More details/abstract: This paper explores the complex interactions that occur as formal policies are interpreted and utilised to develop water management plans in peri-urban Delhi. With an emphasis on people's participation in decision-making, the paper examines some of the disjunctures between formal assumptions about water management in periurban areas and practices on the ground. In doing so it attempts to reveal some of the key processes responsible for social fragmentation of services. The paper describes informal coping strategies adopted by poor and marginalised peri-urban communities with little or no access to formal provision. Within this, the role of 'hidden; interactions with the formal system are highlighted in the context of failures of formal participatory platforms. The paper argues that enhanced understanding of the policy process, and the alternative arrangements that emerge in response to its shortfalls, could be an important contributory factors in identifying realistic intervention strategies for enhanced, more socially just, water management in periurban situations.

Policy Transformations and Translations: Lessons for Sustainable Water Management in Peri-Urban Delhi, India

Pritpal Randhawa[a] & Fiona Marshall[b]

Abstract

This paper explores the complex interactions that occur as formal policies are interpreted and utilised to develop water management plans in peri-urban Delhi. With an emphasis on people's participation in decision-making, the paper examines some of the disjunctures between formal assumptions about water management in peri-urban areas and practices on the ground. In doing so it attempts to reveal some of the key processes responsible for social fragmentation of services. The paper describes informal coping strategies adopted by poor and marginalised peri-urban communities with little or no access to formal provision. Within this, the role of 'hidden; interactions with the formal system are highlighted in the context of failures of formal participatory platforms. The paper argues that enhanced understanding of the policy process, and the alternative arrangements that emerge in response to its shortfalls, could be an important contributory factors in identifying realistic intervention strategies for enhanced, more socially just, water management in peri-urban situations.

Keywords: Peri-urban, water, policy process, formal and informal, sustainability, Ghaziabad

[a] Centre for Studies in Science Policy, Jawaharlal Nehru University, New Delhi (India); email: pritpalrandhawa@gmail.com

[b] Science and Technology Policy Research, University of Sussex, Brighton (UK); email: f.marshall@sussex.ac.uk

Introduction

It is predicted that 60 percent of the global population being urbanised by 2030 (UNFP, 2007). Alongside this rapid urbanisation is the expansion of the peri-urban. This is characterised by dynamic flows of commodities, capital, natural resources, people and pollution and a range of processes leading to the intensification of urban/rural linkages. The current and future management of peri-urban situations presents both opportunities and enormous challenges, not only for peri-urban residents but also for the sustainability of the adjacent urban core and rural hinterland.

The term peri-urban has been used to define "a place, process or concept" (Narain and Nischal, 2007, page 261). The "place-based" literature defines peri-urban as "midway between urban centres and rural spaces" (Dupont, 2005, page 36). While, as a process, Friedberg argues that the peri-urban is fundamentally integrated into urban contexts. As such, peri- urban areas occupy "unique space, in that they are simultaneously sustained and imperiled by the dynamics of the urban economy" (Friedberg, 2001, page 353). As a concept, peri-urban can be seen as instances where rural and urban features co-exist, in environmental, socio-economic and institutional terms (Allen et al, 2006). In whatever way the peri-urban is defined, questions about the implications of current development trajectories for the health and livelihoods of affected communities are pertinent.

The ambiguity of the peri-urban interface, which is split between urban and rural jurisdictional boundaries, presents significant governance challenges. There are often

contradictory or absent regulatory frameworks, contradictory technology arrangements and poor health, water and sanitation service provision. There is a haphazard mixture of planned and unplanned operations and a tendency to flout regulations. These features are associated with intense pollution and land degradation, poor public health and sanitation, changing disease ecologies and a changing, and increasingly competitive, labour market. This is an environment with often worsening levels of discrimination and access deficit and a decline in social capital, which poses enormous challenges for the health and livelihoods of an increasing number of disenfranchised, poor and marginalised citizens. Not only are peri-urban areas framed in different ways by policy makers, academics, the powerful and powerless; but there is also a lack of understanding about the peri-urban environment, the diverse nature of the livelihoods of people experiencing different degrees of urbanisation, and the perceptions and priorities of peri-urban villagers. As a result, planning decisions are almost inevitably flawed (Marshall et al 2009).

Over the past one and half decades there has been a growing body of literature looking at the conflicts and contradictions of the peri-urban through the lens of changing land use patterns, contesting governance structure, lack of service provisions and so on (Allen et al, 2006; Arabindoo, 2005; Narain and Nischal, 2007; Cadène, 2005; Kennedy, 2007; Baud and Dhanalakshmi, 2007). There are now important insights into the shortfalls in existing service provision and recognition of informal practices, but much less attention has been given to the processes by which alternatives might be established and supported. By drawing insights from literature

on "policy process" analysis and the STEPS centre "pathway approach"[1], this paper examines disjunctures between assumptions made during formal policy implementation concerning peoples participation in decision making and associated outcomes, and the perspectives and actions of local stakeholders involved in water management. Important disjunctures can be identified at each stage, which it is argued, result in social fragmentation of services. This paper seeks to make a distinct contribution to the existing peri-urban literature by focusing on the shortfalls of existing participatory processes which contribute to a polarisation of service provisions, identifying weaknesses of participatory platforms, and largely unrecognised, opportunities presented by links between formal and informal peri-urban water management stakeholders. By doing so, it intends to provide valuable entry points for developing alternative pathways for sustainable water management.

The paper is structured into six sections. The first section positions the current study in the context of its contribution to established policy process literature. The second section introduces the Ghaziabad field sites and empirical work, whilst the third maps actors and agencies responsible for water management in peri-urban Ghaziabad, and outlines the official water management arrangements. The fourth section discusses perspectives of formal stakeholders associated with water management in peri-urban Ghaziabad. The focus is on disjunctures between assumptions made in top-down policy and planning processes and implementation by local officials. The fifth section

[1]The STEPS Centre is an interdisciplinary global research and policy engagement hub, funded by the Economic and Social Research Council (ESRC), based at the University of Sussex, UK. By acknowledging the interactions between social, technological and environmental factors in diverse local settings the Centre aims to create more sustainable, socially just and favourable conditions for the poor.

attempts to illustrate how these disjunctures contribute to the social fragmentation of water supply and wastewater services, and how this is experienced and responded to by various communities in Ghaziabad through a range of informal coping strategies. The sixth part of the paper discusses the existing formal platforms for people's participation in Ghaziabad. It also examines some of the 'hidden' arrangements between stakeholders in the formal system and local communities, which have evolved partly in response to the shortfalls in formal platforms for participation in decision-making. In summarising the material we consider how an enhanced understanding of policy and participatory process, and the alternative arrangements which have evolved on the ground, might contribute to more sustainable water management arrangements for Ghaziabad.

