ABSTRACT OF DISSERTATION

Sya Buryn Kedzior

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POLLUTION KNOWLEDGE AND URBAN WATER POLITICS IN THE GANGES RIVER BASIN (INDIA)

ABSTRACT OF DISSERTATION

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the College of Arts and Sciences at the University of Kentucky

By
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Lexington, KY

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Lexington, KY

2011

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Millions of people rely upon the Ganges River as a source of water provision and a site of disposal for sewage, solid waste, agricultural runoff and industrial effluent. The river is also a goddess in the Hindu pantheon who is worshipped for her purificatory powers, despite water quality levels that fall far short of standards for use in bathing, washing, and drinking. In recent years, a number of non-governmental organizations (NGOs) have formed to oppose both pollution of the river and the failure of state-run pollution abatement programs. They are joined by an increasingly frequent number of seemingly spontaneous protests held during the large Kumbh Mela festival gatherings at Allahabad, Uttar Pradesh. Led by priests, sadhus and religious leaders, these protestors refuse to participate in the ritual bathing that is central to river worship until local and state officials take action to improve water quality at the site. These events indicate that the politics surrounding pollution abatement in the Ganges River Basin (GRB) are changing and that civil society organizations are struggling to gain greater representation and influence in the processes that shape pollution abatement and water use management in the GRB.

This dissertation investigates the growing debate around pollution and pollution abatement in the Ganges River Basin and interprets the struggle over pollution abatement and river water management as a struggle over meaning in which various groups attempt to influence the context and context of local environmental knowledge(s). The research compares abatement efforts, civil society activity, and the "pollution knowledge" and water use practices of water users in three urban centers in the central GRB. An analysis of archival data, policy documents, a survey of water users, and interviews with government officials, NGO leaders and members, and other local scientists and activists conducted during fieldwork in 2008 and 2009.

Discussion centers on the meta-discursive productions surrounding public participation and popular "awareness" as precursors to public participation in decision-making and policy-making processes. Findings indicate that water users in the GRB are well aware of pollution in the river and that many users exhibit a degree of cognitive dissonance in their pollution knowledge, indicating that a disconnection may exist
between the knowledge that guides opinion and the knowledge that guides water use activity. Anti-pollution social movement organizations are found to employ methods and tactics that reflect local contexts of environmental degradation and pollution production, but which ultimately aim to reproduce broads shifts in the ideas, values, and power relations associated with water quality and water use in the Basin. Discussion considers the politics of upstream/downstream relations in shaping pollution abatement measures and the occurrence of "missing movements", or the absence of anti-pollution civil society activity. Research findings contribute to literature on the role of environmental knowledge in shaping the “politics of meaning” around which ideological struggles over natural resource use, access, and conservation are waged.

KEYWORDS: India, Water pollution, Environmental knowledge, Social movements, River water pollution
POLLUTION KNOWLEDGE AND URBAN WATER POLITICS
IN THE GANGES RIVER BASIN (INDIA)

By

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For $E$, 
who woke me up

and Travis, 
who kept me going

Thank you.
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I open this dissertation by introducing Raj*, an inspirational figure for this project. Raj is a dhobi, or washerman, in the city of Varanasi. I met him when I was in the city, walking the stair-like ghats that line the river, while conducting surveys on people’s knowledge of water quality and pollution in the Ganges River. Raj walked past me and said, “I make pollution. Pollution comes from me.” (pers. comm. 2009). As we talked, Raj explained that the caustic detergents and bleaches that he uses when washing clothes in the river contribute to the chemical contamination of the water. While Raj is, in this sense, a producer of pollution, he is also a consumer. He told me of the rashes that he now gets on his hands, and on the soft skin of his stomach and back, after bathing in the river. Raj also told me of the putrid smells that emanate from the riverbanks whenever the sewage treatment plant stops working, or when its failure forces sewage to back up into the streets, and of the color of the water that runs black and blue when nearby textile factories release their effluents directly into the river. But, Raj also told me of the deep love and devotion he has for the Ganges River, the Ma Ganga, who provides sustenance and a livelihood for Raj and his family, as she does for millions of people in northern India. He spoke of the river as a mother and a national icon, a symbol of India.

This project began with essentially the same question that has puzzled other observers (Alley 2002, Haberman 2006): If people love the Ganga so dearly and if her waters are indeed so grossly polluted that they pose a threat to the lives and livelihoods of her devotees, why is there not a mass movement in her defense? Why are the people who live and rely on this river not storming the streets and marching on capitals in a show of mass mobilization, in order to demand change? Overall, Raj made clear that while he is well aware of the problem of pollution in the River, and of his own personal contribution to contamination of its waters, his choices are limited. His responses became a well-worn refrain heard time and again from people of many walks of life who participated in this study: People know. Like Raj, people understand well the challenges faced in the effort to

* An asterisk following a name denotes use of a pseudonym.
improve water quality. More than anything else; more than education or awareness, of a lack of funding or motivation, the problem that people face in their struggle to clean up the river is a lack of viable options for meeting their water use needs and for engaging meaningfully in the political processes that influence decision-making related to water use and abatement efforts. Instead, people like Raj, the people who depend on, love, pollute, and die at the shores of the Ganges, are today engaged in a complex struggle over conflicting claims to the power to make and control these decisions.

This dissertation explores the political and social struggle surrounding river water pollution abatement in urban centers of the central Ganges River Basin (GRB) in northern India (see Figure 1.1). It provides an examination of this struggle with particular focus on the role of environmental knowledge in shaping the complex politics related to water use and pollution abatement in the central GRB. It also explores how individuals, groups and institutions attempt to influence this struggle by changing the content and relevance of environmental knowledge in order to affect social and political change and how, within this socio-political context, environmental knowledge becomes a site of struggle around which contentious politics take place. In examining this conflict, the study asks how various groups are attempting to affect change by reproducing distinct and divergent methods of knowing and understanding pollution, what obstacles are faced in efforts to coordinate civil society activity, how these activities influence various urban and environmental contexts in which resistance does, or does not, mobilize, and what patterns of organized resistance emerge from these socio-political struggles to affect environmental change. Particular emphasis is placed upon the resultant effects of these processes on local water use practices and political activity. Subsequent chapters will explore in detail the theoretical framework that guides this study, its epistemological underpinnings, the methodology used to investigate these issues and processes, the various evidence that were produced through this study, and the significance of those findings. The remainder of this chapter introduces the contexts of the problems engaged with in this study, overviews the approach and structure of this research project, explains the significance of this research, and outlines the remaining chapters.
Figure 1.1 Ganges River watershed, showing Uttar Pradesh state boundaries and three study sites
1.1 Background

In late January 2003, the city of Allahabad hosted the great *Kumbh Mela* festival, celebrating the battle between gods and demons that caused a few drops of the elixir of life to fall to earth. On the festival day of *Mauni Amavasya*, millions of people gathered on the banks of the river to bathe at the *Sangam*, the site of confluence for the great rivers Ganga and Yamuna. Thousands of ascetic Hindu *sadhus, sants* and other worshippers refused to perform the ritual *kalpvas*, a thrice-daily practice of bathing in and drinking the river water which cleanses the soul of sin and the body of illness (Shukla 2003). These devotees, joined by thousands of pilgrims, instead formed a human chain along the riverfront and fasted for days in order to draw attention to the problem of pollution in the river. After a few days, the government relented, approving release of millions of gallons of water from an upstream reservoir in order to reduce the pollution load in the river by diluting the water so that it would be suitable for bathing. But the temporary nature of this solution brings people back to demonstrate at every *Mela* celebration in order to critique a negligent government and to petition Hindu devotees of the Ganges to cleanse their sacred river as she has cleansed the land and people of India for centuries (Shukla 2003; Thibodeaux 2007).

It is not surprising that protests against pollution in the Ganges are regularly organized at the Kumbh Mela. Tens of millions of people attend these festivals, making them among the largest gatherings of people in the world. By interrupting the large, economically profitable, and politically significant Melas, protests also draw national attention to pollution in the Ganges and to the failure of government efforts to improve water quality. The organization of these activities in Allahabad, and not at any of the other three Kumbh Mela sites, is also telling. The *Sangam* at Allahabad is an especially auspicious site for bathing in the Ganges River, which is said to wash away sin, cure and prevent illness, provide spiritual fulfillment, and help the soul to achieve *moksha*, or liberation, after death (Alley 2002; Nahar and Peel 2007). By appealing to the significance of these religious practices, protestors are able to expand the cultural resonance of their activities and appeal to a broader audience.

The *Mela* in Allahabad is held during late January and early February, at the height of dry season. River water runs particularly low at this time of year, when the
monsoons are long gone and the snow and ice that feed the river remain frozen at the top of the Himalayas. It is also the height of a winter growing season that produces increased reliance upon river-based irrigation systems and the introduction of chemical pesticides and fertilizers that are released from canals back into the river near Allahabad. The city itself is located in the heart of the most fertile agricultural region in India, and downstream from one of its largest industrial centers. The millions of devotees and pilgrims who attended the festivals here are drawn from around the country. Resorting to direct action, these protestors demand that the government take immediate action to cleanse the water in the holy Ganges River. The annual repetition of their resistance is impressive, but draws attention to the absence of a sustained social movement to improve water quality in the Ganges over the long term.

The Ganges and its tributaries form one of the most important river systems in the world, with a watershed that drains approximately one million square kilometers and supports about 750 million people in areas with some of the highest population densities in the world (Chapman 1995). While the Ganges is neither the largest nor the longest river, water output at its delta is the third highest and it carries one of the highest recorded sediment loads (Helmer and Hespanhol 1997; Gupta 2007). From its source at the Gangotri Glacier in the Himalayas, to the mouth of the river on the Bay of Bengal (see Figure 1.2), the Ganges twists and turns back upon itself, carrying more than 400 million km$^3$ of water each day over a length of 2500 km through some of the oldest and largest population centers in India$^iv$ (Sengupta 2006). The river is fed by snowmelt from glaciers in the high Himalayas and by monsoon rains, which can cause seasonal flooding. In the wet season, between July and November, water levels are at their highest, owing to the contributions of the monsoon rains and the Ganges’ many tributaries. The river delta spans two countries and supports the largest mangrove ecosystem in the world, the Sundarbans Forest. The silt that fills the delta and river basin valley is made from soft, young Himalayan rocks that have been eroded by the river over millennia. This alluvium produces fertile land, including the well-known doab region that lies between the Ganges and the Yamuna Rivers in western Uttar Pradesh. The people of the Ganges River Basin (GRB) utilize the river water to wash dishes, clothes, bodies and animals, to drink and
prepare food, for irrigation and as a disposal site for domestic, agricultural and industrial waste.

While there are many rivers in the world larger and more substantial than the Ganges, it is arguable that no other enjoys the cultural and religious significance of this river. Although water, especially river water, is considered sacred in Hindu religious tradition, the Ganges (Ganga) is the holiest of all rivers in India. To wade on her banks, swim in her streams, or even to take a drink of containerized ganga jal (Ganges water), is to be cleansed by the waters of the Gods, sent to earth to rid humankind of evil and impurity. Traditionally, the river is believed to be a purificatory force whose waters cleanse both material and ritual pollution from those who bathe in or drink it. By bathing in or drinking the water of the Ganges, Hindus aim to wash their bodies of ritual pollution in order to attain suddhata, or religious purity. According to Hindu creation myths found in the Ramayana and other texts, the Ganges was sent to earth in order to purify the ashes of 60,000 dead warriors that had been spread across the north Indian plains (Alley 2002).
The Ganges is therefore regarded in Hindu religious practice as the goddess of purity, intimately intertwined with ideas of cleanliness, filth, and pollution. Many Hindu religious practices reflect this understanding, from the ritual bathing and drinking of river water performed by pilgrims in order to rid the body of both sin and physical illness, to the practice of placing (often partially) cremated bodies in the river to insure liberation of the soul.

Both the material and religious significance of the Ganges has led it to become one the most polluted river in India, with water quality falling far short of that recommended for either drinking or bathing at most testing sites (Ministry of Environment and Forests 2005). Major sources of pollution in the river are untreated sewage and effluents from leather tanneries, soap factories and other industries, which cause and exacerbate rashes and yellowed patches of skin, eyesight problems, cholera, dysentery, typhoid, intestinal worms, trachoma and diarrhea\(^v\) (World Health Organization 2004; Sengupta 2006). Attention to water quality and the pollution of river water was not articulated in official governmental policy until the early 1970s, when the first water quality legislation was drafted, along with a number of other environmental acts, following a decade of increased environmental concern and activity in India\(^vi\). The National Water and Air Acts served to establish Pollution Control Boards (PCBs) at both central and state levels, whose purpose it is to serve as “watchdog [agencies] for the prevention and control of pollution of all forms and dimensions” (Singh 1994, 28). In the first decade of its operation, the Central Pollution Control Board (CPCB) sought to achieve two main goals: First, to establish a system of use-based river classification, which designated each stretch of every Indian river as serving a primary use of irrigation, bathing or drinking\(^vii\). Second, the CPCB oversaw the monitoring of river water quality by the state-level pollution boards (Central Pollution Control Board 1995).

Following an extensive CPCB survey of water quality in the Ganges conducted in 1984 the government launched the Ganga Action Plan (GAP)\(^viii\). Phase I of the GAP involved 261 pollution abatement projects in the 25 towns and cities included in the CPCB survey, including the installation of sewage treatment plants and pumping stations, crematoriums, small-scale sanitation facilities, and other solid waste management programs. The Central Ganga Authority was established to oversee these projects, which
were funded by the central government, in collaboration Dutch and British authorities, and the British Thames Water Company (National Informatics Center 2006). Phase I of the GAP was completed in 2000 to mixed reviews that found water quality to have worsened during the implementation period (Mallikarjun 2003), pollution levels remained largely the same (Kant 2000), that the GAP had at least partially achieved its goals (Chalmers 2001), and that the more than 9 billion rupees (Rs.) budget for the project had, at the very least, not been used appropriately\textsuperscript{ix} (Sengupta 2006). Shortcomings of the plan included its failure to include abatement measures that reflect the relationships between water users and the Ganges in terms of water use practices, its reliance upon technological solutions that could not be supported by current infrastructure, and its lack of attention to industrial sources of pollution. Phase II of the GAP aims to address sources of industrial pollution, rather than focusing exclusively on domestic sewage, through the provision of training, monitoring equipment, and funding industrial effluent treatment facilities.

Despite continual funding of abatement programs for the past 25 years, water quality in the Ganges River continues to fall far short of national and international standards for consumption and use. In response to criticisms of their efforts as ineffectual, unsuitable and even corrupt, the government has repeatedly drawn attention to the role of citizen participation, often arguing that lack of public awareness and support for officials have doomed them to failure. During a speech at the 2006 Water Pollution and Health Conference in Meerut, Uttar Pradesh, the state’s Environmental Minister, Ujjwal Raman Singh, argued that environmental legislation would continue to prove ineffectual until popular awareness of the hazards of water pollution improved (Chandramohan 2006). Reportedly, Singh emphasized both the need to increase public awareness of water pollution and the importance of social movement organizations in influencing public perceptions of water pollution and the impact of water use practices. While Singh’s comments encourage the educational activities of certain civil society organizations, they also locate the cause of pollution squarely among public water use practices. This reflects a propensity of Indian governmental officials to blame all sort of environmental destruction and damage on the (often domestic) activities of citizens,
while diverting attention from industrial sources or from governmental obligations to provide potable water (Guha 1989).

Singh’s comments can also be read as a reaction to the increase in recent years of social movement and other civil society organizations in India that seek to address water pollution issues. While not all of these organizations are directly critical of state-sponsored abatement efforts, they often vie with the state for the power to influence abatement measures and to decide how abatement programs should be structured and prioritized. They also compete with state efforts to educate and inform citizens of the problem of pollution, thereby (re-)producing new ways of understanding and interacting with the river, either as a water source or as a goddess. The growing influence of these groups would seem to suggest that, for many, pollution is becoming understood as a public issue and that mobilization may be perceived as essential for effective political and environmental change. Yet, neither state apparatuses for policy-making and program implementation, nor civil society organizational efforts to propose and support alternative approaches, offer viable and meaningful opportunities for broad-based public involvement. Most anti-pollution non-governmental organizations (NGOs) join the government, and many scholars, in describing the struggle to clean the Ganges as a binary conflict between official “scientific” abatement programs, and popular “traditional” Hindu relationships with the river that rest on appreciation of the Ganges as an eternally pure, inviolable river (McNeill 2000). Their diverse efforts to educate or raise awareness among citizens and water users rests on this dualistic perception of popular environmental knowledge, and fails to account for the complex context in which multiple pollution knowledges are formed and mediated. The Mauni Amavasya protests, then, become a jumping off point for examining how people carve out (and literally claim) space for participating in the processes that influence pollution abatement efforts, for questioning where resistance occurs and why, and for examining how oppositional politics are structured, mobilized, coordinated and sustained.

1.2 An Introduction to the Dissertation

This dissertation project is a study of environmental knowledge as the site of struggle in the contentious conflicts over pollution abatement efforts in the Ganges River Basin
The project begins with the assumption that water quality politics in the central basin state of Uttar Pradesh have changed significantly in the past decade, and continue to undergo processes of revisitation and renegotiation. The Mauni Amavasya protests provide partial proof of this transformation. When considered along with evidence of a rise in the number of anti-pollution protests (Agarwal 2003; Banerjee 2007) and non-governmental organizations, shifts in water use practices, and new approaches to state-prescribed abatement efforts, these changes in the politics of river water quality are significant and can be read as indicators of associated changes in the ways in which pollution is identified, valued, and understood.

The primary objective of this research is to assess how environmental knowledge regarding pollution in the Ganges River influences individual and collective action in terms of resource use and political activity. It seeks, in particular, to explore the effects of environmental knowledge on resource use activities and its role in fostering pro-environmental collective action movements. Secondary research objectives are to elucidate the processes through which environmental knowledge is disseminated, incorporated into existing belief systems, and reconciled with contradictory epistemic systems. While this task necessitates investigations into the specific context of water use and abatement activities in the Ganges River Basin, findings will be applicable to other settings where conflicts over environmental change are gauged on discursive grounds, and where environmental knowledge has become the site of struggle over which various actors seek to exert their influence and affect change.

This research project adopts an eco-constructivist analytical perspective that views changes in the politics of river pollution as indicative of an associated change in the ways in which pollution is identified, valued, and understood. In keeping with geographic literature on social movements (Peters 1984; Escobar 1992; Rangan 2000), the political struggle over pollution and water quality in the Ganges River Basin is analyzed as a “struggle over meaning” in which local interest groups (politicians, scientists, religious leaders and civil society organizations) are caught up in a discursive contest to control the construction of these meanings, and in which “pollution knowledge” has become the site of struggle over which various actors seek to exert their influence and affect change.
This dissertation therefore provides an in-depth analysis of the relationship between pollution knowledge and the local politics of water and water quality in the Ganges River basin. In examining water pollution knowledge, it questions not only the processes of its formation, but also the “work” that this knowledge does and the ways in which it influences water use practices, water quality outcomes, policy formation and implementation, and the formation of anti-pollution civil society organizations. These questions address how water pollution knowledge is shaped and constructed, who is located in these networks of knowledge formation, how pollution knowledge is shaped and mediated by individuals and groups, how it is called upon to perform certain tasks or achieve particular ends, and how it relates to the actions of individuals in terms of water use practices and political activities. While previous research on environmental knowledge, water politics, and pollution in the Ganges River has examined influential factors in the formation of environmental knowledge, the politics of policy formation, and the intra-linguistic semantics of pollution and purity (see Chapter Two), relatively inadequate attention has been paid to issues surrounding the intersecting relationships between pollution knowledge and the local politics of pollution abatement, especially in the unique context of the GRB.

The general research question that guides this study is: *How is pollution in the Ganges River understood and how does that knowledge shape the context of water use practices and the content of local political struggles over water quality in the GRB?* Within this broad framework, the inquiry has been partitioned into five subsidiary questions:

1. *How is pollution knowledge produced and how is its construction reflected in the documentation reproduced by various informational agencies (including state and local municipal authorities, local anti-pollution civil society organizations, and media publications)?*

2. *How has the recent growth of anti-pollution organizations changed local political conflicts over pollution abatement and impacted processes of pollution knowledge construction?*

3. *How are disparate sources of pollution knowledge prioritized, reconciled and determined to be valid?*
4. Do individuals adjust water use practices in response to changing knowledge or information about the nature and degree of river water pollution?

5. How do various types of pollution knowledge correlate with water use practices, and how do water use practices inform environmental knowledge?

These research questions promote the identification of multiple, conflicting pollution knowledges, exploration of their sources and methods of produce, and investigation of their various impacts. By examining how various individuals and groups understand and identify the problem of pollution, and act on the basis of that knowledge, we can gain a sense of why anti-pollution efforts are becoming increasingly focused on the role of popular awareness, how various interest groups attempt to restructure the power relations that shape approaches to abatement, why mass mobilization has yet to manifest in response to degradation of water quality in the GRB, and to identify to obstacles to coordinated anti-pollution politics.

1.3 Approach to the Dissertation

Geographers have long engaged in studies related to human interactions with the natural environment. For most of this history of our discipline, questions related to the various interrelations between society and environment have been our defining focus. Within this tradition, geographers have investigated and attempted to measure the environmental perception or awareness of various individuals and group populations. In recent years, increasing attention has turned to environmental knowledge as a broader and more critical means of interacting with some of the same issues traditionally considered under the purview of environmental perception studies. Research on environmental knowledge attempts to understand social ways of knowing the natural world by adopting a more comprehensive view of knowledge as inclusive of not only ideas and information about the natural environment, but also to the complex (and often contested) social and material processes through which these understandings are constructed and (re)produced (Goodman et al. 2008).
Guided by a set of disparate theoretical and analytical approaches, this dissertation engages with a particular type of environmental knowledge, “pollution knowledge”, in order to understand not only how and what people think and know about pollution, but also to assess the multiple processes through which knowledge relating to pollution is reproduced, how conflicting knowledges are validated and reconciled, and how these ways of knowing pollution inform action in terms of water use and political activity. Pollution is an ideal object of study in an examination of environmental knowledge, because pollution is ultimately produced by humans and through social processes. Now, we can talk about natural and anthropogenic sources of pollution, but what is meant here is that we produce pollution because humans decide what is and isn’t considered to be pollution. In most standard definitions, pollution is described as the introduction of harmful substances or contaminants into a natural environment (Oxford English Dictionary 2010). Pollution therefore includes any matter that alters the characteristics or conditions of a natural environment, or that causes harm or damage to environments and their inhabitants. In other words, what gets counted as “pollution” rests directly on our diverse methods of characterizing what is “natural” from that which is “unnatural” or “foreign” to an environment.

By interrogating “pollution knowledge” then, we are asking where we draw the line between the human and non-human natures, between what we think should or can be part of an environment, and what we consider tolerable in terms of risks to the health of our societies and environments. For example, a common practice along the Ganges River is to collect mud, clay or sands from her shores and fashion them into a murti, or sculptural image of a divinity. These murtis are embellished, adorned, and decorated with flowers, fabric, jewelry, and sometimes paint, and then incorporated into acts of worship. As the embodiment of a deity, murtis are often placed on an altar or esteemed site and kept for days, weeks, or even months. At the end of their usage, murtis are often immersed into the river by their users. Some people argue that this reimmersion does not produce pollution, as murtis are being returned to the river from which they were made. Others argue that the return of the murti causes pollution because it contributes to turbidity in the water and introduces into the river foreign elements associated with the decorations. As this example illustrates, whether or not the murti is categorized as
“pollution” rests directly on our diverse understandings of what is natural and what we consider to be part of, or separate from, the river system.

But, pollution knowledge encompasses more than our categorizations of what is and isn’t pollution. It also includes the ideas and information we have about pollution, like its causes and sources, and the values that we associate with pollution and polluted materials. Our lived and transferred experiences with pollution, such as those gained through observing or contacting pollution, or even those conveyed to us by others, are also encompassed in this definition of pollution knowledge. Significantly, though, this method of understanding pollution knowledge incorporates not just these various methods of understanding, valuing and experiencing pollution, but also the framing practices employed in reproducing those values, experiences, and understandings. In other words, pollution knowledge includes the methods of (re-)interpreting such knowledge, for making it meaningful, and for using such knowledge to “organize experience and guide action” (Snow and Benford 2000, 614). These framing practices allow us to interpret “the injustice or immorality of specific social conditions, [to attribute] blame for them, [to formulate] some kind of action agenda for solving them, and [to motive ourselves into] taking that action” (Taylor 1995, 41). Therefore, pollution knowledge also includes the power relations that control and mediate the reproduction of knowledge itself, as well as the struggles that result from conflicting interpretations or methods of associating meanings with pollution or polluted water. Finally, this description of pollution knowledge also subsumes the methods of engaging with pollution that result from these various other processes of meaning-making, including water use practices and political activity.

This research project has been designed to explore pollution knowledge, its construction and (re)production, and the social and discursive relationships that govern pollution abatement efforts in the GRB. In doing so, it investigates the political conflict that surrounds abatement activities and assesses the political, economic and ecological outcomes of these struggles. While difficult to apprehend and assess, ‘pollution knowledge’ can be investigated by examining the epistemic framing practices employed by individuals and groups when discussing local environments, by analyzing the ways in which environmental issues are bounded through discursive representations of recurring
themes (such as “nature”, “filth”, or “nationalism”), and by interrogating the power relations that govern the environment through policy, media, science, and education (Goodman et al. 2008). Because of its highly subjective nature, studies of environmental knowledge commonly entail deeply contextualized empirical research that seeks to explain how the environmental knowledge of particular social groups shapes, and is shaped by, local resource use practices, cultural norms, histories, economies, ecologies, and politics. Consequently, studies of pollution knowledge often adopt a mixed-method research design, which may be necessary “in order to capture the social processes by which individuals and groups construct ideas about… pollution” (Bickerstaff and Walker 2003, 49-50).

This dissertation adopts such a mixed-methods approach that supports an in-depth analysis of the socio-ecological context in which the struggle over pollution abatement is taking place, the epistemic framing practices of individuals and groups involved in this conflict, the framing of the conflict through discursive representations of pollution and abatement activities, and the power relations that govern pollution abatement efforts in the GRB through government policy, popular media, science, and education. Specific data collection techniques include archival data gathering, a general population survey, participant observation, and semi-structured interviews with civil society members and leaders, anti-pollution activists, government officials, factory owners and consultants, water quality scientists, and ‘water users’, broadly defined. Analytical methods include statistical analysis of quantitative survey data and discursive textual analysis of policy documents, government websites and other publications, NGO brochures and websites, media coverage in prominent Indian English-language newspapers, and of the qualitative evidence gathered through surveys and interviews. Combination of these approaches “increase[s] the likelihood that contradictory… knowledge claims might surface and be more thoroughly investigated” (Kwan 2002, 158).

Data collection and fieldwork associated with this project was conducted over two trips to India between February 2008 and March 2009. Funding for the research was provided by the Society of Woman Geographers’ Evelyn L. Pruitt National Fellowship for Dissertation Research, the Water Resources Specialty Group of the Association of American Geographers (WRSG-AAG), the University of Kentucky Graduate School and
Department of Geography. Research sites included the three cities of Kanpur, Allahabad, and Varnasi. Each of these large, urban centers is located along the Ganges River in the state of Uttar Pradesh. Uttar Pradesh and the central Ganges River Basin (GRB) serves as an ideal site for this research for a variety of reasons: First, the Ganges is one of the most important rivers in the world, as its watershed area supports a greater and more dense population than any other river (Biswas and Uitto 2001). Second, the Ganges suffers from high rates of pollution that have been measured at certain sites at more than 100 times worse than that required for it to be safe enough to for bathing (Bhagat and Bhagat 2004). Yet, pilgrims and local inhabitants use the water of the Ganges for a variety of activities, including washing clothes and dishes, bathing, occasional drinking (often for spiritual reasons), and waste disposal.

Third, pollution abatement policies and programs implemented by various governmental institutions have met with limited success. The subsequent rise of anti-pollution civil society organizations in the GRB provides a foundation for exploring the role of pollution knowledge in shaping both the effects of popular discontentment with policy measures and participation in non-governmental environmental politics. Finally, Hindu religious belief identifies the Ganges as an infallibly pure river, leading adherents to seek the waters of the Gangs to cure both physical and spiritual ills. The existence of Hindu teachings and practices that identify the Ganges as a “mother goddess” and associate her with powers of purification also allow for investigation into the question of whether religious beliefs serve as an obstacle to water quality improvement, or as the motivation for devotees to “bring together worship for Ganga’s transcendent purity and concern for her immanent role as Mother” into a cohesive anti-pollution movement (Alley 2002, 246). Research on the Ganges River, then, affords an ideal context in which to explore the factors of high levels of pollution, contested understandings of water pollution and its possible abatement, weak environmental policy implementation, civil society organization influence, and conflicts between water policy and daily water use practices.

The research is sited in three major urban centers on the Ganges River: Kanpur, an industrial city well-known for its leather tanning industry, Allahabad, where the Ganges meets the Yamuna River at a great pilgrimage center, and Varanasi, an ancient
holy city and tourist destination. Conducting research at multiple sites is necessary to understand the “logic of (dis-)connection” between anti-pollution organizations, for understanding how groups relate to one another via the river and the upstream-downstream politics it engenders, and for understanding the context-specific nature of pollution knowledge reproduction. Because each of these three study sites is a major urban center, with populations between two and five million, socio-political relationships with water resources uncovered there are likely quite different from those in rural areas. Nonetheless, exclusive focus on urban contexts allows for an ease of cross-comparison between sites. It also reflects both the urban concentration of population in the Basin and the tendency of multiple anti-pollution groups, including government agencies, to identify cities as sources of pollution, and to structure abatement efforts to reflect this understanding. My findings are therefore limited to urban water politics, water use, and associated pollution knowledge.

1.4 Significance and Contributions
Understanding pollution knowledge, and the multiple processes associated with its reproduction and contestation, is vital to making sense of the shape that environmental issues take in various social settings, as well as the ways that decisions regarding resource-use and conservation are constructed, and why responses to environmental problems change over time, space, and place (Robbins 2004). This study reveals some of the multiple methods of understanding and interacting with water pollution and polluted water in the Ganges River. It also elucidates the multiple processes through which this knowledge is reproduced, contested, valued, and incorporated into the water use and political activities of individuals, groups and institutions in the GRB. Examining the way in which various understandings of pollution are formed and articulate into water use practices and political activity allows for unique insight into the changes taking place in Indian civil society in terms of increased interest in (and dialogue on) pollution abatement and water use practices. Findings from this study indicate that, while governmental and non-governmental civil society organizations focus on a perceived lack of public awareness and support for pollution abatement measures, waters users are frustrated by the failure of both of these groups to provide either reasonable alternative
water use sources or meaningful opportunities for involvement in decision-making processes or oppositional politics.

In a broader sense, this dissertation advances an argument in support of cognitive dissonance. It provides evidence that people are able to hold, process, and incorporate multiple, even conflicting, ways of understanding their relationships with the natural world, and draw upon these simultaneously to inform their actions. While environmental knowledge is conventionally conceived as homogenous, fixed and static, this dissertation seeks to de-stabilize these conceptions through an analysis of multiple, co-existing, and conflicting pollution knowledges. In doing so, this project adds to critiques of environmental knowledge studies that privilege “expert” or “scientific” ways of knowing by demonstrating the social contingency of “valid” knowledge and identifying epistemologies of environmental degradation and conservation that account for religious belief and cultural practice as more than mediating factors in decision making processes.

Finally, the project broadens the way we think about the discursive politics involved in struggles over resource-use and conservation by tracing environmental conflict beyond dualistic struggles, through a wide network of actors that mediate political decisions and contribute to the organization of environmental governance. By identifying obstacles to knowledge dissemination and coordination, and exploring the role(s) of “non-expert” social organizations in shaping popular knowledge formation, this dissertation argues for a more comprehensive and inclusive approach to the study of the discursive politics involved in struggles over resource-use and conservation. The project also argues that social movements and socio-political conflict must be understood as “more than” dualistic struggles between civil society organizations and the state. Instead, social and political power and change are negotiated through a wide network of individuals, groups and institutions that mediate political decisions and contribute to the organization of environmental governance. These arguments are explored throughout the remaining chapters of the dissertation.

1.5 Structure of the Dissertation

This dissertation is organized into eight chapters, seven of which follow this introduction. Chapter Two includes a review of literatures on river water pollution in general, pollution
in the GRB in particular, and of environmental social movements in India. It then introduces the theoretical approach that guides this dissertation and the definitions of environmental knowledge and pollution knowledge that inform this inquiry.

Chapter Three details the research design and use of mixed-methods of data gathering and analysis that guided the collection and evaluation of evidence in support of this project. Chapter Four discusses the context in which the study, and the politics it examines, takes place, with particular emphasis on the geography and geomorphology of the GRB, the religious and mythic values associated with the river as goddess, the significance of the river in regional and national agriculture and economies, the role of the river in transportation networks, the sources and distribution of pollution in the river, historic and contemporary abatement efforts, the discourses of nationalism associated with the river and essential to renewed efforts to improve water quality, and, finally, the three study sites in which fieldwork was conducted.

Chapter Five is the first of three “meaty” analysis chapters. It begins with a chronology of river water pollution abatement policies and programs, with particular attention to the shifting context in which these approaches were formulated. Next, it focuses on two themes identified through a discursive analysis of these documents: participation and awareness. This section of the chapter explores how “participation” and “awareness” became central to the policy debate and how the discourses with which they are associated ultimately serve to shift blame and regulatory attention from industrial polluters and toward bathing and local individual water use.

Chapter Six explores civil society organization at each of the three study sites. It includes a discussion of the Sankat Mochan Foundation in Varanasi, the Eco-Friends of Kanpur, and the seemingly spontaneous protests and unofficial educational programs organized in Allahabad. The chapter includes an analysis of the pollution knowledge being reproduced by each of these efforts and of the methods of reproduction, contention, and social mobilization. In conclusion, it argues that the environmental knowledge promoted by social movement organizations reflects localized contexts of the pollution problem and aims to reproduce broads shifts in the ideas, values, and power relations associated with water quality and water use in the Basin. While knowledge (re-)production is found to be relatively effective at a local scale, it acts as a barrier to inter-
organizational coordination and prevents organization of the type of national-scale mass movement necessary to affect significant change in state and central government policies.

Chapter Seven presents the results of the survey of water users, summarizing findings related to how people define, identify, value, and base decision-making and water-use practices on various sources of pollution knowledge. It argues that while learned knowledge and educational or awareness efforts can have an influential role in shaping pollution knowledge, most water users base their water use practices on social norms, religious expectations, and personal experience and observation. These water users are often able to incorporate conflicting interpretations of pollution (from media or awareness programs) into their knowledge systems, but most are hesitant to change water use practices or to participate in the type of large-scale political mobilization they recognize would affect change. Many water users argue that there are no viable alternatives for material water use and critique activists and anti-pollution organizations for promoting abatement programs that increasingly disenfranchise users from river resources without supplying viable alternatives for water use or waste disposal.

Chapter Eight summarizes the arguments and findings advanced in earlier chapters and then returns to the “big picture” contributions of this study to research on environmental knowledge, the politics of water pollution and social movement mobilization. In conclusion, it provides an analysis of how “pollution knowledge” and the debate over pollution abatement is affected by the politics of place specific to each study site, and suggests a tentative answer the question of why no cohesive basin-wide anti-pollution movement seems imminent.

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CHAPTER TWO
ENVIRONMENTAL KNOWLEDGE AND SOCIAL MOVEMENTS AS STRUGGLES OVER MEANING

This project is situated broadly in two geographic traditions. First, the society-environment interrelationship studies tradition, which has served as a keystone for the discipline by reflecting its paradigm shifts and engagements with various theoretical and methodological approaches. Second, social movement studies, while regarded as the purview of sociologists, have benefitted from the contributions of geographers to understandings of the place-based nature of social resistance (Miller 2000). Both of these traditions have been relatively neglectful of environmental movements and the sociopolitical context in which they take and shape place. Geographic studies of relationships between society and nature have focused upon human impacts on the environment, human responses to environmental degradation and change, and, more recently, the study of natural resources and their management (Fitzsimmons 2004). Geographic research on social movements has focused on the importance of place, space, and scale in social movement mobilization, but has largely failed to consider these movements or politics as a reflection of the unique society-environment interrelationships found in those places (Miller 2000). This project attempts to blend these two traditions in an examination of an emerging anti-pollution environmental movement in the Ganges River Basin as an expression of the place-based and deeply contextualized inter-relationships between the river and the diverse people, institutions and processes it supports.

Generally speaking, this project adopts a social constructionist theoretical approach to the study of pollution politics and the struggles over pollution abatement. Referred to as “social construction of nature” thesis, the form of constructionism with which this work identifies shies away from the anthropocentric tendencies inherent in a theory that, in its extreme, argues that all reality is a social construct. The social construction of nature thesis attempts to be less dismissive of ontological objectivism by conceding that environmental phenomena have a material existence, but that social or scientific understanding of that existence is limited to their social construction (Hacking 1999; Proctor 1998; 2001). In other words, external phenomena (especially those that are
part of “biophysical nature”) exist, but can only be understood in terms of the meanings and values that various social or knowledge groups ascribe to them.

The general constructionist approach to this project is further informed by theoretical contributions from feminist theory and political ecology, which both warn against anthropocentric views of environmental problems and politics and encourage the identification of environmental processes as dynamic actors in the production of environmental issues. The dissertation is further influenced by sociological social movement theories, especially approaches to frame analysis, and geographical theories of social movements as “struggles over meaning”. Each of these approaches, described in greater detail below, have influenced the focus on pollution knowledge, broadly defined, as an object of inquiry. The next pages provide a review of literature on pollution and water politics in general, of pollution and anti-pollution politics in the Ganges River Basin in particular, and finally of studies on Indian environmental movements. Following those discussions are descriptions of the various approaches to the study of environmental knowledge and social movements that influence this dissertation.

2.1 Review of Literatures

River water pollution, abatement measures, and the sociopolitical struggles that surround these issues are not topics often engaged in human geography. Literature on these subjects is infrequently published and, as discussed below, more often adopts an econometric or spatial scientific approach to measuring the negative impacts or distribution of pollution. Nonetheless, critical studies of water pollution and its associated politics offer productive ground for examining social relationships with degraded environments and the negotiation of abatement or conservation efforts. The next pages provide a brief discussion of geographic literature on pollution and water quality in general, followed by a review of literature on pollution and abatement efforts in the Ganges River Basin in particular, with emphasis on studies of anti-pollution movements and mobilization.

