes and socio-economic realities (Allen, 2003; Follmann, 2020).

Two recent developments make a compelling case for renewed attention to periurban water insecurity: first, the outbreak of the Covid-19 pandemic and second, the Intergovernmental Panel on Climate Change (IPCC)'s 6th Assessment Report (AR6) which draws attention to periurban development and the growth of informal settlements. The outbreak of the Covid pandemic drew attention to periurban spaces where people live in crowded settlements with poor or inadequate access to safe water, increasing their vulnerability to the effects of the pandemic. The IPCC's AR6 drew attention to the growth of periurban spaces as enhancing climate risk for vulnerable populations.

We draw on research on periurban spaces in South Asia to support these claims. The process of periurbanisation captures the transition from the rural to the urban; land use change is often a driver of this process, which triggers off changes in water use and allocation practices. There are gainers and losers in this process; thus, periurbanisation is characterised by both conflicts and conflicts of interest over water resources, while this process of transition also creates opportunities for cooperation. The expansion of several South Asian cities has been shaped by the acquisition of land and water from the peripheral areas, compromising the water security of periurban populations, often leading to local conflicts, for instance, between agriculturists and fishermen (for Nepal, see Shrestha, 2019; Shrestha et al., 2018; for Bangladesh, see Khan et al., 2021; Kumar et al., 2011). At the same time, the scholarship on periurban water security with a regional focus on South Asia has grown significantly in recent decades (as examples, see Narain & Prakash, 2016; Narain & Roth, 2022; Roth et al., 2019), making a South Asian focus in this article pertinent.

Periurban spaces reveal a heterogeneous mix of land uses and a diversity of actors and institutions, straddling the rural and urban divide. These may include informal living spaces and insecure land tenure—for instance, slums and temporary settlements—though informal living is not necessarily a feature of periurban spaces. Such spaces could exist at the periphery of the megacities or in the heart of small cities.

Water security is considered as a paradigm with diverse and often contradictory conceptualisations (Cook & Bakker, 2012). Broadly, it is a term that we use to denote access to water of sufficient quality and quantity for a variety of human needs and ecosystem services. Having said that, it is difficult to work with objective benchmarks of water security in periurban spaces. Periurban water security needs to be appreciated in the backdrop of the processes characterising periurban spaces that cause access to water to be fluctuating and varying, rather than as a configuration of different water sources yielding fixed quantities of water. Though water access can be varying and fluctuating both in rural and urban settings, the periurban space, being a space in transition and experiencing both rural and urban stresses and opportunities, is characterised by greater fluctuations and variations in water access.

Each periurban context is unique – situated within or in the peripheries of cities, towns and agglomerated villages, influenced by various periurbanisation processes. On

account of land use and other changes that affect periurban spaces, water access is continually altered. We define access along the lines of Ribot and Peluso (2003) to refer to the ability to derive benefits from things. This definition focuses on various social relationships that allow or constrain benefits from resource use beyond mere property relations.

Varying geographical spaces intersect with diverse social identities to shape differential water access in periurban spaces, further shaped by power relations and differential access to social capital. The effects of these different social identities are aggravated by geographical and topographical factors such as the location of fields or of residential settlements concerning diverse water sources. A tremendous social diversity translates into a wide diversity of sources from which people may derive access to water. There is a variation not only in the sources of water but also in terms of the quantity or volume of water that people may appropriate from these sources. Landlords, tenants, sharecroppers, residents and migrants enjoy water access that is highly socially differentiated. Short-term settlers or migrants lacking secure tenure or living in informal settlements may be more disadvantaged in their water access than local residents.