1. Policy research in relation to peri-urban water management in India

Much research relating to the failure of service provision and environmental management in peri-urban situations has focussed on flawed policy, and the need for major changes in policy direction. In relation to water supply in the informal colonies of peri-urban areas, it is suggested by a number of authors that privatisation is the only solution to enhance supply (Mishra and Goldar, 2008; McKenzie and Ray, 2009). However, the logic of privatisation is criticised by many (see Hall and Lobina, 2007; Ranganathan et al, 2009; Furlong and Bakker, 2010). The case of privatisation of water in the peri-urban areas of Bangalore exemplified how privatisation tends to favours the connection and supply of water to wealthier areas which generate more revenue than the poor localities (Ranganathan et al, 2009, page 61). Since the water and sanitation needs of the peri-urban poor are neither met by conventional (policy

driven) approaches nor through privatisation, an array of non-conventional (needs driven) but informal approaches are employed (Allen et al, 2006, page 334). There have been a number of studies of informal water vendors, who have no access to formal water supplies but provide an essential service to many poor peri-urban dwellers (see Kjellen and Macgranahan, 2006; Dardenne, 2006). Whilst some argue for the need to formally recognise such providers, Reut et al (2007) argue that the 'tripartite' water agreement in Chennai, that formalised arrangements for peri-urban farmers supplying water, has led to tremendous distortion of land use patterns, intra-rural socio-economic relationships and property regimes (Reut et al, 2007, page 119).

Failures relating to "top-down decision-making practices" that do not involve local actors in the policy process have been previously reported (Halkatti et al, 2003; Kennedy, 2007; Narain, 2009). But new "multi-stakeholder arrangements" have rarely been successful. For example, Baud and Dhanalakshmi, (2007) contest that multi-stakeholder arrangements in the peri-urban Chennai are successful only in the middle-class localities, recognising that political representation and interventions at different scales play an important role in the outcome of public utility projects[2].

Studies focusing specifically on wastewater reuse and management in peri-urban situations have argued that decentralised approaches may offer opportunities for wastewater reuse and resource recovery, as well as improvements in local environmental health conditions (Otterphol et al, 2002; Parkinson and Taylor, 2003). It is also argued that the key to structural improvements in water and sanitation lies in

[2] Multi-stakeholder arrangements, as defined by Baud and Dhanalakshmi (2007), means a participatory platform developed by the government with an intention that government works together with other types of organisations – civil society organisations as well as the private sector – in different forms of multi-stakeholder arrangements as an instrument for reaching public policy goals.

the recognition of non-conventional practices and their articulation to the formal system under new governance regimes (Allen et al, 2006). In the absence of appropriate support, many informal strategies, such as the use of wastewater for irrigation, also carry with them significant avoidable risks to health and wellbeing alongside the obvious benefits (Bradford et al, 2003, page 157; Singh et al, 2010). This supports the case for further investigation into appropriate means of engaging with and supporting informal water management strategies, and the policy and institutional arrangements that would be conducive.

The potential solution to 'flawed' policies and the lack of recognition of unconventional practices discussed above, may be more fully understood using "policy process" analysis, with a particular emphasis on the role of different forms of knowledge in policy development. Recent theoretical developments concerning the role of knowledge in the policy process have focused on ideas around politics and legitimisation (Jones, 2009) recognising that power is infused throughout the knowledge process, will often reflect and sustain existing power structures, and is used to contest, negotiate, legitimise and marginalise throughout the policy process (ibid). What different groups or categories of actors believe and do about a policy question will be partly a reflection of their own interests, and thus the degree of influence of different interests groups will play a major role in outcomes at each stage of the policy process (Keeley and Scoones, 2003). Through discursive processes certain claims or justifications can appear more legitimate while others can be sidelined or excluded (Long, 1992). In the current scheme of things expert knowledge (scientific knowledge) plays an important role in formulating the discourse, and there is often a serious disjuncture between scientific knowledge and local knowledge

(Lewis, 2006; Owens et al, 2006; Davoudi, 2006). However there are enormous challenges involved in integrating these forms of knowledge, as they are often attached to different claims of power, authority and legitimacy (Keeley and Scoones, 2003).

The STEPS Pathways approach unpacks these challenges, and also attempts to explore entry points for alternative, self-reinforcing trajectories towards more sustainable outcomes. The STEPS centre pathway approach (Leach et al, 2007) views the contemporary world as highly complex and dynamic, involving systems of interacting social, technological and ecological processes across multiple scales, with many uncertainties, and with often-conflicting understandings and priorities amongst different people. Different people often value particular systems, goals and outcomes, in very different ways. They are open to multiple 'framings', where framing refers to particular contextual assumptions, methods, forms of interpretation and values that different groups might bring to a problem, shaping how it is bounded and understood. Thus, Rather than singular notions of progress, there is a multiplicity of possible goals, and multiple pathways to reach them. The dominance of particular views of systems and their goals to the exclusion of others is not mere a chance; it also reflects politics and power. The central STEPS question concerns the extent to which sustainability is and can be achieved; and how contestation between alternate pathways and goals is being played out, whether between women and men in households, between wealthy and poorer groups, or between citizens, state agencies and global organisations. This paper, which draws on these theoretical insights is one of a series of outputs from the STEPS centre peri-urban initiative, which seek to contribute to enhanced understanding of the complex dynamics of linked social,

technical and ecological systems in relation to water management in peri-urban situations (Leach et al, 2007 and 2010). Here we focus on understanding some of the processes responsible for the fragmentation of water services in peri-urban situations, In examining community responses to failures of the formal system, we consider what can be learnt from the informal arrangements and 'hidden' transactions that emerge, that may contribute to the development of alternative, more sustainable water management pathways.