2.1.1 The Politics of River Water Pollution

Most geographic research on pollution has been conducted either under the rubric of economic geography, often as part of development studies, or in studies of environmental
justice issues and their associated social movements (McManus 2000, see for example Bhansali et al. 1992; Bowen et al. 1995; Low and Gleeson 1997). Other notable areas of pollution research include environmental perception studies (including Bladen and Karan 1975; 1976) and quantitative case studies of regional pollution patterns or extreme pollution disasters or events (Bickerstaff and Walker 2003). Many of these works reflect general trends in the academic literature on pollution, which “characterized problems and solutions in… [terms of] the “economos” –the language of management, of control”, but not the language of politics (DuPuis 2004, 1). With the rise of political ecology in the mid-1980s, pollution, along with other environmental problems, has been examined as a social and political, not solely ecological and economic, issue. Recent contributions to pollution research from political ecology and socioecological perspectives have begun to address issues related to the culture and politics of pollution (DuPuis 2004), the social construction of pollution perception (Bickerstaff 2001), and the political ecology of pollution control (Lombard 1999).

Unfortunately, research on water politics has failed to engage with matters of pollution and water quality, except as tangential aspects of inter-state water sharing treaties (Elhance 1999). This may be because the study of water politics is not well distinguished from the study of hyropolitics, which focuses on inter-state disputes over access to water resources and emphasizes the impact of water availability on international politics. Recent work on water politics has attempted to expand these foci by investigating the role of intra-state hyropolitics in producing new ideas about nature that disrupt dominant political-economic relations (Swyngedouw 2003), by investigating how institutionalized water sharing arrangements shape environmental knowledge relating to river basins (Sneddon and Fox 2005), and by broadening the definition of hyropolitics to include regional conflicts over water quality and pollution, in addition to those over access and control (Trottier 1999).

Research conducted in this vein often adopts some version of a constructionist approach to the study of water politics. For geographers embracing the ‘social construction of nature thesis’, water pollution becomes a particularly productive site for interrogating water politics in general and the importance of environmental knowledge in particular (Bickerstaff and Walker 2003). “Pollution”, by its very essence, is a social
construct that is often ill-defined as ‘foreign’, ‘unnatural’, or ‘introduced’ matter. The socio-political contingency of what is considered “foreign” or even “harmful” rests directly upon ideas of what is “natural” and which materials or substances are considered to be natural parts of an ecosystem. How we separate and bound our local environments (delineating “forest” from “scrub”, river from watershed, soil from trees) results in immediate and meaningful distinctions in what “counts” as “nature” or “pollution”, and therefore in what (or sometimes who) are identified as the source(s) of pollution. Pollution knowledge therefore varies greatly over time and between social contexts. Attention to this place-based difference is important for developing an understanding of how pollution knowledge develops and is mediated, contested, reproduced, and ultimately relied upon to inform action. This research project adds to these critical approaches to the study of pollution and water politics by examining socio-political conflicts over water quality and pollution abatement and the governance, management, control, and conservation of river water.

2.1.2 Literature on Pollution Abatement and Anti-Pollution Movements in the GRB

Research on water pollution in India, and the Ganges River Basin, reflects some of the trends identified in the wider literature on pollution and water politics. Of the dozens of studies included in a 1987 review of research on water quality and pollution in the Ganges River (Sinnarkar et al.), only one examined the political aspects of water pollution. The balance of research was found at that time to have considered sources of various pollutants, current levels of chemical contamination, the health effects of biological contaminants, the spatial distribution of pollution, the efficacy of water quality indices, and the environmental impact of major industries (ibid.). In the years since that report was published, the body of research on pollution in the Ganges has run the gamut from assessments of the economic impacts of water pollution (Maria 2003) and the Ganga Action Plan (Markandya and Murty 2000), to studies of the health risks associated with regional water use practices (Hammer et al. 2006), and analyses of water pollution policy and regulation (Khator and Ross 1989; Desai 1990).

Only three main texts have examined the broader politics of pollution abatement in the Ganges River Basin, with particular attention to the role of civil society organizations in anti-pollution struggles. First, Sarah Ahmed’s article *The Rhetoric of*
Participation Re-examined: The State, NGOs and Water Users at Varanasi, Uttar Pradesh, India (1994) focuses on the implementation of the Ganga Action Plan (GAP) at Varanasi, with particular attention to the Plan’s failure to genuinely incorporate public participation. Instead, she argues, the GAP is designed specifically to exclude water users from participation in Plan programs and allow existing social and institutional orders to remain intact. While Ahmed does not consider the state of a larger anti-pollution mass movement, she does examine the role of the Sankat Mochan Foundation, saying that the organization must operate “within the socio-economic and politico-administrative framework of the city”, and as such, it fails to “posit a significant threat to either the hegemony of the State or dominant social groups” and is therefore unlikely to affect real change (ibid., 14).

Next, Kelly D. Alley’s On the Banks of the Ganga: When Wastewater meets a Sacred River (2002) examines the inter-linguistic semantics of purity and pollution in order to understand debates over pollution and wastewater management, also in the city of Varanasi. Drawing on fieldwork conducted in the mid-1990s, she found that local understandings of pollution are produced primarily through the transmission of Hindu religious beliefs, which often countermand direct experience with the polluted river. She argues that these Hindu interpretations of waste, filth, and cleanliness conflate religious impurity with chemical contamination, preventing the possibility of widespread popular awareness of the problem of pollution in the Ganges. While Alley (ibid.) found no evidence of an anti-pollution environmental or social movement along the Ganges and argued that none seemed to be emergent at the time (49), her conclusions may have been limited by her geographic focus on the city of Varanasi, or by her narrow definition of a social movement. She did, however, express hope that recent discourses that attempt to separate religious and scientific views of pollution might prove fruitful in changing local understandings of pollution and subsequent water use practices. She also argued that religious leaders have the potential to “bring together worship for Ganga transcendent purity and concern for her immanent role as Mother” into a cohesive anti-pollution movement (2002, 246).

Finally, David Haberman’s River of Love in an Age of Pollution: The Yamuna River of northern India (2006) examines the cultural and religious significance of the
Yumuna River, a major Ganges tributary, in order to understand how contemporary pollution problems are changing ritual water use practices and perceptions of Indian rivers as inherently holy. He found that religious beliefs regarding the sacred purity of rivers actually serve to reinforce direct experiences with pollution, and may even motivate individuals’ environmental actions and political activity. Haberman (ibid.) argues that changes in pollution knowledge could result in the abandonment of ritual river worship, the disassociation of physical rivers with their mythical and often deified counterparts, or the formation of a massive and widespread anti-pollution movement that employs religious notions of purity and pollution to change water use practices and approaches to pollution abatement and management (177-179).

The last two of these works each engage with a question that is also central to this dissertation: Is there an anti-pollution “social movement” in the Ganges River Basin (GRB) and, if so, what are the prospects of it becoming a successful mass movement? Both Alley and Haberman conclude that no mass movement is currently active in the GRB, but come to differing conclusions about its prospects. Alley (2002) asserts that religious ideas associated with pollution prevent mass mobilization because people’s perceptions of the river as supreme goddess cannot be reconciled with a campaign to save her—doing so would require too drastic of a shift in how people view the power of gods relative to their own. Haberman (2006) argues that if a mass movement were to form, it would require either abandonment of religious beliefs associated with rivers or the leadership of a dynamic religious figure who would serve as a catalyst uniting people in the struggle against river water pollution.

While this dissertation draws from and builds upon these studies, it also breaks with them by focusing on the growing influence of civil society organizations and protests occurring across the Basin, and in considering the environmental knowledge of a wide population of water users, including factory owners, farmers, washerpeople, boatmen, and others, in addition to Hindu religious worshippers and bathers. This broader view, including multiple cities and diverse water users, helps to draw attention to the various ways in which conflicting knowledge systems are navigated, how judgments of “pollution” are made, how pollution knowledge is judged valid and granted social purchase, and how pollution knowledge influences decision-making practices regarding
resource use. In terms of assessing potential for a mass movement, I argue that the anti-pollution struggle in the GRB fails to fit definitions of a social movement because it lacks the cohesion that we expect to find in large-scale social mobilizations. However, this unity may be illusory or only easily identifiable in retrospect. Throughout history, major social movements, including American feminist and civil rights movements, failed to achieve broad solidarity among their many branches, organizations, and supporters. Postcolonial feminist theories have drawn attention to the eliding of difference and diversity by scholars who speak of “the” movement and points out that these singularities (whether “the” people, “the” movement, or “the” state) exist only in our analyses, memories, and imaginaries, and not in “reality” (Spivak 1988, 272). The case of anti-pollution campaigns in the GRB therefore provide compelling evidence for a reevaluation of what constitutes social movements in general and the importance of cohesion for movement success in particular.

2.1.3 Literature on Indian Environmental Movements

Of the many studies on environmental social movements in India, most share two features: the employment of case-studies that focus almost exclusively on rural environmental movements and the subsequent conclusion that the unifying characteristic of Indian environmental movements is their anti-development orientation. In one of the most influential works on the subject, renowned environmental and social historian, Ramachandra Guha, and economic historian Juan Martinez-Alier (1997) find that not only Indian environmental movements, but all types of environmentalism that emerge in the Global South, are “of the poor”, or fundamentally struggles between “one party [that] seeks to step up the pace of resource exploitation to service an expanding commercial-industrial economy… [and] those communities who earlier had control over the resource in question, and whose own patterns of utilisation were (and are) less destructive of the environment” (5). In this model, the former party, represented as industry, landowners, and urban elites, is “given preferential treatment by the state”, which seeks to increase economic development, while the latter party or local peasant community is left with “no recourse except direct action” (ibid., 5). The mobilization of these rural peasants, referred to as “ecosystem people”, represents their resistance not only against particular programs
and policies, but also against the ideology of urban “omnivores” that seek to capture natural resource control in order to fuel economic development (ibid., 12).

This theory of the “environmentalism of the poor” has come to represent the standard in scholarship on Indian environmental movements, which often view struggles over natural resources as fundamentally dichotomous (and perhaps overly simplistic) conflicts between urban elites supported by development policies and anti-development rural peasants who seek to reclaim resource control and practice more sustainable resource utilization. Beyond universalizing rural peasants, this view serves to classify people living in urban contexts as “elites” who aim to dispossess rural peasants of access to natural resources, while marginalizing the role of middleclass urban environmentalists and poor, urban populations who often similarly struggle over natural resource access and control.

Amita Baviskar (2005) is one of few scholars that have critiqued Guha’s contention that Indian environmental movements represent an “environmentalism of the poor”, calling attention to the role of elite landowners in the Save the Narmada Movement and to the role of urban representatives and audiences in supporting and popularizing other environmental struggles, such as those of the Chipko movement. Therefore, Baviskar (ibid.) breaks from Guha by arguing that the “environmentalism of the poor” and the “environmentalism of the rich” are not two fundamentally opposed entities, but rather interconnected parts of an environmental ideology that combines rural struggles for subsistence in India with urban tendencies to idealize rural actors and environments while ignoring their own environmentally damaging practices of resource utilization. Indeed, in Baviskar’s formulation “environmental” movements do not exist in urban areas of India, precisely because the environmental injustices faced by the metropolitan poor and marginalized people fail to fit neatly into romanticized categories of “indigenous” and “tribal” that are essential to environmentalist discourse.

Although Baviskar may have a compelling point that urban environmentalists can tend to ignore local environmental issues in favor of supporting rural conflicts over resource access and use, struggles over urban environmental issues nonetheless exist in India and may be proliferating as urban environmental problems become more significant and environmental discourses become popularized and incorporated into everyday
activities, such as religious practices (Hansson 2001). By continuing to focus on rural
movements, even when considering the role of their urban supporters, Baviskar
perpetuates the interpretation of environmental movements in India as universally anti-
developmental, despite her problematization of the "environmentalist" label.

Other scholars of Indian environmental movements support similar conclusions
about their anti-development orientation. Gail Omvedt’s (1993) analysis finds that both
rural and urban movements in India are anti-capitalist, if not explicitly anti-development, citing many of the same case studies employed by other scholars (the Chipko, Save the
Narmada, Baliapal, and Appiko movements). Her analysis breaks with others, however, in her recognition that many of these movements are composed of higher-class and caste supporters. The Chipko Movement, she points out, involved land-owning high-caste peasants, while its successor, the Appiko movement of Karnataka, was based more directly upon the concerns of Brahmin cultivators. Omvedt’s (ibid.) argument supports those of Baviskar (2005) by arguing that these environmental movements have been able to achieve relative success, and national recognition, through the support of urban elites and media. However, she fails to examine any cases of environmental movements that occur in urban contexts in order to support her contention that urban environmental movements, as opposed to urban environmentalists involved in rural movements, share an anti-development (or anti-capitalist) orientation.

In a short review of environmental movements in India, P.P. Karan (1994) argues that Indian environmental movements should be viewed as a response to the “socioecological effects of narrowly conceived development based on short-term criteria of exploitation”, and as an attempt to define an alternative model of development (33). Karan draws these conclusions from an analysis of three non-violent, Indian grassroots environmental movements (Chipko, Silent Valley and Save the Narmada) which he contrasts with similar movements in the West that do not share their concern with environmental preservation as tied to “issues of economic equity and social justice” (1994, 32). Similarly, Vikram K. Akula (1995) performs a sweeping analysis of Indian environmental movements that includes Chipko, Save the Narmada, the Keralan Fishworker’s Movement, resistance to mining projects, and the Jharkhand Movement. He concludes that ecological resistance groups in India “are challenging a conventional
development apparatus that seeks to exploit natural resources with little concern for the environment and for the people who directly draw their subsistence from the environment” (Taylor 1995, 128).

While these scholars echo the popular contention that Indian environmental movements, as peasant struggles against resource exploitation, share an anti-development orientation, Paul Routledge (1993) argues that this characteristic may not be a reflection of movement members’ peasant status, but of their occurrence in rural regions. Routledge’s (ibid.) work on nonviolent movements in India draws on case studies of the Chipko and Baliapal movements. He concludes that the anti-development orientation of its members has less to do with their status as peasants, since the movement successfully united Uttarakhandi people across lines of class and caste, and more to do with the movements’ *terrains of resistance*, or occurrence in rural regions that were treated (adopting the term from Berreman 1985) as “fourth world colonies”, or internal domestic colonies, which were relied upon inequitably for the provision of natural resources that fueled state-centered development policies and programs.

Routledge’s (1993) analysis, then, serves as an ideal point of departure for the consideration that environmental movements occurring in urban areas, where benefits from spatially inequitable development programs accrue, are likely to have a different ideological orientation to state-centered development policies than their rural counterparts, or for questioning whether the classification of Indian environmental movements as universally anti-developmental continues to be productive when addressing the relatively neglected subject of *urban* environmental movements and mobilizations in India. While this dissertation does engage with issues related to movement orientation, ideology, and framing practices, it is less concerned with verifying or refuting Guha and Alier’s thesis on the environmentalism of the poor. Instead, this project intends to draw the attention of environmental social movement scholars, and others, to the existence of urban environmental movements in India, to their virtual absence in the literature, to the usefulness of their inclusion in our analyses, and, finally, to the possibility that environmental social movements in India, and elsewhere, may not share a universal orientation toward development and therefore may not be easily categorized under a single rubric of analysis. As a work of geographic political ecology,
this dissertation in more in keeping with the conclusions reached by Rootes (1999) in his
discussion of the environmental justice movement, “While there are obvious themes
repeated throughout the movement… the particular experiences of these issues, and the
formulation of understandings and responses, differ according to place” (124). It is the
exploration of this place-based difference that warrants inclusion in our analyses of
environmental social movements in India, as does attention to the increasing emergence
of environmental movements in urban contexts.

2.2 Theoretical Approach
This project draws from a variety of interdisciplinary theories and approaches that inform
the overall approach to the research questions, and the methods of inquiry and data
collection. Ultimately, this project is guided by theories and approaches developed in
three sub-disciplinary traditions: environmental knowledge studies, social movement
studies, and political ecology. Constructionist and feminist theories of knowledge and
power were also influential in shaping this project’s attention to the roles of power,
difference and positionality in shaping environmental knowledge and the politics of
abatement efforts. The following pages describe each of these theoretical traditions and
their influences on the approach that guided this inquiry.

2.2.1 Environmental Knowledge: From Perception to Knowledge-Systems
Geographers have been concerned with understanding the role of environmental
knowledge (EK) in shaping decision-making and resource-use activities for most of the
past century. As early as 1923, Harlan H. Barrows called for greater geographic attention
to human responses to environmental phenomena and studies of the effects of human
resource-use activities on the environment. While Barrows was an early proponent of
geographic cultural ecology as the study of “man’s adjustment to the environment”
(ibid.), his followers were largely interested with observing and describing human
reaction to, and impact on, the environment, and did not attempt to consider decision-
making processes or knowledge systems that informed human action. With the rise of
logical positivism in the 1950s, geographers embraced the belief that “true” science can
only concern itself with empirical questions regarding how things are “in reality,” rather
than how they are valued or perceived (Holt-Jensen 1980). This meant that few
geographers were interested in understanding the effects of human knowledge or understanding in shaping social relationships with the natural world, as it was often assumed that human societies are predisposed toward the control and management of the environment (Olwig 1996).

Critiques of positivism began to gain purchase in the 1970s, as geographers noted its tendency to obscure individual experience, diversity, and ambiguity in its attempt to illuminate universal laws that were supposed to represent constant and definite patterns or phenomena (Domosh 1996, 416). Many post-positivistic approaches developed in response to these critiques, including cognitive-behaviorism, which is concerned with human perception and the “failure” of some humans to act in a predictive, rational manner (Johnston 1991). Behaviorists reject the positivist notion of “rational man”, arguing instead that humans do not act the same way at different times or under different circumstances. In geography, behaviorism manifested in studies of human perception of the environment that sought to understand how human awareness of environmental problems relates to decision-making practices.

Environmental perception is defined as the way in which people understand environmental phenomena and the method of thought by which individuals arrive at decisions regarding the use of environmental resources and by which they gauge responses to environmental risk (Whyte 1985). This body of research theorized that perception of environmental phenomena is influenced both directly, through experience with the environment or a natural resource, and indirectly, by the ideas and information we adopt from other sources. Both direct and indirect experiences are then filtered through a perceptual framework that is shaped by an individual’s cultural beliefs and values (Larimore 1969). In this conceptualization, environmental phenomena are pre-determined and usually part of a measurable “reality” that exists outside of our conception or construction of them\textsuperscript{xix}. Consequently, studies of environmental perception often sought to gauge the “accuracy” of individuals’ awareness of external environmental phenomena and to understand how human knowledge of environmental problems relates to decision-making practices (Brookfield 1969). Initial research on environmental perception examined the influences of perception on natural hazards and risk management (White 1974)\textsuperscript{x}; the psychological formation of perception (Saarinen 1966)
and, the influence of cultural values and attitudes on environmental perception (Larimore 1969). By mapping the process of perception formation, geographers attempted to develop theories that predicted human response to environmental hazards and risk. Hypotheses speculated that ‘man’ was a rational actor whose decisions and actions were the result of reflective weighing of perceived benefits and risks. But empirical fieldwork failed to bear this out and, instead, provided evidence that people rarely make rational, replicable decisions in the face of environmental risk (Du Puis 2004). Bickerstaff and Walker (2003) summarize many of the critiques levied at perception studies, by arguing that the focus on responses to perceptions of environmental risk, or the relationship between awareness and response, marginalized the relationship between knowledge formation and perception. They argue that the data produced through environmental perception survey methods failed to assess the complex and variable process of perception formation, and “fail[ed] to explore the basis of variation between places and social groups… presum[ing] that attitudes remain stable and consistent over time, that these attitudes underpin how people think and act… and that… [the environment] exists ‘out there’, independent of society, history or culture” (ibid., 48). Despite these critiques, studies of environmental perception continued into the 1980s, and have appeared occasionally throughout subsequent decades. These more recent studies of environmental perception have modified the approach to consider urban environmental perception (Mesch and Manor 1998), the influence of sensory perception and aesthetics on scientific research (Freidman and Carterette 1996), relationships between perception and social responses to environmental change (El Ramly 2003), and relationships between perception and willingness to participate in environmental projects (Hema and Jamal 2004).

In the face of critiques that environmental perception studies failed to account for, and even obscured, difference among people and ways of knowing, scholars reluctant to abandon decision-making theories attempted to compensate for observed variability by incorporating “awareness” as a factor in the decision-making process. In this conceptualization, environmental phenomena remain part of an objective, external, and measurable “reality”, of which people hold partial, subjective and often incomplete
views. An individual’s degree of “awareness” can then be measured and quantified through comparison with an idealized set of “correct” or “expert” information. Individuals whose beliefs or understandings regarding an issue align with the “correct” perspective are found to hold greater awareness, while those with impartial, differing or “incorrect” information and perspectives are deemed less “aware” (Brookfield 1969). While “awareness” complicated the decision-making process, it accounted for the unpredictability of human action and allowed for the possibility that uncertainty related to human decision-making practices could be eliminated through targeted public education campaigns. This rationale remains prevalent in EK research outside of political ecology, where studies aim to measure quantitative differences between “expert” knowledge and the awareness or perception of a population, as well as among institutions that organize “awareness programs” in order to promote support for, or compliance with, particular policies (DuPuis 2004). While these programs can provide a valuable service, they are often built upon the assumption that scientists, policy makers and other “experts” hold “true” or “accurate” knowledge, while other groups possess “incorrect” or “incomplete” systems of understanding. Conflict can result from attempts to efface the latter with the former.

In the past few decades, geographers embracing the discipline’s ‘critical’ turn and employing approaches that draw upon political ecology and social constructionism have criticized these notions of “environmental awareness” by refusing to privilege “expert” knowledge and by drawing attention to the complex socio-political contexts that produce multiple contemporaneous methods of understanding and interpreting the world around us. Advocates of social constructionism argue that, unlike environmental perception theory, this approach allows for more “detailed and embedded accounts of environmental problems and public concern” and for the consideration of “multiple socially-constructed rationalities” by shifting research on shared social knowledge of the environment from its engagement with public “perception” to questions of social “understanding” and knowledge formation (Walker 2003, 49 and 62). Constructionism, then, is associated with epistemological studies of the nature of knowledge and its formation, which often investigate the variable social contexts in which knowledge is constructed, rather than the gap between “perceived” and “accurate” knowledgexxiii (Barnes 2000, 748).
Although constructionist epistemological studies rarely measure the accuracy of knowledge, they are often concerned with distinguishing “valid” from “invalid” knowledge and identifying the processes that form this distinction. This perspective allows for nuanced accounts of the ways in which concomitant, possibly conflicting, environmental knowledges acquire social and cultural resonance. Feminist research on environmental and scientific knowledge has questioned the objectivity of scientific knowledge and has contributed to the growing body of work on “situated knowledges” and positionality (Haraway 1988 and 1989). This research argues that knowledge is “always produced by positioned actors working in/between all kinds of locations, working up/on/through all kinds of research relations(hips)” (Cook et al. 2005, 16). Although work on “situated knowledges” is most influential in critiquing science and the research process, it also has implications for how we understand the ways in which “public” or “everyday” knowledge is produced and validated, because it draws attention to the ways in which knowledge is imbedded in variable social relations. But, further research is needed on the ways in which conflicting knowledge systems are navigated, how knowledge is granted social purchase, and how it influences decision-making practices regarding political activity.

Political ecologists have attempted to address these lacunae by broadening the definition of environmental knowledge to include not only ideas and information about the natural environment, but also to the complex and often contested social and material processes through which these understandings are constructed and reproduced (Goodman et al. 2008). In his introduction to political ecology, Paul Robbins (2000) argues that studies of environmental knowledge are an important aspect of the sub-discipline, whose disciples he argues, “must explain how certain accounts of environmental process became dominant and to what effect” (120). For political ecologists, then, environmental knowledge takes on a much broader meaning. It shapes how individuals, social groups, institutions, governments, and other organizations explain the natural world around them, how they identify and assign value to various environmental attributes, how they judge appropriate relationships with the natural world, and how they account for evidence of environmental change (ibid.). EK involves not only the information, ideas and values that are associated with a ‘thing’, like pollution, but the entire way in which we structure how
a thing is thought, and how we act upon that thinking. In political ecology, EK studies go beyond examinations of knowledge to interrogate the *politics of knowledge*, recognizing the diverse ways of knowing, structuring and acting upon ideas.

As a political ecologist, I am interested in the importance of EK in shaping the social and discursive relationships underlying contemporary environmental problems and their associated politics. Understanding EK is vital for making sense of the shape that environmental issues take in various social settings, as well as the ways that decisions regarding resource use and conservation are constructed, and why responses to environmental problems change over time, space and place. My investigation of “pollution knowledge” as a form of environmental knowledge is guided by constructionist theories and therefore is concerned with understanding the construction, reproduction and contestation of pollution knowledge (and the politics of meaning associated with these knowledges), rather than assessing the differences between types of knowledge as “expert”, “public” or “everyday”. Yet, in keeping with traditional aspects of environmental perception studies, attention is still given to the effects of this knowledge, not only in guiding resource use activities but also in its influence over political opinion and activity.

This attempt to marry the strengths of both approaches is in keeping with a “heterogeneous” approach to constructionist epistemological studies of pollution developed by Bickerstaff and Walker (2003). This heterogeneous approach “accepts that... pollution has an ontologically objective existence, but that the conception and classification of it are socially contingent” (ibid., 46). Attention to the social context in which pollution knowledge is constructed and reproduced is therefore a cornerstone of this approach. According to Bickerstaff and Walker (ibid.), the heterogeneous approach to environmental knowledge is characterized by in-depth case-studies that provide “social and cultural analysis and interpretation” in addition to considerations of individual practice and measurements of the objective reality and risk posed by the existence of material pollution (61, 47).

Following from these diverse contributions to the study of environmental knowledge, this dissertation engages with “pollution knowledge” (PK) as a form of environmental knowledge that includes:
• **Ideas** and information about pollution (i.e. causes, sources, content)
• Lived and transferred **experiences** relating to pollution
• **Values** associated with pollution (i.e. filth and cleanliness)
• **Framing practices** used in reproducing the above
• **Power relations** through which the above are controlled and mediated
• **Conflicts over the meanings** associated with pollution
• Subsequent **methods of engaging** with pollution

This definition has guided the approach of this dissertation, its objects and methods of inquiry and engagement, and shaped its ultimate arguments and findings.

2.2.2 **Social Movement Theories and Struggles over Meaning**

Social movement studies and theories are traditionally the purview of sociologists who often focus on internal movement dynamics in an attempt to understand relationships between movement members, the importance of leadership, and the ways in which movement rhetoric are framed, or presented to the general public in order to encourage widespread mobilization. Unlike sociological studies of social movements, those conducted by geographers have been distinguished by their focus on movement context and the significance of space and place in the formation of political resistance. While there are a number of social movement theories that attempt to explain the processes associated with social mobilization, this dissertation allies sociological approaches to frame analysis with interdisciplinary and geographic approaches to the study of social movements, especially in terms of the study of environmental social movements as “struggles over meaning”. The next pages present a discussion of sociological frame analysis, geographic place-based studies of environmental social movements, and the study of social movements as “struggles over meaning”.

As an approach to studying social movements, frame analysis entails examining how conflicts of interest among a diverse group membership are overcome by particular framing practices; how individual audience members interpret frames in meaningful ways that inspire collective identity and political action; and, how individual indignation inspired by frames transforms into a shared, collective movement identity (Tarrow 1998, 107). A “frame” is a “schemata of interpretation”, through which people “locate, perceive, identify, and label” various phenomena or events (Goffman 1974, 21). Framing
refers to the practice of interpreting “the injustice or immorality of specific social conditions, and attribution of blame for them, some kind of action agenda for solving them, and a motivation for taking that action (Taylor 1995, 41). While the practice of framing may seem similar to that of knowledge reproduction, the framing of a particular issue is less about creating meaning than reinterpreting knowledge in such a way that individuals are inspired to take political action. Unlike ideological change or knowledge reproduction, which can occur unintentionally or sub-consciously, framing is an intentional, measured action undertaken by a particular group or organization with the explicit intention to “mobilize potential adherents and constituents, to garner bystander support, and to demobilize antagonists” (Snow and Benford 1988, 198).

Frame analysis entails critical examination of the framing practices adopted by particular social movement organizations. Individual frames are analyzed as part of the tactical repertoire of a social movement organization, as well as a system of meaning (Taylor and Whittier 1995). But, the subjects of frame analyses are not the only the frames and framing practices of social movements, but also of other (oppositional) organizations and groups (i.e. media, government), which can help us to understand how public audiences mediate multiple messages and interpretations. Frame analysis is therefore a particularly useful approach for understanding how different groups explain and identify solutions to problems of resource degradation, and can also be useful in countering the common perception of a binary division between “valid” scientific knowledge and “invalid”, “everyday” or even “illogical” religious or other popular interpretations of environmental issues. While frame analysis can stand alone as a distinct approach to the study of social movements, it can be successfully allied with a number of other approaches to studying social movements, such as those developed in geography.

Geographic studies of social movements break from traditional sociological approaches that tend to focus almost exclusively on “the goals, organization and success of particular struggles”, while paying little attention to the unique contexts and place-based nature of struggle in particular movements (Routledge 1993, xv). Byron A. Miller (2000) argues that geographic analyses of social movements show how “social movement processes… are constituted through space, place, and scale, and [how] that constitution affects how they interact, articulate, and play out” (166). As he contends, increasing
attention is now being paid to the significance of context and geographic themes such as space, place and scale in social movement studies, with direct consequences for our understanding of not only the temporal formation of social movements, but also their spatial distribution and relationships to the places where resistance occurs: geographical studies of social movements consider not only how space and place shape political resistance, but also, in turn, how these struggles reshape the spaces in which they occur.

While there is evident value in approaching SM studies from a spatial perspective in order to address “the mediation of social movement agency by place” other geographical traditions and approaches, especially society-environment interrelationship studies and geographically-informed political ecology, have shown particular promise for contributing to our understanding of the context-dependent nature of environmental social movements (Routledge 1993, 21). By drawing upon the tradition of society-environment interrelationship studies, geographers are in a unique position to help elucidate the ecological dimensions of environmental degradation and their influences on the formation and characteristics of environmental movements. Environmental movement studies in geography often draw attention to the ways in which society-environment relationships constitute and shape the occurrence of struggles at specific times and places, that inspire certain individuals into political action, and allow for movement rhetoric to gain purchase at particular scales, all in ways that contribute to a movement’s characteristics, dynamics, and measures of success.

Studies of environmental social movements in political ecology also allow for attention to those environmental or ecological issues to which movements respond, providing a more complete perspective of the multifaceted nature of environmental social movements as protracted sociopolitical responses to environmental degradation. Political ecologists have been engaged in this type of research since the 1990s, when influences from critical social and constructionist theories drew attention to struggles over resources and the symbolic politics they constitute (Watts 1990; 1997). In the subsequent years, studies of environmental and livelihood movements have become one of the core themes of political ecology, leading to detailed examinations of the processes by which groups “influence social relations and access to resources” through forms of organization and protest (Walker 1998, 77).
Political ecology also engages with the growing body of literature in geography and sociology that views environmental issues and politics in ideological terms, interpreting them as “struggles over meaning” (Escobar 1992). This work regards shared meaning as the basis of community and society, upon which common responses to events and phenomena are built. Although these shared meanings are socially constructed, “we are not in complete control of them, either as individuals or as communities. [They] attain a reality that confronts us as external to and independent of ourselves… turn[ing] back upon us and shap[ing] our responses” (Sederberg 1984, 4-5). The struggle to control the construction of these meanings, then, is ultimately a struggle over the social context that shapes which actions and responses are deemed appropriate. While the means of knowledge production can be controlled, if only in part, social knowledge or meaning appears to be external or independent from ourselves, leading most individuals and groups to perceive themselves as responding to a pre-constructed set of social meanings, rather than actively involved in (re-)producing those meanings (Sederberg 1984).

The body of literature on “struggles over meaning” developed both from constructionist theoretical perspectives, which view environmental politics as struggles over the terms on which the construction of nature takes place, and from new social movement theories, which found that traditional struggles over material conditions and state power were being supplemented (or even supplanted) by campaigns for change in cultural meaning and social practice (Buechler 1997). Social and environmental social movements, then, like all types of political struggle, are perceived as attempts to control the processes through which social meaning is constructed, as well as the context in which those constructions take place and in which responses to environmental or social events and phenomena are deemed appropriate. In other words, social movements are viewed as no less than struggles over the meaning that shapes the basis of human societies (Sederberg 1984), and environmental social movements are understood as a particular type of political struggle that seeks to change, reevaluate or control the terms under which social relationships with the environment are determined and valued.

Today, most political ecologists view "struggles over resources [as] struggles over meaning and representation", producing research that examines how political groups employ various tactics in order to shape the context of environmental politics, as well as
the social relations that influence access to natural resources (Eriksson 2000; Walker 1998). Understanding environmental politics in these terms has allowed researchers to explore the representational practices embedded in various approaches to environmental policy-making (Keeley and Scoones 1999; 2000), the role of environmental politics in constituting “green” knowledge (Jamison 2001), and the consequences of conflicting organizational ideologies in shaping approaches to environmental management (Dryzek 1997). These studies provide insight into the tangled web of knowledges and ideologies that shape environmental politics, as well as the relations of power that constitute, and are constituted by, these methods of understanding and valuing the world.

2.3 A Political Ecology of Environmental Knowledge and Social Struggle
As described above, the theories that drive this work are largely constructionist, sharing a critique of realist epistemologies that theorize a disconnection between an external, objective reality and individual or social experiences of that reality (Denzin and Lincoln 1994). Constructionists reject the objective ontological assumption that an external reality exists, and embrace a relativist ontological assumption that multiple realities co-exist and can only be understood in terms of the social perceptions, beliefs, and knowledge associated with them (ibid.). Phenomena, such as pollution or environmental social movements, are therefore understood as products of the social structures and processes that constitute a particular context or knowledge group. As an example of constructionist research, then, this project is less interested in making sense of external phenomena (such as a social movement or organization itself), but rather explores the systems of knowledge and meaning that are associated with those phenomena, as well as the social contexts in which that meaning is produced.

My engagement with feminist theories and political ecology, and their concern with the role(s) of power in (re-)producing social knowledge and influencing the processes by which knowledge is judged to be valid or legitimate (Cope 2002) has led me to adopt a specific set of analytical objects, including the mechanisms by which knowledge is reproduced (i.e. educational programs) and represented (i.e. research/media publications), the power relations embedded in these processes of knowledge production, and the locations of gendered individuals in those webs or networks of power relations.
My adoption of theories from sociology and political ecology on social movements as “struggles over meaning” has further drawn my attention to the protest tactics, methods of knowledge reproduction, and social relations inherent to the NGOs and other anti-pollution efforts with whom I engaged. In keeping with other studies in this vein, my methods of inquiry attempt to understand how these groups employ various forms of organization and protest to shape the context of environmental politics, as well as the social relations that influence access to natural resources (Eriksson 2000; Walker 1998). Objects of analysis therefore include the discursive productions of social movement organizations (found in movement publications and interviews with movement leaders and members), the tactics or “cultural idioms of protest” employed by particular organizations (Routledge 1993), and the stories about historical eco-social practices and relationships or environmental social movements themselves (found in media coverage and interviews, see Sivamakrishan 1995 and Rangan 2000). These sources are analyzed with the goal of understanding how their discourses, tactics and stories are used to create or reproduce social meaning, to contest existing power relations, and “to alter cultural and material practices and relations of power within [a particular] spatial and political context” (Rangan 2000, 41).

These theoretical influences lead me to adopt a set of ontological assumptions that guide my dissertation research on pollution and water politics in the Ganges River Basin. These assumptions include:

- While water pollution has an ontological existence, the hydropolitical debates surrounding it consist of ideological struggles over the meanings associated with river water and pollution, as well as the power relationships through which these meanings are (re-)produced. These meanings and debates nonetheless have real, material implications and consequences for water use practices, water quality and associated health risks, policy approaches, social organization, etc.;
- While individuals and groups actively (re-)produce pollution knowledge, their actions (in terms of water use or political activity) can also be viewed as responses to pre-existing social meanings and may therefore need to be “read” for the types of meaning they embed;
• Pollution knowledge includes multiple, often conflicting meanings, information, ideas and beliefs about what water pollution is, where it comes from, the health risks it may pose, and possible methods of its abatement, as well as the social structures and relationships that form the basis of these meanings;

• Gender and other forms of social difference play an important role in shaping the social structures and power relations through which pollution knowledge is produced and legitimized, as well as determining the location of individuals and social groups in those processes and relationships.

This set of assumptions leads me to engage with a specific set of analytical objects that includes:

• the social, historical, political, and ecological processes that shape the context in which pollution knowledge is produced and hydropolitical struggles take place;

• the various discursive productions in which pollution knowledge is embedded (including policy documents, educational materials, media reports, civil society organization publications, water use practices, tactics of protest, religious myths, and oral histories);

• the institutions and organizations that produce these documents and the mechanisms of their (re-)production;

• the location and interrelationships of individuals and groups in these processes of meaning-making; and,

• the methods by which individuals and groups determine pollution knowledge and judge it to be (in)valid or (il)legitimate.

In order to engage with these analytical objects, I have developed a mixed methods research design that employs multiple methods of data collection and combines methods of data analysis. The design and methods employed in this research are discussed in the following chapter.
CHAPTER THREE  
RESEARCH METHODS AND DATA ANALYSIS  

As described in the last chapter, this dissertation draws from approaches and theories developed in political ecology, studies of environmental knowledge and perception, and sociological and geographical studies of social movements. These approaches and theories lead me to view environmental degradation and its associated politics as deeply contextualized products of social structures and unequal power relationships (Moss 2002; Zimmerer and Bassett 2003). In order to investigate the particular dynamics and contextualized processes that shape contemporary struggles over pollution abatement in the Ganges River Basin, this dissertation adopts a research design characterized by a mixed-method approach to data collection and analysis.

In the next pages, I describe my approach to studying pollution knowledge and water politics in the Ganges River Basin, with particular attention to my use of a mixed methodology. I discuss how my epistemological grounding shaped my dissertation research design and my adoption of a combined methodological approach. In doing so, I engage with some interdisciplinary literature on combined or mixed methodologies. I then detail each of the methods of data collection that were employed in this project, including archival research, survey, interview and participant observation methods. The second half of the chapter reviews the methods of data analysis, with particular attention to methods of discourse analysis and survey analysis. Finally, I discuss issues related to validity, interpretation, and the ethics of research, closing with some reflections on my role as a researcher in knowledge reproduction.