The dynamic nature of the periurban context causes water supply to vary temporally and spatially. For instance, constructing a wastewater canal carrying the city's wastewater may provide new irrigation opportunities, allowing farmers to cultivate lucrative crops like paddy, as witnessed in periurban Gurgaon in India (Narain & Singh, 2017). While those who had lands adjacent to the canal could primarily benefit from its presence, social relations and local norms of cooperation allowed the resource to be used by a larger number of irrigators. At the same time, a wastewater canal that an irrigator accesses to irrigate may suddenly get sealed to beautify the surroundings or free them of the stench of the wastewater, again as witnessed in periurban Gurgaon (Vij & Narain, 2016). The construction of a road to the city may suddenly obstruct access to a water source. Likewise, constructing a canal carrying freshwater to the city may raise the local water table and provide opportunities to appropriate water, for instance, by installing hand pumps along the canal (Narain, 2014). On the other hand, the springing up of farmhouses or gated colonies in the vicinity may lower the local water table, causing irrigators to switch to rainfed agriculture or to leave their land fallow (Narain, 2014; Vij et al., 2018).

2. The gendered and intersectional nature of periurban water insecurity

Gender is a crucial axis of social differentiation, and it becomes more telling when seen in relation to other axes of social differentiation such as caste, class, ethnicity, religion, age or marital status. The gendered nature of water governance manifests in the gender-based division of labour around water collection, the gendered nature of water access and use and the subordination of women by men in local structures of governance and decision-making and their exclusion from leadership positions (Ahmed 2008; Das, 2014; Devi & Buechler, 2009; Joshi, 2014; Zwarteveen et al., 2014). The gendered nature of periurban water (in)security is shaped by the diminishing access to land and water, often aggravated by climatic variability and change, compounded by the unintended impacts

of urban water infrastructure expansion. This manifests in many forms: the expansion of urban water infrastructure by engulfing village commons could translate into increased or new roles and responsibilities for women around natural resource collection (Vij & Narain, 2016); the migration and daily movement of men in the face of land use change and occupational diversification common in periurban spaces could create additional water collection tasks for women who traditionally did not engage in this activity (Ranjan & Narain, 2012); urbanisation and climate change can intersect to make access to water sources more difficult, thereby adding to women's water burdens (Narain & Singh, 2019).

3. Hotbeds of vulnerability and climate risk

The AR6 of the IPCC (Working Group 2, Chapter 6) identified periurban development and the growth of informal settlements as critical drivers of climate risk. It is the conditions and processes characterising such spaces that make residents low on their adaptive capacities while being high on exposure to the effects of climate change (as an example, see Mishra & Vij, 2022). Low adaptive capacity can be due to insecure land tenure and weak social capital resulting from migration or due to poor or diminishing access to natural capital. Weakening social capital on account of migration or the loss of common property resources that provide a social glue; diminishing access to land and water; and institutional complexities and lacunae along with poor civic engagement are other factors that make periurban spaces highly vulnerable to the combined effects of climatic change and increasing water insecurity (for South Asia, see Narain & Prakash, 2016; Narain & Roth, 2022).

In South Asian coastal cities, once the core of the cities gets saturated, urban expansion occurs into the coasts – into low-lying regions prone to land subsidence, coastal flooding or sea level rise. A good example of this is that of Khulna, Bangladesh, where climate change and urbanisation interact closely to cause problems of sea level rise, salinity intrusion and water insecurity, compounding the effects of multiple stresses on people's livelihoods (Khan et al., 2022; Kumar et al., 2011).

Wetlands function as natural buffers against flooding and are acquired or encroached upon for building residential areas and setting up industry or educational institutions. When the waters recede or for the part of the year that the wetlands are dry, they are easy prey to encroachment. Because of the wide variety of ecosystem services that are provided by such wetlands, they are of immense value for urban resilience. However, their location in the city's periphery creates a situation where they receive less policy and political attention. The Municipal Corporation of Guwahati, a city in North-East India, has a dump yard located on the *Deepor beel* (a local word for a wetland), a Ramsar Site (Vij et al., 2023). The Deepor *beel* is home to the Greater Adjutant Stork, an endangered species. Carcasses of the bird are increasingly reported around the site of the Deepor *beel*, resulting from ingesting plastic, contaminants and toxic substances around the wetland. The contamination of the *beel* also lowers the diversity and quality of the fish catch for local fishermen. A railway track was constructed cutting through the *beel*, affecting the navigating routes of the

wetland-dependent periurban community. Damage to the wetlands has also increased the flood risks in the city; for instance, in 2022, there was unprecedented rainfall and flooding in Guwahati, hampering the lives of the city residents.

