

11 Changing Waterscapes in the Periphery

Understanding Peri-urban Water Security in Urbanizing India

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INTRODUCTION

Urbanization and economic growth are considered to be the most striking features of the past century (McGranahan 2006). There is currently a radical demographic shift in progress worldwide, wherein people are moving from rural to urban areas at an increasing rate. In the mid-1970s, less than 40 per cent of the world's population lived in urban areas; by 2025 the figure is expected to reach 60 per cent.¹ In 1950, 41 of the world's 100 largest cities were in developing countries. By 1995 this number had risen to 64 and the proportion has been rising ever since. Increase in the urban population is particularly likely to affect low income countries. As per future predictions, nearly 90 per cent of the urban dwellers will be living in developing countries.

The UN-Habitat report 2005 (cited in Adesina 2007: 2) indicates that in 2025, 61 per cent of the 5

billion world population will reside in the urban areas with about 85 per cent of the development process taking place in the urban hinterlands widely referred to as 'peri-urban', 'suburbs', 'urban fringe', 'city edge', 'metropolitan shadow', or 'urban sprawl'. The peri-urban zone is considered to be a transition zone and is conceptualized as a space in 'continuum' with the urban area, characterized by mixed land use with agricultural land predominating the landscape within which there is other rural land that is converted into permanently built-up areas and covered with infrastructure. 'Urban sprawl makes intensive demands on the environmental resources and poses problems by eating into valuable natural habitats of their hinterlands' (OECD 1990 cited in *ibid*: 3). It is associated with loss of natural wetlands along with loss of core forest habitat, loss or damage

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¹ This is not withstanding the fact that definitions of rural and urban vary across countries; sometimes, that may hinder cross-country comparisons (Satterthwaite 2006).

of prime farmland and increase of impervious surface (Hasse and Lathrop 2003). This is a process emerging out of development activities, manifested in changing social and economic interactions and increasing mobility of production factors, such as capital, labour, technology, and information to the urban fringe near mega cities. A ‘peri-urban interface’/‘urban fringe’/‘suburb’ comprises small farmers, informal settlers, industrial entrepreneurs, and urban middle and elite classes all co-existing with varied interests, practices, and perceptions (Allen 2003; Iaquina and Drescher 2000; Narain and Nischal 2007).

The process of rapid urbanization has thinned down the distinction between what is purely ‘rural’ and ‘urban’ with the intermediary ‘peri-urban’ zone becoming more prominent and visible in the future. Since peri-urban regions have specific social, economic, and institutional characteristics, there is a case and need to understand and document these better. An understanding of these unique characteristics is essential in order to develop new and innovative ways of addressing peri-urban challenges, cutting across the frontiers of rural and urban governance.

In this backdrop, this chapter documents the process of urbanization and its impact on the lives of the people and the water bodies in the peri-urban areas of Gurgaon and Hyderabad in India. The chapter is divided into three broad sections. Section one provides an understanding of the urbanization process in Hyderabad and Gurgaon and the issues therein. Section two focuses on the concerns around water insecurity in peri-urban areas due to increased urbanization. Section three focuses on the policy implications coming out from the analysis of the two case studies.

URBANIZATION TRENDS IN HYDERABAD AND GURGAON

India’s urban population grew from 290 million in the 2001 Census to an estimated 340 million in 2008 representing about 30 per cent of the total population. According to a recent study, the projection of urban growth rate at urban population in India will increase to 590 million by 2030 (MGI 2010). Urbanization is the defining characteristic of cities in India and the two cities under study—Hyderabad and Gurgaon—are not an exception. For these cities, the post-liberalization period has seen a form of development, where the

process of change has been induced by growth of the information technology (IT) sector leading to tremendous growth and expansion post-liberalization.

The Growth and Expansion in Hyderabad

Hyderabad is a historical city which was founded in the 15th century and was the centre of princely state rules by Nizams till India’s independence. Post-independence, it became a part of the Indian Union and became the capital of Andhra Pradesh, which was mostly carved out of the erstwhile state/province of Madras. In the mid-1990s, when the structural adjustment programme was initiated by the Government of India, Hyderabad became a node in the global web of economic flows and linkages. The development of the city made the Ranga Reddy district (of which Hyderabad is a part), the most developed district of the state. With a population of 5.53 million as per the 2001 Census, Hyderabad is currently ranked as the sixth largest urban agglomeration in the country. The Hyderabad Urban Agglomeration (HUA) consists of the Municipal Corporation of Hyderabad (MCH), 12-peripheral municipalities, Secunderabad Cantonment, Osmania University, and other areas. In recent times, the 12 surrounding municipalities were assimilated and the Greater Hyderabad Municipal Corporation was formed. The population growth rate in these three components within the Hyderabad Urban Agglomeration is given in Table 11.1.