3.1 Assessing Environmental Knowledge and Sociopolitical Struggle

Whether knowledge can be identified as such, labeled, investigated, interrogated, and assessed or measured is nothing if not debatable. Even if we concede that knowledge can be objectified or subjectified in this manner, the methods for undertaking such an endeavor are themselves dubious. Can environmental knowledge be identified as such, interrogated, assessed or measured? If so, how does one do that? Or have any assurance of the validity of these measurements? In order to address these questions, I have drawn
from a host of disciplinary and theoretical traditions and adopted a mixed-method research design, in the hope that these combined approaches will “increase the likelihood that contradictory… knowledge claims might surface and be more thoroughly investigated” (Kwan 2002, 158).

Each of the methods that employed in this project have been used in previous research on environmental perception, knowledge, politics, or social movements. Geographical research on environmental perception is characterized by the use of survey methods, which aim to assess and represent the perceptions of a wide segment of the public, while postcolonial feminist theory and political ecology often employ qualitative methods, such as in-depth or semi-structured interviews and/or participant observation in order to capture a depth and breadth of information than can be missed by the structured survey or questionnaire. Research on social movements has drawn on a wide variety of research methods, which often include textual analyses of movement publications, ethnographic or participant observation, and in-depth interviews with movement members and leadership. My operationalization of pollution knowledge and the design of my research are guided by these theoretical underpinnings and approaches. In the following pages, I describe my general project design and approach to the research, detailing methods of data collection and analysis.

### 3.1.1 Mixed Methods Research

This dissertation adopts a combined or mixed methodology in order to develop a more holistic understanding of pollution knowledge, its construction, and its role in shaping the context and content of debates over water quality in the Ganges River Basin. Generally, studies of pollution knowledge that are guided by constructivist theories have tended to apply this type of mixed-method approach, which may be necessary “in order to capture the social processes by which individuals and groups construct ideas about… pollution” (Bickerstaff and Walker 2003, 49-50). Although combined and mixed methodologies are becoming more common in geographic research, they are still relatively underutilized. This is likely the result of a traditional understanding of qualitative and quantitative methods as distinct approaches that occupy opposite ends of a methodological spectrum, and of the tendency of researchers to critique the shortcomings involved in the selection
of one of these methodological approaches, rather than combining them in order to overcome their inherent limitations (Montello and Sutton 2006).

The perceived incommensurability of quantitative and qualitative methodologies stems from the belief that each approach is dictated by a particular epistemological stance (Philip 1998). For most of the 20th century, then, positivist geographers adopted quantitative methodologies and methods of data collection and analysis, while humanists and postmodern feminists adopted those from qualitative methodologies (Montello and Sutton 2006). If positivist and relativist epistemologies are mutually exclusive, then their associated methodologies are assumed to be as well. In addition, qualitative and quantitative techniques are often believed to be best suited to address entirely different problems or types of research questions. In the social sciences, quantitative methods are often adopted in studies that aimed to measure particular phenomena, whereas qualitative methods are employed in studies that aim to produce descriptive data (Philip 1998). Lawson (1995) argues that this “emphasis on the difference between quantitative and qualitative methods among geographers has obscured considerable overlap in the actual operations involved in both sets of techniques”, effectively preventing the development of combined or mixed methodologies that adopted complementary qualitative and quantitative methods (451).

In recent decades, these assumptions (along with the qualitative/quantitative dualism itself) have been productively reexamined, especially by political ecologists and feminist geographers employing mixed or combined methodological approaches. For example, political ecologists are employing mixed methodologies that combine quantitative remote sensing with qualitative methods of discourse analysis to understand patterns of degradation, land use and conflicts over resource use and access (see Robbins 2003). Feminist geographers are combining quantitative survey methods that enumerate or “count” aspects of women’s experiences with interview methods that examine the meaning embedded in these experiences, producing descriptive analyses of women’s experiences that “demonstrate the operation of processes of oppression and of difference” (Lawson 1995, 452). This project is more in keeping with the latter approach of combining qualitative and quantitative methods of data gathering in order to provide both a breadth and depth of information that illuminates the diversity of ways of knowing river
water pollution, while exploring the multiple processes through which this knowledge is reconstructed, reproduced, contested, and applied by a wide variety of individuals and institutions.

The research design for this project therefore entails the use of a specific set of qualitative and quantitative data collection and analysis methods, including archival research, surveying, interviewing, participant observation, and discourse and statistical analysis. My aim is not to practice these methods in tandem, but to integrate them so that the data they produce is complementary, or as Rank (2003) advocates, so that the strengths of each compensate for the others’ weaknesses. Quantitative data is therefore used to identify patterns among a sample population in order to illuminate shared social knowledge and experience, and to avoid the potential qualitative pitfall of privileging individual knowledge or experience. Qualitative data, on the other hand, is used to explore the “richness and depth” that often eludes more quantitative approaches, while illuminating the processes through which diverse types of pollution knowledge are reproduced, reconciled and contested.

The following section on data collection provides a detailed discussion of each of the methods used to gather data for this project, addressing concerns related to data sources, instrumentation, sampling techniques, participant selection, and data storage. I then describe methods of data analysis before concluding with a discussion of some of the ethical and practical considerations that arose over the course of this project.

### 3.2 Data Collection

Methods of data collection for this project were conducted in two discrete phases. Phase One (December 2007 to August 2008) involved the identification and gathering of archival data, including government policy documents and media coverage of pollution in the Ganges River, abatement efforts, and popular protests. Archival research was conducted at the University of Kentucky (using interlibrary loans) and, during the summer of 2008, in the South Asia special collection at the University of Wisconsin at Madison (a member of the Committee on South Asian Libraries and Documentation, CONSALD). Early in Phase One, preliminary fieldwork was also conducted in Allahabad in order to begin participant observation, identify potential collaborators, and to
determine themes and issues to be explored in the survey and interviews administered during Phase Two fieldwork. Phase Two of data collection (December 2008 to March 2009) entailed fieldwork in each of the three study sites, including survey administration, interviewing, and participant observation. NGO publications and archival data on KAVAL towns (Kanpur, Agra, Varanasi, Allahabad and Lucknow) was also gathered from the Sankat Mochan Foundation and at the Geography Department Library and Archive at Banaras Hindu University during Phase Two of the project. The following pages describe, in detail and in turn, each of the methods of data collection conducted during these two phases of research.

3.2.1 Archival Data Collection

The collection of archival data was a principle method in this project. The identification of texts and their later subjection to discourse analysis allowed me to gain insight into the reproductive content of diverse and competing pollution knowledges and to better understand their methods of reproduction. Texts, both written and oral, were grouped into subsets according to type: policy documents, water quality reports, newspaper coverage of pollution in the Ganges, newspaper coverage of anti-pollution protests, NGO publications, and websites of NGOs, environmental campaigns and partner organizations, and government institutions. These texts were collected at a variety of sites in the U.S. and in India.

Most policy documents and government reports were available online, especially following passage of the 2005 Right to Information Act (RTI). Older policy documents on microfiche were requested via interlibrary loan from the Council for Research Libraries (CRL). A full list of policy documents collected can be found in Chapter Five (Table 5.1). Newspaper coverage prior to 1992 was accessed through the South Asia collection at the University of Wisconsin at Madison Library and identified using the Indian Press Index, a monthly indexing journal with coverage of 26 widely circulated Indian newspapers from 1968 to 1986. Indexed daily news coverage from 1986 to 1992 was obtained from the Guide to Indian Periodical Literature and Index India, similar indexes of daily newspaper publication. Indexes were searched for the following terms: Ganges, Ganga, pollution, protest, river, and water. Articles indentified through these indexes were accessed on microfiche archives, with notable gaps during the Emergency
period in 1974 and 1975 and waning coverage starting in the late 1980s. Periodicals not archived at UW Libraries were accessed through interlibrary loan from the CRL and other CONSALD libraries. Newspaper coverage after 1992 was accessed through Lexis-Nexis Academic, which holds archives for Indian newspapers, including Indian Express, the Statesman, the Pioneer, the Times of India, the Telegraph, the Tribune, and Community Express. Table 3.1 lists newspapers included in this study. Notable gaps in online newspaper databases existed from 1992 to 1998. NGO and campaign publications (including brochures, flyers, printed reports, and an audio file of a French media interview with Dr. Mishra of the Sankat Mochan Foundation) were obtained directly from the organizations during site visits in the fieldwork period. Websites of NGOs, environmental campaigns and partner organizations, and government institutions were accessed online and archived in print by the author.

3.2.2. Survey Methods

Surveying was one of the primary methods of data collection, as surveys are one of the most useful tools available to geographers for measuring the prevalence, patterns and causes of attitudes, beliefs or behaviors in a sample population (Weisberg at al. 1996). Surveys are useful for obtaining information and opinions from a broader segment of a population than may be possible with other methods, like interviewing. However, the breadth of data collected using survey methods is often done at the cost of depth of analysis: questionnaires, even when field tested, are predesigned and unable to be

<table>
<thead>
<tr>
<th>Newspaper Name 1</th>
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<tr>
<td>Amrit Bazar Patrika</td>
<td>Indian Nation</td>
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<tr>
<td>Business Standard</td>
<td>Madhya Pradesh Chronicle</td>
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<tr>
<td>Community Express</td>
<td>National Herald</td>
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<tr>
<td>Deccan Chronicle</td>
<td>North Indian Patrika</td>
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<td>Deccan Herald</td>
<td>Patriot</td>
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<tr>
<td>Economic Times (Delhi)</td>
<td>Pioneer</td>
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<tr>
<td>Financial Express</td>
<td>Searchlight</td>
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<tr>
<td>Free Press Journals</td>
<td>Statesman (Delhi)</td>
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<tr>
<td>The Hindu</td>
<td>Times of India</td>
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<tr>
<td>Hindustan Times</td>
<td>Tribune</td>
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<tr>
<td>Indian Express</td>
<td>The Telegraph</td>
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adjusted in the field without a cost of comparability between samples, responses are often limited to those pre-selected by the researcher, and, even when more qualitative, open-ended questions are included in a survey (as in this case), researchers are rarely able to delve deeper into participant’s responses or to encourage the type of back-and-forth exchange and cooperative exploration possible with more qualitative methods. Many of these shortcomings can be productively addressed by combining surveys with other qualitative methods, like interviewing, that allow a researcher to fill gaps in knowledge or information, to investigate patterns or responses in greater depth, and to investigate the complex relationship between opinions and practices. This way, surveys are not used as a stand-alone method, but rather an essential component of a broader mixed-method approach. Coordination of surveys and other methods of data collection in a mixed method research design is therefore an important aspect of the overall research design. In this project, surveys and interviews with water users were conducted in tandem: survey participants whose responses were determined to be unique, who wanted to add to or elaborate on their responses, or who seem constrained by the limitations inherent in the inflexibility of the survey questionnaire were invited to participate in an on-site interview.

For this project, a survey was administered to water users at each of the three study sites during the period of fieldwork from December 2008 to March 2009. The aim of this survey was to assess the pollution knowledge of a representative segment of the population at each research site and to understand how types of pollution knowledge vary between water users and with types of water use practices. The use of survey methods was intended to provide a broad assessment of the knowledge, sources of knowledge, opinions on abatement measures and politics, and water use practices of a wide population of water users. Throughout this work, I refer to the population targeted by surveying as “water users”. In using this term, I seek to avoid making a distinction between types of water use (irrigation, bathing, ritual, laundering, etc.), between those who use water for survival (to drink) or for profit (boatmen and dhobis) or in religious practice, or between water users as producers or consumers of pollution. I do not believe that drawing distinctions between types of water users would be productive or assist me in developing better evidence in response to my research questions. Attempting to do so
would have led to general confusion, as most water users participate in a number of water use activities: farmers use water for irrigation, for domestic use, and for bathing; herders bathe their cattle and themselves, and then worship at the riverbank; women bathe themselves, their children, and wash clothes in the river before gathering water to take home for puja.

By employing the term, “water user” in a near universal sense, I seek to draw attention to the shared accountability, responsibility, and risk faced by the diverse peoples who make direct use of the river water. However, I do not wish to imply that all “water users” share the burdens, benefits and risks of water use equally. In future projects, I aim to explore differences among water users and how their positionality (particularly among women as water gatherers and guarantors of household subsistence) lead them to be unequally exposed to the detrimental effects of water pollution (or, in the case of factory owners and government officials, how their positions of relative power lead them to be uniquely responsible for addressing water pollution). For this project, and for survey administration in particular, these distinctions were not made in order to maintain focus on assessing the pollution knowledge and practices of a wide population.

The survey instrument (see Appendix A) was organized into six parts. First, demographic data was collected, including age group, gender, marital status, residence (in city, in state, out of state, and international), occupation, and newspaper reading habits. Second, water use habits were assessed, including purpose of today’s visit, usual purpose of visits, river bathing habit and frequency, river water drinking habit and frequency, and water collection habit and use. Third, data was collected on personal history and observation at the river site, including time since first visit to the site, observation of change in river water since first visit, and description of observed change in river water since first visit. Fourth, descriptive information on pollution was collected, including judgment of whether or not there is pollution in the Ganga, definition of what pollution is, identification of the source(s) of pollution, and identification of informational sources about pollution in the Ganga. Fifth, political opinion and activity was assessed, including identification of party(-ies) responsible for dealing with pollution in the Ganga, awareness of the existence of the Kanpur Eco-Friends and Sankat Mochan Foundation, respondent’s participation in anti-pollution activities, and level of
satisfaction with current efforts to address pollution in the Ganga. Finally, a set of nine Likert-scale questions assessed respondents’ perception of water safety, judgment of changes in the quantity of pollution in the river, judgment of severity of pollution problem, health risks posed by river water consumption, and degree of concern over pollution problem. The instrument also included space for the administrator to record location (city and site on river) and time of survey administration, any concern over confidence or reliability of recorded responses, and use of translator in administration of the questionnaire.

Surveys were administered orally to people who were actively participating in some sort of water use activity at the time of data collection, including water collection, bathing, swimming, fishing, irrigation, laundering, communing visually with the river (\textit{darshan}), etc. During survey administration, a translator was used in order to ensure reliable and regular communication of survey questions and responses. Surveys were administered by the author with assistance from a translator, by walking the river bank and sampling every 10\textsuperscript{th} person passed. This sampling strategy was adjusted in Kanpur, where few water users were present at any of the survey sites. In Kanpur, every 3\textsuperscript{rd} person engaged in water use was identified for participation in the survey. People actively engaged in prayer or worship, bathing, or in a state of undress were skipped over in the selection process. Respondents identified for participation were told that I am a doctoral student from the United States, affiliated with Banaras Hindu University in Varanasi, and conducting research in regards to the River Ganges. Respondents were informed that the survey would take between 10-15 minutes and that all responses would remain anonymous, but that they would be conducted in a public setting. Generally, response rates were quite high, with 153 water users identified for participation and only 32 refusals, or a completion rate of 79\%. Instances of refusal were tallied between surveys (four tallies on a questionnaire meant that the responses belonged to the fifth person identified for participation). On a few occasions, surveys were stopped during administration and disregarded. This occurred only on three occasions: once, when a young man indicated that he was at the river to dispose of his recently deceased wife’s ashes and pray (the translator and I agreed that he should be left in peace), a second time when a husband intervened and stopped his wife from responding, and a third time when
a working washerwoman had to leave suddenly in order to chase after a young child who had dashed to the other side of the ghat.

Despite the randomized approach to sampling, a representative sample was not achieved, especially in regard to the gender of respondents. The public nature of my research meant that, while I might “randomly” select every tenth (10th) person to survey, a group of people might “elect” another member for me to speak with, often an elder or educated person who I was told would be more knowledgeable on the topic. Women were more likely to refuse participation, citing a lack of knowledge, education or literacy. In Kanpur and Allahabad, women were also not at the rivers in a proportion equal to men, and therefore were less represented in the randomized sample. In order to account for this inequity, I varied the time of survey administration, deliberately visiting the ghats in early mornings, when women were more likely to be worshipping, bathing, or attending to housework. I also varied the site of survey administration, targeting areas on the ghats or riverbanks frequently used by women for housework, water gathering, or other labor. But, during these times, and in general, women were less likely to be willing or able to stop their activities and participate in the survey, which took at least 10 minutes to complete. Ultimately, the sample obtained was not representative, with only 26 female respondents out of a total of 121 respondents (21.5%).

In total, fewer survey questionnaires were administered than originally planned. In Varanasi, 57 surveys were completed, 43 in Allahabad, and 21 in Kanpur. The biggest factors influencing the small sample size were reduced time in the field (twelve months planned were reduced to four after significant delays in obtaining a research visa) and difficulty with identifying translators in Allahabad and, especially, Kanpur. As a major destination for international tourists, Varanasi has a large number of experienced and professional translators. In Kanpur and Allahabad, University students were employed as translators, owing to the difficulty of finding professional translators willing to work in the field. Because my initial visits to Kanpur and Allahabad coincided with exam periods at local Universities, students were not available to work as translators and my itinerary was adjusted so that, at those sites, interviews and participant observation activities were conducted during initial visits early in the fieldwork period, while surveys were conducted during later return visits.
3.2.3 Interview Methods

Interviews are one of the most commonly used methods of data collection in human geography and have been productively applied in research on environmental knowledge and politics. Informal and semi-structured interviews were employed in this project, in concert with survey and other research methods, to fill gaps in data and information collected elsewhere, to allow for the in-depth investigation of previously identified patterns and processes, and to explore the complex processes of knowledge reproduction and the relationships between opinions and practice. Informal and semi-structured interviews were conducted in order to provide another dimension of validity and reliability to research data by allowing the researcher and respondent to co-produce the content of the interview without being limited by pre-constructed interview questions (McKay 2002).

Twenty-two interviews were conducted for this project, with a wide variety of individuals, including NGO members and leaders, volunteers and other activists, local government officials, water quality scientists, factory owners, economic development consultants, a water treatment plant manager, and six water users identified during administration of the survey. Most participants were selected by the nature of their position (i.e. NGO leaders and government officials), their accessibility, or, in the case of water users, the uniqueness of their responses to the survey questionnaire. A list of interview participants is included in Table 3.2. Interviews were conducted in various settings, often at the discretion of the participants. Interviews with NGO leaders, volunteers, government officials, factory owners, scientists, factory owners, consultants and the water treatment plant manager were conducted in their offices. Other interviews were conducted at participants’ homes, at public sites (restaurants and shops) or on the streets, riverbanks or ghats.

Interviews were recorded using a variety of methods. After reviewing the IRB release form and consenting to participation in the study, participants were asked to agree to the use of a digital voice recorder and to use of their name. When consent was not provided for voice recording, interviews were recorded in notes handwritten by the author. Notes were taken during all but one interview, when a respondent asked that no methods of recording be undertaken. In this case, notes and observations were recorded
after the interview. In a few cases, technical failure of the voice recorder meant that author’s notes were used exclusively, even when participants had granted permission for recording. Most interview participants preferred to remain anonymous, especially NGO members, who often disclosed that they were not supposed to serve as representatives of the organization or that they wanted to express opinions that differed from official organizational discourse. Every effort has been made to protect the anonymity of these participants. Interviews were conducted in English or, in few cases, in Hindi with assistance from a translator.

Interview questions varied for each participant, depending largely on the nature of their participation in the study. For example, interviews with NGO leaders focused on organizational knowledge and activities, while interviews with factory owners and

<table>
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<tr>
<th>Table 3.2: List of Interview Participants</th>
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<tbody>
<tr>
<td>Dr. K. Dutt*, Professor, Indian Institute of Technology-Kanpur</td>
</tr>
<tr>
<td>M. Dixit, Boatman, Kanpur</td>
</tr>
<tr>
<td>Rakesh Jaiswal, Executive Secretary, Kanpur Eco-Friends</td>
</tr>
<tr>
<td>J. Kumar*, Factory Consultant, Kanpur</td>
</tr>
<tr>
<td>M. Khan*, Factory Owner, Kanpur</td>
</tr>
<tr>
<td>R. Patel*, Member, Kanpur Eco-Friends</td>
</tr>
<tr>
<td>Dr. L. Desai*, Scientist, Kanpur</td>
</tr>
<tr>
<td>R. Reddy*, Environmental Activist, Kanpur</td>
</tr>
<tr>
<td>P. Gupta*, Male Worshipper at Sirsaya Ghat, Kanpur</td>
</tr>
<tr>
<td>Veer Bhadra Mishra, President, Sankat Mochan Foundation, Varanasi</td>
</tr>
<tr>
<td>O. Tripathy*, Officer, Sankat Mochan Foundation</td>
</tr>
<tr>
<td>K. Sharma*, Officer, Sankat Mochan Foundation</td>
</tr>
<tr>
<td>F. Varma*, Volunteer, Sankat Mochan Foundation</td>
</tr>
<tr>
<td>Mr. Agarwal, Worshipper, Asi Ghat, Varanasi</td>
</tr>
<tr>
<td>Dr. U.K. Choudhary, Ganga Lab, Banaras Hindu University</td>
</tr>
<tr>
<td>Anonymous Farmer, Varanasi</td>
</tr>
<tr>
<td>Raj, Boatman, Varanasi</td>
</tr>
<tr>
<td>R. Singh, Officer, Varanasi Treatment Plant</td>
</tr>
<tr>
<td>S. Ghanshyam, Uttar Pradesh Pollution Control Board</td>
</tr>
<tr>
<td>D.N. Shukla, Activist, Allahabad</td>
</tr>
<tr>
<td>A. Chopra*, Activist, Allahabad</td>
</tr>
<tr>
<td>Dr. S.S. Ojha, Activist, Allahabad</td>
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consultants focused on the industrial production (and reception) of pollution and attitudes toward abatement efforts. Interviews were semi-structured, meaning that an open framework of questions was selected by the author, but that this framework lacked fixity and was continually renegotiated by both author and participant. This allowed for a degree of free-flowing exchange, or a conversation of sorts, in which author and participant could explore productive avenues of discussion. Many interviews explored issues related to participants’ pollution knowledge: the processes and methods by which they came to ‘know’ pollution, how pollution is known and identified (sources and signs), the various meanings attributed to pollution, the negotiation of new or different pollution knowledges (Bickerstaff and Walker 2003, 59). In most cases, interviews explored the participants’ particular location in networks of knowledge reproduction, decision-making, or abatement program administration. Questions asked participants to identify challenges to abatement and mobilization, structures of public participation, and relationships or possible collaborations with other participants and organizations.

On multiple occasions, the most revealing part of an interview conversation took place after the formal interview had concluded and the voice recorder was turned off. At this time, often over a post-interview cup of chai, informants who were acting as representatives of an organization (government office or NGO) began to disclose their own opinions about pollution in the river and challenges to abatement efforts. Most of these post-interview commentaries related to inter-religious conflict between Hindu and Muslim populations in communities along the river. Participants drew attention to the differences in water use practices between Hindus and Muslims, to the perceived lack of respect or affection for the Ganga among Muslim people, and to some extraordinary stories about Muslim communities living in tunnels under the city where trash and sewage accumulate before emptying into the river. Some of these interview excerpts were included, where appropriate, in the analyses presented in later chapters. Others will inform future research on the role of inter-religious conflict in pollution abatement efforts. These instances provided opportunities for participants to express opinions that were not included in, or often stood in contrast to, those of the organization they represented. They also inspired me to seek out these moments by asking NGO members and organizational representatives to meet away from their offices, where interviews
could feel more like a personal interaction and exchange, rather than in a professional setting where participants may have been reluctant to express any opinions that broke from organizational discourse. In cases where these “post-interview” conversations occurred, participants permission to use the entirety of the interview conversation was requested, and most often granted, at the conclusion of the meeting.

### 3.2.4 Participant Observation

Participant Observation is a vital component of the research methods, because it provided the opportunity to assess water use practices, political activities and relationships, and processes of knowledge formation through visual observation and material participation, rather than relying on language as the primary mode through which information was gathered (Atkinson and Hammersley 1994). The qualitative methods employed in this research, particularly interviewing, rely upon language to serve as the tool through which social knowledge, relationships and practices are accessed and assessed. This over-reliance upon linguistic expression as a “pure” representation of social knowledge can be at odds with the “reality” of material social practice, which is rarely accounted for in studies of social and environmental knowledge. Although this research primarily engages with epistemological questions regarding knowledge formation and meaning-making, it also examines material practices and social relationships that are sometimes not found among (or are often at odds with) those expressed in language. The use of methods of participant observation therefore enabled an alternative assessment of water use practices, the material treatment of polluted objects and bodies, social interaction among individuals, and groups and other aspects of “everyday” activities.

Participant observation methods were conducted at various sites on the banks of the Ganges River, and at different times of day and week. I walked the banks of the river, stopping to observe and/or participate in activities being engaged in by individuals or groups of people on the river. Most often, this method was conducted by me alone, or on occasion with a translator or my husband as chaperone, when social convention dictated. I observed and took detailed notes on the various ways in which people interacted with the river site, the water, the banks or ghats. I was particularly interested in how people navigated the river site, the types of water use practices in which they engaged, the various methods of conducting those practices (for example, when people
worshipped, what did they do? Did they bathe? How? Did they pray? When they drank the water what other activities or performances did they undertake?). Often, non-water use activities captured my attention. On one occasion, I became involved with a group of children who were playing a kite-capturing game on the ghats in Kanpur. Understanding the rules, and their competition with another group of children on the opposite bank, changed how I thought of the riverbank as more than a site for water use, and as a site for social interaction, community-building and play. On another occasion, my attempt to observe water use practices without participation in Varanasi drew the attention of local vendors, one of whom I ended up walking with as he sold peanuts on the ghats. This activity drew my attention to the Ganges as a site of “everyday” commerce, and to the myriad ways in which she provides livelihoods even for those who are not directly interacting with the river.

There was little structure to my use of participant observation methods. I often engaged in participant observation when other methods were not producing results, when I failed to make contact with potential translators or study participants, or when I was frustrated by a lack of progress. I varied the sites and times at which I conducted participant observation, going to places where I knew or had heard I might find people engaging in worship, fishing, farming, playing, doing household chores or other work. When not directly participating in any activity other than observation, I would explain to curious onlookers that I was conducting or receiving darshan from the river: seeing and interacting with the river in a devotional manner, which is a common practice along the Ganges. On other occasions, I would reveal that I was a student from the United States who was studying the Ganga. My methods of data collection were notably variable. I often took detailed notes during my observations, but at times, I would also observe or participate in an activity and write up the notes later in the evening. On occasion, I made a voice recording of my observation notes in order to expedite the “writing up” process while my memory of observations was still fresh. In my notes, I wrote up observations of water use practices and took note of the context in which these practices take place, by documenting my perceptions of “what’s [was] going on” (Bernard 2001, 189). During or after writing up my notes, I often shared my observations with people along the river, translators and other interlocutors with whom I worked in order to gain perspective, or
sometimes an explanation, of the activities that I observed. These feedback periods were often as enlightening and revealing as the observation itself, and were added to my participant observation notes.

3.3 Data Analysis
Two primary methods of data analysis were employed in this project: discursive and textual analysis and statistical analysis. This section of the chapter details my use of these methods of data analysis, including the specific procedures of analysis and challenges encountered.

3.3.1 Discourse Analysis and Textual Analysis
While there are multiple forms of textual analysis employed in human geography, my search for meanings embedded in texts leads me to adopt a discursive approach. Discourse analysis involves the search for interconnected discursive statements in text. Discursive statements “structure the way a thing is thought, and the way we act on the basis of that thinking” (Rose 2001, 136). Discourse analysis is one of the most widely used methods in Human Geography, often building on the theorizations of Michel Foucault. He posited that all “talk” is undergirded by a system of rules and preconditions that grant speech meaning (1969). In this way, Foucault encourages analysis not only of the content of speech, but of the context is which that speech is granted meaning. For this project, I have adopted a Foucauldian-inspired approach to discourse analysis that follows from Fairclough (2003). Fairclough’s critical discourse analysis (CDA) emphasizes both the need to focus on the content of particular texts (textual analysis) and the ‘order’ of the text, or the way in which the text stands as an “element of the relatively durable structuring and networking of social practices” (ibid., 3).

Much of the data collected through the multiple methods detailed above were subjected to discourse analysis, including policy documents and media reports, interviews, participant observation notes, and organizational websites. These sources of data, whether written, oral, or visual, were treated as “texts” and analyzed for the “pollution knowledge” they reflect and the explanatory language they employ. Particular attention was paid to the variability in textual representations of pollution between institutions. In keeping with the traditions of discursive analysis in political ecology,
analysis of these texts involved not only the identification and exploration of these meanings associated with pollution knowledge, but also assessment of the circulation of meanings between and among texts, people and institutions, and analysis of the specific contexts in which texts were created and the networks of power in which they circulate and which they actively reproduce (Zimmerer and Bassett 2003). In this way, the method of discourse analysis employed in this project was inter-textual and inter-contextual.

The specific tasks conducted in my discursive analysis of these texts also followed a modified version of that developed by Fairclough (1995):

1. First, I determined the historical and political context in which the text was produced. This included information about the author of the text, date of production, intended audience, purpose of publication, and the socio-political climate in which the document was produced.

2. Second, texts were read (or listened to) at least twice in order to develop a familiarity with the text. This was done so that I could get a sense of the content, ideas and information conveyed in the text as well as of the structure of the text itself. Recorded interviews were not fully transcribed at this stage, so that the “reading” of these texts could include the full range of data captured in the voice recording: intonation and emphasis in the speakers’ voice, emotive context, hesitant pauses, instances of confusion, which might not otherwise be captured in a written transcript.

3. Third, after the initial readings, I was familiar enough with the texts to identify recurring themes and their textual context. Different themes were identified for each set of texts (policy documents and government official interviews, media coverage, NGO interviews and websites, etc.). These themes formed the basis for creation of categorization codes (including pollution-definition, pollution-source, power, waste, corruption, nationalism, etc.). Themes were each assigned a corresponding color or symbol and documents were re-read and coded for references that I interpreted as aligning with these categories.

4. Fourth, texts were examined for their presentational strategy. Notes were taken on how each text was organized and presented, the style of writing or presentation, and the existence of intertextuality or references made to other texts. For example,
I was particularly concerned with textual references to pollution and water quality. I took note not only of references to these themes, but also to where and how to these references appeared, the other terms and references they were associated with, and of the notable absences or silences in texts that hint at information their authors did not want to present or had not considered. Results of this analysis illuminate the processes by which pollution knowledge is articulated, emphasized, and presented by various individuals and institutions, and illuminates the processes associated with policy making, abatement efforts, political struggle, social mobilization, meaning-making, and water use.

3.3.2 Statistical Analysis

Data produced through administration of the survey instrument was both qualitative and quantitative in nature. Of the 36 questions included on the survey instrument, 28 were quantitative (see Appendix A). Added to these were data collected by the author, including location (city), site (place on river) and time of day of survey administration, for a total of 31 quantitative variables (the name of the translator was also recorded for reference, but not coded or entered into the survey database). The variables assessed for each person surveyed, or each case, was entered to a data matrix. In instances when survey respondents did not answer, either because they refused to respond, did not know or have an answer, or could not decide on a response, no value was entered into the matrix. The data matrix was uploaded into Microsoft Excel for statistical analysis.

Survey data were analyzed using descriptive statistical calculations. Simple percentages were calculated for closed, or fixed-answer exhaustive questions. For example, percentage calculations were performed to assess the number of respondents in each age group. Univariate analyses allowed for assessment of responses along a single variable. For example, univariate analysis was performed to assess the distribution of responses to question M1, a Likert-scale question that asked respondents to indicate their level of (dis-)agreement with the statement, “It is safe to drink water directly from the river”. A preponderance of the data was subjected to correlation and dependence analyses that calculated the relationship between two variables. Most correlation calculations involved determining relationships between demographic data (age, gender, marital
status, and residence) and other variables (for example, reported frequency of bathing in the river). The results of these analyses are reported in Chapter Seven.

3.3.3 Mixed Method Data Analysis

The use of mixed quantitative and qualitative methods and methods of discursive and statistical analysis produce discrete data sets and findings that needed to be unified into a cohesive data set in order to produce responses to the research questions. Therefore, after their initial discrete analyses, both qualitative and quantitative data were subjected to a mixed-method analysis that modified Onwuegbuzie and Teddlie’s (2003) mixed-data analysis process:

1. First, data were consolidated and common themes identified. Major themes, such as the identification of pollution sources were shared in both sets of data.

2. Second, instances of correlation between qualitative and quantitative data were identified. For example, in texts produced by members of the Sankat Mochan Foundation (organizational websites, brochures, interviews), sewage was identified as the main source of pollution in the river. This was correlated against survey data to see whether residents of Varanasi were therefore more likely than residents of other cities to identify sewage as a primary source of pollution.

3. Third, in Onwuegbuzie and Teddle’s (ibid.) model, quantitative data is converted to narrative form in order to enable ease of comparison with qualitative data and vice-versa. My analysis focused only on “qualitizing” quantitative data, because quantitative data collected during survey administration was already complemented by qualitative, open-ended survey questions.

4. Following data transformation, newly qualitized data was correlated and compared with qualitative data.

5. Qualitized and qualitative data were then integrated into a combined data set.

6. The combined data set was then analyzed for its descriptive and evaluative content. This step closely followed the approach to discourse analysis described above.

The combination of data and their subjection to a mixed-method analysis was most helpful when comparing findings across data sources. Information gathered in interviews with government officials could be cross-checked with similar data collected from the
survey of water users, and the survey data could be compared with evidence from interviews with water users. While I would break from Onwuegbuzie and Teddle’s (ibid.) argument that this process assures internal validity or legitimacy for the study, it was helpful in comparing the competing claims advanced by various research participants and investigating the prevalence and distribution of those claims.

3.4 Validity, Interpretation, Ethical Considerations and the Researcher’s Role

While this dissertation adopted a mixed-method research design, the methodology was more qualitative than quantitative in nature. Even the quantitative component, the survey, contained a number of open-ended and interpretive questions (see Appendix A). Therefore, this project is open to the same critiques levied against all qualitative research, namely that it is difficult to determine validity or dependability of the data and that data analysis relies on interpretation. While the necessity of validity in qualitative research is debated (Wolcott 1994), the use of mixed methods allows for some degree of cross-checking for validity. Survey findings were consistent with the opinions, critiques, and concerns that were identified during the interviews, and observations were consistent with reported water use practices. For example, interviewees and survey respondents in Kanpur both indicated that bathing, for religious and pragmatic purposes, was not a common practice along the ghats and observations confirmed that, indeed, bathing was far less common at these sites and worshippers more likely to limit exposure to water by using cups or splashing their foreheads with a small amount of water that was soon washed off or wiped away.

Nonetheless, the findings reported in the study are largely subjective and rest on methods of discursive analysis that are interpretive (Fairclough 2003). For example, my interpretation of policy documents, addressed in Chapter Five, is subjective and based on a detailed contextualization of the policy development process, rather than confirmation by government officials. In this case, officials with the UPPCB and other state offices were the least forthcoming in interviews. The UPPCB official with whom I was able to speak often replied to questions by saying that he did the work assigned by his superiors, and they did the work dictated by policy and law. The timing of my fieldwork contributed to this challenge, as I was conducting interviews in the months and weeks preceding a
major election that could see many of these elected or appointed officials losing office. Therefore, the validity of these interpretations and the explanatory logic they reflect is largely left to the reader to judge. I have attempted to provide my audiences with a “thick description” of the context in which this research and the politics and events it explores took place, to explain and justify my findings, to use direct and accurate quotes in order to convey the voice found in sources as disparate as bathers and policy documents, and to support my arguments with multiple and diverse evidence.

One of the more frequent and challenging issues I faced during survey administration was the difficulty of disturbing people at work or in worship. While I attempted to identify every 10th person for participation in the survey, I excluded those people who were actively bathing or swimming in the river, in the middle of ablutions or prayer, in the process of dressing or undressing before or after bathing. Because the survey instrument, translators, and myself were highly mobile, I did not excuse or skip over people at work, but attempted to move with them in a manner that would minimize my disturbance. This meant ducking under laundry lines or skirting clothes drying on the ghats, getting splashed with dung as women shaped and dried patties on the steps, and walking rows of crops with farmers. In general, most people seemed happy to speak with me, were willing to stop their work for a break, and tried, I think, to answer my questions with interest and candor.

Concerns regarding validity were further complicated by my lack of fluency in Hindi and other Indian languages and my subsequent reliance upon an interpreter. Identification of reliable and professional interpretation services was more difficult than anticipated. In both Varanasi and Kanpur, older male interpreters I arranged to work with were hesitant to translate survey questions word-for-word and instead posed questions in a way that they felt would elicit the responses they thought I wanted. Luckily, my Hindi is sufficient enough to understand what was not being said and after some frustration, both of these translators were removed from the project. None of the surveys collected with their assistance were included in the data matrix, analysis or findings presented herein. One of these excluded surveys led to a short conversational interview between a participant, translator (for half of the interview), and myself. I have not yet secured independent translation of the exchange, but it contains a brief and heated argument.
between the translator and participant, followed by a more lengthy and fragmented conversation between the participant and me, in which we discussed the problems of interpretation and the loss of control and ownership when data gathering relies on third-party services. This event led immediately to dismissal of this translator (only half a dozen surveys were collected with his assistance) and to the exclusion of all surveys gathered with him. I plan to have the recording of the exchange translated and used in a future article on problems associated with fieldwork and translation.

While this incident raised concerns regarding the validity of data gathered with assistance from an interpreter, it ultimately led me to question the ethical implications of my research. Feelings toward and about the Ganges, and its despoilment, are sensitive and emotional issues. Interrogating people about them has unforeseen consequences, both positive and negative, that are difficult to control for. One of the disconcerting issues I faced while planning and conducting my fieldwork was questioning the role that I would play in the reproduction of knowledge around pollution in the Ganges. By interrogating, questioning, and probing the knowledge of others, I also contributed to the reproduction and reformulation of that very knowledge. I had to ask myself what outcomes might occur when I asked water users to reflect on their own opinions and practices, how my interrogation of political relationships (or the lack thereof) might impact government officials and NGO members and the potentials for their collaboration, how my probing into peoples’ lives and thoughts could be divisive or disruptive to the ritual and work that they were undertaking at the riverside. While I can’t assess the full impact of my work in these ways, ethical questions reemerged throughout my research in unforeseen ways.