4. Revisiting periurban after the Covid-19 pandemic

The Covid-19 pandemic created compelling reasons to provide renewed attention to periurban spaces. Periurban spaces in South Asia reveal many characteristics that created high-vulnerability conditions. During the second wave of the pandemic, which was at its peak during April and May 2021 in India, the number of Covid cases had started falling in the cities and municipal corporation areas; however, the incidence of Covid increased in the rural and periurban areas (Times of India, 2021). The large number of containment zones were in rural areas surrounding gated communities (Narain, 2022). This could be due to several reasons. First, periurban spaces are characterised by high population densities that could make social distancing difficult; access to safe water and sanitation is often compromised, as demonstrated by the rapidly growing literature on periurban water insecurity in South Asia (Narain & Prakash, 2016; Narain & Roth, 2022; Roth et al., 2019). Specifically, this could be due to inadequate institutional coverage in the peripheries and water insecurity for adequate handwashing and access to private toilets (Ashraf et al., 2020; Chattopadhyay, 2022). Many people in such spaces live under conditions of insecure land tenure, which translates into poor access to water (Narain, 2012). There is a considerable preponderance of the informal sector, with large concentrations of migrant labour inhabiting periurban spaces. In India, Dandekar and Ghai (2020) note that the majority of migrants serving cities live in periurban spaces. Many of them had to make an arduous journey back home on foot when inter-state transport links were disrupted in the wake of state-induced pandemic lockdowns.

Many periurban spaces suffer from institutional voids and complexity, which adds to the challenge of securing access to safe water and sanitation. Traditional water sources like village ponds – earlier managed through community-based institutions – now suffer neglect at the hands of the local Panchayat (unit of village-level governance in India) and Municipal Corporation of Gurgaon (Vij & Narain, 2016). Similar observations are made for Nepal, where urbanisation has led to a demise of traditional technologies and institutions for water management (Shrestha & Shrestha, 2014).

5. Improving access to water in periurban spaces

The diversity of actors, technologies and institutions through which water is accessed in periurban contexts is complex. A common thinking about improving governance in periurban contexts is that since periurban is a space in transition from the rural to urban, bringing it under a formal urban governance structure is the de facto solution to inadequate access to water. The periurban, in policy circles, is often portrayed as a space that is neither

rural nor urban, hence 'nobody's baby'. Periurban is better understood in terms of processes and features rather than as a 'jurisdictional type'. Much of what we call periurban is called so because it reflects the co-existence of the rural and urban in terms of economic activities, processes and institutions.

Improving access to water in periurban spaces requires taking cognisance of the diversity of water sources and the complementarity between state and non-state actors, technologies and institutions in water supply. Rather than assume that state-supported piped water supply is the apparent solution to periurban water insecurity it is imperative to understand the diversity of state and non-state actors, technologies and institutions mediating water insecurity in periurban spaces. The multitude of informal actors, technologies and institutions will not disappear when a municipal corporation starts to govern a periurban space. For instance, in Rawta village, New Delhi, piped water supply provided by the drinking water utility meets, at best, the domestic water requirements only partially (Narain et al., 2023). Residents need to connect with the underground piped network through their own personal pipes; they also have underground storage devices in which this water is stored for the times when the piped water supply is not available. Further, they pump water to higher elevations through another network of pumps and pipes installed in their homes. Water for domestic purposes is also made available by a private groundwater vendor who sells water of a pre-defined quantity daily to residents in partnership with another village resident. Even this falls short of meeting the village's domestic water supply requirement. This is made good by providing water through formal water tankers and informal piped water supply. As an urbanising village, Rawta is under the jurisdiction of the South Delhi Municipal Corporation and the Delhi Jal Board has the official mandate of providing drinking water to the village. However, this does not reduce the significance of other actors in water provisioning that fill in the void left by inadequate water provisioning by the state utility.