TABLE 11.1 Percentage Growth Rate of Population in the Components within HUA

	1981–91	1991–2001
MCH	45.24	19.02
Surrounding municipalities	160.53	71.72
Others	39.13	25.00

Source: Calculated from data in GHMC Hyderabad City Development Plan (undated).

A future projection of population for HUA is shown in Figure 11.1. This figure projects an interesting trend, whereby the population of the surrounding municipalities will grow very rapidly and is expected to touch the population of the main corporation. The observed growth as well as projections indicate that development will continue to happen in the surrounding areas of the main city. These areas have

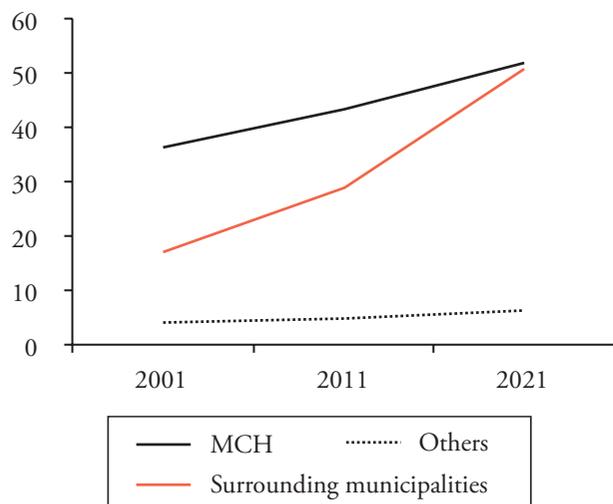


FIGURE 11.1 Projected Population Figures (in lakh) for Components of Hyderabad Urban Agglomeration (2001–21)

Source: Calculated from data in GHMC Hyderabad City Development Plan (undated).

become nodes of development in recent years and the real estate sector has boomed largely in these areas.

Another interesting issue is the growth of population in the surrounding municipalities of Hyderabad. Table 11.2 shows that the level of urbanization has been decreasing from 1981 to 1991 to 2001 in the municipal corporation area of Hyderabad and the other parts of HUA. However, the surrounding municipalities show increasing levels of urbanization during the same period.

TABLE 11.2 Level of Urbanization in Hyderabad

	1981	1991	2001	2011	2021
MCH	77.49	69.95	63.35	56.09	47.47
Surrounding Municipalities	14.02	22.71	29.67	37.44	46.74
Others	8.49	7.34	6.98	6.48	5.79

Source: Calculated from Census of India (1981, 1991, and 2001) and projected figures in the GHMC Hyderabad City Development Plan (undated: 12).

Table 11.2 shows that much of the growth since 2001 has taken place in the surrounding municipal areas. These areas fall within the jurisdiction of the panchayats and are now considered as revenue villages within the Hyderabad Metropolitan Development Authority. With the expansion of the city, some of the changes that these villages have come across are massive real estate development, decrease in agricultural land and shortage of water for round the year growth of paddy, water stress and degrading groundwater quality, acute shortage of drinking water during summers, increased dependency on bore water for all purposes, and supply of 24×7 water to surrounding development enclaves adjacent to these villages.

The Drivers of Urban Growth in Gurgaon

The present city of Gurgaon can be considered a metropolitan area encompassing settlements around the original city, and expanding even further with the establishment of new neighbourhoods and districts. A favourable tax policy by the Haryana government, improvement in the city's infrastructure by the Haryana Urban Development Authority (HUDA), and the need of a business centre close to the Indira Gandhi International Airport in Delhi saw the emergence of Gurgaon as one of the most prominent outsourcing and off-shoring hubs in South Asia. With the initiation of economic reforms in 1991, Gurgaon saw a massive expansion in its population and economy after the real estate major, the DLF Group, started buying farmland owned by the local people to start developing housing societies for the upper-middle class residents of Delhi. Further to this, the government removed bottlenecks in obtaining permits and provided special incentives to information technology/IT enabled services² (IT/ITES) and the business process outsourcing (BPO) sectors which attracted foreign investment. They were to receive preferential allotment of resources and facilities like land and electricity. This made Gurgaon India's outsourcing hub in 1997 when GE Capital International Services (GECIS) was set up as the India-based business process services operations of GE Capital. Very soon, a plethora of BPO and knowledge process outsourcing (KPO)

² The information technology-enabled services (ITES) industry provides services that are delivered over telecom or data network to a range of external business areas. Examples of such business process outsourcing (BPO) include customer service, web-content development, back office management, and network consultancy.

firms, such as Genpact, Evalueserve, Dell, Accenture, Hewitt Associates, Copal Partners, and Convergys expanded their operations into the city. Apart from these, a few IT and pharmaceutical firms set up base as well, though their distribution has tended to be skewed. At present, Gurgaon is the regional head office of Alcatel-Lucent, Niksun, IBM, Opera Solutions, and Bain & Company. Gurgaon is also the headquarters of two biggest automobile manufacturers in India—Hero Honda and Maruti Udyog.