In Allahabad, the representatives of the AU-sponsored education program with whom I spoke shared that my presence indicated to them that international interest in the issue may be significant and that officializing their efforts into an NGO may allow them to tap into the funding mechanism of international NGOs and potential donors. In this instance, I clearly saw the impact that my presence and interest in the politics of pollution abatement could have on the struggle to clean up the river. When speaking to water users in Varanasi, who were quite familiar with foreign researchers surveying locals about the pollution problem, two people on separate occasions commented that current NGOs leaders were too corrupt to lead a mass movement and encouraged me to adopt this role.
While I took their encouragement in jest, these comments brought to my attention both the desire by many people for a leader to serve as a catalyst for the anti-pollution movement and the fact that I could not separate myself from the inquiry I was performing. At other times, I wondered if my role might help to popularize the issue of pollution in the Ganga and/or draw attention to NGO efforts to combat this problem. In Kanpur, where water users were well versed on the causes and dangers of water pollution, many respondents indicated that while they were not aware of the Kanpur Eco-Friends, they were relieved to hear that there was such an organization working in their city, and would consider supporting their efforts. During preliminary fieldwork in Allahabad, a number of water users responded to my inquiries about the lack of a sustained local anti-pollution organization by questioning whether something should be done about this absence.

The interpretive and descriptive nature of this research project entails manifold ethical considerations, many of which are only compounded by my status as an “outsider” in the communities where my research was conducted. Problems and limitations I faced were largely no different than those documented by others conducting this type of outsider research, and perhaps by all researchers who take on an “outsider” positionality by engaging in investigative inquiry in the first place (Gilbert 1994). For this project, however, I believe that my outsider status was ultimately beneficial and expedited my objective of assessing popular pollution knowledge and attitudes toward the Ganges River. In my fieldwork, I found that affection for the Ganga, familiarity with the stories of her creation, information on causes and sources of pollution, obstacles to abatement efforts, and other issues I wished to explore were considered “common knowledge”. As an outsider, people seemed to assume that I did not share in this common knowledge and would hospitably sit with me, explaining the intricacies of the policy making process, the proper method of worshipping the river, or the best time to view the Ganga in all her glory. This impression was confirmed by a group of Geography students at Allahabad University with whom I shared my research and initial impressions. They agreed that research of this nature would be more challenging for them as “insiders” because people may not have the patience to sit and explain to someone the commonly held knowledge they should already have.
Throughout my survey administration, the public nature of my work and my visible outsider difference drew people to gather around, and sparked many a conversation about the nature of the issue, my work, problems with the Ganga, government shortcomings, and more. While these instances make for compelling tales and perhaps carry a few lessons about the impact a researcher can have, I regard them as largely unavoidable outcomes of inquiry and do not believe that significant harm came from my work. What did come clear was that a great deal of energy and excitement, diversity of opinion, passion, concern, and emotion are tied up in the struggle surrounding pollution in the Ganga and that any move to probe this issue is bound to produce innumerable reactions. The social and political debate over pollution in the Ganges can be likened to a smoldering fire – not yet aflame with the vitality of a mass movement, but simmering and awaiting a gust of wind or a spark to set it off. My inquiry stirred the pot in ways I cannot measure or fully understand, but which I like to believe added tinder to the fire.
CHAPTER FOUR
A SOCIO-POLITICAL ECOLOGY OF URBAN WATERSCAPES IN THE GANGES RIVER BASIN

This chapter presents a discussion of the Ganges River Basin (GRB), its site and contexts within India and the state of Uttar Pradesh, before continuing with the presentation of research findings in the next three chapters. The chapter begins by reviewing the site and waterscape of the GRB, in keeping with a geographic tradition of regional description. Then, the history of the Ganges in Hindu myth and religious folklore is presented, with emphasis on the influence of Ganges creation tales on modern religious and water use practices. Following that discussion, the chapter turns to an analysis of the central basin as a focal point for human settlement and agricultural production. Then, the chapter turns to a discussion of the development of the river in the colonial and post-colonial contexts, first as a conduit for transporting goods and people and then as a center of industrial development. Next, problems of pollution and decreasing water quality are discussed, with particular attention to sources and patterns of pollution along the river. Finally, the three study sites are described, with particular attention to their unique histories of local water use, pollution production and abatement, and civil society organization and protest.

4.1 The Ganges River Basin
The Ganges River Basin is part of the larger Ganges-Brahmaputra-Meghna basin, which drains over a million square miles of land in four countries. It is also part of a much larger drainage basin that encompasses the Himalayan source waters for most of Asia’s major rivers, including the Indus, Yangtze, Mekong, Chao Praya, Irrawaddy, and Yellow Rivers (see Figure 4.1). This drainage basin includes more than 15 countries and houses almost half of the global population. The Ganges River Basin (GRB) encompasses nearly all of the land area of Nepal, half of that of Bangladesh, and about a third of the land area of India (see Figure 1.1). It is the largest river basin in South Asia. The central GRB is generally considered to include those areas located in the north Indian plains: between Haridwar in Uttar Pradesh and the Brahmaputra, or more recently the Farakka Barrage near the border with Bangladesh. The north Indian plains developed over
millennia, following the collision of the Indo-Australian and Eurasian plates and subsequent formation of the Himalayan Mountains. The convergence of these tectonic plates shapes the geomorphology of the basin, with its continental uplift producing the Himalayan range and revealing the soft metamorphic and sedimentary rocks that are eroded by the Ganges at a rate of 1,000 tons per year (Cumming 1994). The gradual deposition of this alluvium from seasonal flooding of the Ganges and Indus rivers filled in an ancient valley that had formed at the base of the Himalaya, creating the Indo-Gangeatic Plain and shaping the massive delta that spans the border between India and Bangladesh (see Figure 4.2).

The Ganges is the largest river in India, with the third largest water discharge in the world (35,000 m³/s), following only the Amazon and Congo rivers (180,000 m³/s and 42,000 m³/s). It flows more than 2,500km (1550 miles) from its snow-fed source streams around the Gangotri Glacier among the Himalayan peaks in the north Indian state of Uttarakhand to the Bay of Bengal in Bangladesh. The main headwaters of the river are
the Alaknanda and Bhagirathi Rivers, the latter of which originates at Gaumukh, the terminus of the Gangotri Glacier. The Ganges proper begins at the confluence, or Sangam, of the Alaknanda and Bhagirathi rivers in the Garhwali Himalayas at the town of Devprayag. In the upper course of the river, waters flow southwest in a steep and narrow gorge between hewn channels of Himalayan bedrock. In the first 500 kilometers (310 miles) of its run, the Ganges descends almost 3,800 meters in altitude (12,477 feet) before debouching onto the plains of north India at the town of Haridwar (Figure 4.3). Here, the flow of the Ganges slows considerably and much of its waters are diverted via a dam into the Upper Ganges Canal, which provides for irrigation through the fertile doab region to the south. The volume of river water is therefore significantly decreased as the Ganges turns to flow southeast through the plains of north India. Its elevation varies little after Haridwar, falling only another 210 meters in the remaining 1600km (1000 miles) of its run to the Bay of Bengal.

While in the north Indian plains, the Ganges follows a relatively fixed course that is controlled by the rocky edges of the Himalayan foothills to the north and the rise of the
Deccan Plateau to the south (Geddes 1960). The river’s reduced flow after the Upper Ganges Canal diversion at Haridwar compounds water quality and siltation problems in the upper central basin, especially between Kanpur and Allahabad. At Allahabad, the Ganges meets its largest tributary, the Yamuna, another snow-fed Himalayan river, with sources very near the glaciers that feed the Ganges. The Yamuna adds not only its own flow to the Ganges, but also returns much of the irrigation runoff that had been diverted into the doab via the Upper Ganges Canal. Between Allahabad and Bhagalpur (Bihar), the river grows large again with contributions from multiple tributaries, including the Gomti, Ghaghara, Sone, and Gandak Rivers (Figure 4.4). This middle stretch of the river is most variable, shifting across the landscape in response to flooding that washes away soil in some years and deposits it in others, leaving many once riverside cities stranded far from the banks (Cumming 1994, 9).
After Bhagalpur, the Ganges is joined by the Kosi River before turning south toward the Bay of Bengal. Shortly before entering Bangladesh, the Ganges’ first major distributary, the Hooghly-Bhagirathi breaks off from the main river, flowing almost due south through the major city of Kolkata (West Bengal). Near its point of departure, the Indian government constructed the Farakka Barrage between 1960 and 1974. The
Barrage diverts water from the Ganges into the Hooghly River in order to ensure water supply to Kolkata during the dry season, to flush out accumulated silt, and to allow navigability of the river around Kolkata. Much maligned, the Barrage significantly reduces the flow of the Ganges into Bangladesh, where it meets the Brahmaputra River, after which their combined flows are known as the Padma River. The final major tributary, the Meghna, joins the Ganges-Brahmaputra-Padma River just south of Dhaka before draining into the Bay of Bengal. The river delta between the Hooghly and Padma Rivers is the largest in the world, covering 128,000 km\(^2\) and housing the Sundarbans, the world’s largest mangrove forest and UNESCO world heritage site.

While the Ganges and most of its tributaries are glacier- and snow-fed rivers, its volume is highly dependent upon the South Asian monsoon cycle, which brings heavy rains and increased discharge between July and October (see Figure 4.5). These compound the increased runoff experienced upstream during the summer from high temperatures and snowmelt. During the late summer and autumn, the Ganges is at greatest risk of flooding. In the dry season, from December to May, the waters in the Ganges, especially between Haridwar and Allahabad, can become dangerously low, posing significant problems for water quality and the health of those who live along the river. Multiple dams and reservoirs along the river attempt to reduce risks posed by flooding and low-flow, but ultimately serve to divert water from the river for irrigation and hydropower projects. The Farakka Barrage and Ganges Canal projects are the largest on the river, but other dams on the Bhagirathi tributary in Tehri and planned projects on the Damodar and Mahakali rivers are also the source of much debate, as is the nation-wide interlinking rivers project, for which the Ganges would be a central water source (Prabhat 2003). The most recent threat to water flow in the Ganges was the Tehri Dam, constructed in 2006 just upstream from Davprayag on the Bhagirathi River. It is a 346 mega-watt hydroelectric facility that provides additional irrigation for 667,000 acres, as well as a supplemental water supply for Delhi (Sharma 2009). This project has further reduced water levels in the upper course of the river, which concentrates pollutants and causes increased siltation throughout its course. At the Delta, reduced loads cause infiltration and salinization, which threaten local farming and river ecosystems.
From the Gangotri to the Sundarbans, the Ganges River Basin is home to a variety of ecosystems, florae and faunae. Human settlement in the Basin has a significant impact on the health and distribution of this natural ecology. The once-dense forests that lined the river have been removed to make way for human settlement, destroying habitats for native wildlife, including the Bengal tiger, Asian elephant, rhinoceros and musk deer, which now live only in highland forests or in conservation parks (ibid.). Nonetheless, the Basin is still home to a variety of animals, including bears, monkeys, and many bird species. The river also supports a variety of fish and other animals, including crocodiles and the blind Ganges dolphin. Most recently, the Ganges became home to a population of 25,000 snapping turtles. Introduced as part of an effort to reduce the number of corpses seen floating in the river, the turtles were trained to consume only necrotic flesh. However, these turtle populations, released predominantly in the 1980s and 1990s, have already experienced significant decline, most likely at the hands of local poachers (Stackhouse 1992). The most fragile ecosystems and the Ganges are found in the upper

Figure 4.5 Seasonal precipitation and water demand in the GRB (High Noon 2011)
and lower sections of the river, where high-mountain and tropical riparian zones support threatened biodiversity hotspots (Kishore 2008).

4.2 The Ganges as Myth and Goddess

The Ganges River Valley is counted among the world’s seven major cultural hearths and is the genesis site of a number of the world’s major religions, including Hinduism, Buddhism, and Jainism (Bonnemaison 2005). The Ganges features prominently in the history of India and in Hindu mythology, and is itself a goddess in the Hindu religious pantheon. It is in the GRB that Aryan invaders with proto-Hindu Vedic religious practices are said to have first settled and began to live with pre-Aryan urban-dwelling Dasyus peoples of the northern river basins around 1500 BCE. The Ganges River Basin therefore plays a prominent role as the setting for much of ancient South Asian history and often receives significant mention in many Hindu myths and texts. Stories of the river and goddess Ganga (Figure 4.6a-d) are intertwined with those of the greatest Hindu gods and kings. In the *Ramayana*, Ganga is associated with the god-king Rama. He lives in Ayodhya, along the Gaghara River, another Ganges tributary, and is sent to the confluence of the Ganga and Yamuna at Allahabad to pay his respects to the River Goddess. At one point in his story, Rama crosses the Ganga reciting sacred hymns with his wife, Sita, who prays to the river for protection. Sita is later revived by water from the Ganga and gives birth to her twin sons in the river (Pandey 1984).

References like these to the Ganga are found in nearly all major Hindu texts, starting with the Aryan Vedas of the 16th to 9th centuries BCE. In the Rig Veda (17th to 12th century BCE), both the Ganga and the Yamuna are given priority over other rivers and described as divine (ibid.). In the *Mahabharata*, a great epic written between the fifth and fourth centuries BCE, it is explained that goddess Ganga was expelled from the realm of the gods along with Mahabhisa, after the two fell in love and angered Brahma, the great Hindu god of creation. After Mahabhisa was reincarnated as Santanu, the two were reunited and married. But, Ganga would drown any son she bore. When Santanu stops her from throwing their eighth son into the river, she reveals her identity and leaves the earth. But, her son Bhimsa stays and plays a significant role in the remainder of the epic. The *Valmiki Ramayana*, an epic account of the exploits of the ideal God-King
a) The goddess Ganga depicted clad in white, riding a crocodile and carrying a pot and lotus flower

b) Carved relief of the descent of the Ganges (Mahabalipuram, Tamil Nadu)

c) An actor plays Shiva, complete with squirting Ganga wig, at a festival near Jaipur, Rajasthan (photo by author)

d) Statue of Ganga at Devprayag confluence (Stupia 2008)

Figure 4.6 Images of the goddess Ganga
Ram(a) believed to be written by Valmiki in the 4th century BCE, includes an account of the birth of the Ganga:

Thus urged the sage recounted both
The birth of Ganga and her growth;
The mighty hill which metals stored
Himalaya is the mountain lord:
The father of a lovely pair
Of daughters fairest of the fair
Their mother offspring of the will
Of Meru everlasting hill
Mena Himalaya’s darling agreed
With beauty of her dainty waist
Ganga was elder born: then came
The fair one known by Uma’s name
The all the gods of heaven in need
Of Ganga’s help their vow to speed
To great Himalaya came and prayed
The mountain king to yield the maid
He not regardless of the weal
Of the three world with holy zeal
His daughters to the immortals gave
Ganga whose waters cleanse and save
Who roams at pleasure fair and free
Purging all sinners to the sea
The three-pathed Ganga thus obtained
The gods their heavenly homes regained
...
Thus Ganga King Himalaya’s child
The heavenly river undefiled
Rose bearing with her to the sky
Her waves that bless and purify (Ramayana I, translated by Ralph T.H. Griffith from the original Sanskrit 1870-1874, as quoted in Pant 1987, 3-4)

There are various creation myths associated with the formation of Ganga, her materialization from goddess to river, and her descent to earth. In most of these, the Ganga originates in the heavens, and various gods and mythical figures are credited with the work done to bring her to earth. In the Puranas (a collection of Sanskrit legends written down between the 3rd and 16th centuries CE), Bharat (India) sits on one of the eight petals of the lotus flower that is the earth. At the center of the flower is Mount Meru, on the summit of which is the city of Brahma, enclosed by the headwaters of the Ganges: “The river issues from the foot of Vishnu above, washes the lunar orb and falls
here from the sky, encircles the city and then divides into four mighty rivers flowing [in the four cardinal directions]” (Chapman 1995, 15). In another Puranic tale, the feet of Yamana, the rays of the sun, scratch a hole in the matter that encapsulates this world, releasing Ganga and Yamuna from limitless space down onto earth. Thus, the origins of the Ganga and her sister tributary the Yamuna are divine, and not earthly, as with the other major rivers of the earth (Pandey 1984).

Of the many creation myths of the Ganga, she is associated most with the god Vishnu, especially his toes and feet, granting her the alternate name of Vishnupadi, meaning “originating from Vishnu’s feet” (Gupta 1993, 107). In the Bhagavata Purana, the descent of the Ganges is attributed to Vishnu, when his large toe scratches a crack in the comic egg that encapsulates this world, releasing the river to wash the dirt from his foot, and thereby washing away the sins of humanity and purifying the entire world (Alley 2002, 60). In another tale, Ganga is one of the three wives of Vishnu. During an argument with another of his wives, Saraswati, the two women curse each other to become rivers and descend to the earth (Gupta 1993, 108). In addition to Vishnu, the Ganga is also connected to other major Hindu gods, especially Shiva and Krishna, who are often credited with reigning in the river goddess’ mighty power. In the Bhagavad Gita (100-300 CE), the river is described: ‘Gam prithvim gachhati iti Ganga’ (The one that descends onto the earth from the heaven is the Ganga’, quoted and translated by Anshul Shree Kunj in Kishore 2008, xiii). In the same text, Krishna reveals, ‘In rivers, I am the Ganga’ (Pant 1987, 1). In the Brahmavaivarta Purana, Krishna’s consort Radha drinks the river goddess in a fit of jealousy. Ganga takes shelter from her at Krishna’s feet, removing all water from the world. After the gods pray to Krishna for her release, he ruptures his toenail and frees her back upon the earth (Gupta 1993). But, the river itself is too powerful and, if released directly upon the world, threatens to crack or deluge the earth. Only the dreadlocks of Shiva (interpreted by some as the Himalayas) are strong enough to catch the flow of the river and release her safely onto land.

But the best known, and for the purposes of this project perhaps the most relevant, legend associated with the descent of Ganga is that of King Sagara and Bhagiratha found in the Ramayana. The 60,001 sons of King Sagara, an ancestor of Ram, went to attack the great sage Kapila because they thought he had stolen the horse being used by their father
for *yajna* or *ashvamedha*, a territory-claiming ritual involving the sacrifice of a horse. Kapila burned the sons before they could strike him, leaving their ashes scattered across the great plains of India. The descendents of Sagara appealed to Ganga to come to earth and release the sons from their earthly bondage. Bhagiratha, the great-grandson of Sagara, lived an ascetic life in the Himalayas and eventually convinced Brahma to release Ganga (or, in some versions of the story, convinced Ganga herself to descend). But, Ganga warned that her descent must be contained by Shiva, lest the force of her fall break the world apart. Convinced by Bhagiratha to cooperate, Shiva stood at the top of the Himalayas, capturing Ganga in his hair and eventually setting her free across the plains, where she cleansed and released the souls of Sagara’s many sons (Pandey 1984, Alley 2002). It is this association of the river with the ability to purify bodies, ashes, and souls that becomes especially significant when considering pollution knowledge and water use in the Ganges River Basin.

Although water, especially river water, is considered sacred in Hindu religious tradition, the Ganges is the holiest of all rivers in India, sent to earth to rid humankind of evil and impurity. In the Mahabharata, water from the Ganges, or *ganga jal*, is described: “As Amrita [the gods’ nectar of immortality] to the gods… even so is Ganga water to human beings” (XIII, translated and quoted in Darian 1978, 125). As with other rivers, the Ganges is feminized and “perceived to be nurturing (and sometimes judgmental) mothers, feeding, nourishing, quenching, and when angered flooding the earth” (Narayanan 2001, 193-194). Throughout the major Hindu texts, Ganga is repeatedly referenced as the most sacred river, revered for her purity, sanctity, and emancipatory power (Pandey 1984). To wade on her banks, swim in her streams, or even to take a drink of containerized Ganges water, is to be cleansed of material dirt (*gandagi*) and ritual pollution or contamination (*apavitra*). These actions allow devotees to attain *suddhata*, or religious purity. Ritual use of the Ganga is emphasized in the Ramayana. The origins of the river from the foot of Vishnu endows the river water with this ability to remove all sins and to ensure “attainment of heaven” of the dead whose relics are immersed in the river (ibid., 21). Therefore, placing the ashes or uncremated remains of loved ones into the river assists their release from the cycle of rebirth. In the Mahabharata, we are told that those who die on the banks of the river Ganga are equal to gods, those who bathe in the river and drink
her waters are purified for seven generations, and that one can wash away sin by just speaking her name (Darian 1978).

There are many rituals and methods of religious practice into which the use of ganga jal is incorporated. Ganga jal can be drank or splashed as an element of puja, or worship. A vial or jug of ganga jal can be kept in the home as a blessing or for future use if a family member falls ill. But, above all else, bathing in the Ganga is the most favorable act for a Hindu devotee. In an excerpt from the Mahabharata, a sage explains the sanctity of the Ganga and her waters:

“That end which a creature is capable of attaining by penances, by practicing celibacy, by sacrifice or by practicing renunciation, one is sure to attain by only living by the side of the Ganga and bathing in its sacred waters. Those creatures whose bodies have been sprinkled with the sacred waters of Bhagirathi [Ganga] or whose bones have been laid in the channel of that sacred stream, have not to fall away from the heaven at any time. Those men, who use the waters of the Ganga in all their acts, surely ascend to heaven after departing this world. Even those men who, having committed diverse kinds of sinful deeds in the first part of their life, betake themselves in their after years to residing by the side of the River Ganga, succeed in attaining a superior end. Hundreds of sacrifices cannot produce that merit which men of restrained souls are capable of acquiring by bathing in the sacred waters of the Ganga… As cotton, when it comes into contact with fire, is burnt off without a remnant, even so the sins of the person that has bathed in Ganga become consumed without a trace.” (quoted in Kishore 2008, 26-27)

While bathing in the Ganga at any time is surely beneficial, certain dates and hours are considered more auspicious than others. At sunrise and sunset each day, an Aarti is performed for the Ganga at numerous sites on the river. In most of these, an Aarti lamp is circulated during the recitation of prayers and then waved, while facing the river, in a circular pattern, to indicate that the Ganga is the goddess around whom all life and activity circulate (see Figure 4.7). Aartis for the Ganga also serve to “wake up” the goddess in the morning, and to put her to “sleep” at sunset. After the performance of the Aarti, individual worshippers light candles suspended in a boat made of leaves (often lotus leaves) and filled with flowers, incense and other symbolic offerings. The boats are then placed in the river with a prayer and make their way downstream, presumably to the river delta and the ocean (see Figure 4.8).

Pilgrimage to the Ganga, and especially circumambulation along her shores, is an important practice for many Hindus. The greatest number of tirthas, or pilgrimage sites,
in India are located in the Ganges River Basin, with significant clustering of these at the upper reaches of the river and in eastern Uttar Pradesh, around the prayaga at Allahabad (Bhardwaj 1983). Mass pilgrimage fairs are held regularly along the Ganges. While a yearly event, the *Magh Mela*, is held at the *triveni Sangam* (confluence of the Ganga, Yamuna, and mythical Saraswati rivers) in Allahabad, the *Kumbh Melas* are far more momentous and draw record-breaking crowds. *Kumbh* refers to the ‘pitcher’ or ‘urn’ that contains *Amrit*, or the nectar of the gods and of life. According to Vedic mythology relayed in the *Mahabharata, Ramayana* and *Puranas*, the gods and demons fought over the pitcher of *Amrit* in a war that lasted 12 years. Garuda, a bird- or eagle-like deity that served as the mount of Vishnu, captured the *kumbh* of *amrit* and flew it across the plains of north India, spilling four drops of the nectar at *prayaga* (Allahabad), Haridwar, Ujjain and Nashik. The Kumbh Mela is celebrated at these sites every three years, the *Ardh*
(half) Kumbh Mela is held every six years at Allahabad and Haridwar, and the Purna Kumbh, or full Kumbh, takes place every 12 years. The rare Maha (great) Kumbh Mela is held only after 12 full Kumbh celebrations, or every 144 years. Within these celebrations there are specific days and times during which bathing is particularly rewarding. At these times, millions of pilgrims participate in ritual bathing at the same time. The most recent Purna Kumbh Mela, held in Haridwar between January and April 2010, was attended by tens of millions of people, with about 10 million of those bathing on April 14th (Yardley and Kumar 2010). Chapman (1995) reports that of the estimated 30 million pilgrims at the 1989 Kumbh Mela in Allahabad, 15 million bathed at daybreak on 6th of February. At the last Kumbh Mela to be held in Allahabad, in 2007, approximately 50 million people were present (Kishore 2008). These celebrations represent the largest gathering of people in the world and draw crowds so big that they can be viewed from space (BBC News 2001). Figure 4.9 shows satellite views of the Sangam before and after the 2001 Mela.
4.3 The Ganges as Cradle and Breadbasket

As much as the Ganges may be the spiritual heart of Hinduism, the river also serves as the demographic, political, and agricultural center of the nation. Patna and Varanasi, two of the oldest continually inhabited cities in the world, are both located in the Ganges River Basin. Graham P. Chapman (1995) points out that “the dominant or major power base of South Asia has always been somewhere in the Ganges valley, where population was densest, communication easiest, and the taxation of sedentary agriculture possible to sustain a ruling elite and its armed forces” (17). Waves of migrants and invaders have historically entered the basin and sub-continent through northwest passages from modern-day Afghanistan and Pakistan. Nomadic Aryan invaders were some of the first recorded migrants to enter South Asia through these routes, initially subjugating and then settling and intermixing with the indigenous Dasyus people of the Indo-Gangetic
The Hindu and Buddhist Empires that followed Aryan conquest of north India concentrated their capitals in the central GRB, often around modern Ayodhya in Uttar Pradesh and Patna (former Paliputra) in Bihar. Most of the great empires of ancient India were located, and often centered, in the Ganges River Basin, including the Vedic civilization (16th to 6th centuries BCE), the Magadha Empire (7th to 5th centuries BCE), the Nanda Empire (6th and 5th centuries BCE), the Mauryan Empire (4th to 2nd century BCE), the Chola Empire (3rd century BCE to 13th century CE), the Sunga Empire (2nd to 1st century BCE), the Indo-Scythian Empire (2nd century BCE to 4th century CE), the Kushan Empire (60-240 CE), Guptan Empire (280-500 CE), the Harshan Empire (606-647 CE), and the Pala Empire (810-850 CE). In later years, the Basin would also house many South Asian sultanates of the Muslim period and both of the capitals of British India (Calcutta and New Delhi).

When Mughal invaders entered the subcontinent, again through the northwest passages, they settled and concentrated their power in the western portion of the central GRB, around modern Delhi and Agra (ibid.). The resulting Delhi Sultanate and subsequent Mughal Empire ruled most of north India from the western Ganges Plain between the 13th and 19th centuries. As Mughal power waned, the British East India Company extended its influence, first in the Bay of Bengal at Calcutta (modern Kolkata), and then up the Ganges River to Allahabad and, eventually, to Delhi. Cities along the upper and central Ganges were at the heart of anti-imperial protests and activities during the 1857 Indian Revolution. The Ganges itself became a central waterway for moving people and munitions to and from rioting cities, including Cawnpore (Kanpur), Allahabad and Banaras (Varanasi). After the Revolution, in which the British forces prevailed, the British East India Company was disbanded and India came under direct rule of the Crown. Shortly thereafter, the colonial capital was moved from Calcutta, in the east near the Ganges Delta, to New Delhi, in order to centralize administration in the plains states, where rebels had been able to take advantage of weakness in the military and colonial communication and transportation networks.

With the relocation of the capital to Delhi, the Ganges and the Yamuna became central waterways for the transportation of goods and people upstream from the ports of Calcutta to the new inland capital (see Figure 4.10). This role was short-lived though, as
British authorities invested in improvements to railway services between the two cities, and because the river became largely unnavigable following the construction of the Bhimgoda Dam and Upper Ganges Canal in 1854. The dam significantly decreased the amount of water flowing into the main stem of the Ganges and contributed to the rapid accumulation of silt on the riverbed. By the end of the 19th century, the river was no longer navigable far upstream, forcing British authorities to cancel a paddle-steamer service that had operated between Calcutta and Allahabad from the late 1700s to the late 1800s (Cumming 1994). Today, river-borne traffic is limited to small vessels that transport people, food, and other goods between towns and villages on the riverbanks.

Figure 4.10 Paddle steamer service on the Ganges, c. 1842 (Mahajan 2003)
At Independence, India’s population numbered only 350 million people, with about a third of those living in the GRB (Chapman 1995). Over the past six decades, the population of India has grown to 1.21 billion people (Census of India 2011). While the turn of the century population of the GRB was estimated at only 100 million people (McNeill 2001), current calculations generally range from 400 million (Rashid and Kabir 1998) to 500 million (Sharma et al. 2008) people. Much of this population is clustered in the central basin states of Uttar Pradesh and Bihar, which claim some of the largest (199 and 103 million people, respectively) and densest (828 and 1,102 people per square km, respectively, compared with 382 nationally) populations in the country (see Figure 4.11, Census of India 2011). While India’s population remains, as a whole, relatively rural, the central GRB is home to much of India’s urban population, hosting about a third of the nation’s cities and another third of its urban residents (Kishore 2008). Basin states also house some of the largest urban centers in India, including three of the world’s 39 megacities (Delhi, Kolkata, and Dhaka) with populations of ten million or more (Kraas 2006), 82 Class-One cities with populations over 100,000, (Hosterman et al. 2009) and 23 Class-Two cities with populations over 50,000 (Sengupta 2006). With population growth rates of 1.3% and urbanization rates of 2.4% nationally, these urban populations can be expected to grow significantly over the next few decades (CIA Factbook 2011). Graham P. Chapman (1995) estimates that the population of the GRB may reach 1.2 billion by 2031. This population places significant pressure on the river not only as a source of water for consumption, but also as a site of waste disposal. As these cities grow rapidly in the coming decades, the lack of infrastructure for water and sewage treatment will continue to compromise both the quality and availability of water in urban areas.

Since Independence, the GoI has prioritized food security in order to feed these growing populations. Before that, northern India had been plagued by cyclical famines that resulted from a combination of political mismanagement and reliance on the variable southwest monsoon cycle, which normally runs from June/July to September/October. If the monsoon was erratic, bringing more or less water than expected or arriving earlier or later than expected, crops would be ruined and widespread famine could occur. The late 20th century development of canal infrastructure followed from these famines and provided additional water resources for GRB farmers, especially those within reach of the
Upper and Lower Ganges Canals upstream from Allahabad. These canals act as the backbone of a multi-state irrigation network that waters about 1.8 million acres of farmland in Uttar Pradesh and Uttarakhand (Jain et al. 2007). Canalized irrigation allows farmers to extend the growing season of low water-demand, cool weather winter crops (rabi), such as wheat or barley, into the dry spring months and to cultivate high-demand
warm-temperature summer crops (*kharif*), like rice or cotton, during the hot pre-monsoon season, when evapotranspiration normally exceeds precipitation (Cumming 1994). During the low-water level winter and early summer seasons, the dry silt of the riverbed is used for growing fruit and vegetables, only to be abandoned with the start of the monsoon and subsequent increase in water levels. Figure 4.12a shows a typical irrigation ditch being used to water rabi crops in Kanpur, shown in Figure 4.12b.

Further investment in the extension of irrigation networks and expansion of lands under cultivation helped to improve regional food production in the post-colonial context. But, increased population pressure and fears of the political ramifications of further famine remained and led the GoI and Ministry of Agriculture to work with the Ford Foundation in promoting Green Revolution technologies and strategies during the late 1960s and 1970s. These programs funded the development and distribution of high-yield rice and wheat varieties (HYVs), subsidies and loans for farmer’s using chemical fertilizers and pesticides, as well as the continued expansion of irrigation infrastructure and technology. Over the next decade, grain production in north India increased markedly. Rice yields rose from about two tons per hectare in the 1960s to about 6 tons per hectare by the 1990s (Barta 2007). This increase in production led to a subsequent drop in the price of grain (from more than $550/ton for rice in the 1970s to just under $200/ton in the 1990s) and a measurably victory for the promotion of food security in India, which is now one of the world’s largest grain exporters (ibid.).

The promotion of Green Revolution practices has also produced significant landscape, social, and environmental change in the northern Indian plains. In recent decades, farming in the fertile Ganges-Yamuna Doab, for example, has shifted from subsistence agriculture characterized by small land-holdings to commercial agriculture, with larger holdings, mono-crop cultivation, and mechanization of farm labor (Rehman et al. 2008). This has promoted increased rates of urbanization, as displaced subsistence farmers and farm workers relocate to large towns and cities in search of wage labor, and changes in food variety and availability, as farmlands are used to grow grains for export and livestock consumption, rather than the pulses and root vegetables principal in local diets. Today, about 71% of cultivated land in the Doab is used to grow cereals (rice and wheat), compared to only 12% for cash crops, and 8% each for pulse and oilseed crops
Figure 4.12a Irrigation ditch, Kanpur (photo by author)

Figure 4.12b Winter *rabi* crop cultivation on the dry riverbed (photo by author)
(ibid.). While the promotion of grain production and improvements in social responses have helped to stave off famine, the higher yields evidenced in the late decades of the 20th century have plateaued in the last two decades, especially where continual crop rotation has stripped the soil of nutrients or where farmers have been unable or unwilling to commit to the higher investment in agricultural inputs required for the cultivation of HYV grains. The practice of year-round cultivation, intensification of irrigated water use, and development of canalization in the GRB has changed the character of the river significantly, reducing its flow, especially between Haridwar and Patna. Increased use of chemical inputs, like synthetic fertilizers and pesticides, have also increased the presence of these materials in agricultural run-off, and therefore in both ground and surface water, including the canalized runoff that is returned to the Ganges at Allahabad.

4.4 The Ganges as Furnace and Factory

While the regional economy of the GRB is dominated by agriculture, the central and lower basins are also important centers of industrial production. Development of the Ganges into a key industrial zone began during British colonial rule, when demands were high for the production of durable goods for consumption by officers of the military and East India Company, or for export to Britain and other colonies. Early industries developed along the corridor of the Ganges River between Delhi and Calcutta, often in military cantonments like Kanpur. These strategic sites allowed factory owners to take advantage of infrastructure available in established British outposts. Factories located in the central plains of the GRB were also able to benefit from their closer proximity to raw materials produced in both the Himalayan foothills (i.e. timber, iron, and limestone) and the plains states (i.e. agricultural goods, including rice, cotton, and cattle hides from the “cow belt”xxxiv). Factory sites located on the river also made use of its water in production and for disposal, as well as a channel to transport goods upstream to the capital for distribution and consumption, or downstream to Calcutta for export abroadxxxv. Early industries in the GRB included textiles (known for producing khaki fabric used in military uniforms), leather tanning (for boots and saddles), metalworking (for guns and ammunition, as well as railways), and perfume and soap making (for domestic consumption as well as international export). Many of these industries require riverside
or water-adjacent locations, because they are prolific water consumers, employing large
tubs and washbasins to repeatedly treat or wash their products \(^{xxxvi}\).

Since Independence, India has promoted the expansion of industry, especially
large-scale export-oriented industries, in order to promote national economic
development and poverty alleviation. Indian Independence coincided with the formation
of development economics as distinct field of study. Influential contemporary economic
theories included those of John Maynard Keynes, who argued that public policy and
governance could be structured in such a way as to prevent the type of market failures
that led to the Great Depression (Harrod and Dommar 1948), Arthur Lewis (1955), who
proposed that surplus agricultural labor could be relocated into the industrial sector in
order to promote economic growth, and Paul Rosenstein-Rodan (1944), who argued for
the need for state intervention in public planning. Newly independent India was viewed
as the ideal site for testing these theories through the promotion of high levels of
government intervention in the economy, the use of large “surplus” labor populations,
and rapid development of an economy already reliant upon agricultural production for
subsistence and trade (Adams 1997).

In the post-Independence context, then, India developed a Soviet-style system of
centrally-drafted Five-year Plans that were meant to ensure rapid economic growth
through the promotion of large-scale industrial development. This approach was
influenced by India’s first Prime Minister, Jawaharlal Nehru. He and Independence
leader Mohandas Gandhi broke significantly in their view of how India should pursue
economic growth and poverty eradication. The Gandhian economic plan envisioned the
creation of small cottage industries managed within the structure of small village
governance, while national wealth would be managed through a system of high-caste
trusteeship (Chakrabarty 1987). The Nehruvian strategy, on the other hand, rested on the
dual pillars of Fabian socialism and contemporary Keynesian development economics.
His policies advocated three general points: economic development should not be left to
market forces, but rather strictly controlled via state mechanisms; the government should
protect growing industries; and, investment in large-scale industry would produce more
immediate economic returns than equivalent investments in other sectors (LaRue 1997).
Nehru’s approach was so influential that it shaped national economic planning for nearly four decades, driving India’s focus on the development of large-scale industry and capital goods production. In order to achieve these goals, citizens were rallied to purchase or establish private factories and many existing factories along the Ganges were nationalized. Plans were also developed to construct additional dams along the Ganges and other basin rivers in response to both the agricultural challenges of the post-Independence period, and to the problem of providing the electrical power necessary to fuel the factories that were to become the linchpin in India’s large-scale industrial development plans. However, factories constructed by the British were largely outdated by Independence and the newly sovereign Government of India was not prepared to make the massive investments necessary in order to keep them internationally competitive. So, many factories in the GRB began to specialize in the production of low-cost, low-quality, semi-finished goods, often produced in sub-standard labor and environmental conditions. Regulations related to the treatment of industrial wastewater or effluent, while nascent at the time, were easy for factory owners to ignore, because central and state monitoring authorities had little desire to close those industries that were supposed to be turning India into a global economic power, or to attempt shutting down factories that were themselves owned by the state\textsuperscript{xxxvii}. Few factories, even the gross polluters, were fined or shut down during this period, which served only to draw other gross polluting industries to establish operations in the GRB.

The pattern of industrial development in the GRB promoted industrial agglomeration along stretches of the river, as factories producing similar goods clustered together in order to take advantage of states or zones with lower environmental regulations, large resource bases, trained labor pools, and shared suppliers and buyers. The leather tanning industry, for which Kanpur is well known, provides an effective example of this pattern. The first tanneries established in Kanpur were able to take advantage of the benefits, described above, of a location that provided easy access to both water resources, from the Ganges, as well as cattle and hides. About 22% of Indian buffalo and 12% of cattle are located in Uttar Pradesh (UP), enabling the state to produce about 4.4 million buffalo and 2.3 million cattle hides annually (Schjolden 2000). But the leather produced in Kanpur, and elsewhere in India, is known internationally for its poor
quality (ibid.). For much of the 20th century, tanners therefore specialized in low-quality, low-cost semi-finished leather that was exported for later manufacturing into finished goods. Specialization in low-end goods meant that many tanners participated in a “race to the bottom” that involved reducing investments in updates for manufacturing and treatment technologies, relying on underpaid and often-illegal child labor, and operating in sub-standard environmental conditions. The marginal success of these factories and the national investment in industrial expansion after Independence caused significant growth in the leather tanning industry in Kanpur, which more than quadrupled by the 1990s (ibid.).