2. Introduction to the Ghaziabad case study sites and empirical work.

Ghaziabad is an industrial town with a population of 1.6 million (GOI, 2011). It adjoins Delhi on its eastern border in the state of Uttar Pradesh (UP). Since the early 1990s Delhi has undergone massive transformation in tune with the introduction of neo-liberal policies in India. These transformations were sought for the construction of business and commercial centres, hotels and restaurants, malls, amusement parks, multiplex cinema halls, and infrastructure project such as the metro rail. There has also been extensive closure/relocation of polluting/non-polluting industries from non-conforming zones and demolition of slums located on public land (See Navlakha, 2000; Baviskar, 2002, Roy, 2004). Ghaziabad was majorly affected by the transformations in Delhi, for example, through the acquisition of farm land by the Uttar Pradesh State Industrial Development Corporation (UPSIDC) to provide space for new industrial developments, and relocation of polluting industries from Delhi to Ghaziabad. The real estate speculation and lack of middle class housing in Delhi encouraged property development in Ghaziabad. Several middle class colonies were

constructed close to the Delhi border in the Trans-Hindon region[3] offering flats to middle class dwellers, who often work in Delhi, at approximately half the price of flats in Delhi. Beside the growth of industries and middle class colonies, there was also expansion of informal colonies in the region inhabited by the poor. This expansion was mainly due to the migration that took place because of expectations of increasing livelihood opportunities in Ghaziabad. Alongside these transformations, Ghaziabad has also witnessed serious challenges in terms of public service provision, including water.

Empirical research for this study was carried out between 2008 and 2010 largely in the Trans-Hindon region of Ghaziabad. 25 semi-structured interviews were undertaken government officials representing the centre and state governments, and also local bodies[4]. The government officials were approached and interviews were structured depending on their respective departments and responsibilities, with the interviewers drawing in many cases from previous experience of successful consultation and collaboration with officials. The interviews begin with open questions concerning the roles and responsibilities of the unit concerned. Interviews developed through exploration of the respondents perceptions of water management challenges in the poor localities of peri-urban areas and means by which they were being addressed. Whilst, unsurprisingly access to central government officials was a little more challenging than state officials – the timeframe of our initiative enabled us to send appropriate background information in advance to be flexible on when to

[3] Some of the popular middle class colonies include Koushami, Vaishali, Vasundhara, Indrapuram, Shalimar Garden, Lajpat Nagar, Rajender Nagar

[4] The officials were interviewed from departments such as National Capital Regional Planning Board (NCRPB), Central Ground Water Board (CGWB), Central Pollution Control Board (CPCB), Ghaziabad Development Authority (GDA), Uttar Pradesh Water Board (UPWB), Uttar Pradesh Pollution Control Board (UPPCB), and Ghaziabad Nagar Nigam (GNN) etc.

meet; and scheduling follow ups if necessary. Existing connections through project partners also proved valuable in accessing and building trust with respondents.

Inevitably power and authority played an important role in respondents narratives. The senior government officials , generally engineers and planners, tended to exclude themselves from the larger context of the problem and represent the government's view, while the junior officials, such as maintenance staff at the water pump station, sometimes disassociated themselves from the official structure and presented their view as a resident of poor peri-urban localities.

In addition, 80 semi-structured interviews were carried out with community members in a wide range of localities in the Trans-Hindon region including villages, informal colonies and middle class colonies. The villages included Karhera, Arthala and Karkar Model. The villages claim to have been settled for over hundreds of years, and families narrated their presence over 7-10 generations. The formation of these villages is of a type where land acquisition for different purposes (public and private) leaves small islands of habitations for the *aabadi* (residential populations). Most of the villages in the area have witnessed transformations in terms of the recent entry of a working class population and large numbers of small-scale industrial units within them. Within this general characterisation, however, there were some major differences. For example, for Karhera residents, agriculture is still practiced, whilst in Arthala and Karkar Model the agriculture land has been completely transformed either into an industrial or residential area.

The informal colonies that were included in the study included Sanjay colony, Ambedkar Bastee, Rajiv Colony, Chitrakoot, Ramnagar and Balaji Vihar. The informal colonies are popularly known as *bastees* (slums) that have been settled by the more recent wave of migrant workers almost entirely over the last couple of decades. Some of these settlements, such as Ambedkar Bastee, are inhabited by members of a single caste, particularly the scheduled (lower) caste, while others are mixed caste-communities. They are generally located on lands adjacent to highways and railway tracks. A characteristic feature of informal colonies is lack of tenurial security and negligible provisions of basic services.

The middle class colonies were Vasundhara, Indrapuram and Vaishali. These colonies are usually developed by the Ghaziabad Development Authority or by the private property developers. The colonies are well equipped with public service provisions including piped water supply, underground sewerage system and electricity. Most of the residents of these colonies are an English speaking population largely employed in the corporate sector.

Those interviewed in these different localities included a wide-cross section of the people including factory workers, shopkeepers, farmers, dairy owners, property dealers, activists, teachers, journalists, doctors, students and women taking care of their households. A few interviews were also conducted with private water vendors using reverse osmosis (RO) technology to filter water and sell to the locals. Interviews in the communities were conducted in two phases. As there was no existing local contacts in the specific field sites, we worked in an initial phase to develop contacts with representatives of community based organisations, local