In 2005, the Government of Haryana introduced the new industrial policy, which gave further boost to increased and rapid urbanization; the key understanding and motive behind the new initiative was promoting industrial growth, creating wealth for the citizens, and improving quality of life. The professed goals of this policy were to generate employment and entrepreneurial opportunities across all sectors, facilitate dispersal of economic activities in the backward socio-economic regions of the state, and ensuring sustainable development through investment in key sectors. Since the expansion of BPO/IT/ITES in Gurgaon, there has been a large influx of population largely from Delhi and the surrounding states of Uttar Pradesh, Punjab, and Rajasthan. The migration to Gurgaon city has led to rapid urbanization and further growth of urban outgrowths in continuation of the municipal boundaries

of the city, better known by the Census of India as the Gurgaon Urban Agglomeration (UA). The total population of Gurgaon UA was 228,820 in 2001, which was 62 per cent of the total urban population of the district. A calculation of population growth reveals that from 1971 to 2001, the growth declined but a projected figure from 2001–11 till 2021 shows that the growth rate is above 300 per cent (see Figure 11.2).

The maximum increase in population has occurred in central Gurgaon town, which forms the industrial region, contiguous to Delhi and is therefore the hub of multinational corporations' expansion (Director of Census Operations 2004: 36, 40, 51 in an excerpt from Singh 2004). The NCR Planning Board as well as the master plans for urban areas and census for rural areas have projected the population of Gurgaon city till 2021 to be above 3 million. Based on these figures, the growth rate of the urban population between 1971–2021 is shown in Figure 11.3, pointing to a massive increase in urban population from 2001 to 2010. Likewise the percentage of the Gurgaon Urban Agglomeration to the total population of Gurgaon district increased from 3.35 per cent in 1971 to 13.80 per cent in 2001. In 2011, this proportion is expected to be 52.53 per cent, which will go up to 76 per cent approximately by 2021 (based on projected figures by Town and Country Planning Organization, Haryana) indicating a very steep rise (See Figure 11.3).

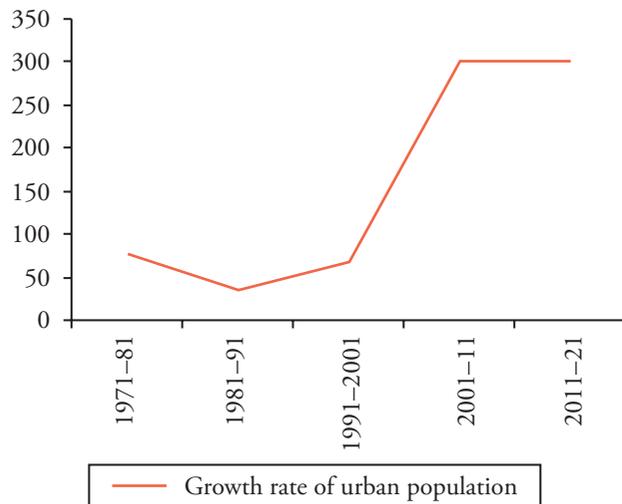


FIGURE 11.2 Growth Rate of Urban Population in Gurgaon

Source: Calculated and compiled from data given by the Department of Town and Country Planning, Haryana.

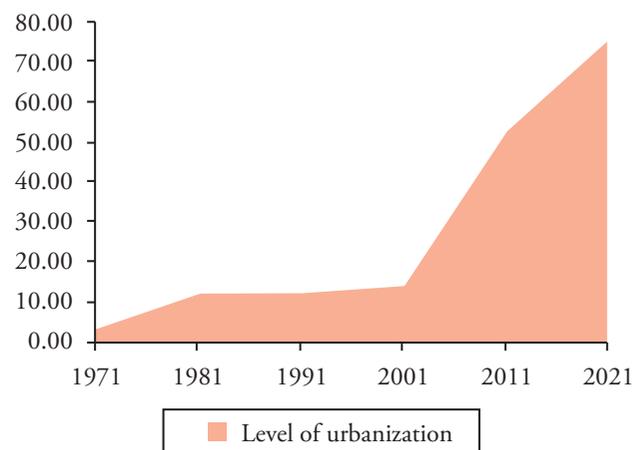


FIGURE 11.3 Urbanization in Gurgaon District

Source: Prepared from data given by Department of Town and Country Planning, Haryana.