A wide variety of approaches have been explored in periurban spaces to improve water access and governance in South Asia. These include community mobilisation (Dahiya, 2003), participatory action planning (Halkatti et al., 2003), improving civic engagement (Narain et al., 2020) and the negotiated approach (Gomes & Hermans, 2018; Hermans et al., 2022). The Covid-19 pandemic, however, made it difficult to work closely with communities. With the constraints posed by the pandemic gradually easing, there is a fresh opportunity to engage with periurban communities using these approaches to research, build and expand capacity to improve water access and governance in transition spaces.

6. Future research agenda

Against this background and taking stock of past periurban scholarship, more recent studies have identified three interlinked conceptual trajectories – territorial, functional and transitional – represented by Follmann (2022) and earlier by Narain (2014), Vij and Narain (2016), Iaquinta and Drescher (2000) and Allen (2003). Considering such conceptual trajectories, it may be helpful to explore whether periurbanisation follows the

trend of planned and top-down forms of expansion or is a more incremental and piecemeal paradigm.

Within the piecemeal paradigm, Caldeira's (2017) notion of 'peripheral urbanisation' can help investigate the logic of production in the Global South, linking to postcolonial thinking. Her work goes beyond the northern-originated analysis of urbanisation, marking the theorisation of a mode of production that is prevalent in the cities and its peripheries of the Global South, shaping water (in)security issues, discourses and institutions. The concept of peripheral urbanisation suggests that cities and their peripheries will emerge with more heterogeneity and unique politics – considering heterogeneity of class, caste and social groups that is distinct from the industrial cities in the Global North. Further, Caldeira's thinking has the potential to enrich the conceptual debate on periurbanisation, going beyond the territorial or spatial boundaries, and expanding on periurban institutional processes and water access and control, linking to urban political ecology and identifying ways to decolonise and challenge the modern infrastructure ideal to find new ways of explaining water (in)security. Analysing the modes of production from a Global South perspective allows to look for local solutions and breaking the colonial shackles of Global North solutions. Periurban residents have their own agency, and they build their environment (urbanise) gradually. At times it is not influenced by the typical market forces or the state; and even if the state intervenes, the residents have the agency to negotiate. Further, peripheral urbanisation involves a unique temporal dimension, where neighbourhoods grow gradually, in long-term processes of incompletion and continuous improvement led by their own residents. Periurban water security needs to be appreciated from a perspective of urban political ecology, highlighting how power shapes water flows and access between urban and periurban spaces and vice versa. A few recent studies such as those by Vij et al. (2018) and Narain et al. (2023) have used a conceptual lens of urban political ecology to explain periurban water security issues, making a case for advancing knowledge in such spaces in transition.

Further, borrowing from a postcolonial perspective, periurban water governance processes can be explored from the 'urban-agrarian' perspective (Cowan, 2018; Gururani, 2020). Focusing on uneven urbanisation processes is closely connected to pre-existing postcolonial and caste-related agrarian inequalities dividing land-rich farmers from landless workers. Failures and successes of collective action and social capital can be studied from the urban-agrarian perspective, relating to water conflicts and cooperation between different social groups along the axis of gender, caste, class and age.

A vital periurban research agenda is to focus on how gender relations and periurban water security issues are intertwined. Gender is a social construction located in time and space, which means that gender relations are contextual. With the expanding cities, there are changes in gender relations not only around water in periurban spaces but also around natural resources more broadly. Social science researchers focusing on gender may want to explore gender relations on a blank slate, investigating who does what at home and outside and how the expansion of urban agglomerations causes this to change – identifying causality and mechanisms. Periurban spaces provide fertile grounds to explore

the fluidity of gender relations, resonating in the concept of 'changing genderscapes' (Goodrich et al., 2019).

Lastly, it is to be noted that periurban water research has been making progressive steps in the last decade, with both critical and postcolonial perspectives decentring the urban focus within the periurban water scholarship. Emphasis on comparative periurban analysis in the Global South can advance the nuanced understanding of unequal water access and expose the injustices in such spaces. Rather than emphasising how much water is needed for periurban communities (quantitatively), we must accentuate water equity and justice perspectives to build water-secured periurban spaces.

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