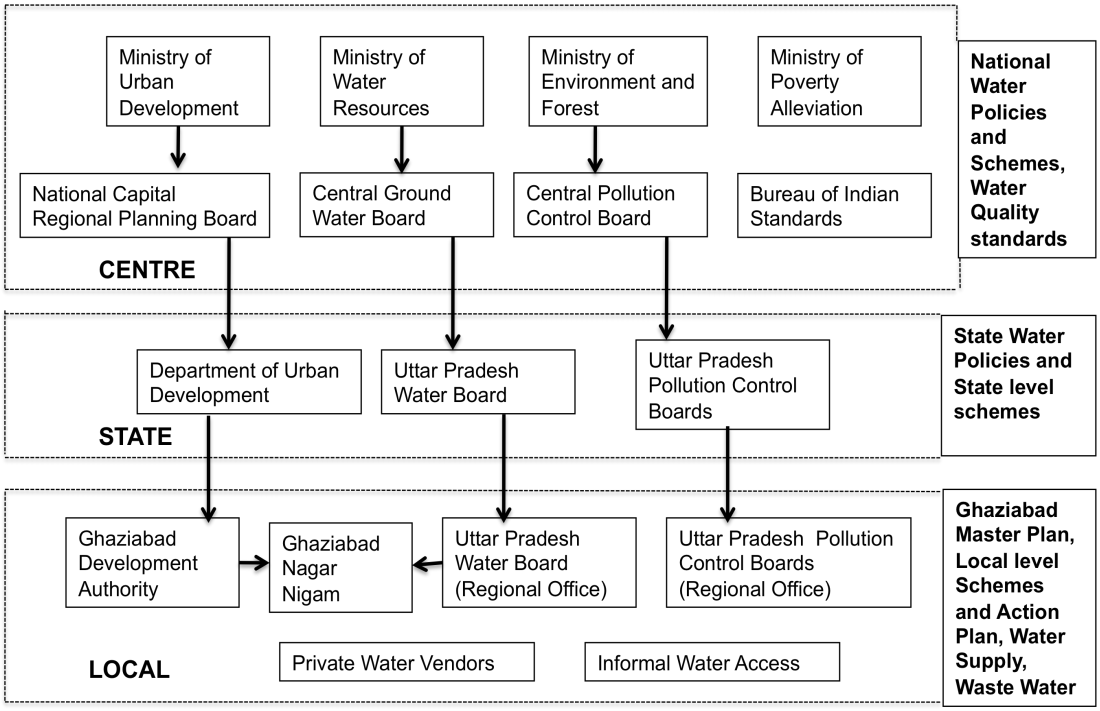
activists, schoolteachers and *pradhan* (the elected representative of a village). These people then worked with us to facilitate interviews in the second phase.

Interviews in the community began with some introductory questions concerning the families and their livelihoods, changes that they have seen during that period, and their experiences and views concerning provision of public services. The narrative of the community was split between distinct localities. The narratives of the old villages, with single caste habitation, were largely about changes in land use patterns and the emergence of new professions and its impact on the area and their lives. The narrative of residents of informal colonies tended to be more concered with the nature of informality in every aspect of their life. More specific areas of enquiry, including the variety of mechanisms adopted by the people to access water and engagement with local governance bodies followed for all respondents. Introductory questions for respondents in the middle class colonies were largely framed around the public services and other facilities they enjoy, the challenges they faced, and their perspective on the multiple crises faced by the neighbouring villages and informal colonies.

3 Peri-urban water management in Ghaziabad

The actors and agencies that shape the water management system in Ghaziabad are situated within and beyond the water sector. Some are from the locality, while others are not. The hierarchical structure and agencies responsible for water management in Ghaziabad are shown in Figure below.

Water Management in Ghaziabad – Institutional Framework



The management of water in Ghaziabad is an outcome of national policies and guidelines drafted by central government ministries, and standards set by their subsidiary organisations. Three key ministries are involved; the Ministry of Water Resources (MoWR), Ministry of Urban Development (MoUD) and Ministry of Environment and Forest (MoEF). There are also two important centre level subsidiary organisations, the Central Pollution Control Board (CPCB) and the Central Ground Water Board (CGWB). Planning, management and distribution of water in Ghaziabad is carried by four different departments, some of which operate at the level of the State of Uttar Pradesh, and others for Ghaziabad[5]. The interviews carried out with officials from each of these departments suggest that there is either minimal or negligible interaction between them.

[5] These departments include Uttar Pradesh Water Board (UPWB), Uttar Pradesh Pollution Control Board (UPPCB), Ghaziabad Development Authority (GDA), Ghaziabad Nagar Nigam (GNN).

The scale of the challenge of meeting rapidly growing water demands in Ghaziabad overall is well recognised. For example, according to the Ghaziabad Master Plan (GMP) the total demand for water will increase from 250 mld per day in 2008 to 510 mld per day 2021. The formal plans suggest that this additional demand will be fulfilled by increasing the number of tubewells and by enhancing the capacity of water treatment plants (WTP) (GDA, 2006).

Official reports of wastewater management are also optimistic. According to the GMP 2021, 70-75 percent of the area in Ghaziabad has an underground sewerage system. There appears to be a focus on domestic wastewater with official reports of 17 pumping stations in Ghaziabad town, which pump the domestic wastewater into two different sewerage treatment plants (STPs), with capacity that can be enhanced to deal with rapid increases in sewerage needs (GDA, 2006). There is surprisingly little focus on the challenge of industrial wastewater. Whilst these waste streams are often combined industrial and domestic wastewater are deal with by different agencies, the former by the bureaucratic Uttar Pradesh Pollution Control Board (UPPCB) and the latter by the local municipality called Ghaziabad Nagar Nigam (GNN). Despite Ghaziabad being an industrial hub there were no common effluent treatment plants (CETP) in the town during the course of research, although we were informed of a proposal under the Yamuna Action Plan (YAP) III to build 3 CETPs[6].

[6] The Yamuna Action Plan (YAP), a bilateral project between the Government of India and Japan, is one of the largest river restoration projects in India. The government of Japan via the Japanese Bank for International Cooperation (JBIC) has provided financial aid of Yen 13.33 billion to carry out the project which is being executed by the National River Conservation Directorate (NRCD), Ministry of Environment and Forests(MOEF), Government of India.

4 Formal policy process: disjunctures between assumptions concerning implementation and practices on the ground.

The national water policies are drafted by committees, largely represented by central government ministries and their subsidiary organisations. After which they are notified to the concerned state government ministry/department, and are further translated into action plan (schemes and programmes) for implementation by the engineers and planners of regional/city level government agencies.