A major impetus to the growth of Gurgaon has come from real estate that has emerged as an important industry in Gurgaon and the construction of office complexes and malls has led to an influx of labour from poor and underdeveloped states like Bihar, Bengal, and Orissa and even illegal migrants from Bangladesh. Real estate remains the third largest employer in the city after IT services and the retail sector (Consultants Mart Report undated). There has been a substantial shift from the traditional means of livelihood like agriculture in terms of the occupational structure (Census of India 2001). Another major driver of land use change has been the initiative of setting up special economic zones (SEZs). In 2005, the Haryana government decided to set up a SEZ through public-private partnership.³ In the official Master plan 2021, a total of 4,570 hectares has been allocated to SEZs.

URBANIZATION INDUCED WATER INSECURITY FOR PERI-URBAN AREAS IN HYDERABAD AND GURGAON

The unplanned and unsustainable development process in Hyderabad and Gurgaon has proved to be quite unsustainable and has turned out to be a serious threat to the cities and their environs. The growth has affected basic amenities, especially water supply for the increasing population in the newly developing areas. In this section, we examine the water insecurity confronting peri-urban residents in these two cities, especially from the peri-urban point of view and derive major conclusions.

Hyderabad—A City Thriving on Peri-urban Water Resources

Hyderabad, being located in an area with hard-rock aquifer, has very limited percolation while water drawn from the aquifer far exceeds the amount that is actually recharged. The groundwater depth during the dry season and during monsoons when correlated to rainfall over the last 10 years can reveal the gravity of the problem. There has been progressive decline in the per cent of rainfall converted into inflows due

to increased usage of surface and groundwater in the catchment areas surrounding Hyderabad. Historical data shows that there were 932 tanks in and around Hyderabad in 1973, which had come down to 834 in 1996. Consequently, the area under water bodies got reduced from 118 sq km to 110 sq km. About 18 water bodies of over 10 hectare size and 80 tanks of below 10-hectare size were lost during this period in the HUDA area. Besides the large water bodies, numerous small water bodies in the peri-urban zones also shrank, when the city underwent a wave of real estate growth (Ramachandraiah and Prasad 2008).

However, systems for water and sanitation have often been specifically planned and constructed for either urban or rural situations, resulting in the peri-urban interfaces being neglected or forgotten, leaving large numbers without sufficient clean drinking water or adequate sanitation (Norström 2007; Törnqvist 2007). This makes planning for sustainable water and sanitation systems in peri-urban areas an important and challenging issue, since sources are limited and often diminish over time due to land acquisition for residential and commercial purposes. A survey done in 2003 in Hyderabad revealed the plight of low income households in accessing water, which was supplied either on alternate days for a few hours or once in three or four days (Ramachandraiah and Prasad 2008). This was in sharp contrast to the large quantity of water supplied to the IT companies and other institutions like the Indian School of Business (ISB) and the National Academy of Construction (NAC). Drinking water was supplied by tankers (which made about 5 trips a day) by the local municipality. The plan to lay pipelines so that domestic connections can be given to those who have the ability to pay clearly points to the concept of ‘users pay’, which brings in inequality and water equity issues.

The area around the Rajiv Gandhi International Airport is a semi-arid zone, dotted with numerous lakes and *kuntas*.⁴ There are 140 lakes and kuntas in this area, one of the largest being the Himayatsagar on the north-west. One of the largest manmade is the Himayatsagar in the northwest, whose catchment lies in

³ This SEZ was expected to be the largest in India and promised to provide 500,000 jobs. The main developer in this project—Reliance Industries Ltd. (RIL)—would hold 90 per cent of the shares of the project (Gurgaon Workers News—Newsletter 2 April 2007).

⁴ *Kunta* is local term in Telugu used when referring to a small lake.

an area, where recent developments have started in full swing (HADA 2003). Seventy per cent of this lake has already shrunk due to the drying up of the smaller lakes in the surrounding areas accentuated by low rainfall and low groundwater recharge along with construction of the international airport (Ramachandraiah and Prasad 2004). The area also has good fertile agricultural land, especially at Ravirala, Kongara, Chowdarypalli, Narkhoda, Adibhatla, and Dosawada etc. (HADA 2003).

In many of these villages, residents depend on groundwater for drinking as well as agriculture. The variability of rainfall during monsoons leads to increased stress on groundwater levels, because of rising demand for water for growing rice. The farmers have installed bores up to 100 to 150 feet deep or even more in order to provide water to their fields. In some cases, water requirements are met by transferring from the large water bodies located in the vicinity through artificial channels only during good monsoon periods. But this has been a rare phenomenon in the last several years. Many of the smaller water bodies, which served as natural water harvesting structures have dried up or shrunk in the last 6 to 7 years, when construction activities started on a rapid scale. (extracted from field notes prepared during field visits to peri-urban areas, September and October 2010).