Environmental protection legislation further encouraged the development of local economies of agglomeration by encouraging factories to operate in clusters, whereby they could share effluent treatment facilities, in addition to common labor pools and suppliers. Today, factory owners and consultants are trying to take advantage of these clusters in order to promote the manufacture of finished leather and leather goods. According to one tannery owner, however, clustering has also allowed factory owners to exert disproportionate political influence in the municipality and the state, and has promoted corruption of UP Pollution Control Board (PCB) officials. He explained that factory owners often coerce employees not to vote for particular officials or political parties that have threatened to fine or shut down their factories. Factory owners also use their economic clout to control the outcome of mandatory effluent testing:

“It is more about the money. The amount you can pay equals the consent that you can get. [The PCB official conducting testing] asks what kind of lab report you want, and this determines the amount you pay [to the official in the form of a bribe].” (Tannery owner, Kanpur, 2009)

While tanneries, and their environmental impacts, remain the subject of much attention, they are among hundreds of industries that line the banks of the Ganges, releasing effluent and wastewater into the river (see Figure 4.13). According to the Uttar Pradesh Pollution Control Board (n.d.), there are currently 420 medium and large factories that meet the criteria for classification as “gross polluting industries” in UP alone. These are industries that involve the use of “hazardous substances” and/or produce effluent with a high biochemical oxygen demand (BOD) load. Of those 420, only 243 have installed effluent treatment plants (ETPs) and are in compliance with national and
Another 78 of those industries are reported as closed and a remaining 75 factories are currently classified as “defaulters” and periodically fined or threatened with closure. These numbers are significantly higher than those reported when the Ganga Action Plan (GAP) began in 1986, when only 34 industries were classified as gross polluters, and again at the start of GAP-Phase II in the early 1990s, when 276 industries were so classified (ibid.). These gross polluting industries include metalworks, pharmaceuticals manufacturing, textile mills, distilleries, chemical plants (fertilizer and pesticide), tanneries, munitions factories, and paper and sugar mills. Effluent and wastewater from these factories introduce a variety of contaminants into the river, including chromium, fluoride, ammonia, lead, cadmium, zinc, and copper.
4.5 The Ganges in Peril

The waters of the Ganges River rank among the most polluted in the world (Ministry of Environment and Forests 2005). Yet, it is difficult to get a full picture of current water quality and sources of pollution, largely due to the seasonal fluctuation of the amount of water in the river and noncomprehensive monitoring procedures. In the most general sense, water quality is highly variable along the course of the river, tending to decline gradually as the Ganges descends and reaches the plains, and becoming markedly worse in the stretch of the river from Kannauj to Varanasi. After Varanasi, water quality improves due to inputs from tributaries in the lower courses of the river. Water quality is best during the late monsoon and post-monsoon months of August and September and worst during the winter and spring months of January, February and March. Unfortunately, it is also during these months that both water extraction from the river is highest, as farmers compensate for lost rainfall by relying more heavily on irrigation systems, and human exposure is high, as pilgrims flock to the banks of the Ganges for the winter/spring festival season. Figure 4.14a shows the variability in water quality, as reflected by DO/BOD and Coliform levels, along the main stem of the river. Figure 4.14b illustrates the seasonal variation in stream load in the Ganges.

Concerns about the quality or cleanliness of water in the Ganges River were first articulated by foreign travelers and British colonists living in the GRB during the 19th century. Prior to that, ancient descriptions of the river found in religious and medicinal texts “are unanimous in their description of the Ganges as wholesome, clear, sweet, tasty, and digestive” (Markandya and Murty 2000, 222), and tales abound of warriors and kings who travelled far and brought themselves much praise for fetching and sharing the perpetually cool and sweet ganga jal (Alley 2002). But, in 1859, the Mela festivities at Allahabad were nearly cancelled by local authorities concerned about the possibility that a cholera outbreak had been caused by the collection at the Sangam of “all the dejections and filth of this immense population” (Deputy Inspector General’s Office, as quoted in Maclean 2008, 78). Concerns about the relationship between poor water quality and the outbreak of disease inspired the creation of Sanitation Police and later a office of North-Western Provinces Sanitary Commissions who were, on many occasions, charged with
Figure 4.14a DO/BOD and Coliform levels in the Ganges River (World Bank 2011)

Figure 4.14b Mean seasonal flow variation in the Ganges (NRCD 2009)
dispersing crowds, controlling mass bathing in the river, and even breaking up festivities during annual Mela celebrations (ibid.). Other observational accounts include those of well-known American travelers, like Samuel Clemens who, writing as Mark Twain, described the Ganges River at Varanasi as “nasty” in 1896 (McNeill 2001). Negative portrayals of the Ganges by foreigners continues to the present day, with particular attention paid to sightings of floating corpses in the river near Varanasi. This reputation inspired a contemporary clean-up program, in which local police monitor and remove evidence of human remains from the river in exchange for a small remittance.

According to a recent report published by the United Nations Environment Programme (UNEP) and World Health Organization (WHO), main sources of pollution in the river are domestic and industrial waste, solid garbage, agricultural runoff bearing pesticides and fertilizers, partially- or un-cremated human and animal remains, direct defecation into the river, and mass bathing and other practices associated with ritual worship of the river (Sharma 1997). But in India, widely published and reproduced figures state that about 75% of the pollution load in the Ganges comes from municipal sewage that flows untreated into the river and the remaining 20 to 25% from industrial sources (ibid.). These shares were calculated in the early 1980s, following the CPCB’s initial survey of water quality prior to drafting Phase-I of the GAP (see Chapter Five), and reflect estimates that the twenty-five Class I cities included in the study emitted 1.34 million cubic meters per day (m$^3$/d) of raw sewage into the river and that the sixty-eight gross polluting factories operating at the time discharged an additional 260,000 m$^3$/d of industrial effluent (ibid., 7). These calculations did not account for pollution produced in smaller cities and towns, by smaller and non-gross polluting industries, or from other non-point sources. In the nearly three decades since these original estimates were made, the population of the GRB has nearly doubled$^{xxxix}$, and there are today 232 Class I cities and more than 400 gross polluting industries in the basin (The Energy and Resources Institute-TERI 2011). So, we lack a clear picture of the current quantity and source loads of pollution in the river.

Current wastewater generation information is available for only 179 of the 232 Class I cities in the basin (149 of which discharge untreated wastewater directly into the Ganges and its tributaries). These cities produce about 11,100 million liters per day
(MLD) of wastewater, in addition to another 147 Class II cities generating about 1,000 MLD of wastewater, for a total of more than twelve billion daily liters of waste. Of this, an average of 24% of sewage created in Class I cities is subjected to treatment before released into the river (Maria 2003). Figure 4.15 shows the treatment plant at Bhagwanpur, Varanasi. In terms of contemporary industrial sources, only 155 gross polluters located on the main stem of the river are accounted for in calculations of industrial pollution in the river. This means that the 20-25% quoted for the industrial share of pollution does not include effluent from factories on the many tributaries of the Ganges, such as the Yamuna, into which the city of New Delhi is alone believed to emit about 265 million liters per day (MLD) of industrial waste (Government of Delhi 2010).

Further, in their near exclusive focus on sewage and industrial sources of pollution, these source share calculations pay little heed to those contaminates introduced from agriculture, solid waste disposal and other non-point sources. GRB states alone consume nearly 10 million tons of chemical fertilizer each year (45% of all fertilizers utilized nationally), of which 10 to 15% is estimated to end up in surface water systems, including the Ganges and her tributaries, which are believed to contain up 70mg/l
nitrogen and .05-1.1 mg/l phosphorus rates; much higher than 10mg/l and 0.1 mg/l phosphorus rates that are considered unsafe in drinking water (TERI 2011). Pesticides, which have a greater toxicity than fertilizers are also used prolifically throughout the GRB. About 21,000 tons of pesticides are applied to cropland in the GRB each year (47.6% of those used nationally). However, it is difficult to get accurate data on the types and chemical composition of many pesticides, as they are often protected as intellectual property of their manufacturers.

When it comes to solid waste loads in the Ganges, accurate estimates are equally hard to calculate. Reliable data on solid waste disposal are available for only five of the largest cities in the GRB (Kanpur, Allahabad, Varanasi, Patna, and Kolkata), none of which use solid waste processing facilities or sanitary landfills. These data estimate solid waste creation at 1,100 tons per day (TPD) in Kanpur, 509 in Allahabad, 80 in Varanasi, 511 in Patna, and 2,653 TPD in Kolkata (ibid.). But, few data exist on how much of this solid waste flows to the river or enters landfills, the size or capacity of current landfills, and their area of coverage. Estimates from Varanasi in the 1980s place the amount of human ash deposited annually into the river at several million tons—the product of 30 million bodies being burned each year in the city’s official crematoria (McNeill 2001). There are also few published measurements of pollutants from other non-point sources, like detergents and bleaches from clothes washing at the dhobi ghats, solid and liquid waste from idol immersion and bathing, or organic pollution from direct urination and defecation into the river, all of which occur frequently along the river. Figure 4.16 shows flowers, polyethylene bags and other trash washing up on the riverbank.

Assessment of water quality in Ganges began with the implementation of GAP-Phase I and initially entailed sampling the river at 39 monitoring stations on the Ganges. Today, the CPCB collects data at 154 monitoring stations on the river, although only 34 of those are located on the main stem of the Ganges and only 16 of those are subjected to regular testing (CPCB 2011). Water samples are collected at those stations monthly or quarterly and tested for nine “core” parameters: pH, temperature, conductivity, dissolved oxygen (DO), biochemical oxygen demand (BOD), nitrates, faecal coliform and total coliform. Other measures include nineteen (19) general parameters for indicators like turbidity, phosphate levels, and the quantity of dissolved solids in the water, as well three
bio-monitoring parameters, nine trace metals and fifteen pesticides (see Table 4.1 for the full list of parameters). However, monitoring for these parameters occurs only annually and at select sites, due to limited resources (CPCB 2009). The three parameters of pH, DO and BOD\textsuperscript{xl} are emphasized by the CPCB because they are believed to be the best indicators of total pollution loads and are used to determine criteria for Designated Best Use (see Table 4.2). However, these are accurate indices of the presence of sewage and other organic pollution in the river and not other pollutants known to have been released into the Ganges, like heavy metals from industrial and hazardous wastes. Irregular and incomplete monitoring complicate the task of developing a comprehensive picture of water quality in the GRB. While it is difficult to get an accurate picture of water quality in any river, due to variations in flow, frequent fluctuations in pollution levels, and differences in sampling location, timing and strategy, the near exclusive focus on organic pollution monitoring in the GRB undoubtedly influences policy abatement strategy and may produce conservative calculations of inorganic pollution and subsequent estimations of exposure risk to human health (Warn 2000).

Figure 4.16 Flowers and other debris collect at the waters' edge (photo by author)
Under the current Best Use Designation scheme, the Ganges is targeted to be a Class B river, indicating that water quality in the river should be safe for organized (mass) bathing. As Table 4.3 illustrates, the Ganges does not meet this standard at most testing sites and is most frequently classified as a Class D river, indicating that its waters are safe enough only for the propagation of wildlife and fisheries, and not human contact or consumption (MoEF 2009). CPCB water quality monitoring data from 2009 (TERI 2011) indicate that average BOD concentrations in the river were 5 to 7 mg/l (Class B ranking requires 3 or less), with higher levels recorded in the stretch of the river between Kannauj and Varanasi. The highest BOD values of 65.8 mg/l were reported during the

<table>
<thead>
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<th>S. No.</th>
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<td>Weather</td>
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<tr>
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<td>Temperature</td>
<td>2</td>
<td>Depth of main stream/depth of water table</td>
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<td>Conductivity, µmhos/cm</td>
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<td>Color and intensity</td>
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<td>Dissolved Oxygen, mg/L</td>
<td>4</td>
<td>Odor</td>
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<td>BOD, mg/L</td>
<td>5</td>
<td>Visible effluent discharge</td>
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<td>6</td>
<td>Nitrate – N, mg/L</td>
<td>6</td>
<td>Human activities around station</td>
</tr>
<tr>
<td>7</td>
<td>Nitrite – N, mg/L</td>
<td>7</td>
<td>Station detail</td>
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<td>Trace Metals (9)</td>
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<td>Total Coliform, MPN/100 ml</td>
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<td>Arsenic, µg/L</td>
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<td>Copper, µg/L</td>
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<td>4</td>
<td>Lead, µg/L</td>
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<td></td>
<td>3 Total Alkalinity, as CaCO3</td>
<td>5</td>
<td>Chromium (Total), µg/L</td>
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<td></td>
<td>4 Chlorides, mg/L</td>
<td>6</td>
<td>Nickel, µg/L</td>
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<tr>
<td></td>
<td>5 COD, mg/L</td>
<td>7</td>
<td>Zinc, µg/L</td>
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<tr>
<td></td>
<td>6 Total Kjeldahl - N, as N mg/L</td>
<td>8</td>
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<td></td>
<td>7 Ammonia - N, as N mg/L</td>
<td>9</td>
<td>Iron (Total), µg/L</td>
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<tr>
<td></td>
<td>8 Hardness, as CaCO3</td>
<td></td>
<td>Particulates (15)</td>
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<tr>
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<td>10 Sulphate, mg/L</td>
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<td>Beta BHC, µg/L</td>
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<td>Gamma BHC (Indane), µg/L</td>
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<td>O P DDT, µg/L</td>
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<td>P P DDT, µg/L</td>
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<td>Alpha Endosulphan, µg/L</td>
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<tr>
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<td>16 Boron, mg/L</td>
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<td>Aldrin, µg/L</td>
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<td>17 Magnesium, as CaCO3</td>
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<td>Dieldrin, µg/L</td>
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<td></td>
<td>18 Potassium, mg/L</td>
<td>10</td>
<td>Carboxyl (Carbamate), µg/L</td>
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<tr>
<td></td>
<td>19 Fluorides, mg/L</td>
<td>11</td>
<td>2,4 D, µg/L</td>
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<tr>
<td></td>
<td>Bio-Monitoring (3)</td>
<td>12</td>
<td>Malathion, µg/L</td>
</tr>
<tr>
<td></td>
<td>1 Saprobity Index</td>
<td>13</td>
<td>Methyl ?erathion, µg/L</td>
</tr>
<tr>
<td></td>
<td>2 Diversity Index</td>
<td>14</td>
<td>Anilophos, µg/L</td>
</tr>
<tr>
<td></td>
<td>3 P/R Ratio</td>
<td>15</td>
<td>Chloropyrphos, µg/L</td>
</tr>
</tbody>
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Table 4.1 National Water Quality Monitoring Programme parameters (TERI 2011)
summer in Kanpur. Coliform levels were also significantly high in the pre-monsoon summer months, with the monitoring station downstream from Agra reporting rates as high as $5.2 \times 10^6$ coliform counts per 100 mL of sampled water, which is far beyond both the CPCB standard 500/100 mL for Class B rivers and the WHO recommendations of no more than 2/100 mL in recreational or bathing waters. These measures compare with recorded values of as much as 16.39 mg/l BOD and $9.2 \times 10^5$/100 mL coliform prior to implementation of GAP-Phase I (NRCD/MOEF 2009).

Despite the health risks posed by contaminates that regularly exceed national and international recommendations for safe use, the river continues to be a site where people gather water for drinking, watering livestock, washing clothes and dishes, and participating in the Hindu bathing rites believed to cleanse the soul of sin and impurity. While much of this use is associated with daily material needs, devotees also seek the waters of the Ganges because tradition identifies it as an infallibly pure river whose waters cure physical and spiritual ills. These diverse water users are subjected to a number of health risks through their exposure to toxic chemicals and pollutants in the water. Maria (2003) has classified health risks posed by water pollution to water users in India into two categories: health risks posed by unsanitary water conditions and health

<table>
<thead>
<tr>
<th>Class</th>
<th>Designated Best Use (DBU)</th>
<th>CRITERIA</th>
</tr>
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<tbody>
<tr>
<td>A</td>
<td>Drinking Water Source without conventional treatment but after disinfection</td>
<td>pH, Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD), Total Coliform</td>
</tr>
<tr>
<td>B</td>
<td>Outdoor bathing (Organised)</td>
<td>pH, Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD), Total Coliform</td>
</tr>
<tr>
<td>C</td>
<td>Drinking Water Source with Conventional treatment followed by disinfection</td>
<td>pH, Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD), Total Coliform</td>
</tr>
<tr>
<td>D</td>
<td>Propagation of wild life and fisheries</td>
<td>pH, Dissolved Oxygen (DO), Free Ammonia</td>
</tr>
<tr>
<td>E</td>
<td>Irrigation, industrial cooling and controlled waste disposal</td>
<td>pH, Electrical Conductivity, Sodium absorption ratio, Boron</td>
</tr>
</tbody>
</table>
risks posed by toxic chemicals. Diseases in the latter category include a wide variety of cancers, endocrine disorders, cataracts, and kidney and liver disease. Other effects include rashes and yellowed patches of skin, eyesight problems and heavy metal poisoning (Sengupta 2006; World Health Organization 2004). While these may sound more hazardous than the diarrhea and bacterial infections caused by E. coli and other pathogens introduced and spread through unsanitary water conditions, they affect fewer people and therefore are viewed as less of a potential threat to human health (Hosterman et al. 2009). Diarrhea alone causes an average of one death every minute in the Gangeatic region (Sampat 1996) and leads to the loss of health and life, calculated as annually equivalent to 28,037 lost Disability Adjusted Life Years (DALYs), which reflect the
number of equivalent life years lost from premature death and disability caused by disease related to pollution in the Ganges (Maria 2003, 47).

4.6 Study Sites: The KAVAL Towns

This project was sited in three major cities in the central basin state of Uttar Pradesh (see Figure 4.17). Uttar Pradesh (UP) is the largest and most populous state in India, with a current population of nearly 200 million people (Census of India 2001). UP is centered in the GRB and the “Hindu belt” or “cow belt”, a dominant center of Hindu language use and national politics. But, the state also has some of the lowest literacy and life expectancy rates in the country, a skewed sex ratio, and history of communal violence
between the majority Hindu and minority Muslim populations. UP is also known as one of the more politically and culturally conservative states in India.

The cities of Uttar Pradesh were selected as study sites for this research because most of the central Ganges River Basin is located within UP (see Figure 1.1) and most pollution abatement measures have seen greater representation from and investment in the state. Of the 861,404 km\(^2\) area of the GRB located in India, 294,364 km\(^2\) or 34\% are located in Uttar Pradesh (Kishore 2008). The UP area of the GRB covers a majority of the main basin valley and houses many of the largest cities and important cultural sites located along the Ganges. The state is also home to some of the most polluted stretches of the river, and to a majority of Ganga Action Plan (GAP) implementation sites. While the GAP is ultimately an interstate program, most of the 25 cities covered in the Plan are located in the state of Uttar Pradesh. This imparts UP-State boards and officers with unusual influence over the governance of pollution and water quality in the basin. Decision-making is often carefully balanced between the central Ministry of Environment and Forests (MoEF), the Central Pollution Control Board (CPCB), the regional Ganga Project Directorate (GPD), the Uttar Pradesh Pollution Control Board (UP-PCB), and local municipal water authorities (Jal Nigam) in each of the cities incorporated into the plan. Uttar Pradesh is therefore an ideal state-level site at which to focus this study, because of the numerous major urban centers available for the collection of data, its large and diverse population of potential informants, and its significance in the basin itself.

Within Uttar Pradesh, a group of cities known as the “KAVAL towns” dominate as the most prominent and populous centers in the state. KAVAL is an acronym for the names of the five towns: Kanpur, Agra, Varanasi, Allahabad, and Lucknow. The three study sites for this research project include the KAVAL towns located on the main branch of the Ganges River: Kanpur, Allahabad, and Varanasi. These sites were selected not only for their location on the river and their regional significance, but also because of the unique characteristics with which they are associated and the presence of anti-pollution civil society activity. The final pages of this chapter present a background and context for each of these cities, focusing on a discussion of the selection of each site for participation in the study.
4.6.1 Kanpur

Kanpur (Figure 4.18) is the furthest upstream of the three study sites. The city is the largest in Uttar Pradesh and second largest on the Ganges, with a population of just over 6.3 million (Census of India 2011). Kanpur is located in the fertile Lower Doab between the Ganges and the Yamuna, about 400km from the Delhi capital. Geographers O.H.K. Spate and Enayat Ahmad (1950) point out that Kanpur was little more than a small village on the banks of the Ganges before the British established a trading factory, and later a military station, at the site. The city grew as a military cantonment after playing a significant role in the Indian Revolution of 1857. Subsequent demand for military-grade khaki, boots, and saddlery led to the development of a local leather processing industry. However, Spate and Ahmad (1950) argue that the “real rise” of the town came from the cotton mills built in the late 19th century in response to demand for cotton during the American Civil War. These textile factories include the renowned Elgin Mills, the longest operating cotton mill in India. Strategically located in the agriculturally productive doab,
the city’s textile mills, sugar refineries, and tanneries soon began to dominate the region economically. On the eve of Independence, 42% of factory workers and 62% of textile workers employed in the state worked in Kanpur (ibid.).

Dubbed by the British as the “Manchester of India” (Cumming 1994, 30), Kanpur first became known for textile processing and munitions manufacturing. But, much of the textile sector has since left Kanpur, as factories became obsolete and new construction in the south became cheaper than updating Kanpur’s ageing infrastructure (Pandey 2008). Today, the city is best known for tanning, and is the largest exporter of finished and semi-finished leather products in the country, an industry which brings in about 2.75 billion Rs. (or around US$ 61 million) annually (Mishra 2009). The industrial centers of the city developed along the southern bank of the river near civil lines (textile cluster), inland behind the central business district and military cantonment (munitions and metalworks cluster), and downstream from the city center in Jajamau (tannery cluster). Today, Jajamau is known as a major leather production zone, housing around 305 tanneries that employ shared Common Effluent Treatment Plants (CETPs) for the treatment of toxic effluent that contains organic matter, chromium, sulfide, ammonium and salts used in stripping and curing hides, as well as a number of trace metals (Beg and Ali 2008). In manufacturing the nearly 100,000 hides exported from Kanpur each year, these tanneries also produce around 1500 tons of chromium sulfate discharge and 146,000 tons of solid waste (Schjolden 2000). This adds to 339 MLD of domestic wastewater from the city, agricultural runoff, and much of the uncollected an unburned trash that flows down to the river through the nalas or drains of the city (see Figure 4.19a-d). Water quality testing conducted just upstream and downstream from the city show that, in the short stretch of the river around Kanpur and Jajamau, mean BOD concentrations increase from 1.8 to 5.2 mg/l, mean fecal coliform counts increase from 2,813 to 26,167/100ml, and ammonia, chloride, sulfate and nitrate levels double (CPCB 2005).

Estimates from 2001 place nearly 2 million workers, about a third of the city’s total population, in the leather tanning industry (GFE 2001). Labor and environmental conditions for these workers are notoriously poor, as the following observational account suggests:
Three labourers were working in collecting slush, the watery mud and spreading out in open to be heated and dried by sun. The dried mud consisted of leather waste and remains of hides. These hides are boiled to produce adhesives, organic manure and chicken feed. The fumes emanated from these factories pollute air and discharge foul smell much to the dislike and annoyance of the residents of the area. (Gupta et al. 2007, 11-12)

Because of Hindu religious proscriptions against consuming or handling animal flesh, most of those employed in the tanning sector are members of India’s Muslim minority.

Figure 4.19 City drains, or *nalas*, of Kanpur
Kanpur therefore has a larger Muslim population than other urban centers in Uttar Pradesh, where Muslims usually constitute 10-12% of the population (Census of India 2011). When considered in the context of the state’s history of inter-religious communal violence, this adds significant tension to local anti-pollution politics and abatement efforts. One local activist (pers. comm.. 2009) explained that tensions often escalate between the local Hindu majority, who don’t like to see factory effluent dumped into the sacred river but who also benefit from the wealth and political influence brought to the city by industry, and factory owners and workers, who want to protect the industry from threats posed by government regulation while preventing the sort of industrial decline caused by obsolescence in the past. Local officials respond to this antagonism by vacillating between rebuking factory owners in order to appeal to Hindu constituents, and working with factory owners to ensure that they are able to continue operation with little intervention by government agents.

Kanpur was selected as one of the study sites for this dissertation because the city is infamous for both its industrial dominance and the poor quality of water that runs through the city, which is often described as “black”, “tar-like”, or dead. The Kanpur Eco-Friends, an official NGO operating out of the city discussed in greater detail in Chapter Six, seeks to address water pollution in the GRB through awareness programs, media advocacy, public protests, and civil litigation (EcoFriends 2008). But, the tension between religious and secular interpretations of water use, the state’s dual commitments to promote industrial growth and pollution abatement, and the political clout enjoyed by factory owners all complicate efforts to improve local river water quality. The city’s reputation as a major polluter also complicates relationships with cities, water users, NGOs and others downstream who point to Kanpur as a source of pollution and a site of contamination.

4.6.2 Allahabad

The second study site, Allahabad, is located 195 km downstream from Kanpur where the Ganges meets its largest tributary and sister river, the Yamuna (Figure 4.20). The Ganges enters the city from the northwest, turning sharply south around the city in order to join the Yamuna at the triveni Sangam site. This is where the two rivers join together with the
The waters of the mythical Sarasvati River that is said to bubble up from underground near the Allahabad Fort. The Sangam is a favored location for bathing in the Ganges and is also the site of the Kumbh Mela, the largest religious festival in India and possibly the world (see above). Identified by some scholars as “the holiest spot on earth” (Darian 1978, 22), Allahabad (formerly Prayag) has been continuously inhabited for thousands of years (Cumming 1994). Figure 4.21 shows a satellite image of the Sangam site during the 2001 Kumbh Mela in which the dark waters of the Yamuna, from the left, can be seen intermixing with the murky brown waters of the Ganges. Today, Allahabad is an important administrative center and home to the powerful Nehru-Gandhi political dynasty.

During the year, the population of Allahabad hovers around two million people, though much of the larger metropolitan area population lives in wards across the rivers from the city (BBC 2007). During the month of Magh (mid-January to mid-February), the Kumbh Mela fair brings millions of pilgrims to the city in order to bathe at the
Sangam. Depending on the year and the size of the Mela, crowds can range from just a few million into the tens of millions. Table 4.4 shows the size of this “floating” population for the last five Purna Kumbh fairs (held every twelve years). Most of these visitors will take the holy dip, *snan*, on certain auspicious days, while others stay for the entire month, conducting *kalpvas*, or thrice-daily ritual bathing in the river. Since pilgrims require immediate access to the riverbank and the city is unable to absorb such large numbers of visitors, a makeshift encampment is constructed on the sandy bars at the Sangam. The 1,620 hectare (6.2 mi²) festival ground becomes a city of 50,000 tents (BBC 2007) that requires its own infrastructure and administration. Water provision for the Mela comes from dozens of tubewells bored near the site, additional street lamps and power supply come from a set of specially constructed sub-stations, and a fleet of pontoons improve access to the river in order to prevent crowds from stampeding. (see Figure 4.21 Sangam at Allahabad during Mela bathing (BBC 2001))
Figure 4.22). Although 25,000 toilets are available throughout the festival grounds (ibid.), much of the sewage and solid waste from the festival drains directly into the river. Figure 4.23a-b show a photo and map of the Mela tent city.

As a whole, Allahabad city lacks much of a sewage system. Only the center of the city has a network of drains for wastewater and stormwater collection, which is often so clogged with solid waste and silt that wastewater backs up into the streets (Allahabad City Development Plan). The rest of the city (about 55%) has no sewerage system or wastewater collection system. This means that most of the waste being produced in the city is being disposed of in the streets and into unlined drains (*kutch nala*) that empty into the river. Of the 57 unlined drains in Allahabad, 36 empty into the Ganga, dumping an estimated 116.8MLD of wastewater into the river. Another 13 drains empty into the Yamuna, releasing a further 96.5 MLD of wastewater just before the two rivers meet at the Sangam (ibid.). When compared to the other two research sites, Allahabad produces far less industrial pollution, largely because industrial development in Allahabad has occurred at a slow pace, due to political opposition and a lack of adequate infrastructure (ibid.). Instead, the township of Naini across the Yamuna from Allahabad has been identified as an industrial zone (ibid.). Gross polluting industries in Naini include a cotton mill and polyester plant, a large steel mill, and a GoI munitions depot. The Allahabad branch of the Lower Ganges Canal, which extends here from Kanpur, also introduces varied agricultural pollutants to the river after its waters irrigate and capture runoff from

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</tr>
<tr>
<td>1966</td>
<td>70</td>
</tr>
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<td>100</td>
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<td>2001</td>
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Table 4.4 Floating population during Purna Kumbh Mela in Allahabad
Figure 4.22 Pontoon Bridge at the Sangam, Allahabad (Dhar 2009)

Figure 4.23a Tent city at the Sangam, Allahabad, 2009 (photo by author)

Figure 4.23b Map of the tent city and bathing area at the Gangam (BBC 2007)
11.8 million hectares of prime farmland. Confluence of the two rivers brings all of the pollutants from the Yamuna, which provides water to and waste disposal for the capital city of Delhi and the large city of Agra.

Water quality in Allahabad can therefore vary significantly, depending upon the site at which the river is accessed. During the Ardh Kumbh festival in 2007, the CPCB conducted water testing at various sites around the city. Findings indicated that the highest rates of pollution in the city can be found in the Ganges River before it joins with the Yamuna. Testing indicates that before it joins the Yamuna, the Ganges has a Biochemical Oxygen Demand (BOD) of 4.7-7.6mg/l, compared with only 1-2.1mg/l in the Yamuna, 2.7-6.2mg/l at the Sangam and 3.7-4.2mg/l as the combined rivers leave the city. Dissolved Oxygen (DO) levels are also highest in the Ganges, though this parameter showed less variability across sites, registering between 11.2-12mg/l in the Ganges alone, compared to slightly lower measurements of 9-11mg/l at the other sites. Fecal coliform levels also showed limited variability across sites, with counts between 4x102-1.7x104 in the Ganges, 1.1x103-1.7x10.4 in the Yamuna, 8x102-1.4x104 at the Sangam, and 2.2x103-1.7x104 as the joint rivers leave the city (CPCB 2007). Nitrate levels are higher at Allahabad and surrounding areas than in most of the remaining stretch of the river, but phosphate levels are not much higher here than other sites in the GRB. This indicates higher than normal fertilizer use in the area, or upstream in the Ganges Canal.

Allahabad was selected as a site for this study because it is one of the most important locations for bathing and worshipping the river. It is also strategically located at the confluence of the Ganges’ main tributary and at the terminus of the lower doab. Allahabad has also become host to numerous protests and campaigns, organized during the Mela fairs. Through these demonstrations, religious leaders, sahus, sants, and kalpvasis demand that water quality be brought up to a standard acceptable for bathing. The largest of these was coordinated during the 2002 Mela on Mauni Amavasya, or the day of the new moon during the festival month of magh. Tens of thousands of Hindu ascetic sadhus and pilgrims protested against pollution in the Ganges by boycotting the ritual kalpvas bathing (Shukla 2003). These protestors formed a human chain along the riverfront and fasted for days in order to draw attention to the problem of water pollution. While the political pressure and visibility of these protests has brought some success in
terms of immediate political response to their demands, the city has yet to see a sustained movement or official organization develop in opposition to the persistently low quality of water in the river. Chapter Five explores these events, their causes and impacts, and their relationships to the official anti-pollution NGOs located at the other two study sites.

4.6.3 Varanasi
Another 130 km south of Allahabad, Varanasi is one of the holiest cities in India, and one of the most auspicious sites for devotees to die, be cremated, or bathe in the Ganges (see Figure 4.24). Varanasi, or Banaras, is also the ancient city of Kasi (Kashi) and the former capital of the Kingdom of Kasi. Varanasi has been an important religious and educational center for about 3,000 years (Cumming 1994). The city is not just important for Hindus, but other South Asian religions as well, as it served as the birthplace for a number of Jain leaders and is was a temporary residence for the founder of Sikhism. Just outside the city is Sarnath, where the Buddha first taught the principles of Buddhism in the 5th century.
BCE. The city is home to a number of important temples and festivals associated with the Shiva and Ram, as well as celebrations of the arts, including the works of well known poets and saints Kabir and Tulsidas. Varanasi is widely known as a city of worship, learning, literature and light. But, more than anything else, the city is associated with the Ganges River. Images of the city highlight the ghats or stairs that line nearly the entire waterfront of the city, the boats that line up to carry passengers into and across the river, and the numerous temples that make up the city skyline (see Figure 4.25a-d):

“The curving shore is lined with great flights of steps, the bathing and burning ghats, with massive temples, in turn tawdry and splendid, with monasteries and the palaces of princes from all parts of India. Behind these is a labyrinth of narrow, fetid alleys, overhung by tall galleried houses, and interspersed with innumerable shrines.” (Spate and Ahmad 1950, 264)

The ghats not only capture the attention and admiration of visitors to the city, they also:

“are the primary public space for interchanges between pilgrims, tourists and their service providers. They are also a setting where residents witness public uses of the Ganga and form opinions about sewage management infrastructure… perform their respective practices and interact as strangers.” (Alley 1996, 192)

Varanasi occupies the western bank of the Ganges River as its course turns, briefly, north before joining with the Ghaghara tributary and continuing east into Bihar. The city was originally located in the four kilometers between the Varuna and Asi rivers, but has now grown beyond these boundaries into a large urban agglomeration with more than 3 million residents (Census of India 2011). Tourism is the single most important industry in Varanasi, bringing more than 1.4 domestic and 125,000 foreign overnight stay tourists into the city each year (Ministry of Tourism 2006). Most of these come to see the Ganges, one of the city’s many temples, or to participate in arts and cultural activities, especially the study of yoga and music. The city is also well known for handicrafts and trade, though both of these likely developed to cater to or take advantage of the large numbers of tourists and pilgrims in the city. The silk weaving industry in Varanasi is especially well known for producing top-end saris, often woven with gold in intricate designs. Silk dyeing and weaving employ thousands of people in the city, especially children (Cumming 1994).

Varanasi was selected as a study site because the city itself is nearly synonymous with the Ganges. The people of Varanasi seem to accept this association, relying on
imagery of the city and ghats in tourism brochures, and taking advantage of this affiliation to promote the city as the primary site for abatement efforts and investment. Of course, Varanasi is also home to one of the most renowned anti-pollution NGOs in the GRB: the Sankat Mochan Foundation (SMF). The SMF is a quasi-religious organization that seeks “to restore the [Ganges River] to its pristine purity and glory by preventing [the] discharge of pollutants into it” (SMF 2006). Many local activists believe that this
work to save the river must take place at Varanasi first, because this is the city of the Ganges and because water quality is purported to be worst at this site (see Chapter Six). However, it is only in terms of BOD and fecal coliform levels that Varanasi is unparalleled: 2006 testing showed that BOD levels are twice as high (15.2mg/l) in the river as it leaves Varanasi than as it leaves Kanpur (BOD levels at Kanpur are themselves two or three times higher than those at Allahabad, at 8.6mg/l and 3.2mg/l respectively), and fecal coliform testing found as many as 94,000-110,000 bacteria per 100mL sample of river water (CPCB 2006). This compares to about 9,000/100mL in Kanpur and 5,000/100mL in Allahabad. All of these far exceed the Bureau of Indian Standards (BIS) maximum for Class B rivers of 3mg/l BOD and 500/100mL of coliform. Each of the study sites clearly faces unique and shared challenges in their efforts to improve river water quality. The following chapters will explore how people navigate these challenges and come together (or fail to come together) in their efforts to overcome them.
CHAPTER FIVE
WATER POLICY AND THE PRODUCTION OF POLLUTION KNOWLEDGE:
DISCOURSES OF PARTICIPATION AND AWARENESS

The previous chapter presented a background and context for contemporary anti-pollution politics in the Ganges River Basin. This chapter discusses the historic trajectory of river water quality governance in India and introduces some of the prevalent discourses that are shaping the socio-political struggle over pollution abatement. Specifically, the chapter presents the results of a discursive analysis of national water pollution policy documents, informed by news and press releases, reports, and interviews with public officials. This analysis explores the reproduction of discourses of “participation” and “awareness” in environmental policies and programs adopted and supported by the Central Government of India (GoI), the Ministry of Environment and Forests (MoEF), and its various institutions and offices. Examination includes documents drafted between 1948 and 2009 (see Table 5.1). As described in Chapter Three, methods of discursive and textual analysis draw upon those described by Fairclough (1995, 2003) in order to understand how pollution knowledge is constructed and reproduced. In this approach, the policy record is itself explored as an ongoing and changing discourse: this “conversation” reflects not only contemporary pollution knowledge, including international meta-discourses surrounding environmental conservation and sustainability, but also a focused effort to reproduce such knowledge and to reshape the socio-politics of pollution abatement.

Analysis of the policy record and contextualizing documents revealed four discernable meta-discursive shifts that occurred in the post-independence period, classified here as: the period from Independence to Stockholm (1947-1974); the first “environmental decade” (1974-1985); the Ganga Action Plans (1985-1992); and, the post-adjustment period (1992-present). This chapter begins by examining each of these policy periods in order to explore how approaches to water pollution governance have changed over time. Then, detailed analyses of discourses related to “participation” and “awareness” are provided in order to explore the specific and grounded outcomes of those historic discursive shifts, which have resulted in the official attempt to shift blame
for the “pollution problem” onto the backs of citizens and water users, the rollback of industrial regulation, and state cooptation of “public participation”. These discursive structures form the background against which anti-pollution social movement organizations (SMOs) struggle to redefine pollution knowledge and water politics in the GRB, and shape the context in which they must wrestle with the benefits of complicity with and/or resistance against official agendas. The next chapter will explore how the three study ESMOs operate within this context and how they, in turn, attempt to affect shifts in pollution knowledge and abatement politics in the GRB through reproductive, contentious, and oppositional activities.

5.1 The Context of Text: History and Structure of Indian Water Quality Policy

While national water pollution policies reflect and respond to particular domestic social, political, and ecological circumstances, they also reflect international trends in approaches to water quality governance and natural resource conservation. This chapter opens with a chronology of policy measures related to river water pollution and traces the trajectory of these efforts while placing them within wider national and international historical contexts. The goal of this discussion is to develop a picture of the broad discursive shifts reflected in various stages of policy development in India. While policies and action plans are sometimes “established without an effort to follow them up” with practicable laws or programs, they are meant to guide state action and provide the

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<tr>
<th>Year</th>
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<tr>
<td>1956</td>
<td>River Boards Act</td>
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<td>1974</td>
<td>Water (Prevention and Control of Pollution) Act</td>
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<td>1985</td>
<td>Ganga Action Plan</td>
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<td>Ganga Action Plan- Phase Two and National River Conservation Plan</td>
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<td>National Environment Policy</td>
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rationale for official approaches to pollution prevention and abatement (Dwivedi and Khator 1995, 64). Therefore, they are some of the best source material for understanding official discourse on water pollution prevention and abatement strategies.