A close look at the recently declared Draft National Water Policy 2012 (DNWP) suggests that there is very limited representation of academia or local community in the process of formulation of this draft. The majority of committee members are bureaucrats and engineers from the Ministry of Water Resources and its subsidiary organisations (GOI, 2012). Whilst there were some consultations with state departments, but there are no representatives of state or local government agency in the committee[7]. Whilst the knowledge contributing to policy formulation appear to be very limited the disjuncture between the assumptions of formal planning and ground realities appeared to be amplified during implementation. Interviews with the officials of water and wastewater related departments in Ghaziabad suggest that the modus operandi is based on calculation and projections. Thus, problems related to water and wastewater are deemed to have largely technical solutions, overlooking interactions with the conflicts and contradictions on the ground concerning, access, provision,

[7] The Drafting Committee of DNWP 2012 comprised of Dr. S.R. Hashim, former Member, Planning Commission and Chairman, Union Public Service Commission; Prof. Subhash Chander, former Professor, IIT, Delhi; Shri A.D. Mohile, former Chairman, Central Water Commission; and Shri S.C. Jain, an expert from an NGO. This Committee was supported by a team of officers from the Ministry of Water Resources, Central Water Commission, Central Ground Water Board, National Rainfed Area Authority; National Institute of Hydrology and Planning Commission.

power and politics (Keeley and Scoones, 2003). At the stage of implementation (in the form of GMP 2021), this principle boils down to the logic of demand and supply, which simply means assessment of present availability and consumption, and projection of future needs followed by augmentation of the existing availability by exploiting more water resources and looking for new technological arrangements (GDA, 2006).

There are apparent conflicts between action plan and the perceptions of officials who execute them. For instance, the GMP 2021 states that there are about 33 percent of informal colonies in Ghaziabad, which would be regularised and also provided with public utility services (ibid). Our interviews with officials of the Ghaziabad Development Authority (GDA) indicated that there is no planning for unauthorised colonies, and that the informal settlements are deemed to be the responsibility of GNN. On the other hand, an official of the GNN made it clear that they did not have a mandate to regularise colonies, but are a service provider organisation. Thus the official plan appears to be entirely overlooked.

Even though the GNN is not empowered to regularise informal colonies, a GNN official explained that, under the Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT), a plan had been prepared by his department to provide water in the informal colonies. This plan recognises quite clearly that these communities are facing acute water problems. According to this plan, land is currently being sought in the older residential localities to install tube wells and underground water pumps. The official explained that a local action plan has been drawn on the basis of the national scheme, but that the money has not been released

by the central government to execute that plan. In this hierarchical policy process, officials at the lower levels may not necessarily lack the will or capability to implement plans, but may be hampered by inactions further up the system, compounded by their lack of authority and access to resources (in this case stemming from the fiscal disempowerment of a locally elected body).

The example above illustrates some of the problems with the current policy process in relation to provision for poor and marginalised peri-urban communities. Our research considered the role of different forms of knowledge, and its interface with power during policy development and planning, but with a focus on implementation. At the national scale, policy formulation is based on the expert knowledge of the bureaucrats and politicians. It largely excludes other forms of representation or knowledge. Action plans tend to be based on technical calculations carried out by engineers and planners of local government bodies, which are disconnected with complex social realities on the ground. Further more there are misunderstandings and conflicts between government action plan and the officials who implement them. The majority of the officials encountered in this research appeared to be ignoring any provisions in the action plan for the poor and for informal settlements. While others had some intent to support poor peri-urban localities on the basis of national schemes but were unable to do so due to lack to appropriate action from central agencies agencies. These conflicts and contradictions within the policy and implementation process in Ghaziabad appear to increase the fragmentation of service provision already created through a ‘politics of exclusion’ (Fernandes, 2004) which has been linked to a new wave of urban transformation in the developing world.

5 Social Fragmentation of Services as experienced in Ghaziabad

The social fragmentation of services in Ghaziabad in very apparent, with middle class colonies benefitting from a regular water supply and a sewerage system, while the traditional villages and informal colonies are bereft of any water supply or sewer lines.

The residents of villages and informal colonies such as Arthala, Sanjay Colony and Ambedkar Colony explained how water is accessed through a combination of, very limited formal provision (mostly in the form of handpumps), in addition to a range of informal coping strategies. These informal strategies include tapping into the piped supply intended for the formal colonies, extracting ground water through submersible pumps or borrowing drinking water from the middle class colonies. It is largely women and children who go out to collect water. Women are the ones who manage the meager amount of water that is available, endure acts of drudgery related to water utilisation practices of everyday life and also often bear the brunt of the poor water quality. By contrast, women living in the adjoining middle class colonies such as Vasundhara, Indrapuram and Vaishali etc. have relatively easy situation. Their water-related tasks involve managing the motors to get the water storage tanks filled, washing clothes using washing machines and cleaning the dishes either by themselves or with the help of housemaids. The sanitation situation in the villages and informal colonies is often extremely poor with significant adverse health implications.

The evidence from the field illustrates that people in the poor colonies have to pay different types of costs for accessing water. For the very poorest such as people in

Rajiv Colony and few localities of Arthala and Karhera villages, costs involved are time and opportunity cost and most importantly health costs associated with poor quality water, which is drawn either from hand pumps or from tapping water from formal sources. At its most extreme, for the poorest located in Ambedkar Colony, the cost of obtaining water is sometimes even life itself. This has to do with particular geography or precisely social geo-spatiality of the Ambedkar Colony. For the community here, till such time that people could influence local political leadership and avail patronage in the form of getting a submersible pump arranged, lives were lost as they had to cross the railway line every day to borrow water from the adjoining middle class colony. Given that most of the poorest neighbourhoods in the periphery or in the city are located in highly degraded or dangerous localities, such accidents are not likely to be exceptional to this neighbourhood.

The sanitation system in the middle class colonies is well planned. In every colony there are sewer lines connected to the large drains. It is claimed that the wastewater from these drains is pumped to the sewage treatment plant, where it is treated and subsequently discharged to the local river Hindon. In contrast, the sanitation in the villages and informal colonies is extremely poor, and with no drainage system, wastewater flows into the open spaces outside the houses. Whilst beyond the scope of the current research, it is likely that untreated industrial wastewater is also discharged in the locality. In Arthala, which is a mix of formal and informal settlements, residents reported that they had never been provided with any kind of underground sewerage system despite residents' long-standing requests and articulations at various levels sewage system. The networks of small informal drains in Arthala empty into a

large pond behind the village boundary. Ironically, this large sewerage pond has been developed by the GDA to build an 'aqua' entertainment space.