Apart from this, illegal water trade is carried out for supplying water to urban colonies (see Box 11.1). Local people are unaware of the possibilities of a further drop in groundwater levels over time and have not gone in for any way out of this situation through other technical interventions or by identifying other sources or conserving other sources of water which face a threat.

A report by the Ground Water Board shows that in the Ranga Reddy district, 22 mandals out of 37, utilize more than 70% of the available groundwater resource. Based on the stage of groundwater development 15 mandals are categorized as safe (less than 70 per cent of available resource), 8 semi critical (70–90 per cent) to critical (90–100 per cent) and 12 over exploited (more than 100 per cent). The maximum stage development of groundwater is 187 per cent in Shamirpet mandal, which falls within the peri urban areas of Hyderabad. Shamshabad and Maheswaram mandals, also falling within the peri-urban area have been categorised as “over exploited” (CGWB 2007: 22 and 23). The present rate of access to water varies over socio-economic and

physical terrains. With the privatization of water and tariffs being the same for commercial and domestic use and within domestic use, between large residential complexes and residences of the lower socio-economic classes, a conflict is anticipated in the core and newly developing peripheries of Hyderabad. Again Hyderabad depends on its peripheral rural counterparts for food. Some farmers in the villages in the peri-urban areas, lack marketing skills and have to depend on local moneylenders to invest in their land, and in return have to sell half of their entire produce at a rate much lower than the market rate and pay higher interests for the investment made. This will pose a serious threat in terms of livelihood along with water stress in the future. Arguments about the need for a 24×7 water supply, have been countered by arguments for 4 hours of daily uninterrupted supply being sufficient for any household. This also leads to wastage of 20 per cent of the water. If 24×7 supply actually takes place, further wastage is expected. Equitable distribution of water to all areas and sectors (CGWB 2007) must be one of the priorities in policy documents. Also, agricultural practices in most peri-urban villages are completely dependent on groundwater and as per current regulation like the Andhra Pradesh Land Water and Trees Act coupled with the free electricity policy of the government, there is accelerated privatization of groundwater in the state as a whole (Ramachandru undated). Therefore, policy intervention for equity as well as groundwater regulation, especially for peri-urban zones must be taken up as a priority.

Consequences of Urbanization and Peri-urban Growth for Landuse Change and Water Security in Gurgaon

A study by urban scholars (Chaudhry et al. 2008) indicates that the land use pattern in Gurgaon has changed largely because of rapid urbanization and the expansion of the city into the peri-urban areas. Using remote sensing and GIS, the study shows how the expansion of Gurgaon and development of the new satellite town of Manesar saw the total built-up area increasing from 26.58 sq km in 1996–7 to 124.15 sq km in 2001–2. Most of this expansion has taken place in areas which were earlier scrubland, pastures, water bodies, land susceptible to water-logging with a high water table, or agricultural land.

Box 11.1
Water Security Concerns in Mallampet

Mallampet, 7–8 km away from Greater Hyderabad Municipal Corporation (GHMC) boundary is one of the several villages from where water is brought in tankers during summers to serve the needs of the city. This is one of the many villages from where the tankers operated by private entrepreneurs extract water. The sarpanch, Vekatesham indicated that the village has about 500 households, with about 50 acres of agricultural land left but only a small portion of it was actually being cultivated. Some villagers had sold their land and bought land near Narsapur. The primary reason indicated by him for change in the livelihood pattern is the cost of labour in agriculture: 'If industry pays Rs 150/day and agriculture pays only Rs 80/day, a labourer prefers to work in the industry'. The primary source of water in the village comes from 15 bores that have been set up by the panchayat which are up to 400 feet deep. If the lakes are full, the water table tends to be high and with 8 hours of electricity, water can be easily pumped and distributed to all the households for personal use and there is not much scarcity. In 2010, the lakes were full because of good rains. The first bore was dug in 1987, which later dried up due to pollution of the water from the surrounding industries; new bores were dug later. In 2005, some more bores were dug due to increasing demand for water in several other parts of the village along with new storage facilities and new pipe connections. To maintain this system along with a water treatment plant, Rs 2 is collected every month from each household. The village seems to be self-sufficient, but the illegal extraction of water has been a source of worry for the panchayat. For agricultural purposes, there are separate bores installed by villagers. But because right to water is tied to the right to land, many of the villagers who had bores dug in their land for agricultural purposes are actually selling water to private tanker entrepreneurs who in turn sell it to the industries in the vicinity. A villager selling water from his land makes Rs 150–200 from each tanker (5,000 ltrs/10,000 ltrs respectively) of water he sells and the tankers visit the village almost 15 times in a day to abstract water. The villagers are finding this more profitable than agriculture. Some villagers are also buying *manjira* water and bringing it in big tanks from surrounding villages which get supply and are selling it to the village community at Rs 10-15 (approximately) for 20 litres. Much of the water from the bores located in the village lake tend to get further polluted, especially during the monsoons, when the entire drainage water from the villages flows into this lake. The water pollution problem started in 1986. However, after much hue and cry and repeated complaints being filed against the polluting industries, the government has stopped providing permissions to set up new factories in the area... 'Only new factories cannot be set up as per the regulation, but the existing ones still operate and discharge their effluents into the other lakes located near the village', says the sarpanch. During the construction of the ring road, almost 78 acres of land was acquired. The construction is still underway and has encroached portions of the lake which is a source of groundwater for the villagers. However, the impact of builders and real estate developers has not been felt very strongly in the village itself, though land has been sold to developers and has been plotted for future growth. Till 1997, agriculture was the only source of income for a large part of the village but since 2002, with the real estate boom, households started selling their land. However, there are no large apartment complexes in the vicinity; only a few duplex complexes. The water security concerns also emerged very strongly in Mallampet, whose water resources are being randomly exploited by illegal tankers, selling water to the industries, which in turn pollute the groundwater by releasing effluents. This is a vicious cycle which is a cause for worry and needs policy attention.