The discursive and textual analysis of policy documents and legislation produced between 1948 and 2009 revealed four historical periods characterized by distinct shifts in approaches to the control and abatement of river water pollution: The first policy phase began in the mid-1960s, following a post-independence period characterized by negligible environmental legislation. International pressure related to the rise of global conservationist movements led to the adoption of pro-nationalist modernist environmental discourses. Policies drafted in this period envisioned a strict regulation of industrial effluents and municipal waste, but were curtailed by domestic power struggles between Central and State governments.

The second phase began with the passage of sweeping environmental legislation in the mid-1970s, kicking off the first “environmental decade”. The inability to balance the pursuit of economic growth with environmental protection and conservation measures led to the adoption of “polluter pays” principles and Neomalthusian-inspired efforts to reduce environmental degradation through population control measures. But, these efforts failed to produce the results they promised and actually allowed further environmental deterioration over the next decade.

Third, the disastrous 1984 industrial gas leak in Bhopal, Madhya Pradesh, inspired renewed civil environmental activism and led to another round of new environmental legislation. This period is marked by passage of the Ganga Action Plan (GAP), the first such scheme to tackle river water pollution at a basin-wide, inter-state scale and to reflect a shift in international discourse that promoted the adoption of principles of public participation.

Fourth, in the early 1990s, India suffered from an economic recession that resulted in adoption of a series of structural adjustment programs (SAPs), which (among other measures) forced the nation to implement policies that favored foreign investment and loosened restrictions on industrial growth. This reality had to be married with commitments to the goals of sustainable development and participatory governance, producing a set of interesting discursive maneuvers by government officials. Each of
these periods, along with the policies and outcomes they produced, is discussed in greater detail below.

5.1.1 From Independence to Stockholm (1947-1974)

Following independence and withdrawal of the British Raj in 1947, environmental protection fell low in priority on a national agenda concerned with increasing food production, protecting domestic security, and establishing status as a global power. Early post-colonial river water governance largely maintained the British colonial model, which focused on the punishment of instances of poisoning and “defoulment” of water sources that resulted in harm to human health or lost income\textsuperscript{xliv}. By the 1960s, the lack of comprehensive resource management and environmental protection policies had exacerbated problems like pollution and deforestation at a time when most world powers were experiencing an escalation of popular environmental concern and activism. As the largest recently independent nation, India sought not only to protect its environment and resources, but to keep pace with other countries that were adopting new conservationist legislation. However, efforts to protect the environment were viewed in conflict with economic development goals and the agenda of rapid national industrialization envisioned by the first Nehruvian administration. Indira Gandhi emphasized this perspective when speaking at the 1972 Stockholm Conference on the Human Environment, where she highlighted connections between poverty and pollution, stressing the need for recently independent nations to encourage economic growth. The path from national independence to leadership at Stockholm was characterized by pro-nationalist sentiment that struggled to prioritize either economic growth or environmental protection, without instituting any real efforts to marry the two. The environmental legislation passed during this period, while frequently revised, established a benchmark that continues to influence approaches to environmental policy-making today.

In the decade following Independence, parliament passed two important laws governing river water quality. The 1948 Factories Act empowered State-level governments to frame and enforce rules regarding the disposal of industrial effluents. Under Section 12 of the Factories Act, Uttar Pradesh (UP) created its own set of Rules (1950) that required all factories to obtain consent for disposal of effluents from the State
Board. Instituted in 1955, the UP State Effluent Boards were the first of their kind established in India (Tripathi and Pandey 2009).

The broader 1956 River Boards Act, passed with the Interstate Water Disputes Act, established advisory boards to propose river basin-wide irrigation projects and monitor data regarding water availability and water quality. This was the first law to suggest basin-wide, multi-state regulation of river waters in order to mitigate disputes that had arisen between river-sharing states. However, the River Boards served only an advisory capacity and had no direct power to monitor or regulate water quality, or to approve river water projects. These Acts were among the first to empower state governments and inter-state authorities, rather than municipal courts, with limited governance of river water quality. But, the prevention and abatement of pollution were subsidiary to their principal objectives. Water quality was necessary only as part of a broader effort to ensure “optimum utilization of water resources of the inter-state river” (River Boards Act 1956, c. 3.13). In keeping with the British model, post-independence legislation was more concerned with the health and safety aspects of water pollution than with its environmental implications. Most abatement efforts were “piecemeal”, “fire-brigade” responses to often-localized emergency situations, rather than comprehensive or preventative strategies (Khator 1991, 54).

For two decades following independence, the national political agenda was occupied with issues related to national unification, war, and poverty alleviation. Policy-making followed a Soviet-inspired system of Five Year Plans meant to guide policy creation, which ultimately focused on economic development. While early planning included considerations related to agriculture and irrigation, environmental protection and conservation were not incorporated until 1968, with the drafting of the Fourth Five-Year Plan (1969/70 to 1973/74). In it, the Planning Committee called for attention to “the environmental impact of planning and development” (Dwivedi 1997, 64). But environmental protection continued to be discussed as an obstacle to the national development agenda, particularly in the areas of industrialization and agricultural production. This is exemplified in the Central government’s mid-decade embrace of Green Revolution technologies that promised increased food production, which also increased water pollution from the intensive use of pesticides and fertilizers (Joshi 1999).
By the 1960s, water pollution was recognized as an increasing problem and, in 1962, the Ministry of Health sponsored a study of the problem that was intended to produce findings upon which to base laws “to regulate water pollution from domestic and industrial sources” (Khator 1991, 57). The findings recommended national-level legislation, in addition to that which already existed in certain states, in order to ensure a more comprehensive response to the problem of water pollution. But, constitutional provisions placed the governance of water resources under State, rather than Central, government authority, hindering this effort. So, the Central government first had to pass constitutional reforms that moved water governance from the State List to the Concurrent List, meaning that both Central and State governments would hold jurisdiction over water resources.

While the inclusion of water on the Concurrent List allowed the Central government to draft bills pertaining to water pollution, support and ratification had to be obtained from individual state governments who were less interested in pollution abatement than water distribution schemes (ibid.). Even after parliamentary redrafting, only six states were signatory to preliminary versions of a national water bill, making it applicable in less than a quarter of Indian states during the 1960s. At the end of the decade, efforts to pass a national water policy were overshadowed by the election of Indira Gandhi and subsequent split of the ruling Congress Party (officially Indian National Congress or INC). In order to retain a strong majority in both parliamentary houses and state legislatures, Indira’s Congress Party (R) united with the Congress Party of India (CPI) and instituted more populist and progressive social policies.

Despite Indira’s progressive leanings, environmental issues continued to take a back seat during the early years of her first administration. Following her 1971 landslide re-election, some attention was turned to the environment as the nation prepared a preliminary report for the 1972 United Nations Conference on the Human Environment in Stockholm. In preparing the report, the committee convened to make recommendations on environmental issues to the Central government found the degree of environmental degradation so “shocking” that they recommended immediate creation of a National Committee on Environmental Planning and Coordination (NCEPC) just four months before the Conference began (Environmental Information Systems).
Indira’s administration was so focused on poverty eradication and economic development that “they refused to participate [in the Conference]… until the definition of environment was broadened to include issues of poverty, hunger, and sanitation” (Khator 1991, 55). Once in attendance, Indira denounced the Conference’s exclusive attention to the environment, particularly pollution, and instead argued that poverty itself was the worst form of pollution (Dwivedi and Khator 1995). This radical view drew attention to the interconnection between environmental degradation and economic development, but only in terms of the impacts of poverty on the environment, rather than the consequences of unchecked economic development. It also helped Indira lobby and rally support from other non-aligned countries in her attempt to establish India as leader of a conference block of “developing” countries. Ultimately, Indira adopted a complex position in which she denounced the issue of pollution at the Stockholm Conference, but championed environmental protection after returning home. This reversal has been credited elsewhere to her personal insecurities and vulnerability to international critique (see Khator 1991). But, Indira had to carefully balance the demands of two groups: domestic critics who were reluctant to preserve an environment whose resources could be tapped to fuel economic development, and an international community that was concerned with the global impact of pollution and environmental deterioration in newly industrializing nations.

The Stockholm conference was a significant event for Indian environmental legislation because it provided the impetus for passage of the first comprehensive round of environmental legislation and drew such significant international attention to environmental issues in India that the Central government was able to pass those laws with little open objection from industry or state governments (ibid.). This broke the trend seen in other countries, like the United States and Japan, where citizen environmental groups or campaigns pressured their own governments to create new laws and institutions to monitor or protect against environmental degradation. Environmental legislation in India took a decidedly “top-down” form, being not only drafted, but also driven by the Prime Minister and other government officials, rather than being written in response to citizen grievances. As a result, little public discussion or citizen participation was incorporated into the early policy drafting or program planning stages. The shortcomings
of this approach were obvious, and expressed repeatedly by members of the Lok Sabha, who argued that "top down" legislation would have little impact and be difficult to implement because it would be out of touch with the problems being faced by the public.

According to Renu Khator (1991), “The issue was defined by the government as based upon the perceptions of the people within the government. The strategies adopted to solve the issue were the ones that were preferred by the government itself.” (63). Among Central and State Ministers and officers, the debate over how to approach environmental governance and prioritize response to specific problems took on a decidedly nationalistic tone. Those in favor of new regulations argued that India needed to protect its national ecological heritage and demonstrate that the nation was just as capable of safeguarding its resources and cleaning its rivers and streams as other world powers, like the U.S., U.K., and Japan. Arguments against legislating conservation held that new laws would obstruct economic development and that the nation should draw upon its considerable wealth of natural resources in order to build the economy and secure India’s position as a world power. Both of these perspectives would influence later stages of environmental policy-making, specifically the late-century adoption of sustainable development as an attempt to balance conservation and economic growth. In the next period, we see pro-nationalist discourses evolve in the effort to concentrate power over environmental management with the Central government.

5.1.2 The First “Environmental Decade” (1974-1985)

The first “environmental decade” that followed the Stockholm Conference began with a spate of new legislation and ended with one of the most devastating environmental disasters in Indian history. The path from Stockholm to Bhopal was littered with missteps and false starts as initial rounds of environmental protection laws were critiqued for being ineffective, weak, and underfunded. Air, Forest, Wildlife and Water Acts were all passed in the early and mid-1970s, largely under administrative pressure. While comprehensive in design, these laws were burdened with large bureaucracies and insufficient funding.

The 1974 Water (Prevention and Control of Pollution) Act was an important piece of legislation that established a framework for the division of Central and State duties related to pollution prevention, monitoring and abatement. The Act created a vast network of boards, offices and personnel responsible for carrying out these duties and its
enforcement. Under the Act, both Central and State Pollution Control Boards (PCBs) were established and charged with promoting the “cleanliness of streams and wells” through the prevention, control and abatement of water pollution (art. 16, emphasis added). The Central Pollution Control Board (CPCB) was established as an advisory authority for setting national water quality standards, conducting independent research, and assisting with inter-state coordination and disputes. The State PCBs retained power to draft and implement pollution prevention and abatement programs. At both levels, Boards included representatives from State and Central government, state-owned industry, public health, agriculture, fishery, and “other interests” (in later years, these “other interests” included private industry and non-governmental organizations).

Ensuring the cleanliness of water resources was paramount to Board activities at all levels during the first environmental decade. Strategies to achieve this goal were driven by the Act’s definition of pollution, the first articulated in independent water policies:

‘Pollution’ means such contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or trade effluent or of any other liquid, gaseous or solid substance into water (whether directly or indirectly) as may, or is likely to, create a nuisance or render such water harmful or injurious to public health or safety, or to domestic, commercial, industrial, agricultural or other legitimate uses, or to the life and health of animals or plants or of aquatic organisms. (1974, art. 2)

In addition to identifying pollution as contamination of an otherwise clean or pure water resource, this definition performs a couple of discursive maneuvers that prove significant for future legislative efforts. First, pollution is equated to contamination that alters the natural properties of water: this contamination is clearly assumed to have a source external to the water system and is introduced to the water system through (human) activities that include sewage and trade effluents. Pollution is regarded as external and not “natural” to the river system. It does not occur without some sort of intervening human activity.

This idea of “pollution as unnatural” may seem indisputable, but it prompts policy makers to focus on point-source anthropogenic pollutants, rather than those coming from within an eco-system or non-point anthropogenic pollutants (such as increased siltation from upstream deforestation and flooding or runoff from streets and farms). It also
precipitates technological responses to solving the problem of pollution. At the municipal level, the technological “fix” is deemed an appropriate solution to pollution problems caused by the “unnatural” concentration of industry and population density in urban areas. An official with the Varanasi Jal Nigam exemplifies this view in saying, “the pollution plan is a totally technical matter” (interview, 27 February 2009). In later years, this perspective would be reflected in action plans for pollution abatement at Kanpur and Varanasi, where high-tech electric sewage treatment plants and crematoria would be constructed, despite popular acknowledgement of their infeasibility and the lack of sufficient power supply to run these works (Subramanian 2009).

Second, pollution is identified as contamination that causes injury to human health or reduces the productive capacity of water. The value of water is limited to its “domestic, commercial, industrial, agricultural” uses (Water Act 1974, c. 1.2). This appraisal is a carry-over from colonial discourses that placed water pollution under the realm of public health concerns and only permitted litigation in cases where the productive capacity of a water resource was diminished. This discourse is important because it separates the river or water body from the productivity of its water, so that the water, rather than the river as a whole, becomes a material or object of value. This allows for a river and its water to be used and managed as two separate entities: water can be separated from the river, stopped and moved and different points without affecting the river. The river itself, its larger watershed, and the riparian ecosystem are also not counted among the productive values of water. Because water and river are separable, it is the water, not the river, that is regarded as polluted, leading the Act to endorse pollution abatement methods such as water dilution, which aims to increase “tolerance limits of pollution permissible in the water of the stream”, rather than reduce the overall pollution load (Water Act 1974, c. 4.17).

The 1974 Water Act has been recognized elsewhere as both an “excellent piece of legislation” and, once implemented, an abject failure (Khator 1991, 69). One of the Act’s main shortcomings was the ability of state governments to exempt some areas from the water quality standards established by the CPCB. This enabled local- and state-level corruption, as individual industries used their often significant political influence to ensure that their factories were included in non-compliance zones or were otherwise
exempt from the intended regulatory effects of the Act\textsuperscript{xlvii}. A second weakness was that the Act initially applied only to new industries, which were required to receive clearance from State PCBs, while existing industries could not be closed due to non-compliance.

The subsequent 1977 Water Cess Act allowed for fines to be levied against existing polluters, but they were often less costly than implementing abatement technologies and procedures. They came to be regarded as a \textit{de facto} “pay to pollute” system, wherein polluters accepted fines levied against them rather than change their practices. When State PCBs did take action to close offending industries, they were required to do so through lengthy legal proceedings that discouraged action against all but the grossest polluters: between 1974 and 1983 only 16 out of 1483 large- and medium-size offending industries were taken to court under the Act (Khator 1991, 70). Sanctions against government agencies and municipal polluters, who often allowed the dumping of untreated sewage directly into rivers and other water bodies, were not permissible under the Act. Finally, unlike similar laws in the United States, the Act provided no legal recourse for citizens affected by pollution. Instead, individuals had to petition Boards to file court cases against harmful polluters who were operating without Board permit. With limited funding, Boards were only able to follow up on a small number of the complaints filed\textsuperscript{xlvii} (ibid.).

Just as the 1974 Water Policy was put into action, India went into a state of national emergency following PM Indira Gandhi’s conviction for electoral fraud. Indira and then President Fakhruddin Ali Ahmed declared the Emergency in response to widespread protests and strikes, justifying their action in the name of safeguarding national security. Between 1975 and 1977, elections and civil liberties were suspended, press censored, opposition imprisoned, and Indira ruled the country by fiat. In the name of protecting national health and economic growth, she directed her son, Sanjay Gandhi, to conduct slum clearance and “family planning” programs in order to address problems of persistent poverty, natural resource depletion, and environmental pollution. These actions resulted in the displacement of thousands of people and the coercive, and sometimes forcible, sterilization of hundreds of men and women. At the end of the Emergency, both Sanjay and Indira were charged with, but not convicted of, human
rights abuses. The Congress Party also lost post-Emergency elections to the Janata (People’s) Party, and yielded executive control for the first time in Indian history.

During the Emergency, Indira passed a number of laws, including the 42nd Amendment to the Constitution of India. Among a host of other actions, the Amendment directed that, “[t]he State shall endeavor to protect and improve the environment and to safeguard the forests and wild life of the country” (Constitution of India, art. 48A). In addition to these fundamental duties of the State, individual citizens were also charged “to protect and improve the natural environment including forests, lakes, rivers and wild life, and to have compassion for living creatures” (ibid., art. 51A). A later court case expanded Article 51A to apply to industry, which the courts have determined to be a “legal person” (Agrawal 1994, 69). Of course, implications of these decisions are manifold: industries may be held to the same duties as individual citizens, but may also enjoy some of the same individual rights afforded under the Constitution. With the passage of the 42nd Amendment, the Constitution of India became one of few national charters to charge their citizens and government with responsibilities for environmental protection.

The Janata Party was in power for less than three years, but oversaw approval of the Sixth Five-Year Plan (1980-1985). The Plan emphasized the need for state provision of sewage facilities and safe drinking water under expansion of the Minimum Needs Programme (MNP), a previously underfunded effort to improve living standards through investment in education, public health, rural infrastructure, sanitation, and urban environmental improvement. Fundamentally a social services program, the MNP was established with the goal of improving living conditions in order to facilitate rapid economic development.

When Indira returned to office in 1980, she oversaw creation of the Department of Environment (DOE) following a report from the Tiwari Committee that recommended formation of a stronger, national-level agency to monitor the state of the environment and to help coordinate Central and State environmental programs. Although the DOE was able to conduct assessments of development projects and monitor water quality, it suffered from the same limitations as the CPCB: both were essentially research and advisory bodies that had little power to implement programs, enforce laws, or penalize
offenders. As the decade advanced, these national environmental agencies were accused of being merely symbolic and unable to achieve the improvements in environmental quality that they promised (Environmental Information Systems). These criticisms were borne out by the events following the industrial disaster in Bhopal, Madhya Pradesh.

On December 3, 1984, a pesticide plant in Bhopal leaked dozens of tons of toxic methyl isocyanate gas, leading to the deaths of thousands of people. Widely regarded as the worst industrial and environmental tragedy in Indian history, the event was compounded by the failure of plant staff and Union Carbide executives to make use of emergency alert systems, notify public officials of the leak, report the precise chemical content of the gas to health officials, or provide full compensation for the health, economic, and environmental impacts of the event. The administration of Rajiv Gandhi, who assumed the Prime Ministership following the assassination of his mother in October of that year, and the DOE were accused of being slow to respond to the leak, assisting Union Carbide executives to escape prosecution, and failing to ensure factory safety.

The Bhopal disaster drew attention to environmental issues, particularly industrial chemical pollution, and to the lack of adequate legislation for the protection of public safety. It provided evidence for the argument that industrial regulations had clearly not been successful. Not only was the disaster possible because of a lack of governmental oversight in industrial safety standards and protocol, but the lack of recourse experienced by the victims of the tragedy drew attention to the inadequacy of environmental laws to protect victims of industrial accidents. The public outrage that followed the disaster led to the enactment of new environmental legislation and a reorganization of administrative agencies, as well as to the creation of a host of environmental protection groups.


The Bhopal disaster provided Rajiv’s newly inaugurated administration with the impetus to revise India’s environmental policy framework. Rajiv strove to “bring a corporate management approach to the task of running the Government of India” that came to be dually applied to environmental governance (Iyer 2003, 50). Following his appointment as Prime Minister, and under pressure from domestic and international environmentalists, Rajiv and his Central administration redrafted much of India’s environmental legislation and restructured its oversight agencies in the mid- and late-
The most significant of these changes was the creation of the Ministry of Environment and Forests (MoEF) in 1985\textsuperscript{lviii}.

The MoEF, like other Ministries, is found at the highest level of Central Government and subordinate only to the Prime Minister, President and administrative cabinet. The Minister of Environment and Forests sits on the national Council of Ministers and is assisted by two Ministers of State, who also answer directly to the Prime Minister. Ministerial status granted the MoEF greater enforcement capability and allowed for the centralization of previously independent units, like the CPCB, under one umbrella agency (Environmental Information Systems). While individual states initially retained control of pollution abatement programs, the ministerial standing of the MoEF reflected the GoI’s commitment to increased centralization of environmental governance. The MoEF continued many of the services and responsibilities of the DOE, but it also adopted a greater role in setting standards and monitoring for water quality compliance, especially in rivers and lakes shared by multiple states. At the passage of the 1977 Water Cess Act, only 18 water-quality monitoring stations were operating across the nation. By 1992, 480 stations had been established, most along major inter-state rivers (Environmental Information Systems).

In terms of pollution abatement in the GRB, the most significant program instituted by the MoEF was the Ganga Action Plan (GAP). An inaugural effort of Rajiv Gandhi and the MoEF, the GAP (Phase One) was introduced in 1985 and administered by the Ganga Project Directorate (GPD). One of the two independent units of the MoEF, the GPD was directly responsible for reducing the pollution load in the Ganges River through projects administered in 25 (and later 59) of the largest cities along the river. The GAP is the first, largest, and most complex of India’s River Action Plans (see Figure 5.1 for a chart of the organizational structure of the GAP, later NRCP, that illustrates relationships between the GPD, central and state governments, and other state agencies, including pollution control boards). It emphasizes interception of pollution, provision of low-cost sanitation, and promotion of pollution-reducing technologies.

A number of different aspects of the program make the GAP unique. First, it is implemented at a basin-wide scale, rather than by individual states or municipalities. This is significant because it provides the Central government with greater oversight under
ORGANIZATIONAL STRUCTURE FOR THE GAP (NOW NRCP)
(Source: Department of Environment, Govt of India, 1985)

CENTRAL GANGA AUTHORITY (Now NRCA)
Chairman: Prime Minister
Policies Programme-Approval, Review

STATE GOVTS
Nodal Deptt.
Programme formulation, Co-ordination at state level

STEERING COMMITTEE
Chairman: Secretary, MOE&F,
Chief Secretaries of States,
Representatives of Ministries
Specialist organizations and experts
Action Plan approval, fund allocation, programme formulation

GANGLA PROJECT DIRECTORATE
(Now NRCD)
Project Director
Project appraisal, clearance, fund release, coordination, monitoring, servicing CGA (now NRCA) and Steering Committee.

CENTRAL GOVT
Specialised Deptts. and agencies,
Central Pollution Control Board, DNES etc.
Schemes preparation, execution, Pilot projects.

STATE AGENCIES
Water & Sewage Boards, Pollution Control Boards, Development Authorities, Local Bodies, Specialist Agencies,
Scheme preparation, execution, maintenance

NON GOVT-ORGANISATIONS
Voluntary Organisations
Scheme preparation, execution
Maintenance, public participation

Figure 5.1 Organizational structure for the Ganaga Action Plan (GAP)/National River Conservation Plan (NRCP)
(Department of Environment. 1985)
new abatement programs, but also grants their agencies enhanced ability to enforce older laws and standards that previously fell under the purview of state and local authorities. Second, it focuses on abatement of municipal pollution, especially untreated sewage. This breaks from previous programs, and later policies, that prioritize industrial pollution abatement. While the GAP emphasizes dilution of contaminants in the river, it was the first policy to call for “[t]he immediate reduction of pollution load (leading eventually to total prevention)” (Department of Environment 1985, c. 4.1).

From the initial drafting of the GAP, limitation of pollution from religious practice and rituals was given high priority. According to the Introduction of the GAP, “urgent steps need to be taken to prevent [municipal and pilgrim] pollution and restore the purity of river water” (Department of Environment 1985, c. 1.1). In order to achieve this, officials incorporated two efforts into program administration: Hindu definitions of pollution and purity were adopted into official policy discourse and “awareness-raising” programs were aimed at changing the water use practices of Hindu worshippers. At the 1985 inauguration of the Plan, Rajiv Gandhi declared that the sacred purity of the Ganges was unquestionable, but that pollution of its waters was undeniable and caused by the introduction of the “dirt of the city”, and other sources, into the River. While he made clear that religious and material pollution were not the same, in Rajiv’s speech these ideas were intertwined in order to emphasize that measures to reduce both types of pollution would be necessary to make the waters of the Ganges “clean” again (Alley 1998).

While religious notions of pollution and purity were promoted in official discourse surrounding the GAP, they were not discernable in the implementation of the Plan and the locally-run programs that represent the transformation of Plan discourse into practice. Instead, municipal programs adopt an older discourse that views pollution as “waste” and “contamination” which affects an otherwise “pure” or “wholesome” water resource. So, even though religious notions of purity and impurity were incorporated into water pollution discourse, government officials simultaneously perpetuated two distinct ideas about pollution: First, pollution was viewed as a sullying agent that reduces the natural productivity of water resources; Second, pollution was viewed as befoulment of a sacred object caused by the introduction of previously unclean items or materials. While
the latter discourse became dominant in official speeches and press releases, the former continued to dominate policy choices and programs institutes by the MoEF and GPD. Both of these discourses draw upon ideas related to cleanliness in order to build pollution knowledge, but for many water users they are fundamentally at odds: a rotting corpse is unclean under the first view, but is purified through submersion in the river under the second view.

Shortly following the inauguration of the GAP, Rajiv’s administration passed its first major piece of environmental legislation: the 1986 Environment Protection Act (EPA). Drafted in response to the Bhopal tragedy, the EPA is really India’s first extensive environmental legislation, meant to safeguard air, water, land, and property, as well as the interrelationships between these and human or plant and animal life (1986, c. 1.2). One of the main purposes of the Act was to extend and reaffirm protection of the human environment and to prevent hazards to human beings that result from environmental degradation or the mismanagement of hazardous waste (ibid., preamble). The Act also expanded the definition of “environmental pollutant” to include any substance “present in such concentration as may be, or tend to be, injurious to environment” (ibid., c. 1.2). This was one of the first efforts to prioritize environmental damage, rather than risks to human health or economic investment, in the approach to pollution abatement. These new priorities and related programs were supported by a large increase in the MoEF budget, from Rs. 405 million under the Sixth Five-Year Plan (1979-1985) to Rs. 4279.1 million under the Seventh Plan (1985-1989) (Dwivedi 1997).

National water pollution governance was more comprehensively addressed in the 1987 National Water Policy (NWP), which represented a complete revision of the 1974 Water Policy in response to earlier criticism. The 1987 Policy increased fines and penalties against polluting industries and required all old industries, in addition to newly established ones, to receive State Pollution Control Board clearance. But, like its predecessor, the NWP failed to be fully implemented and instead “remain[ed] largely a set of general principles” rather than a cohesive program for national water quality governance (Iyer 2003, 55). The NWP reads as a list of goals regarding what best practices should be undertaken in relation to water use and pollution (i.e. we shouldn’t deplete ground water). But, there is little mention of why or where these problems occur,
how they can be avoided or fixed, or what real steps could be taken to ensure Policy goals. These best practices reflect contemporary scientific knowledge about water resource management, but fail to consider “grounded” situations and practices that would affect the success of its efforts.

Efforts to ensure improved water quality were subsumed by the NWP’s concern with managing national water resources in a manner that reflected the Central administration’s vision of India as a high-tech, modernized nation and supported an industry-led approach to economic development:

Water is one of the most crucial elements in developmental planning. As the country prepares itself to enter the 21st century, efforts to develop, conserve, utilise and manage this important resource have to be guided by national perspectives. The need for a national water policy is thus abundantly clear: water is a scarce and precious national resource to be planned, developed and conserved as such. (National Water Policy 1987, art. 1)

The NWP continued to place emphasis on the role of water resources in national economic development strategies. Introducing the principle of “polluter pays”, the Policy tried to ensure that point-source polluters would pay for the environmental, health, and economic damage they caused: “The adverse impact, if any, on the environment should be minimised and should be off-set by adequate compensatory measures” (ibid., art. 4.3).

“Polluter pays” is implemented in India as a deterrent that seeks to prevent pollution by taxing or fining industries for their effluents, but is also in place for cases of accidental or negligent gross pollution that cause environmental damage, harm to human health, or financial loss. Unfortunately, the fees are often so insignificant that they are easily incorporated into product cost, or serve themselves as a deterrent in the adoption of more costly treatment methods or technologies that would reduce the total discharge of pollution. According to Ramaswamy R. Iyer (2003), the “polluter pays” principle “seems sounds but it is in danger of being inverted from ‘if you pollute, you must pay’ to ‘if you pay, you can pollute” (167).

From 1985 to 1992, environmental issues garnered greater national attention and pollution abatement in the Ganga River Basin (GRB) became a defining project for Rajiv Gandhi’s administration. The GAP ushered in the first effort to incorporate participatory governance into program implementation and was a significant attempt by the GoI to include formal Hindu religious interpretations of purity and pollution in discourses
surrounding abatement programs. The GAP broke from the prior understanding of pollution as point-source waste and inefficiency seen in earlier policies and began to promote the idea that pollution emanates from human bodies: particularly those of worshippers and domestic water users. These ideas become more significant with further embrace of sustainability and participation in the 1990s.

Throughout the 1980s, the GoI and MoEF continued to make use of discourses related to nationalism and modernity that supported technocratic approaches to abatement and promoted industrial development over environmental conservation.

Politically, the Congress-Nehru-Gandhi dynasty waned, as this period ended with the rise of the BJP and the destruction of the Babri Mosque in Ayodhya, sparking religious conflict and communal violence. These events precede an economic recession that forced the adoption of new economic policies, discussed in detail in the following section, that have important ramifications for environmental protection and resource management. According to M.G. Rajan (1997), very little changed in the approach to environmental legislation and management/governance between the administrations of Rajiv Gandhi (1984 to 1989) and those of V.P. Singh, Chandrashekar Singh (1990 to 1991), and the first years of P.V. Narasimha Rao (1991 to 1996). This assertion is borne out, at least in part, by the lack of significant new environmental legislation or programs between 1988 and 1992. Both Prime Ministers Singh held office for less than one year, with V.P. Singh vacating after a vote of no confidence. Prime Minister Rao’s first years (1990-1992) were marked by economic recession and political unrest that diverted attention away from environmental issues.

5.1.4 The Post-Adjustment Period (1992-Present)

The recession in the early 1990s left India unable to make payment on its foreign debt and petitioning for a bailout from the International Monetary Fund (IMF). In return for IMF aid, the Indian economy had to undergo a series of structural adjustments that shaped a period of economic liberalization that continues to this day. Prime Minister Rao oversaw the passage of sweeping economic legislation that ended public monopolies, encouraged foreign direct investment, and reduced tariffs. Most significantly for pollution prevention and control efforts, the reforms reduced industrial regulation and licensing requirements. While restructuring did not directly require modification of national
environmental policies, they were rewritten in order to reflect these new priorities. The Central Government adopted the rhetoric of “sustainability” in order to link environmental conservation with economic development objectives.

“Sustainable development” was advanced as a method of increasing the rate of economic growth while minimizing negative impacts on the environment. It became the official approach of the GoI starting with the Eighth Five-Year Plan (1992-1997):

The goal of sustainable development is implicit in the Eighth Plan Document which underlines the significance of ensuring coordinated and integrated Governmental action for conserving nature and ensuring sustainable use of natural resources through a participatory process. (Ministry of Environment and Forests 1993, 8).

Themes of the Plan included decentralization and public participation, although its specific goals were industrial modernization and population control, in addition to poverty alleviation. While sustainable development is ideally an approach that ensures both current and future human needs while safeguarding against environmental destruction, the ambiguousness of the term often leads to strict resource management programs that centralize decision-making and promote resource depletion (Beder 1994). As sustainability became the dominant discourse in the MoEF over the past two decades, the Ministry has been accused of operating in service of national economic development goals, as a resource-management and clearance agency, rather than safeguarding environmental quality (Kohli and Menon 2008).

The effort to marry environmental protection and economic development under the aegis of “sustainable development” materialized in the 1992 National Conservation Strategy and Policy Statement on Environment and Development (NCS), which declares the government’s commitment to re-orient policies and action “in unison with the environmental perspective” by “working towards a unique compatibility between the Development and the Environment” (art. 1.4 and Preface). The NCS states that, “judicious and sustainable use of our natural resources” must be allowed in order to combat poverty and ensure economic growth, and that “[d]evelopment requires the use and modification of natural resources” (ibid., art. 4.1, emphasis added). The document recognizes that this type of growth produces consequences, including, “progressive pressure on the environment and the natural resources”, which “detract[s] from the gains
of development and worsen[s] the standard of living of the poor who are directly dependent on natural resources.” (ibid., art. 1.3).

Drafters of the NCS carefully balanced their call for resource-intensive economic growth with concerns over the effects of these activities, like pollution, which might curb that growth. But, the perceived need to accelerate development turned efforts to protect and conserve the environment into pleasant, but unrealistic ambitions. Article 7.1 illustrates:

> On a philosophical plain, the scientific proof of [environmental] problems provides an opportunity to reconsider the development path ushered in by the industrial revolution, and the blinkered pursuit of lifestyles which place extreme pressures on the natural resource base. But at a practical level, it means pressures on developing countries to take measures which they can ill-afford. (NCS 1992).

The GoI was a leading proponent of the argument that India and other “developing” nations should not need to make the same concessions, in terms of limiting growth or protecting the environment, as so-called “developed” nations. Instead, they should be able to follow along the same trajectory of industrialization, with assistance from developed nations in the form of technology transfers that would lessen the environmental impact of this process:

> It has been India's firm conviction that it is the process of industrialization, and the continued profligacy of industrialized economies that have created the problems which threaten our planet and its life forms. Not only do they use up non-renewable natural resources in disproportionate quantities, but create discharges and emissions which disturb delicate balances in eco-systems and atmospheric equilibrium. It is true, of course, that this has not been done consciously or intentionally…. Nevertheless, the responsibility is clearly established, as also the need for urgent and effective action, by the developed world, to prevent global disaster. This includes not only direct action, but also indirect measures such as creation of an economic order which helps developing countries to exert less pressure on their own natural resources. (NCS 1992, art. 7.2)

Following on this view, the NCS classified all environmental problems in terms of their relation to the processes of economic development. First were “[t]hose arising as negative effects of the very process of development”, which were considered unavoidable, and second, “those arising from conditions of poverty and under-development” (ibid., art. 2.1). The poor people falling under the second category were identified as one of the prime sources of environmental degradation and resource
depletion. In a Neomalthusian fashion, population control was advanced as the essential step needed to simultaneously reduce the number of people living in poverty and slow the pace of natural resource depletion:

Population is an important resource for development, yet it is a major source of environmental degradation when it exceeds the threshold limits of the support systems. Unless the relationship between the multiplying population and life support systems can be stabilized, development programmes, however innovative, are not likely to yield the desired results… the need for a vigorous drive for population control can hardly be over emphasized in view of the linkage between poverty, population growth and the environment. (NCS 1992, art. 2.2)

Population control was listed as the single greatest priority under the action plan detailed in the NCS (1992):

Unabated population growth, as at present, not only adds to the economic burden for all developmental activities, but also reduces the impact of economic growth on our society. Therefore, for the success of our planning, population control becomes the most urgent necessity… Population control should be a national mission for the next decade. (art. 5.1.2)

This rationale fit with ideas about the relationship between poverty and pollution that had been advanced by Indira Gandhi at the 1972 Stockholm Conference and which guided environmental protection and pollution abatement policy-making in India for the first few decades following independence. Like Indira, the administration of PM Rao used this correlation to draw attention to the pollution caused by large urban populations and substandard living conditions, and to distract from the environmental problems caused by rapid, poorly regulated industrial growth.

The 1992 Policy Statement for Abatement of Pollution addressed industrial pollution, but failed to provide any revolutionary new perspectives on regulation or abatement strategies. The promotion of clean technologies was advanced as a primary method for both preventing pollution and encouraging industrial efficiency. The Policy Statement also advocates the use of fiscal disincentives to encourage polluters to reduce their output or undertake effluent treatment measures. Discursively, the Policy Statement continued to reproduce the idea that pollution posed a threat not only to the environmental sanctity of water and the health of the citizenry, but that it also has potential to “adversely affect” and “damage” the economic functioning of the nation (1992, art. 2.3). Nonetheless, connections between “pollution” and economic
development begin to reflect a logic wherein pollution, particularly industrial air and water pollution, became an economic ‘necessity’ (Environmental Information Systems).

Phase II of the GAP, approved in stages between 1993 and 1996, and GAP-related Projects at Kanpur and Varanasi, implemented this prioritization by focusing on the regulation of small industrial operations, less likely to produce goods for export and trade. The GAP-Phase II (GAP-II) was an extension of the first GAP program, which covered both the main stem of the Ganges and its largest tributaries, the rivers Yamuna, Gomti, and Damodar. Programs under GAP-II were initially extended to 59 cities and towns (from 25 with GAP-I), and the Ganga Project Directorate (GPD) was expanded to the National River Conservation Directorate (NRCD), which also administers pollution abatement plans for other principal rivers. National River Conservation Plans (NRCPs) cover 141 towns located along 22 interstate rivers in 14 states. These plans represent an effort to improve the water quality of India’s major rivers through implementation of GAP-based approaches, especially investment in sewage lines and treatment facilities. Rather than being a cohesive policy statement or unified program, GAP-II is a set of programs and projects approved and funded in stages between 1993 and 1996. In its approach, GAP-II did not break in any drastic manner from the methods introduced under GAP-I, despite the fact that GAP-I was widely considered an abject failure that did not succeed in improving pollution levels in the Ganges (The Hindu 2004). Nonetheless, the GAP approach has become the pattern from which all other river water pollution programs are drafted.

While the GAP focused on prevention of untreated sewage dumping directly into the river, the 1993 National Environmental Action Plan (NEAP) addressed official strategies for industrial pollution abatement. The NEAP follows the logic that all environmental problems could be placed into two categories: “those arising due to lack of the development and those which arise on account of development” (Ministry of Environment and Forests 1993, 90). Further, it advances the argument that:

For a country like India which has been for the last five decades, endeavouring for economic growth and development, it is logical to accord primacy to environmental issues arising from the lack of economic development, to ensure that the pursuit for environmental well-being is symbiotically linked to the development process. (ibid., 90)
This explains the MoEF’s nearly exclusive attention to issues like sanitation and clean drinking water provision, while withdrawing from regulation and legislation of “industrial pollution, energy related pollution, hazardous substances, commercial agriculture and overuse of natural resources for industrial activities” (ibid, 90). Instead, the impact of these development-related issues was only to be assessed, presumably to be dealt with once India has a fully “developed” economy. In the meantime, programs for mitigating development-related environmental problems may be adopted, but it seems, only when feasible.