In this challenging environment, there are also striking examples of alternative community based means of wastewater use. Karhera, one of the oldest villages of Ghaziabad has a unique method of domestic wastewater use. The villagers use domestic wastewater for irrigating their fields. Villagers informed that this activity is a part of the long history of the village. The drains running through the interior of the village are carefully maintained. The wastewater carried through these drains runs very swiftly across and is well directed to the fields behind the village. Once reaching the boundary of the village all the drains merge into a larger drain, which runs exactly from the middle of the cultivable lands. From thereon, the wastewater from the bigger drain is systematically allowed to reach the farmlands. To manage an equitable distribution of this drain water, the villagers have formulated a day-to-day rotational system, wherein water is discharged to each field. The system has been operating efficiently in this village for many years. In these extremely difficult circumstances interview respondents suggested that people have regained a sense of community through mobilisation to access water and manage wastewater reuse.

The situation described above can be represented within Partha Chatterjee s' concept of 'citizens' and 'population' in urbanising areas. Citizens carry the moral connotation of sharing in the sovereignty of the state and hence claim all the rights. For the population citizenship remains adhoc. They are treated as not having any legitimate right to stay in the city because they are considered to be encroachers (Chatterjee, 2003). In the case of Ghaziabad, the middle class are treated as citizens,

who have access to all the facilities, while the poor survive on informal coping strategies.

6. People's participation, and the interface between formal policy and practice

Senior government officials involved in our study were of the view that with the 74th amendment of the Indian constitution, decision-making processes had opened up[8]. The 74th amendment was viewed as a means of ensuring people's participation in the decision making process, and in linking expert knowledge with local knowledge. The argument followed that if people are deprived of services it is a result of inadequacies of the representatives in the local bodies.

There is a reflection and rhetoric of this act in every national and local policy and action plan. For example, the National Water Policy 2002 states that "water users associations and the local bodies such as municipalities and *gram panchayats* should be involved in the operation, maintenance and management of water infrastructures/facilities at appropriate levels progressively, with a view to eventually transferring the management of such facilities to the user groups/local bodies" (GOI, 2002, page 5). The assertion of people's participation in decision-making is also reflected in different forms in Ghaziabad. Organisation of *darbar* (public hearings) by the Municipal Commissioner (MC) was one such form of people's participation. The MC had a one-hour dedicated session of public hearing everyday for listening to the grievances of people. The people of informal colonies informed that they have been to

[8] The 74th Amendment of Indian constitution provides a basis for the State Legislatures to guide the State Governments in the assignment of various responsibilities to municipalities and to strengthen municipal governance.

this session on several occasions for the augmentation of water supply and construction of sewer lines in their colony, but eventually nothing happened. The second form of people's participation in Ghaziabad existed in the form of forums created by government departments. These forums include *Sichai Bandhu* (friends of irrigation, comprising of government officials and farmers) and *Udyog Bandhu* (friends of industries, comprising industrialists, industry associations, GDA, GNN, UPPCB, civil society groups and residents of industrial areas). *Sichai Bandhu* was meant to ensure participation of farmers in any decision taken on the irrigation related issues by the concerned government agency. *Udyog Bandhu* was a platform to ensure participation of a range of stakeholders on any decision taken related to industrial pollution. The third form of people's participation exists in the form of elected representatives of people in the Urban Local Body (ULB) through the enactment of 74th amendment.

The evidence from Ghaziabad illustrates that the existing participatory platforms in urban and peri-urban areas have been of benefit to the elite and middle class. People in many peri-urban localities informed that they have tried very hard to put forth their demand for a formal water supply and arrangements for underground wastewater disposal in several *darbars* but their voice always went unheard. The communities appeared to be unaware of *sichai bandhu* and *udyog bandhu*. The research team came across only one person (an activist cum local journalist) in Karkar Model village of Ghaziabad, who was aware of *udyog bandhu*. For more than a decade he has been legally fighting against the water and air pollution caused by the industries surrounding his village. He informed that despite his several complaints in the UPPCB and many court cases, no action is taken against the polluting industries, as

there is a nexus between the officials of UPPCB and industrials. He was of the opinion that the forums, such as *udyog bandhu* are created to strengthen these nexus.

In practice, the ULB is significant for communities in Ghaziabad, but not in the way that the formal description would suggest. The *Sabha Sad* (municipal councilor), is the elected representative of the people on the ULB, and plays the role of negotiator between the formal system and informal practices. For example, in 2009, due to the insufficient and inefficient GNN water supply, the residents of Sanjay Colony in the Arthala region approached their *Sabha Sad* with a proposal to put up a submersible pump of high capacity in the locality and avail water through the use of a self-laid pipeline extending to the households of the Colony. The *Sabha Sad* accepted their proposal and also assured them that he would try to coordinate with the GNN officials that residents of the colony would not use the existing GNN supply and thus should not be charged for it. He also promised that he would urge the municipal council to provide maintenance charges for the submersible pump installed and electricity costs for the usage of pump. There are similar types of cases found in several other colonies of Ghaziabad. In some cases *Sabha Sad* plays an active role, as in the case of Sanjay Colony, while in other cases *Sabha Sad* only intervenes in the situation of crisis when there is threat that local officials will cease to allow informal practices to continue.

The discussion above suggests that many participatory platforms such as *sichai bandu* and *udyog bandhu* benefit only certain stakeholders. There is some evidence that the ULB in Ghaziabad is partially successful in addressing the needs of poorer communities, but not in the manner officially determined. In some cases, such as

Sanjay Colony, the municipal councilors are actively encouraging informal coping strategies, while in other cases, such as Ambedkar Bastee, they only intervene when there is threat to the operation of these coping mechanisms. The representative of the ULB appeared to play a role of negotiator between the formal system and informal practices, rather than directly trying to formalise water supply services in the informal colonies.