Source: Field note diary, Sreoshi Singh, 11 November 2010.

Peri-urban areas of large cities are subject to being taken over by expanding boundaries and often grow upon land where the natural water cycle occurred once, such as forests, meadows, or wetlands. This can harm the recharging of the groundwater table, and can affect local water bodies. The natural water cycle is disrupted, and often new pollutants such as pesticides can create problems for the ecology of an area. Figure 11.4 shows the sector-wise percentage gross groundwater draft (in hectares per metre) in the four blocks of Gurgaon district in 2004. Interestingly, the Gurgaon blocks show the highest values in the domestic and industrial sector.

Tube wells in the depth range of 45 to 90 m bgl (below ground level) have been installed by different agencies in the blocks.

Further, around Gurgaon city there are eight golf courses. A 100-acre golf course needs roughly 10 million litres of water a day, according to Force, an NGO working for water conservation. This water is enough to meet the requirements of 50,000 households. The eight golf courses (1,200 acres) consume close to 120 million litres of water daily, which is sourced from groundwater. This could be considered bad news for the water table in Gurgaon, which at present is 160

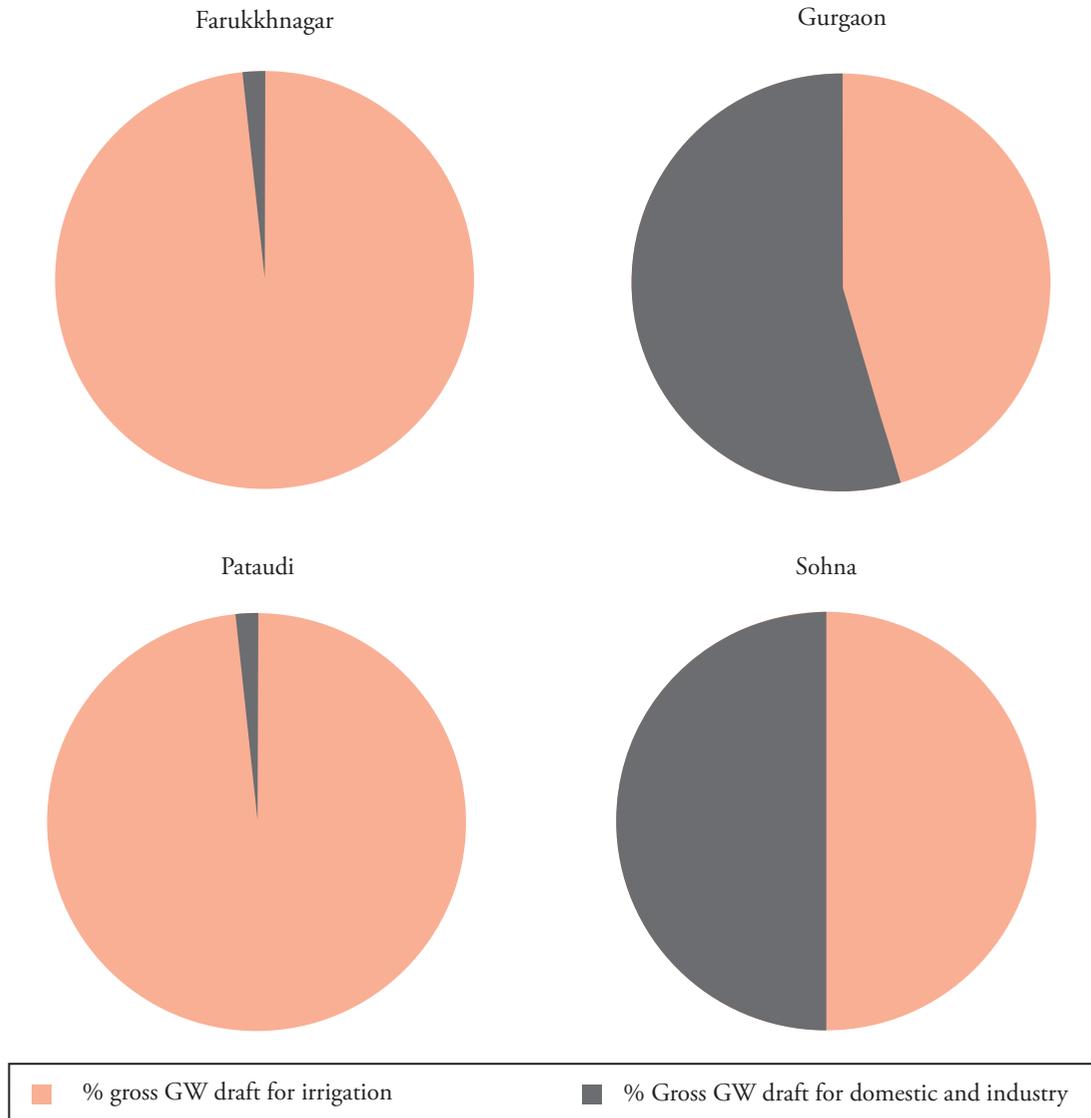


FIGURE 11.4 Sector-wise Percentage Gross Groundwater Draft, (in ha per metre) in four blocks in Gurgaon, 2004

Source: Central Ground Water Board (2007).

feet below ground level in certain areas.⁵ The water runs out at around 200 feet (Gill 2010). Other recreational centres are also coming up which are encroaching forest areas, some of which have been designated as closed

forests to be protected against any encroachment due to urbanization (Chaudhry et al. 2008). Besides, land has been acquired to build water treatment plants in peripheral villages to quench the thirst of the city;

⁵ *Times of India*, Delhi edition, 2 February, 2010, states that, ‘... scientists at the Central Ground Water Authority have been warned that Gurgaon’s water table has been declining at a rate of about two meters (six feet) every year since 2006. Haryana draws 2.72 billion cubic meters of water whereas the annual availability is 2.64 bcm within NCR. It is predicted by the scientists that the city will have no water left by 2017’ and this will also have serious implications for the residents of peri-urban Gurgaon, since their remaining water resources would also be under severe threat.