Throughout the NEAP, its authors recognize that the trend toward industrial deregulation will inevitably lead to more pollution: “The process of industrial/trade deregulation initiated in the plan period is bound to promote rapid growth of infrastructure and industries… The impact on pollution and generation of wastes would be considerable as the process of industrialization accelerates” (ibid., 10-11). Rather than speak out against this strategy, a handful of smaller, piecemeal solutions are advanced in order to allay these anticipated effects, most of which involve adoption of new technologies or organizational control measures.

One of the steps taken with the NEAP was the switch from setting concentration-based to load-based standards. This meant that polluting industries were taxed or fined for the total quantity of chemical effluent discharged from a facility, rather than the concentration of particular chemicals in their liquid waste. This move was made in order to “remove incentives to dilute effluents by adding water, and strengthen incentives for adoption of cleaner technologies” (Environmental Information Systems). There was also an effort to target smaller industries that were producing goods for domestic consumption and to encourage similar industries to cluster together in order to share expenses related to effluent treatment.

Fifteen years after the original National Water Policy (NWP) was enacted in 1987, the GoI passed a revised NWP in 2002. At the time, the Bharatiya Janata Party (BJP) controlled the Central government, with A.B. Vajpayee serving as Prime Minister. However, few changes in the overall perspective of the policy can be noted. Language used in the opening article of the 2002 NWP repeats from the 1987 version
with notable additions that emphasize the need for water management and incorporation of socioeconomic concerns:

Water is a scarce and precious national resource to be planned, developed, conserved and managed as such, and on an integrated and environmentally sound basis, keeping in view the socio-economic aspects and needs of the States. It is one of the most crucial elements in developmental planning. *(National Water Policy 2002, art. 1.4, additions to 1987 NWP language indicated in italics)*

After nearly a decade of river water pollution serving as a focal point of national environmental policy, the 2002 NWP passed with very little mention of water quality or pollution abatement. Instead, the document focuses on water supply and provision for drinking water and irrigation, and promotes a nation-wide river inter-linkage program that would allow for water transfer between from water-rich to water-poor regions for agricultural use. Where water quality is discussed, emphasis is placed on the need to develop and adopt “new techniques”, with specific reference to “[s]cience and technology and training” *(ibid., art. 1.9)*. Otherwise, the Policy recommends that effluents should be treated “to accepted levels and standards before discharging them into natural streams” *(ibid. art. 14.2)*, minimum stream flow should be ensured *(ibid., art. 14.3)*, the “polluter pays” principle should continue to be followed *(ibid., art. 14.4)*, and that further legislation should be drafted to preserve water bodies and prevent the further deterioration of water quality *(ibid., art. 14.5)*. The failure to cite precise proposals or plans for improving water quality is illustrative of the general ambiguousness of the entire Policy, which has been described by Ramaswamy R. Iyer *(2007)* as incoherent and not sustained or purposeful *(163)*.

The 2006 National Environment Policy (NEP) stands in contrast to the 2002 NWP by providing specific guidance on actions to be taken and programs implemented in service of its goals. While it does not break with previous emphases on the prioritization of economic development, the NEP does argue that conservation and protection of natural resources will contribute to the economic well being of people:

The dominant theme of this policy is that while conservation of environmental resources is necessary to secure livelihoods and well-being of all, the most secure basis for conservation is to ensure that people dependent on particular resources obtain better livelihoods from the fact of conservation, than from degradation of the resource. *(National Environment Policy 2006, 3)*
In terms of specific policy prescriptions, however, the NEP follows the same logic as other pollution abatement strategies advanced by the GoI and MoEF for more than a decade. It continues to identify poverty and population growth as the primary drivers of environmental degradation, adding that “perverse production and consumption practices” are also contributing factors (ibid., 22). But, each of these is said to have negative environmental effects only when institutional failures occur that result in the lack of enforcement, inappropriate fiscal incentives, and government constraints (ibid., 4). Ultimately, the NEP has been characterized as “implicitly accept[ing] the industrialists’ or project-planners’ negative view of environmental concerns” and “show[ing] a constant deference to the economic point of view” by facilitating industrial investment (Iyer 2003: 168).

Since passage of the NEP, no major new policies have been enacted. However, in 2009, current Prime Minister Dr. Manmohan Singh oversaw creation of the National Ganga River Basin Authority (NGRBA). The Authority aims not only to reduce pollution loads in the river, but also to ensure “minimum ecological flows”, which responds to many critic’s concerns that the amount of water removed from the river (or held in upstream dams) prevents the dilution of downstream pollutants and forgoes any possibility of a clean river (Ministry of Environment and Forests 2009a). This endeavor also runs counter to prevalent approaches, which argue that any “unused” water entering the sea as run-off is a “wasted” resource (Ministry of Environment and Forests 2009b, 80). The authority has launched ‘Mission Clean Ganga’, which aims to ensure by 2020 that no untreated municipal sewage or industrial effluent will flow into the River. In order to achieve this goal, the Central Government is working with seven Indian Institutes of Technology (IITs) to draft new action plans by the end of 2010 (Nanda 2010). The GoI has committed an unprecedented amount of money for the construction of treatment plants and has secured a US$1 billion loan from the World Bank for five years of funding (The Hindu 2009).

It seems that the current effort to clean the Ganges may be more than the usual declarations that often emit from party officials just before major elections. Prior to creation of the NGRBA and the 2009 Lok Sabha elections, the Indian National Congress (INC), led by PM Manmohan Singh and INC President Sonia Gandhi, widow of former
PM Rajiv Gandhi, declared the Ganga to be the “National River” (see Figure 5.2). According to the INC’s Manifesto (Indian National Congress 2009), “Water security is of paramount concern to the Indian National Congress and steps will be taken to enhance it measurably for local communities” (18).

The pattern of presenting pollution abatement in the Ganges as a nationalist project has continued since Rajiv Gandhi’s announcement of GAP-I in 1985. The GAP discursively connected nationalism and modernity to river protection and cleanliness by arguing that the pollution of the Ganges is a national dishonor and an embarrassment to India as a modern nation and world power. For the past decade, this discursive connection has been shifted as river water pollution was presented as a necessary social and environmental cost or unavoidable outcome of national development and economic growth. In the same period, abatement efforts have shifted from their previous focus on
industrial regulation and sewerage provision to industrial clustering and “awareness” programs meant to change the practices of individual water users. In reflection, we have seen a general move from a period where water pollution discourses were characterized by reference to conservation, nationalism, and modernity to one in which policies are structured around neoliberal notions of sustainability targeted at encouraging economic development. The next section explores discourses related to “participation” and “awareness”, their development within the policy framework, and the ways in which they both influenced and reflect the general trends presented above.

5.2 Discourses of Participation and Awareness in Water Pollution Policy
The preceding pages traced a few meta-discursive shifts in Indian water pollution policy. The importance of nationalism, modernity, and sustainability were emphasized in relation to changing ideas about river water pollution prevention, control and abatement. The following pages consider how discursive shifts create or (dis)allow space for meaningful change in approaches to pollution abatement. Discussion surrounds the adoption, development, and products of discourses about “participation” and “awareness”. These discourses shape not only official abatement policies and programs, but also the relationships between (and actions of) government institutions, officials, social movement organizations (SMOs), and individual water users that struggle for change in the GRB. It is argued that “participation” is employed as a “red herring” device to quiet dissent and appease critics of top-down planning, that the goals of participatory governance are far from fully realized, and that adoption of the discursive language associated with “participation” and “awareness” allows government officials to accomplish a number of ends:

• First, the state is able to relinquish responsibility for pollution prevention and abatement, shifting liability to water users who are expected to change their activities and practices.
• Second, the state is able to justify its reduction of industrial regulation.
• Third, the state is able to establish the terms and conditions of participation in environmental governance: to decide who participates when, where, and in what capacity.
Each of these outcomes is discussed in greater detail in the remainder of the chapter.

5.2.1 Participation

“Participation” has been a key buzzword for at least the past three decades, and has informed approaches to economic development, community organizing, democratization, and environmental governance. Generally speaking, the push for “participation” came in reaction to critiques of centralized, “top-down” forms of decision-making in which extra-local governmental or non-governmental groups made decisions to pass laws, implement programs or institute projects without including the input, influence, or involvement of people who would be affected by those decisions (Cooke and Kothari 2001). In its ideal form, participatory governance would empower people to make the decisions and actions that affect their own lives. These “local people” (also called stakeholders, end-users, the “community” or “public”, and target or affected populations) would work with government and non-government agencies in a shared system of decision-making and project-implementation, theoretically producing better results from the programs and projects in which they were involved. But, like all power sharing activities, participatory governance rarely takes this idealized form, and more often serves to reify existing power relations and institutionalize government-led managerialism (ibid.).

Participatory governance was embraced by the World Bank, IMF, and United Nations in the 1980s, and promoted through structural adjustment programs in the 1990s and through events like the 1992 UN Conference on Environment and Development (UNCED) in Rio de Janeiro. Prior to the 1990s, only a few policies or programs instituted by the GoI involved a significant participatory component. Because India’s first environmental protection policies and laws were drafted under pressure from the Prime Minister following the Stockholm conference, they were written in a decidedly top-down manner. Public involvement, consultation, and feedback were notably absent. Officials did not seek input or advice from water users, neither did any established citizen’s environmental groups petition for a greater role or representation in this process.

One of the first programs to emphasize participation was the Ganga Action Plan (GAP), launched in 1985 when the international environment and development communities were first becoming sensitized to the “ineffectiveness of externally imposed
and expert-oriented forms of research and planning” (ibid., 5). Phase One of the GAP (GAP-I) was the first policy to explicitly address participation, its purpose and goals: “Above all, public cooperation and participation have [to] be mobilized to sustain awareness about the problems of pollution of the river, to speedily implement the Action Plan and to maintain the purity of the river” (Department of Environment 1985, 5.1). Rajiv Gandhi and GAP authors were concerned that Hindu religious beliefs regarding the river as pure and inviolable would prevent the wider public from supporting official abatement efforts. They could also face obstacles to program implementation, or even loss of popular political support, if people objected to the Plan. The participation envisioned in the GAP was not public involvement in either planning or implementation processes, but rather more of an consensus-building exercise designed to raise people’s support for the centrally-designed and administered project. This was an important campaign for Rajiv, because his administration had received considerable public condemnation for his handling of the Bhopal disaster, and the Plan to clean the Ganges promised to restore his reputation for environmental protection.

Sarah Ahmed (1994) argues that the participatory measures instituted with the GAP were “symbolic rather than substantive” and that the Plan did not deliver on its promise to change preexisting systems of institutional norms (3). Indeed, while participatory ideals were emphasized in the discourse surrounding the GAP-I, they failed to carry over into plan action. Instead, the GAP set a precedent for future participatory efforts in which public involvement is limited to “end-of-pipe” feedback on programs that are planned by the government, or to “educational” and “awareness-raising” efforts that are meant to facilitate implementation by raising public support for official policy.

During the 1991 economic restructuring, the IMF encouraged India to adopt “participation” as one of four principles of good governance, also including transparency, accountability, and social safety nets (Wendt 1999). The IMF and World Bank first promoted participatory development in response to criticism over the negative impacts of structural adjustment and other sponsored programs. They encouraged a form of ‘bookend’ participation that sought to obtain information from “project stakeholders” prior to program implementation and to gather their feedback once projects were
complete. It was hoped that these efforts would produce more efficient, “high quality” development projects (ibid.).

Participation was also promoted at the 1992 Rio Conference, after which India adopted an approach to sustainable development that re-emphasized the need for public representation. Participation was central to this model of sustainable development because it would allow local people to take part in the decision-making processes that produce the laws and programs affecting their needs and choices. Those actions would have a greater effect on poverty reduction and the conservation of natural resources, because they would reflect the needs of local people, who know best what they need to improve livelihoods and protect resources in their communities. But, as described above, India’s approach to sustainable development drew heavily on Neomalthusian interpretations of the relationships between environmental degradation and population growth. By focusing on the capacity of people, particularly poor people, to create pollution (rather than the health hazards or economic hardships faced by those exposed to pollutants), the GoI brought new meaning to “people-centered” environmental governance. Over time, “public participation” came to consist of efforts to change individual and communal water use practices through education and awareness-raising programs, rather than empowering local people to make decisions about the fate of their environments and resources.

Adoption of “sustainable development” by the GoI following the Rio Conference also entrenched the idea that people’s participation should be limited only to local-scale, rather than national or supra-regional, inclusion. Principle 10 of the Rio Declaration states:

Environmental issues are best handled with participation of all concerned citizens, at the relevant level. At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities… and the opportunity to participate in decision-making processes. States shall facilitate and encourage public awareness and participation by making information widely available. (Rio Declaration on Environment and Development 1992, emphasis added)

Among Indian policy makers subsequently adopting participatory approaches, emphasis was placed on local involvement in program implementation, while people remained alienated from national policy-making and planning processes: “Underlying the policy
statements is the recognition of the principle that effective management and control of natural resources requires the support and participation of the local people” (Ministry of Environment and Forests 1993, 6). The 1992 National Conservation Strategy and Policy Statement on Environment and Development (NCS) emphasized that steps to be taken to ensure the sustainable use of water included, “[m]icro-level planning to develop appropriate methodology and implementation of action plan by involving the people at the village level” (art. 5.2.1.4).

The distinction between local participation and local or decentralized governance has not always been clear. The 1993 National Environmental Action Plan states:

Participatory management systems have been established by various State Governments for managing degraded forest lands. There now remains the larger task of integrating these participatory systems to the panchayats/urban local bodies at the local levels... The National River Action Plan to be shortly launched in India will also necessitate evolving novel local participatory structures for managing river water quality and maintaining rivers in environmentally sound conditions. (112-113)

While local-level participation and local level governance (like panchayats) are not referred to synonymously, neither are they made completely distinct. The GoI envisioned participatory water governance following a model similar to the social forestry system, which is perceived by many officials as a successful effort to decentralize and localize forest management through public involvement:

Water Users’ Associations and the local bodies such as municipalities and gram panchayats should particularly be involved in the operation, maintenance and management of water infrastructures / facilities at appropriate levels progressively, with a view to eventually transfer the management of such facilities to the user groups / local bodies. (National Water Policy 2002, art. 12).

Although social forestry programs allowed for local use of communally- or family-managed forests, they rely upon the ability to divide forest resources into small village holdings or individual tree farms and large state-managed forests. Social or communal water management does not conform easily to this model, as large rivers are not easily divisible into separate resources for village or city users and state or national interests. Water Users’ Associations are also often focused on distribution and access issues, rather than water quality concerns, and dominated by agricultural interests, which allows little space for domestic or household user representation. So, the appropriate form for “local
participation” is unclear, particularly in the case of water quality and pollution abatement programs.

By relying on panchayats and other municipal governing bodies to organize public participation activities, water policies further entrench unequal power relations existing at the village, community, and household level. Women and children, in particular, are further marginalized from the “participatory decision-making” processes that affected them most as primary household water users and water gatherers. This weakness was cursorily acknowledged in the 2002 National Water Policy, but concrete strategies were not identified: “Management of the water resources for diverse uses should incorporate a participatory approach… duly ensuring appropriate role for women” (art. 12).

The question of who participates, and in what capacity, is of course central to participatory approaches. In the early years of environmental policy making in India, so much attention was focused on the division of power between Central and State governments that there was little subsequent effort to address the role of the citizenry. After all, as a representative democracy, there was little in the view of the GoI to distinguish elected officials from the citizenry: people participate by voting for officials that (ideally) represent and protect the interests of their constituents. The idea of a “participative policy” was thought to be in contradiction with representative government: the state draws its power from public sanction, which permits it to take action in the “public interest”, obviating public involvement “even where it excites dissension and resentment” (Ramanathan 1992).

As the Central government gradually captured more decision-making and enforcement power over environmental management, and pollution abatement in particular, they argued that the GoI and its ministries were better able to represent national public interest and will than were the individual states: “[I]t is expedient in the public interest that the Central Government should take under its control the regulation and development of inter-state rivers and river valleys” (River Boards Act 1956, c. 1.2). This effort was strengthened after the Bhopal disaster, which resulted in the general feeling that state-level governments were ill equipped to manage large-scale
environmental problems, especially when they required legal action against other powerful interests, like foreign corporations or large domestic industries.

In the national policy record on participatory governance, three main groups have received a lion’s share of the attention: panchayat or other municipal government bodies, industry (including industrial agriculture), and non-governmental organizations (NGOs). In acting on behalf of the “public” (but not with them), the GoI put more attention into sharing participatory decision-making activities with industry and business (viewed as essential to the processes of economic development and environmental regulation), rather than other forms of public representation, like non-governmental social movement organizations: “Private sector participation should be encouraged in planning, development and management of water resources projects for diverse uses, wherever feasible” (National Water Policy 2002, 13). The Central Pollution Control Board (CPCB) was mandated to include in its governing board up to three individuals “to represent the interests of agriculture, fishery or industry” and “two persons to represent the companies or corporations owned, controlled or managed by the Central government” (Water Act 1974, c. 2.3). A similar order was issued for State and Joint Boards.

After SAP-mandated privatization of state-owned industries in the 1990s, private sector participation was pursued with greater vigor, and justified by highlighting the financial and technical benefits of these partnerships: “Private sector participation may help in introducing innovative ideas, generating financial resources and introducing corporate management and improving service efficiency and accountability to users” (National Water Policy 2002, 13). The choice to prioritize private sector participation reflects the dominant role adopted by industry following privatization and liberalization of the economy, and the desire of the GoI to find partners to share in the costs and benefits of improved water management. It also indicates the influence enjoyed by industries with vested interest in the allocation of water supply, regulation of industrial effluents, and monitoring of factory compliance.

NGOs were incorporated into the participatory framework almost two decades after their private sector counterparts, but not granted seats on the Pollution Control Boards at either State or Central levels. The drive to incorporate people’s participation through state-NGO partnerships became quite strong following the adoption of
sustainable development approaches and the renewed emphasis on people’s participation. The GoI began to view NGOs as an effective conduit for accessing, organizing, and educating the public. They were expected to act as intermediary agencies that would transfer information from the government to the people:

> Implementation of the conservation strategy would be impossible without active participation of the people. Non-Governmental Organizations (NGOs) can play an important role in mobilizing the people at grassroots… [and interfacing] between people and Government to work on community involvement, providing information on environmental surveillance and monitoring, transmitting development in science and appropriate technology to the people at large. *(National Conservation Strategy and Policy Statement on Environment and Development 1992, art. 8.7)*

NGOs could also work to channel the dissent of aggrieved citizens into a form more structured and amenable to officials than popular protest. Then, only a handful of NGO leaders, rather than a mass of disorderly and disaffected individuals, needed to be incorporated into decision-making networks.

An official with the UP State Pollution Control Board explained that the PCBs work with NGOs because they perform a sort of representative participation: standing in for a public that would otherwise be difficult to organize and access (interview, 27 February 2009). Only certain NGOs are incorporated into the participatory process because various ministries and offices are able to select those groups with which they would rather work. While public pressure can affect the dynamic of state-NGO partnerships, organizations that adopt a less oppositional stance, or who share the state’s technocratic-scientific view of pollution control, are more likely to be incorporated into decision-making processes. Also, marginalized populations that do not form official and registered NGOs are often left completely out of the framework, as there are as yet no groups to represent homemakers, children, Muslims, fishermen, dung collectors, and other water users with little or no political associations. These people are even further removed from central decision-making power by the failure to include them in participatory processes.

Public participation quickly moved from being considered a single element in the more comprehensive effort to protect the environment, to being a key component: “People's participation at the grass-root, local and regional levels holds the key to the
success of such a concrete programme of action” (Ministry of Environment and Forests 1993, 2). While “participation” has been discursively embraced and promoted by the GoI, participatory measures have been minimally incorporated into practice beyond invitations for people to provide feedback on policy decisions and program implementation. According to Ramaswamy R. Iyer (2003), former Secretary of Water Resources for the GoI, the 2002 NWP “was drafted and approved entirely without public input or discussion—a fait accompli” (57). Instead, feedback was sought from scientific and economic “experts” and, even then, not included in final drafts of the policy. An economic consultant working with tanneries in Kanpur disclosed that, even when working with private sector representatives, the “government listens and forgets” (interview, 8 January 2009).

“Participation” has yet to fully materialize in GoI and MoEF practice because it is more valuable to the government as a discursive object than as a new approach to governance. By incorporating reference to participatory approaches in policy and program language, the GoI and MoEF are able to take credit for following the IMF’s prescription for “good governance”, to quiet critics, and to quell popular dissent. At the same time, limiting public participation to project-based “bookend” feedback and NGO or panchayat partnerships allows the GoI and MoEF to avoid undertaking the power-sharing activities that would allow for legitimate popular participation. Again, Iyer (2003) argues that current forms of participation represent “a condescension by the government which will retain the primary role in planning, and will graciously ‘consult’ the people concerned. This is the same old tradition of ‘top-down’ planning, and not true participation” (ibid., 60). The next section briefly discusses the discourses associated with environmental “awareness” that followed incorporation of participatory approaches into environmental governance and decision-making practices by the GoI and MoEF. At the end of the chapter, a few observations will be made about the products of these discourses and effects that have resulted from their adoption.

5.2.2 Awareness

The focus on public participation brought concomitant attention to the issue of popular environmental awareness. While not initially part of “participation” discourses, “awareness” became an issue raised by officials concerned with the outcomes of the
power-sharing activities promised by participatory approaches to environmental governance. Awareness-raising programs rest on the assumptions that (1) people are not aware, (2) people can be made aware through educational programs, and (3) awareness and conservation can be forced through economic measures that will motivate rational decision-making. Those who emphasize the need for awareness-raising programs often cite doubts about the ability of uneducated, untrained and possibly illiterate people to effectively participate. Proponents of these programs express reservations that, without sufficient awareness, public participation would slow the decision-making process and that programs with a participatory component would fail if the people involved were unwilling to undertake implementation tasks. Almost as soon as participatory approaches were adopted, the GoI and MoEF began to focus their attention on awareness-raising programs intended to remedy these issues.

Conventional wisdom holds that improved “awareness” enables people to participate and helps impart unto them the “expert” knowledge held by program administrators, scientists, and engineers. With this foundation of “proper awareness” people would be able to participate in decision-making activities as rational, informed actors, who would then comply with state-conceived and run programs:

The public must be made aware in order to be able to make informed choices. A high governmental priority will be to educate citizens about environmental risks, the economic and health dangers of resource degradation and the real cost of natural resources. *(Policy Statement for Abatement of Pollution* 1992, art. 11.1)

The first efforts to educate the public about pollution abatement efforts and their underlying rationale were entirely “top-down”, disseminating state knowledge among the populace. State PCBs were directed to “organize through mass media a comprehensive programme regarding the prevention and control of water pollution” in order to inform the public of abatement efforts. *(Water Act 1974, c. 4.16). Later, the Central Ganga Authority was charged with “mobiliz[ing] public support for accomplishing the [Ganga] Action Plan” (Department of Environment 1985, Preface). These awareness-raising efforts were designed to inform the citizenry about programs being undertaken by various government agencies with the goals of raising political support for their proponents and facilitating program implementation. A regional officer of the UP-PCB argued that the primary outcome of state-run awareness-raising programs is intended to be
encouragement of popular support for centrally-conceived programs: “People are getting aware, so you get support… common folk cooperation is a must” (interview, 8 March 2009).

After participatory approaches were embraced following the adoption of sustainable development in the 1990s, awareness-raising became central to pollution abatement policies and plans. Citizen-participants were now intended to be more integral to the implementation process and it was essential that they understood and endorsed the methods being utilized by government authorities and the rationale upon which those methods were based:

It is not enough for the Government to notify laws which are to be complied with. A positive attitude on the part of everyone in society is essential for the prevention of pollution and [that] wide consultation has been held with those who will ultimately implement the policy. (Policy Statement for Abatement of Pollution 1992, art. 3.1)

Many Central and State officials viewed “top-down” decision-making and implementation as efficient processes, relying on a system of experts and elected representatives to make decisions about abatement programs, approaches, and technologies. As the public was vested with a more significant role in these activities, that efficiency could be compromised by incorporation of a wider number of perspectives and proposals. In order to streamline participatory decision-making, people needed not just to support state actions, but to change their own actions so that they would be in compliance with state abatement efforts. This means that awareness programs need to make people self-govern by changing the knowledge upon which they base their actions and choices.

The first step in changing public knowledge has involved negating or invalidating popular ways of knowing and privileging “expert” knowledge. Expertise was established as a prerequisite for sitting as a member or representative on the Central and State Pollution Control Boards (Water Act 1974, c. 2). The Central Government is vested with the power to determine whether members have enough knowledge or expertise to qualify for participation. The sole categories in which one can achieve expertise are engineering, the physical or natural sciences, and economics. The knowledge and observations of water users and riverside residents who may be best able to report on the changing quality of river water, instances of non-compliance, and mal-effects of water use are
disregarded. Instead, these people must attend educational awareness-raising programs in order to “contribut[e] to [an] information base on local inventory of natural resources and systems of use” (Ministry of Environment and Forests 1993, 134).

The validity of knowledge is determined by experts and officials whose chief interest is where knowledge comes from, rather than its potential contribution: knowledge produced through scientific method, in controlled conditions or an institutionalized educational setting, or from experts via popular media are deemed valid. Above all, it seems, “valid” knowledge embraces the tenets of scientific conservation and sustainability. Therefore, increased environmental awareness would generate greater commitment to the principles of sustainability: “concern for the environment is essentially a desire to see that national development proceeds along rational, sustainable lines” (National Conservation Strategy and Policy Statement on Environment and Development 1992, art. 2.13).

Of course, awareness-raising activities aim not only to change popular opinion on issues like conservation and sustainability, they are ultimately designed to affect change in individual and group action:

Enhancing environmental awareness is essential to harmonize patterns of individual behaviour with the requirements of environmental conservation…. Awareness involves not only internalization of environmentally responsible behaviour, but also enhanced understanding of the impacts of irresponsible actions, including to public health [sic], living conditions, sanitation, and livelihood prospects. (National Environmental Policy 2006, 47)

Awareness programs rest on the assumption that people are rational decision makers who will modify resource use activities when fully informed about the need for conservation and sustainable use. When the public cannot or will not be “made aware” through traditional or institutional means, “awareness” is forced upon resource users through neoliberal pricing of environmental services and cost incentives or disincentives:

The efficiency of utilisation in all the diverse uses of water should be improved and an awareness of water as a scarce resource should be fostered. Conservation consciousness should be promoted through education, regulation, incentives and disincentives. (National Water Policy 1987: art. 15)

Over the years, policies and plans became more crowded with references like these to the need for popular awareness programs to foster pro-conservationist or
sustainable attitudes and practices. Funding was made available for these efforts from various government agencies, including the MoEF and CPCB. The nine “Instruments for Action” listed in the National Conservation Strategy and Policy Statement on Environment and Development (1992), included as one of its main objectives, “to create environmental consciousness through education and mass awareness programmes”, while industrial regulation and sewage treatment provision receive no such direct reference (art. 4.4). The Policy Statement for Abatement of Pollution (1992) also promises, “greater emphasis… on promoting awareness, undertaking and competence in schools, colleges, and training institutions. Professional and non-governmental bodies will be encouraged to be more active in environmental training and building awareness” (art. 11.5).

Focusing on the perceived lack of popular awareness allowed the GoI and MoEF to laud their incorporation of public participation, while justifying the need to delay or limit mass involvement until the public achieves a sufficient state of awareness that will allow for their full and productive contribution. This allows the GoI and MoEF to shift the discourses surrounding pollution abatement and participatory governance to focus on building a popular environmental awareness that may be perpetually elusive, while actively rolling back industrial regulation and failing to invest in widespread sewage treatment facilities. Meanwhile, failure to improve water quality can be blamed on the lack of popular awareness and the MoEF and CPCB can absolve themselves of responsibility for the failure of abatement programs: “It is imperative that environmental consciousness becomes a pre-occupation with our people as no amount of government intervention can reverse ecological collapse” (National Conservation Strategy and Policy Statement on Environment and Development 1992, Preface, emphasis added).

Framing water pollution as a problem that is beyond the scope of government intervention not only emphasizes the need for popular participation and awareness, it implies that water users are the prime source of pollution. When speaking at a national conference on Water Pollution and Health in 2006, the State Environmental Minister of Uttar Pradesh, Ujjwal Raman Singh conveyed this official perspective, saying that legislation is futile unless consumers realize the dangers they are spreading through dumping of inorganic and chemical wastes (Chandramohan 2006). While water users undoubtedly produce a host of environmental pollutants, depending on the nature of their
use activities and treatment approaches, the MoEF and CPCB now only reluctantly draw attention to their obligation to provide basic infrastructure and services, like sewerage and sewage treatment, or to mandate the closure of high-polluting industries. Instead, officials emphasize the need for improved or increased public awareness, and are able to delay incorporating non-“expert” public participation in a meaningful way.

5.3 Participation-Awareness and the Production of Pollution Knowledge
Participation and awareness have become central to discourses surrounding river water pollution and pollution abatement and have affected the political struggle over water pollution in the GRB. Discursively, if not practically, embracing participatory approaches and advancing the goals of awareness-raising has allowed the GoI and MoEF to achieve a number of ends:

First, and perhaps most significantly, through a manipulation of the logic associated with participatory governance, blame for the pollution problem has been shifted to individual water users. As the discourse surrounding “participation” became more solidly enshrined in Indian policy, the GoI went from arguing that environmental management and protection were under the purview of the Central government to asserting that responsibility was shared between the state and the citizenry:

It is recognized that maintaining a healthy environment is not the state's responsibility alone, but also that of every citizen. A spirit of partnership should thus be realized throughout the spectrum of environmental management in the country. While the state must galvanize its efforts, there should also be recognition by each individual - natural or institutional, of its responsibility towards maintaining and enhancing the quality of the environment. (National Environmental Policy 2006, 2)

As user participation became a necessary element of policy and programmatic success it was not difficult for officials to make the leap that citizen-users must also be an element of the problem, otherwise their contribution to a solution would not be necessary. If people are the only ones who can fix the problem, then logic dictates that people must also be the cause of the problem. The GoI’s Neomalthusian take on sustainable development supports this argument, because it views the pressure of the populace, and their use and reliance on natural resources, as the cause of degradation and pollution. In order to solve the problem, population must be reduced and resource users must change
their consumptive habits. The categories of participant and water user here begin to become indistinguishable, and user participation becomes necessary not for programmatic success or facilitation but rather in order to incorporate people into educational programs designed to raise awareness and affect change in water use practices.

With water users (citizen-participants) identified as source and solution for the pollution problem, then the state was freed to redefine its role. Having incorporated the IMF and UNCED recommendations including public participation into the policy machinery as an element of “good environmental governance”, the MoEF declared its job complete:

We now have a system of environmental checks and balances fully in place. There is enough institutional, legislative and political strength to combine with a responsive citizenry to produce a practicable environmental culture. In Constitutional terms too, India has enough guarantees to protect its ecological systems. (National Conservation Strategy and Policy Statement on Environment and Development 1992, Preface)

The MoEF felt they had fulfilled their obligation to ensure environmental quality, but degradation continued, and pollution even increased. Once again shifting blame to water users, the MoEF maintained that continued pollution of the river, despite existing programs and legislation, is not proof that legislation and government-run programs are insufficient or poorly implemented, but rather that they cannot solve the problem alone. According to a GoI press release (1999), former Minister for Environment and Forests, Suresh Prabhu, said that, “no environmental programme could succeed without people’s participation, and this was even more true of the GAP”.

With little else to explain the failure of pollution abatement efforts (other than perhaps deregulation, lack of infrastructure, and unchecked industrial growth to which the state did not want to draw critical attention), the MoEF argued that the shortcoming must lie elsewhere: either with the water users whose lack of awareness prevented them from adopting new practices, or with that which makes the Ganga different than other rivers “sustainably” governed by UNCED-sanctioned methods: its religious significance and centrality in Hindu religious rites. Mass bathing, deposition of cremated remains, and casting of offerings into the River become the focus of official discourse explaining the ongoing pollution of the Ganges. In discussing the major obstacles to improving water
quality in the Ganga, a regional officer with the UP-PCB commented, “one thing… is required: religion has to be separated from all these issues. Unless religion is separated from these issues, things will not change” (interview, 8 March 2009). This logic allowed the officer to further argue that pollution abatement could not be achieved because it relies upon awareness-raising among religious groups: “No body can change. The few us [working] here in the office… submitting reports, monitoring, we can’t make people change. It won’t happen until, unless the psychology changes” (ibid.).

Through these manipulations of the logic surrounding the debate over river water pollution, the state has drawn attention to water users as perpetrators of harmful practices. Bathing and other public-use issues receive more attention than that justified by the share of pollution they create. The centrality of awareness-raising programs in official policy measures is therefore justified as a solution that promises to solve the pollution problem by changing the individual practices of water users. Attention to institutional failures or programmatic shortcomings is successfully avoided, and the GoI is able to continue its prioritization of economic development over environmental protection. Official can argue that India’s inability to clean up its national river is not a result from its approach to governance, lack of investment, implementation of inappropriate technology, or massive and ineffectual bureaucracy, but rather to the lack of “participation” by household water users and religious worshippers whose lack of “awareness” leads them to maintain practices that cause river water pollution.

The second significant product of participation-awareness discourses is that the state is able to justify its withdrawal of industrial regulation. Shifting liability for causing pollution to individual water users and emphasizing the negative impacts of pollution created through practices like mass bathing draws attention away from the SAP-related rollback of industrial regulation, as well as continued underinvestment in municipal sewage treatment. The MoEF touts its environmental impact assessment (EIA) and industrial clearance requirements, executed through State PCB offices, and claim they have achieved universal enforcement. But in practice, many industries operate without state clearance or under conditions that permit excessive water pollution. According to a Regional Officer with the UP PCB, only the most harmful industries (like metalworks) are required, in practice, to receive Board clearance. Others, once constructed and
operational, may fall out of compliance with little real ramifications from State PCBs. Without popular attention to these cases, even gross-polluting factories are often able to operate out of compliance (India Resource Center 2008). Industries are effectively deregulated when clearance requirements can be skirted with ease, a possibility allowed by the corruption inherent in a system dependent upon quasi-independent inspection officers and limited opportunity for public criminal or civil litigation.

The desire to deregulate industrial pollution reflects the GoI’s understanding of pollution as an inevitable outcome of economic development and their prioritization of fiscal growth over environmental protection. Perpetuating the understanding that pollution is caused mostly by individual water use practices justifies the allocation of increased funding for awareness programs and community participation efforts while drawing attention away from the reduction of funding for methods industrial regulation.

In the view of a large tannery owner-operator in Kanpur, government interests are best served by permitting non-compliant industrial operation, and then making money from the fines that can be levied at individual factories (interview, 8 January 2010). In his perspective, factory operators have the option to follow government laws and meet regulations, or be incompliant and buy off the water quality inspector, hope for lapses in inspection schedules, or simply pay any fines levied for excessive emissions. In reference to restrictive policy measures, he emphasized that even “what is on paper is not put into practice” (ibid.).

While policies continue to make mention of the need for industrial monitoring, water quality testing standards employed over the past three decades reflect state disinterest in investigating, monitoring and restricting industrial pollution. Starting with the GAP, the MoEF’s focus on limiting generalized “pollution” led to a failure to distinguish between specific pollutants during water testing, or even to include measures of industrial chemical contaminates in addition to testing for indicators of organic pollution (Alley 200). Water quality testing in major rivers like the Ganga measures for dissolved oxygen (DO), biochemical oxygen demand (BOD), and coliform, which are introduced primarily through the disposal of human waste and other household or religious practices (like washing bodies, clothes, and animals in the river, or disposal of crematory ashes). They do not test for copper, chromium, cadmium, dyes, bleach and
other chemicals produced in the soap, paper, leather, and textile factories that cluster along the banks of the river at Kanpur and other sites.

Failure to test for major industrially-produced chemical contaminants reflects the general disinterest in industrial regulation on the part of state authorities. The ease with which factory owners can evade existing regulatory requirements and the state’s discursive turn away from industrial pollution toward domestic and religious waste are further evidence of the increasing reluctance to address the problem of pollution in the Ganges in an effective manner. Officials justify their neglect of industrial regulation by citing statistics that identify human waste and organic material as the greatest proportion of river pollution. However, this statistic neglects to acknowledge that industrially-produced chemical contaminants pose a great risk to both human and environmental health. As long as the GoI employs an approach to “sustainable development” that prioritizes industrial-led economic development over environmental protection, the regulation of industrial pollution will continue to be disregarded.

The third major outcome of participation-awareness discourses is that the state has captured the power to define public participation. By instituting participation in a “top-down” manner, mandated by the GoI as an element of its approach to sustainable governance, the state is able to establish the terms and conditions of participation: to decide who participates when, where, and in what capacity. Referred to here as “preemptive participation”, this process is likened to “preemptive greening”, when environmentally friendly measures are adopted by corporations and other bodies in order to forestall restrictive external regulations. A type of self-regulation, preemptive participation occurs when governments adopt participatory approaches before they are demanded or forced to do so by citizens. This allows the government to set the terms and conditions of participation, and by doing so to control who is able to participate and in what capacity. The GoI and MoEF have established nominal participatory measures: “bookend” feedback from project stakeholders, board membership for private corporate interests and academic experts, and partnerships with selected NGOs administrating public “awareness” campaigns. When accused of failing to include public involvement in their policy making, or of continuing a “top-down” model of planning, the government can point to these efforts, and reference the multiple passages promoting participatory
approaches found throughout the documentary record. But, meaningful incorporation of participatory measures has not been achieved, and even the process of deciding the extent and degree of people’s participation in policy-making, program formulation, and project implementation remains itself top-down.