Conclusion

Our research has provided graphic illustrations of the shortfalls in current water management systems, as they relate to provision for many peri-urban communities. Evidence from Ghaziabad illustrates a straightforward technocratic model of planned interventions with stated objectives of achieving a safe and secure water supply. The development of the plans are largely based on models of estimated supply and demand, designed almost exclusively with expert scientific inputs, with little or no participation from other stakeholders. This results not only in questionable priorities and technology choices, but also impractical implementation plans. The formal water management system is shaped by a plethora of government agencies within and beyond official water agencies with responsibilities within the implementation process. However there is minimal or negligible interaction between them, and limited empowerment of key local bodies, resulting in a wide range of understandings, interpretations and distortions of the initial plan. The accounts from local officials demonstrate that slow responses from state authorities, and lack of fiscal empowerment of local bodies often results in an inability to set up formal schemes for poorer communities, even when there is a commitment on the ground to

do so. Not only do the poor and marginalised suffer directly, but poor water quality and waste water management will inevitably have wider environmental and health impacts.

The failure of formal provision, and absence of effective platforms for people's participation in decision-making leads to the emergence of parallel forms of co-operation to evolve a range of alternative coping strategies. In these processes, new interfaces between the formal system and informal practices emerge. Our research provided many examples of these. Whilst the specific interactions that we observed between the formal and informal may be temporary and opportunistic they do raise the possibilities for co-producing alternatice sustainable water management pathways in Ghaziabad. Lessons from these ongoing interactions may help us to reframe the notion of decentralisation, moving far beyond the current, limited, consultation that takes place during planning. This would recognise diverse forms of engagement and the highly innovative approaches that communities establish to meet essential needs.

Current community based innovations, as they stand, may be little more than a basic survival strategy, but the nature of the relationships and transactions developed provides guidance on what might be possible if the development and implementation of policies and regulations were considered in more integrated and holistic fashion.

This analysis presented in this paper has provided insights into some key aspects of the policy and implementation process which contribute to failures in water management in peri-urban Ghaziabad. These issues are overlooked by standard review and assessment processes. It has also provided important insights into how

people respond when the system fails them, what sort of alliances are effective on the ground in meeting the needs of the poor, and the opportunity costs of officials failing to recognise informal practices. These insights are important, both in terms of recognising alternative water planning and management pathways, and in providing specific entry points for realistic intervention strategies.

Acknowledgement: This paper is an output from the research project titled "Peri-urban Interface and Sustainability in South Asian Cities" at STEPS Centre, funded by the Economic and Social Research Council, based at the University of Sussex, United Kingdom. The research for this paper was jointly carried out by the team of researchers from STEPS Centre (UK) and Sarai (India) including Awadhendra Sharan, Alankar, Bhagwati Prasad, Lokesh, Lyla Mehta, Linda Waldman, Hayley MacGregor, Fiona Marshall and Pritpal Randhawa. We are indebted to all the interviewers in Ghaziabad and Delhi for giving us their valuable time, and sharing information and their experience on the issue. We are particularly grateful to Shushil Raghav (Karkar Model Village), Karan Chauhan (Karhera Village), Pushpa (Ambedkar Bastee), Ram Kishan (Arthala Village) and Ratan Devi (Sanjay Colony) for spending immense amount of time with the research team in introducing the area and the residents of their locality. Finally, we would like the referees for their insightful comments on the earlier version of this paper.

List of Acronyms

CBCP:	Central Pollution Control Board
CETP:	Common Effluent Treatment Plant
CGWB:	Central Ground Water Board
CPCB:	Central Pollution Control Board
DNWP:	Draft National Water Policy
GDA:	Ghaziabad Development Authority
GDA:	Ghaziabad Development Authority
GMP:	Ghaziabad Master Plan
GNN:	Ghaziabad Nagar Nigam
GOI:	Government of India
MoEF:	Ministry of Environment and Forest
MoUD:	Ministry of Urban Development
MoWR:	Ministry of Water Resources
NCRPB:	National Capital Regional Planning Board
RO:	Reverse Osmosis
STP:	Sewerage Treatment Plant
UIDSSMT:	Urban Infrastructure Development Scheme for Small & Medium Towns
ULB:	Urban Local Body
UP:	Uttar Pradesh
UPPCB:	Uttar Pradesh Pollution Control Board
UPSIDC:	Uttar Pradesh State Industrial Development Corporation
UPWB:	Uttar Pradesh Water Board
WTP:	Water Treatment Plant
YAP:	Yamuna Action Plan

References

Allen A, Dávila J D, Hofmann P, 2006, "The Peri-urban Water Poor: Citizens or Consumers?" *Environment and Urbanization* **18** 333-351

Arabindoo P, 2005, "Examining the Peri-Urban Interface as a Constructed Primordialism", in *Peri-Urban Dynamics: Population, Habitat and Environment on the Peripheries of Large Indian Metropolises. A Review of Concepts and General Issues* Eds V Dupont, (Centre de Sciences Humaines: New Delhi) 39-74

Baud I, and Dhanalakshmi R, 2007, "Governance in urban environmental management: Comparing accountability and performance in multi-stakeholder arrangements in South India" *Cities* **24** (2) 133–147

Baviskar A, 2002, "The Politics of the City" *Seminar* **516** 40-42

Bradford A, Brook R, Hunshal C S, 2003, "Wastewater Irrigation in Hubli-Dharwad, India: Implications for Health and livelihoods" *Environment and Urbanization* **15** 157-170

Cadène P, 2005, "Dynamics of Peri-Urban Areas: From the French Case to the Developing Countries", in *Peri-Urban Dynamics: Population, Habitat and Environment on the Peripheries of Large Indian Metropolises. A Review of Concepts and General Issues* Eds V Dupont, (Centre de Sciences Humaines: New Delhi) pp 75-101

Chatterjee P, 2003, "Are Indian Cities Becoming Bourgeois at last?" in *Body City-Sitting Contemporary Culture in India* Eds I Chandrasekhar and P C Seel (Tulika Books, Delhi) pp 171-184