routes to water sources have been obstructed by construction of highways and water sources have been filled up for residential and other urban purposes (Narain 2009a, 2009b). When land is acquired for urban or other purposes—a common phenomenon in peri-urban contexts—the landowners gain doubly; they not only get the compensation for the land, but also the agreed amount from tenants for the land that is given on *kann*. If, however, a tenant has sown some crop over the land, it is a loss to him when the land goes, as he gets nothing—neither the compensation, nor the value of the crop produced or about to be harvested.

To cater to the increasing gap between demand and supply, illegal groundwater extraction is rampant. In the past three decades, 35,000 bore wells have come up, of which only 9,780 are registered. In May last year, the Central Ground Water Authority (CGWA) allowed more new bore wells to come up creating a flutter among local authorities in Gurgaon (ibid). Moreover, long power cuts during summer accentuate the problem and force residents to depend on tankers, which charge Rs 600–700 per household for supplying about 3,000 to 4,000 litres of water. During summers, severe power cuts often urge residents to demand scheduled power cuts to alleviate their problems, but state-owned Dakshin Haryana Bijli Vitran Nigam (DHBVN) finds itself helpless because of a supply shortage of about 42 per cent (*Hindustan Times*, Anonymous 2010). A 70-km long NCR water supply channel for carrying drinking water supply to Gurgaon, Manesar, Bahadurgarh, Sampla, and Badli has been undergoing construction, at a cost of Rs 322 crore (Akansha 2010). This channel cuts through the peripheral villages, engulfing their land and water sources. Besides, the policies for developing SEZs also have severe socio-economic and environmental impacts because a bulk of the land acquired is fertile, agricultural land or in some cases even forest land (Basu 2007). To attract private investments, state governments have often provided facilities like free or subsidized water supply (ibid), as a result of which there is inequality in water access for agriculture and domestic uses in the surrounding villages. Another serious impact is with regard to the release of effluents from the SEZs, which pollute the groundwater as well as surface water sources that exist in the vicinity (Sanhati 2009).

TOWARDS PROTECTING WATERSCAPES AND MAINSTREAMING PERI-URBAN IN POLICY AND PLANNING

Several key issues emerge from a case study of the two cities of Hyderabad and Gurgaon. First, the uncertainty associated with water supply caused by mismanagement of water is further aggravated by the processes of urbanization. Water security, which was earlier ensured by numerous water bodies in and around cities, has been under threat by land use changes, land grabbing, and an environmentally unconscious development focussed on growth through unsustainable means.

When these cities began to attract investment from IT companies and other financial corporations due to opening up of the economy, the government provided land and other basic amenities in order to attract further growth. However, rapid real estate growth in specific locations saw many of the peri-urban villages, earlier outside the main city limits, getting quickly absorbed within the municipal boundaries to be provided regular services. However, in this process large tracts of agricultural land along with water bodies were taken over for developing large residential complexes. Further efforts were also made by the government to develop SEZs and other commercial enclaves in new peri-urban locations, which are outside the city administration but within a specified development zone for which agricultural land was also acquired. This process of annexing agricultural land has caused much threat to the lives and livelihoods of the local villagers around Hyderabad and Gurgaon. The residents in the peri-urban villages of these cities not only lost their main source of livelihood but also access to water, in quality and quantity, forcing them to migrate to the city for alternative sources of livelihood. In recent times, continuous pressure on available groundwater sources has increased the groundwater overdraft leading to acute water scarcity for people, especially the poor and marginalized.

In particular, peri-urban areas in Hyderabad have lost several lakes during the process of development, which were earlier natural sources of water for agriculture and several other economic activities. With the increase in the number of concrete structures, catchment areas of the larger lakes that have historically remained primary sources of water for the city have been reduced. With

the pressure on surface sources increasing, newer sources have been tapped by the government.

Third, the water policies have highlighted some of the serious issues discussed earlier, but all of them pertain either to the urban or to the rural areas. There are no specific policies for the peri-urban zones that lie in between and get choked, leaving people more vulnerable. Here lies an important institutional vacuum which requires breaking away from the dichotomy of rural and urban water with a need to better appreciate the linkages and flows of water across rural and urban areas.

Fourth, there is seldom any recognition of water bodies in the planning process. All water bodies are recognized through land survey numbers. A large water body may have two or three or more survey numbers and, therefore, part of the common land can be easily transferred for the developmental process through a nexus of builders, bureaucrats, and local politicians with vested interest in grabbing communal land. There is a need to recognize waterscapes as a separate entity to protect them as a resource that influences water security for the people.

Mainstreaming Peri-urban Issues in Policy and Planning

As urbanization proceeds, the distinction between 'rural' and 'urban' will get blurred, and more of the intermediary, peri-urban zone will become visible. Peri-urban issues need better reflection in policy and planning. There is a need for rigorous studies on the carrying capacity of cities. Urban expansion plans need to be based on the carrying capacity of cities. Otherwise, the ecological footprint of cities will continue to spill over to the peripheral areas, engulfing the land and water resources of peripheral villages, depriving locals of access to land, water, and other natural resources. This breeds a pattern of urbanization that is inequitable,

conflict-ridden, and unsustainable. Urban development policies also need to revisit and revise the existing building by-laws in peri-urban areas, which often ignore the negative consequences of urban expansion for the socially and economically marginalized communities who are affected by the development enclaves leading to reduced access to clean and safe water sources as well as other natural resources.

Increasingly, we need to devise ways of breaking the rural and urban dichotomy in planning. The focus of urban authorities on urban expansion and rural authorities on rural areas often implies that the relationships across 'rural' and 'urban' go unaddressed. Even if the peri-urban areas fall within a development zone, the focus tends to be largely urban-centric with little efforts to integrate rural development with the activities undertaken. The 74th amendment to the Constitution of India provides for the creation of District Planning Committees (DPCs) to integrate planning at a district level. There is a need for such committees to be set up and similar other institutions as well to better integrate planning across rural and urban areas.

In general, there is a need to better recognize flows of water across rural and urban areas. The dichotomy between 'rural' and 'urban' water supply is superficial and overlooks the flow of water between rural and urban areas, which will become more visible with ongoing processes of urbanization. Often the expansion of urban water supply is at the expense of rural water supply, as peri-urban residents give away their land and water to allow canals to pass through to quench urban thirst, or allow water to be transported from their villages to the city in tankers. A strong policy for conserving natural resources, especially water and forests in peri-urban areas should be formulated. They are often a source of livelihood for the landless as well as for resource-poor farmers.

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