Dardenne B, 2006, "The Role of the Private Sector in Peri-urban or Rural Water Services in Emerging Countries", OECD, http://www.aspa-utilities.com/OECD_paper.html

Davoudi S, 2006, "The evidence-policy interface in strategic waste planning for urban environments: the 'technical' and the 'social' dimensions" *Environment and Planning C: Government and Policy* **24** 715-717

Dupont V, 2005, "Peri-Urban Dynamics: Population, Habitat and Environment on the Peripheries of Large Indian Metropolises: An Introduction", in *Peri-Urban Dynamics: Population, Habitat and Environment on the Peripheries of Large Indian Metropolises. A Review of Concepts and General Issues* Eds V Dupont, (Centre de Sciences Humaines: New Delhi) pp 3-20

Fernandes L, 2004, "The Politics of Forgetting: Class Politics, State Power and the Restructuring of Urban Space in India" *Urban Studies* **41** (12), 2415-2430

Friedberg S, 2001, "Gardening on the Edge: The Social Conditions of Unsustainability on an African Urban Periphery" *Annals of the Association of American Geographers* **91** (2) 349-369

Furlong K, and Bakker K, 2010, "The contradictions in 'alternative' service delivery: governance, business models, and sustainability in municipal water supply" *Environment and Planning C: Government and Policy* **28** 349-368

Ghaziabad Development Authority, 2006 *Ghaziabad Master Plan 2021* (Government of Uttar Pradesh, Ghaziabad)

GOI, 2002 *National Water Policy* (Ministry of Water Resources, New Delhi)

GOI, 2011 *Population Census India* (Ministry of Home Affairs, New Delhi) http://www.census2011.co.in/census/city/105-ghaziabad.html

GOI, 2012 *Draft National Water Policy* (Ministry of Water Resources, New Delhi)

Halkatti M, Purushothaman S, and Brook R, 2003, "Participatory Action Planning in the Peri-Urban Interface: the Twin City Experience, Hubli- Dharwad, India" *Environment and Urbanization* **15** (1) 149-158

Hall D, Lobina E, 2007, "Profitability and the Poor: Corporate Strategies, Innovation and Sustainability" *Geoforum* **38** 772-785

Jones H, 2009, "Policy-making as discourse: a review of recent knowledge-to-policy literature", ODI-IKM Working Paper No. 5, ODI, London

Keeley J, and Scoones I, (2003), *Understanding Environmental Policy Processes: Cases From Africa* (Earthscan, London)

Kennedy L, 2007, "Regional industrial policies driving peri-urban dynamics in Hyderabad, India" *Cities* **24** (2) 95-109

Kjellén M, Mcgranahan G, 2006, "Informal Water Vendors and the Urban Poor", Human Settlement Discussion Paper Series, Theme: Water-3, International Institute for Environment and Development, London

Leach M, Scoones I, Sterling A, 2007, "Pathways to Sustainability: An Overview of the STEPS Centre Approach", STEPS Approach Paper, STEPS Centre, Brighton

Leach M, Scoones I, Stirling A, 2010 *Dynamic Sustainabilities: Technology, Environment, Social Justice*, (Earthscan, London)

Lewis D, 2006, "The science-society interface in the urban environment: a policy perspective" *Environment and Planning C: Government and Policy* **24** 715-717

Long, A. (1992) New Perspectives on old problems: Goods, Knowledge and beer: The methodological significance of situational analysis and discourse. In N. Long, And Long, A., ed. Battlefields of Knowledge: The Interlocking of

Theory and Practice in Social Research and Development. London: Routledge., pp.147-170.

Marshall F, Waldman L, MacGregor H, Mehta, L and Randhawa P, 2009, "On the Edge of Sustainability: Perspectives on Peri-urban Dynamics", STEPS Working Paper 35, STEPS Centre, Brighton

McKenzie D, Ray I, 2009, "Urban Water Supply in India: Status, Reform Options and Possible Lessons" *Water Policy* **11** 442-460

Mishra S, Goldar B, 2008, "Likely Impact of Reforming Water Supply and Sewerage Services in Delhi" *Economic and Political Weekly* **October** 57-66

Narain V, 2009, "Growing city, shrinking hinterland: land acquisition, transition and conflict in peri-urban Gurgaon, India" *Environment and Urbanization* **21** (2) 501–512

Narain V, and Nischal S, 2007, "The Peri-Urban Interface in Shahpur Khurd and Karnera, India" *Environment and Urbanization* **19** (1) 261-273

Navlakha G, 2000, "Urban Pollution: Driving Workers to Desperation" *Economic and Political Weekly* **December 16** 4469-4474

Otterphol R, Braun U, Oldenburg M, 2002, "Innovative technologies for Decentrailised Waste Water Management in Urban and Peri-urban Areas", Keynote presentation at IWA Small 2002, Istanbul, http://www.tu-harburg.de/susan/downloads/keynote_istanbul_otterpohl.pdf

Owens S, Petts J, Bulkeley H, 2006, "Boundary work: knowledge, policy, and the urban environment" *Environment and Planning C: Government and Policy*, **24** 633-643

Parkinson J, Tayer K, 2003, "Decentralized Wastewater Management in Peri-urban Areas in Low-income Countries" *Environment and Urbanization* **15** 75-90

Ranganathan M, Kamath L, Baindur V, 2009, "Piped Water Supply to Greater Bangalore: Putting the Cart before the Horse" *Economic and Political Weekly* **August** 53-62

Roy D, 2004, "From Home to Estate" *Seminar* **533** 68-75

Ruet J, Gambiez M, Emilie L, 2007, "Private Appropriation of Resource: Impact of Peri-urban Farmers selling Water to Chennai Metropolitan Water Board" *Cities* **24** 110-121

Singh A, Sharma R K, Agarwal M, Marshall F, 2010, "Health risk assessment of heavy metals via dietary intake from the wastewater irrigated site of a dry tropical area of India" *Food and Chemical Toxicology* **48** 611-619

UNFPA, 2007, "State of World Population, 2007: Unleashing the Potential of Urban Growth", United Nations Population Fund, http://www.unfpa.org/swp/2007/presskit/pdf/sowp2007_eng.pdf