It seems that the GoI’s “preemptive participation” appears spurious even to those within state ranks. In an audit report of the Ganga Action Plan-Phase II, the Public Accounts Committee (2004) “did not find much evidence of any significant initiative on the part of the Ministry and the states to improve and promote public participation” (2.4), despite the “great emphasis [placed] on the need to maximise public participation, particularly of people living on banks of river Ganga, and of the local bodies, social organisations and Non-Government Organisation” (sec. 14.43, sic). Citing evidence that the total expenditure for activities related to enhancing public participation was only Rs. 38.6 lakh for the whole period of 1995 to 2000 (about US $13,600 per year)\textsuperscript{li}, the report called state and Ministry efforts no more than “routine” and condemned their lack of attention to this core concern. In their response to these accusations, the Uttaranchal Government first conceded that “without public participation the success of Ganga Action Plan can’t be ensured”, then revealed that their budget for promoting public participation had been expended on schemes “to create awareness among the people to maintain the purity of holy river Ganga” (ibid., sec. 9.11). The overlap here of “participation” and “awareness” is not coincidental. By focusing on the need to make people “aware”, the state justifies delayed or partial participatory measures: people need to be made aware before they can participate and they should only be allowed limited participation because they don’t (or can’t) yet fully understand the problem.

Controlling the terms and conditions of participation, and the substance of awareness initiatives, further establishes the state in a position from which they are able to dominate environmental governance and the power relations from which it is shaped. In conventional thinking, “environmental awareness” should translate into political action, or at least political will, impacting not just individual resource use activities, but also voting habits and political associations or memberships, including involvement in oppositional organizations and protests. By capturing and controlling the processes and institutions that try to reproduce awareness, the government is able to discourage ideas
and activities that threaten to shift power. Further, the political party in power can use their influence to gain political support through awareness programs designed to build consensus and support among constituents. These consensus-building exercises translate not only into public endorsement for program activities, but also votes for the implementing party. Drawing on the national and religious significance of the Ganges further enables political groups to build public support from any perceived action to “save” the River. This is why we see Ganges River cleanup at the center of many political campaigns: from Rajiv Gandhi’s crusade for the GAP to the INC’s designation of the Ganges as the National River and its sponsorship of the NGRBA.

Reviewing a few of the products of participation-awareness discourses reveals that neither the GoI’s approach to “top-down” decision making nor the power relations upon which it rests have been significantly disturbed over the past half-century. Instead, adoption and promulgation of these discourses in relation to river water pollution has actually served to disenfranchise water users by turning them into targets of abatement and prevention programs while failing to improve river water quality. It has arguably become more difficult for “the public”, water users, or interest groups to capture space for citizen-led participatory measures from the state following institutionalization of its preemptive participatory measures. The state has created a space for anti-pollution NGOs to serve as public liaisons, administering participation initiatives and running awareness programs (in Figure 5.1 NGOs and “voluntary organizations” are designated as an organizational branch of the GAP/NRCP, charged with scheme preparation, execution and maintenance, as well as “public participation”). Those groups that take advantage of this embedded position and the funding the state provides may risk cooptation of their agendas as they are turned into awareness-raising agencies in service of the state. But, those that continue to launch a campaign of oppositional politics, critiquing state (in)action and demanding new approaches or new solutions may find limited outlets for their efforts. The next chapter includes a discussion on the choices made by different anti-pollution groups as they navigate the ground between oppositional and complicit relations with the state, considering how these may be reflected in organizational structure and strategies.

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CHAPTER SIX
SOCIAL ACTION AND THE STRUGGLE OVER POLLUTION KNOWLEDGE:
ANTI-POLLUTION ORGANIZATIONS IN THE GANGES RIVER BASIN

The previous chapter discussed some of the discourses surrounding pollution abatement in the Ganges River Basin and began to evaluate how they impact abatement strategies and the socio-political struggle over pollution knowledge. This chapter explores how anti-pollution activists and organizations operate within and around these frameworks, participating in knowledge (re-)production and contestation activities that carve out space for widening discursive and material struggles around pollution and pollution abatement. The findings discussed here emerged from an analysis of printed promotional material for anti-pollution organizations, organizational websites, media coverage of anti-pollution protests and activism, and interviews with anti-pollution activists and NGO leaders and members. The following discussion has three main goals: First, to explore the pollution knowledge being adopted, developed, reproduced, and employed by anti-pollution movements at each of the three study sites. Second, to examine how these diverse pollution knowledges shape the agendas and activities of each organization, reflecting both the wider context of anti-pollution politics in the GRB and the specificities of place in which these politics are grounded. Third, to identify the obstacles to inter-organizational collaboration and broadening of the anti-pollution struggle to a wide-scale social movement.

The chapter begins by introducing the NGO and other civil society anti-pollution activity at each of the three study sites. Each respective introduction is followed by an analysis of the pollution knowledge(s) reproduced through the discourses (both speech and action) of each group. The first social movement organization (SMO) discussed is the Sankat Mochan Foundation, the best-known and most publicized organization currently fighting against pollution of the river. Located in the pilgrim- and tourist-destination city of Varanasi, the SMF attempts to combine scientific and Hindu religious interpretations of river water pollution under the instruction of Dr. Veer Bhadra Mishra, former Professor of Hydrology and current Mahant of the Sankat Mochan Temple. Next, discussion turns to the activities of the Kanpur Eco-Friends (KEF), a less known but
equally active organization sited in the industrial city of Kanpur. Adopting an approach characterized as “holistic ecology” by founder Rakesh K. Jaiswal, the KEF seeks to engender change through both public interest litigation and direct action campaigns. Finally, we turn to Allahabad, a city located at the sacred confluence of the Ganga and Yamuna Rivers. Here, seemingly spontaneous anti-pollution protests are staged during the annual Kumbh Mela celebration, bringing millions of Ganga worshippers together in demonstration of the government’s mismanagement of the holy river. While these protests are not orchestrated by an official SMO, they are supported by individual activists who host educational campaigns and undertake lengthy fasts meant to draw national attention to the problem of pollution in the Ganges.

In the final pages of the chapter, discussion turns to the question of large-scale movement formation and the possibility of basin-wide inter-organizational coordination. It is argued that the pollution knowledges promoted by social movement organizations reflect localized contexts of the pollution problem and aim to reproduce broads shifts in the ideas, values, and power relations associated with water quality and water use in the GRB. While knowledge (re-)production is effective at a local scale, it acts as a barrier to inter-organizational coordination and effectively prevents organization of the type of national-scale mass protest necessary to affect change in state and central policies.

6.1 Varanasi: The Sankat Mochan Foundation

The Sankat Mochanl Foundation (SMF) is the best-known, most recognized, best funded, and by some measures most successful officially-registered non-governmental organization (NGO) currently campaigning against river water pollution in the Ganges River. Founded in 1982 in the city of Varanasi (Banaras), the SMF’s stated goal is “to restore the Ganga to its pristine purity and glory by preventing discharge of pollutants into it” (Sankat Mochan Foundation 2006). The SMF’s success comes from its ability to capitalize on the dynamism of its leader and from his portrayal as a “savior” of the Ganges. Founder Dr. Veer Bhadra Mishra promotes a technological approach to solving pollution problems in the Varanasi region combined with educational and awareness-raising programs that attempt to change how Hindu devotees understand and act upon their relationship with the holy river. Dr. Mishra explains that this approach, like his life
as former Professor of Civil Engineering at Benaras Hindu University (BHU) and current Mahant of the Sankat Mochan Temple, rests on a combination of faith, in terms of religion tradition and reverence for the Ganges, with a scientific and technological approach to treating and eliminating sources of pollution (Mishra 2005).

Inspired by Mishra, supporters of the SMF include academics from Banaras Hindu University and surrounding colleges, religious devotees who worship at the Sankat Mochan Temple, and foreign environmentalists and followers of the Hindu faith. Tactically, the organization is skillful at targeting its message to an international audience of both individual environmentalists and large environmental organizations. Brochures, flyers, reports and website produced by the Foundation are designed in a manner that appeals to foreign tourists, with the website even including links to Uttar Pradesh’s state tourism board, as well as mountaineering and rafting service providers. The SMF also receives prominent mention in the Lonely Planet’s guide to India, where visitors are encouraged “to make a contribution, financially or through voluntary work efforts” to the organization (Lonely Planet 2010). Appealing to a foreign audience enables the SMF to build relationships with international collaborators and foreign donors. Since its inception, the SMF has worked in close partnership with international NGOs, including Oz-Green (Australia), Friends of the Ganges (U.S.), the Asia Foundation (U.S.), and the Pacific Institute (U.S.). Collaborative projects have also been conducted with researchers from Montana State University’s microbiology department, and funding for SMF projects and facilities has been contributed from Svenska Naturskyddsforeningen (SNF), a Swedish nature conservation society, and the Swedish International Development Cooperation Agency (SIDA). Through these partnerships, the SMF has been able to secure funding for its projects, expand its facilities, and draw international attention to its efforts.

While foreign volunteerism is welcomed by the SMF, there is no mechanism through which local people are able to become involved in the organization. The handful of permanent staff consists of Dr. Mishra’s colleagues from BHU and a few associates hired for their technical or financial expertise. The water users targeted by SMF awareness-raising programs are not incorporated into the organizational structure as members, but rather are encouraged to participate through passive attendance at
organizational events (Ahmed 1994). Awareness-raising efforts are meant to influence the water use practices of a target audience primarily composed of religious worshippers and pilgrims, and to encourage their general awareness of pollution and environmental issues, not to promote their further involvement in organizational or other politics. Ahmed (ibid.) points out that this failure to incorporate local water users in a meaningful way mirrors state discourse on participation, which promotes changes in individual water use practices and permits popular representation through NGO attendance at official board meetings, but does not share decision-making power.

The SMF was formed in response to grievances about the failure of state and local government agencies to prevent and abate pollution in the Ganges. In the past two decades, the organization has been most critical of the shortcomings of the Ganga Action Plan (GAP) and its failure to improve river water quality. However, the SMF does not oppose the GAP per se, but rather envisions an extension of GAP projects, along with increased government funding for the program and adoption of more cost-efficient technologies. The SMF views itself as a watchdog agency for the UPPCB, Varanasi Jal Nigam, and local GAP officials. By collecting and analyzing water samples from the ghats where people bathe and the banks of the river where people gather water, SMF volunteers provide a cross-check against government testing practices and published findings, serving as a watch-dog agency that challenges state claims of river cleanliness and GAP success. The organization tests its water samples at their independent lab housed at organizational offices on Tulsi Ghat and often, but not consistently, posts their findings on a board located just outside of the lab’s entrance for public viewing (see Figure 6.1 and 6.2).

The SMF made significant strides in the last year with its proposal for an alternative sewage treatment facility in Varanasi. Conceived in partnership with Professor William J. Oswald at the University of California, Berkeley, the Advanced Integrated Wastewater Pond Systems (AIWPS) for Varanasi would begin with a single facility constructed outside city limits. The facility would consist of a series of ponds that use gravity, sunlight, oxygen, bacteria and algae to remove sewage and “other pollutants” from water over the course of about 45 days (Mishra 2005). Unlike traditional systems of sewage treatment, the AIWPS requires no consistent power source and is therefore
Figure 6.1 Entrance to SMF Headquarters and Swatcha Ganga Center (photo by author)

Figure 6.2 Swatcha Ganga Lab with water quality Notice Board (photo by author)
argued to be more technologically appropriate for a city like Varanasi with an intermittent power supply. After years of championing this program to the UPPCB and Varanasi Nagar Nigam, the SMF finally received approval and funding for the AIWPS project from the Central Government in 2009, as part of PM Singh’s new National Ganga River Basin Authority (NGRBA) plan. US$184,000 has been granted to the SMF for AIWPS design and construction with an estimated treatment capacity of 40 MLD (million liters of sewage/day), or about 13% of the total sewage output of the city (Pokharel 2010). This victory was won after a protracted legal battle in which the SMF joined with the local municipal government, the Varanasi Nagar Nigam (VNN), to challenge central and state authorities over municipal water and sewage treatment decision-making rights. The VNN was a long-time supporter of the AIWPS proposal, but central and state authorities superseded their authority and funded only conventional sewage treatment programs.

While caught in legal battles with the VNN, state, and central authorities, the SMF focused much of its efforts on developing its Swatcha Ganga Abhiyan (SGA, or Clean Ganges Campaign). Through the SGA, the SMF seeks to draw attention to the problems of pollution in the Ganges River, to encourage the Government of India to renew and pursue the objectives of the GAP, to generate a database on water quality, and to find “local” solutions to the problem of water pollution (Clean Ganga). Co-sponsored by partners in Australia (Oz-Green) and Sweden (SIDA), the Swatcha Ganga Abhiyan (SGA) is fundamentally an educational program that currently focuses on raising public awareness in Varanasi about the causes of non-point pollution, especially “open defecation, laundering activities (dhobi ghats) and removal of corpses and carcasses from the waterway” (Clean Ganga). The main projects of the SGA include:

- Ghat clean-up events: volunteer workers remove trash, corpses, and “floating sludge”
- Conference of Varanasi priests: featuring discussion on “altering ingrained social habits that contribute to Ganga pollution and agreed to [spread] the word [about pollution]” (ibid.)
- Memorandum of Understanding (MoU) with Thames 21 organization (London) and formation of Southall Friend of Ganges-UK
• Community workshops: educated local people on their “rights under the Indian [Constitution] to take charge of environmental issues, including Ganga pollution” (funded by Asia Foundation and the United States-Asia Environmental Partnership).

Other events are sponsored through the main branch of the SMF, including children’s education and painting competitions, poetry and music festivals where “poems, songs and hymns in praise of Mother Ganga are united with a more important environmental message” (Ahmed 1994, 11). These efforts led to a student mobilization campaign (2002) and an international student congress (2003).

But, critics of the SMF argue that these efforts are at best sporadic and at worst, produced as a display for foreign contributors or as an effort to draw attention to the SMF and increase esteem for Mishra. Ahmed (ibid.) points out that the SMF office and its “educational center” are rarely open and relatively inaccessible to local people. An anonymous environmental activist suggests that the organization misuses donations, fails to provide transparent reporting on how funds are spent, and consolidates power in Mishra as its sole leader (Good and Evil). Some of these concerns were echoed by Varanasi water users:

“Mohant issues a few statements, but in practicality does nothing.” (retired male, pers. comm. 2009)

“[The SMF] doesn’t do anything, [it] just takes money.” (Varanasi businessman, pers. comm. 2009)

“They just take money.” (male dhobi, pers. comm. 2009)

“The government gives them money, but it is not being used to clean the water.” (male dhobi, pers. comm. 2009)

Despite these critiques, the Foundation enjoys praise from domestic and international media, environmental groups, and some government agencies. In most accounts, Dr. Mishra is credited for championing the cause to prevent pollution of the Ganges and improve river water quality. Mishra has been repeatedly acknowledged for his efforts. In 1992, the United Nations Environmental Program included Mishra on their Global 500 Forum Roll of Honour, which recognizes “successes on the front lines of global environmental action… [and] outstanding achievements in the protection and improvement of the environment” (UNEP 2010). In 1999, Time Magazine included
Mishra on a list of “Heroes of the Planet” that honors individuals for their work to preserve the environment (Ganguly 1999). In 2000, Mishra was also selected to introduce former US President Bill Clinton, who praised the Clean Ganges Campaign, during ceremonies surrounding the signing of a memorandum of understanding between India and the US on funding and technology transfers to support renewable energy and energy efficiency (Jain 2000). Dubbed a “holy man with a secular plan” (Ridge 2008), Mishra remains the focus of media attention and praise bestowed upon the Sankat Mochan Foundation.

The following pages explore the pollution knowledge and methods of reproduction employed by the Sankat Mochan Foundation and Dr. Mishra. This analysis draws upon texts and documents produced by the organization, including two organizational websites (one no longer updated, but still available online), a separate website for the Swatcha Ganga Abhiyan, and multiple high-quality brochures and reports. Other texts include newspaper and magazine articles on Mishra and the SMF, as well as a handful of short movies and interviews with foreign correspondents. Most of these publications are targeted to a foreign audience of potential donors. Promotional material is scripted in English, with few Hindi or other language translations. These sources are augmented by interviews with Dr. Mishra, two SMF staff, and a foreign volunteer conducted by the author in February 2009.

6.1.1 Balancing Religion and Science: The SMF’s Campaigns to Save ‘Ma Ganga’

The Sankat Mochan Foundation reproduces pollution knowledge that rests on a set of dualisms. They define their approach to combating pollution in the Ganges as a unique combination of science and faith. But, in practice these principles are the basis of a categorization of pollution into opposing camps that reflect organizationally identified divisions between point and non-point pollutants, sewage and community-sourced pollution, state and public responsibility, and their own litigious and educational program responses (see Table 6.1). These sets of dualisms form the basis of a two-pronged approach to pollution abatement through which the Foundation attempts to change the actions of both the State and Central Pollution Control Boards and local water users. However, these approaches are not integrated into a cohesive response, but rather operate as two separate programs run by a single organization: a “scientific” program in which
Table 6.1 Dualisms identified in Sankat Mochan Foundation’s anti-pollution discourse

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<td>programmatic response</td>
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the SMF collaborates with municipal partners and development agencies to sponsor anti-state litigation and formulate proposals for alternative wastewater treatment facilities, and a “faith-based” program in which the SMF solicits foreign donors to support “culturally sensitive” education and awareness-raising programs targeted to local waters.

While it is not unusual for a single organization to coordinate multiple campaigns, the Foundation’s programs are distinguished by the distinct discourses they employ. Foundation staff “talk science” with municipal and development partners. In their work with local people, and in the publications geared to foreign donors, volunteers and tourists, they appeal to a particular vision of Hinduism and Hindu devotees that allows them to portray the organization, and Mahantji, as saviors of the Ganga. Only in publications and interviews geared to foreign media are these discourses merged to support the claim that the SMF is best equipped with the appropriate response to pollution abatement. Otherwise, these discourses, and their operation in isolation from one another, have significant consequences in terms of the success of the Foundation, its relationships with local water users, and its ability to reproduce its distinct form of pollution knowledge.

The scientific campaign against point-source pollution

In defining pollution, the SMF distinguishes two main categories of pollutants: point-source sewage, specified as the un-treated sewage emanating from city drains or nalas that empty directly into the river, and non-point pollution, which includes other “community uses” (SMF 2007). The Foundation identifies point-source sewage pollution as the primary source of pollution in the Ganges River. While most sources agree that the
dumping of raw, untreated sewage does account for between 80% and 85% of Ganges river water pollution, the Foundation argues that sewage actually accounts for around 95% of all pollutants:

“[I]n recent decades the river has become severely polluted. This is primarily because of the flow of untreated sewage into Ganga.” (SMF[a], para. 4).

“The main cause is untreated sewage which in Varanasi and 113 other cities is dumped directly in the river.” (Clean Ganga, para. 5).

Preventing the discharge of point sewage pollution is one of the primary goals of the SMF (SMF New Website, Homepage), and is the focus of their principal efforts to pressure the state government to increase the city’s sewage treatment capacity, to propose and fund the AIWPS treatment facility, to litigate for the Varanasi Nagar Nigam’s constitutional right to determine local approaches to sewage treatment, and to convince the Central Government to increase and expand funding and commitment to Phase II of the Ganga Action Plan (GAP).

Raw sewage entering the river through the city drains, or nalas, is viewed by the SMF as a direct result of the government’s failure to provide for effective sewage diversion and treatment. As one staffer argued, it is “the government [who] should stop pollution [from going] directly into the river” (pers. comm., 2009). The Uttar Pradesh State Government and Pollution Control Board (UP-PCB) are critiqued for insufficient investment in sewage treatment infrastructure and for investing in “inappropriate” technologies and treatment systems:

“The government followed Western scientists’ advice to build treatment tanks, when that solution isn’t appropriate for a tropical country. They also don’t work because of the regular power outages in Varanasi. The treatment tanks will work about 12 hours each day, and when they are not working, they allow sewage to flow directly into the river.” (SMF staffer, pers. comm., 2009)

Failure to ensure proper level of investment in sewage treatment infrastructure is described in SMF discourse as a result of government apathy and lack of commitment to addressing the problem of pollution in the river. In language that ironically mimics that of Varanasi citizens who critique the Foundation’s reputation for seeking praise for saving the river, an SMF staffer stated:

“The government wants to write a policy, put some money to build treatment plants, so that they can point and say, ‘Here. We are taking care of pollution.’ Then, they would say that the water is clean and safe for bathing. But, we do our
own testing and show that it is not, so they can no longer deny that their plans aren’t working.” (SMF staffer, pers. comm., 2009)

Mishra argues that this government apathy is the main obstacle faced by the SMF. On the Foundation’s old website he is quoted as saying that he “finds it hard to wake up the Indian Bureaucracy” (#5). Foundation documents repeatedly assert that governmental lack of commitment is of their greatest obstacles, but something over which, given time, they will prevail:

“We strive to create public pressure for a Ganga and ghats cleanup by smashing through the firewall of political apathy.” (SMF 2004)

“Many attempts have been made to encourage a Ganga cleanup. But only public pressure can break through bureaucratic and governmental apathy in the face of appalling river contamination.” (Clean Ganga)

While Mishra and Foundation staff are critical of the UP State Government and PCB, the Foundation is not anti-state, anti-government, or even anti-GAP. Their discourse is generally supportive of the original GAP project, and even suggests that SMF efforts inspired the government to establish the GAP and related programs. In describing the ‘Accomplishments of the Sankat Mochan Foundation’, the Friends of the Ganges website states:

“Founded in 1982, and working as a catalytic agent to arouse people’s interest in cleaning Ganga, the Sankat Mochan Foundation (SMF) drew the attention of the Government of India. In response, the Government created the Central Ganga Authority (CGA) and the Ganga Project Directorate (GPA) in 1985. In 1986, the Ganga Action Plan (GAP) was launched in a formal ceremony in Varanasi by the Prime Minister of India with the mandate to clean the Ganga River of pollution in Varanasi and other important cities.” (CGA 2003)

Elsewhere, the GAP is described as a “well-financed plan” whose well-conceived objectives could not be achieved due to political and public indifference (SMF New Website). As Foundation staffers explained, the main problem with GAP implementation is that the Uttar Pradesh (UP) state government intervened, unnecessarily insinuating itself as a mediating agent between the Central government agencies that planned and financed the Plan and the municipal agencies responsible for administering pollution abatement programs. It is the UP government, they argue, that was interested in capturing the money and power afforded by the GAP, and which has prevented the funding of the
SMF-sponsored AIWPS plan and other sewage treatment programs as envisioned in the original Plan:

“Rajiv Gandhi gives money, but UP government stopped all projects. [The] Central government accept[ed] Mahantji’s project, not [the] state government… because scientists from other countries recommended [more conventional options]” (SMF Member, pers. com. 2009)

After the SMF won the support of Varanasi’s municipal government (Nagar Nigam) for their alternative AIWPS sewage treatment proposal, the Foundation partnered with the government agency in legal action against the state government for failing to finance their proposal. The Foundation and VNN cited the 1992 Constitutional Amendment (74th, Article 243W) that created municipal governments and endowed them with the authority to manage city and local government affairs in support of their claim that the VNN had the constitutional right to make decisions and implement plans relevant to municipal sewage treatment. So, while the Foundation is critical of the UP government for failing to provide sufficient infrastructure, it is generally supportive of larger Central government efforts to address pollution in the Ganges, and of course, of the municipal government’s support of the AIWPS proposal. The UP government’s failure is seen as a resistance to power-sharing and governmental devolution, which the SMF envisions would not place decision-making power directly into the hands of local people, or even NGOs, but rather to municipal authorities over which the SMF and similar NGOs would have significantly more influence.

Ultimately, despite their criticism of the GAP’s failures, the SMF would like to see an extension of the Plan and increased governmental funding for the program, along with heightened governmental monitoring and management of river water and its use (SMF 2006; Wallace 2006). This is in keeping with the Foundation’s ideology, which envisions an extension of centralized management and control over India’s river water resources. Using the slogan, “Water for Development”, Mishra (2005) argues that water resources fuel national economic development and water pollution problems are best addressed through the combined “processes of development, science and technology” (758). He calls for a neoliberal approach to water management, identifying development projects and associated funding as the appropriate solution for water pollution problems in the Ganges River Basin. Mishra is quick to point out that the World Bank shares this
perspective on neoliberal water management and that it is the “only way” to achieve a balanced approach to development that incorporates environmental protection (ibid.). It is the Foundation’s faith-based campaign, he maintains, that is necessary to change the mindset of Hindu worshippers who he describes as “ignorant of the processes of development” and unaware of the “good things” they offer (ibid., 755-758).

**The faith-based campaign against “community” pollution**

The Sankat Mochan Foundation’s second campaign is described as a faith-based and community-centered effort that is subordinate to their work to gain support for alternative plans to divert and treat point-source sewage pollution. Nonetheless, it is this aspect of their work that often receives the most praise and international attention. The campaign aims at addressing sources of indirect or non-point pollution caused by local people or ‘community use’, especially the effluents produced by the washing of animals, laundry and household goods, as well as “garbage, human and animal corpses and other pollutants from non-point sources” (SMF[a]). In one riverfront cleanup program, SMF workers:

> “enjoined the public to engage in more hygienic habits, rather than using the waterway along the ghats as a washroom and toilet. Wallowing cattle, meantime, were herded away from the ghats to more isolated areas, while laundry workers (dhobi) who also depend on the river were asked to use less toxic detergents.” (SMF[b])

Activities coordinated under this program are aimed at educating and raising awareness of local people who use Ganges river water in their daily activities. The goal of this program is two-fold, aiming to protect both water users from the health risks posed by bathing in or ingesting contaminated water, and to protect the river from contaminants introduced by people who would use the river for washing, bathing, animal care, or as a site for the disposal of trash, waste, and partially- or un-cremated human remains. In Foundation discourse, the people of the city – or the water users – are represented as being both those who the river needs to be saved for and those who the river needs to be saved from:

> “People are responsible for 5% [of pollution] and that is a matter of awareness and over time people will change their practices.” (Mishra, pers. comm. 2009)

> “Community using the Ganga river directly also pollute the river. This is termed as non-point source of pollution. It is only five percent of the total pollution of
Ganga and has to be cleaned by the direct users – the people of Varanasi. For cleaning the pollution caused by direct users the Sankat Mochan Foundation works with the community and uses culturally consistent ways to motivate the people to take care of the river. To sensitize the people to take care of the non-point pollution is our “spiritual work with the people” requiring patience and innovation. We involve regular bathers in the river, children, priests and washer men in this work. We involve schools also and encourage school children to learn scientific aspects of environment, water pollution and work in our Swatch Ganga Research Laboratory.” (SMF 2007, 10)

SMF community awareness and educational activities do not ask water users to reject Hindu faith-based interpretations of the river and its relationship to the country or its people, but rather seek to change how people understand their role in that relationship and act on the basis of that knowledge. In Foundation discourse, the river remains Ma Ganga, the mother of Hindus, the nation and the world. In one organizational flyer, titled ‘The holy river Ganga (Ganges) is divine goddess for one billion believers the world over –She isn’t feeling well’ (Clean Ganga), the SMF asserts, “The problem is, Ganga Ma (Mother Ganges) isn’t feeling well”, and then reassures, “She can be cured” in very large text (inside cover). While her devotees are still encouraged to think of themselves as her children, they are asked to shift from thinking of themselves as protected by the Ganga, to thinking of themselves as protectors of the Ganga. In a 2007 interview, Mishra explains that Hindu pilgrims to the Ganges:

“want to touch the water, rub their bodies in the water, sip the water… If you tell them ‘the Ganga is polluted,’ they say, ‘we don’t want to hear that.’ But if you take them to the places where open sewers are giving the river the night soil of the whole city, they say, ‘this is disrespect done to our mother, and it must be stopped.’” (Hammer 2007).

By appealing to the significance of these religious practices, the Foundation claims that they are able to overcome the resistance that some observers (see Alley 2002 and Haberman 2006) argue is posed by long-sustained religious beliefs about the nature of the river as goddess. The SMF doesn’t try to force devotees to change how they think of the river, only how they think of themselves in their relationship to the river.

But, the relationship between the SMF and the people it claims to represent, protect and educate is complicated by people’s negative perceptions of the Mahant and by his generally paternalistic attitude toward those who use the water to fill both material and spiritual needs. Accusations abound among local water users that Mishra misuses
funds donated to the Foundation and that he caters the Foundation’s activities to foreigners’ visions of what the city should be, rather than local people’s needs. One Foundation staffer (pers. comm. 2009) explained:

SBK: Why doesn’t the SMF have more popular support, among the people here [in Varanasi]?
Sharma*: Because Mohantji is not entertaining any local people, that is a big problem.”
SBK: Is that why there is no mass movement?
Sharma: Some people want to join movement, but the government has chosen Mahantji… The central Foundation has five people doing all projects…[lists some roles]. Only five key people. Then people like you [and others who support the cause but are not part of the organization].”
(later in the interview, when explaining negative perceptions of Mishra)
Sharma: “[The problem is that] he has so many money. One lakh [rupees daily] is from mandir [temple]. Before, I met Mahantji, I was always listening to bad about Mahantji, about Mahantji taking money. But, this is not true. The local people say Mahantji takes money, but this is not true… He spends daily only 100 rupees on himself. Why would he [take money] when he is earning one lakh rupees daily from India… He got money from government only two times.”

Even Mishra recognizes that as Mahant, a separation exists between him and the people of Varanasi. While his position in society demands that many local Hindus pay him obeisance (usually by touching his feet and bowing to him), this means that people rarely engage him directly or challenge him openly. Having inherited his position at 15 years of age, Mishra explained that he had always felt separate from the people and that it was shocking to many in his family and in the Temple when he chose to enroll at University and pursue a degree in Engineering. While he feels that this unconventional path left him uniquely equipped to address pollution in the Ganges from the dual perspectives of science and religion, his lack of identification with the people of the city and his position of superiority have no doubt contributed to his, and by extension the Foundation’s, representation of local city dwellers, worshippers and water users as naive, ignorant and even backward:

“Practicing Hindus believe that Ganga is mother and goddess. Like fish living in water they can not live without Gangaji. They don’t know pollution and can’t believe that Ganga is polluted yet. They are suffering on account of Ganga pollution. In today’s modern world only few have the sensitivity to understand them and their spiritual life. These practicing Hindus have become endangered specie [sic] of human beings. SMF has responded to this human suffering and resolved to make a sincere and committed effort to stop this abuse of mother
Ganga and thus protect the human life and several thousand years old culture which sprouted on her banks… To fulfill the objectives of our mission to clean Ganga is difficult because the masses in India have no scientific appreciation of the pollution and the persons in authority responsible for decision making, are having their own mind set and prejudices.

Common people in India are not ready to believe that Ganga can be polluted. They are unhappy and hurt if one says that Ganga is polluted and filthy.” (SMF 2007, 9)

By portraying local people as ignorant, and as the source of pollution problems, Mishra and the SMF reproduce a rhetoric that disempowers and marginalizes local people and local forms of pollution knowledge. It is this assumption of local ignorance that at least one staffer argued is a misconception held by Mishra and the Foundation:

SBK: So, do people who bathe and drink ganga jal, do they know about pollution?
Tripathy*: “Yes. Every people know. Because when they take a bath in Ganga, they see dead bodies float in the Ganga and the polluted items on the top [of the water]… But Gangaji is Gangaji.” (pers. comm. 2009)

Yet, the idea that water users and river worshippers are not aware of the problem of pollution informs the guiding rationale on which the SMF’s community programs are built. Water users are viewed not only as uninformed or ignorant of the pollution problem, but unwilling to recognize or admit that it exists. In a well-worn narrative, Mishra describes how local people resist the idea that the waters of the Ganges are polluted, and that their refusal to accept this knowledge is only overcome through (guided) direct observation:

“When I go and I speak about pollution in the Ganga—even at the University—people say, ‘No Mahantji, don’t say this, you hurt our ears.’ But, when I go and take them to see where the sewage is pouring out of the pipe, directly into the river, they say, ‘Look at this, it is disrespecting Gangaji.’” (Mishra, pers. comm. 2009)

As Mahant, Mishra’s attitude toward river worshippers and Hindu devotees is also one of paternalism, as he sees his role as protector of both the river and of her devotees. “Pollution,” in his words, “is only that which harms human health—even Western scientists agree with that” (Mishra, pers. comm. 2009). While Mishra and the SMF fight to save the Ganga, they argue that both the river and its worshippers are at risk of extinction from pollution:
“Practicing Hindus still exist in Varanasi… They are the custodians of the ago old culture and faith of India in mother Ganga. This microscopic minority of people, their culture and faith are facing imminent danger of extinction because of the open drains, sewers, and such other outlets discharging domestic sewage and some industrial effluent directly into Ganga river.” (SMF 2007)

The Foundation argues that these people, the worshippers of the Ganga, must be saved along with the river and the culture that unites them. In this way, pollution in the Ganges is interpreted by the Foundation as an affront to Hindu religious beliefs, as well as to the goddess Ganga.

But, sewage and pollution are not described in SMF discourse as natural or historic certainties. In its literature, the Foundation relies upon depictions of the city as historically pristine and idyllic. In a 2004 brochure titled, ‘The holy river GANGA and her ancient GHATS are befouled’ (SMF), the image of a Varanasi cityscape watercolor is captioned:

“The great “ghatscape” of Varanasi is little changed since the 19th Century – as this English-style watercolor makes clear. But there are definitely some differences. Note the abundance of greenery that disappeared years ago – along with numerous ponds usually located just behind the ghats. In the old days, Varanasi was hardly more than a small town, which meant that the ghats were less congested. The great River Ganga herself was almost certainly in good shape, given the absence of industrial waste and the low level of sewage dumped into the waterway. Importantly, there was a sense of civic and religious pride in maintaining a clean river and clean ghats, that together from a seamless physical and spiritual unity.” (SMF 2004).

While a contemporary artist created this portrayal of the city, the image is nonetheless used as a reference point to argue that Varanasi was once ‘small’ and ‘green’, and that the Ganges was once “in good shape”. Each of these qualities is attributed to the pride shared by city residents in maintaining their cityscape, as well as an absence of industry and sewage. Aside from arguing that the city has lost green space and experienced significant population growth, the SMF uses this image as part of its discourse suggesting that the city and the river have broken from their natural states because the people of Varanasi have lost a sense of civic and religious unity and pride. These are the qualities that the Foundation seeks to recover by uniting the people under the auspices of their organization through the reproduction of a religiously-based interpretation of local relationships between the people, the city, and the river\textsuperscript{vi}.  

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For Mishra and members of the Sankat Mochan Foundation, the problem of pollution in the Ganges at Varanasi is unique. While they concede that other cities on the river face similar problems, they argue that the natural purificatory powers of the Ganges treats pollution upstream, and that the city of Varanasi is the starting point for poor water quality further downstream:

“It has been shown scientifically that the Ganga can clean the pollution. So, pollution is put into the river at Kanpur, but Ganga has cleaned and the water is clean again by the time she reaches Allahabad. Then, they put pollutants, sewage, into the river at Allahabad, but the water is cleaned by the river by the time it reaches Varanasi, so the water coming into Varanasi is quite clean.” (Mishra, pers. comm. 2009)

Pollution is therefore understood as a problem created in, and by, the city: “Pollution is from the city, from Varanasi city” (SMF member, pers.comm. 2009). It is the sewage created in the city, the practices of the worshippers who flock to this holy site, and the growing population of Varanasi that pollute the river.

Because the SMF sees river water pollution as a problem of the city, and envisions a faith-based community response, they argue that the problem of pollution in the river basin must first be addressed in Varanasi. They therefore lobby for a significant portion of GAP, and now the National Ganga River Basin Authority (NGRBA), funds to be allocated in Varanasi. Of course, this effort is also an attempt to capture some of these funds and to position the Foundation as the principal NGO leading the crusade against water pollution in the Ganges. By emphasizing aspects of the organization’s faith-based campaign to foreign donors and media, the SMF also argues that their activities are most “consistent with the cultural beliefs and lifestyle of the people” (SMF[a]), and that they are uniquely able to “harmonize the benefits of a Ganga cleanup with traditional Indian culture that regards the Ganga as pure” (SMF[b]). But, in “talking faith” to donors, media, and local worshippers, while speaking the language of science and development with government officials and AIWPS collaborators, the SMF actually effectively prevents the devolution of water quality governance and the involvement of local people in the campaign to save their river. Officials, local water users and pilgrims are enabled and encouraged by the Foundation to continue speaking different languages, with only Mishra and his staff serving as translators. This allows the SMF to maintain a vital position as intermediary agent responsible for education programs that appeal to local
people to change their water use practices and that explain the work of government in terms amenable to (a presumably homogenized) community, for channeling people’s energy into non-threatening shows of resistance, and for rallying public support for both NGO and government-sponsored programs. The SMF’s positioning for supremacy among anti-pollution NGOs in the GRB is perhaps challenged only by their counterpart upstream, the Kanpur Eco-Friends.

6.2 Kanpur: The Kanpur Eco-Friends

Operating from the most populous and industrial city in Uttar Pradesh, the Kanpur Eco-Friends (KEF) is a relatively small, but historically active organization. The group was formed in 1993 by environmental scientist and activist Rakesh Jaiswal after he began investigating the source of problems with the quality of his own tap water (pers. comm. 2009). The KEF describes itself as an environmental NGO that “performs all such acts that may assist in or be conducive to fostering environmental education, protection and security” (KEF 2008). Although the organization seeks to address broader environmental issues, the KEF’s main activities concern “protecting the river Ganga from various sources of pollution” and mobilizing local people to guard against the health risks posed by chemical pollution (ibid.). According to Jaiswal, the Ganges issue came to the forefront only because it is the most pressing problem being faced locally in Kanpur. As he explains:

“I began my career as an environmental activist…in ‘93. In ‘92 Rio had happened, Earth Summit… [I]n the beginning I was, I was an idealist and also read a lot of literature and met some environmentalists in India. And then I thought that the earth was endangered… So, [I] wanted to do something. And then, I was not focusing on local issues in the beginning… So, gradually over the years I kept working and then got focused on local issues: environmental betterment of Kanpur, and then more focused on water and Ganges. And today we are known more for our work on river Ganges. But, we have been working on other urban environmental issues as well, because Kanpur is one of the most polluted towns of India or even world. So, we have been talking about various urban environmental issues.” (pers. comm. 2009)

But, even as the organization focuses on the issue of pollution in the Ganges, Jaiswal is adamant that it cannot be understood or responded to as a stand-alone problem. Instead, poor water quality is viewed as just one of the many negative environmental
outcomes that results from human misuse of nature, specifically rapid and unchecked population growth and industrial economic development. In this excerpt from an interview, Jaiswal explains that pollution in the Ganges is both part-and-parcel and symptomatic of an imbalanced approach to development and growth:

“We are talking about the river itself. It is not just pollution — this is just one aspect of the problems — just one aspect, pollution. It is not only the pollution which is killing the river, but if we see the problems in totality, miss. The problem begins right from its source — the global warming, the melting of glaciers which make it a perennial river, which feed river Ganges throughout the year. So, these glaciers are also receding very fast owing to global warming. Then, various dams or hydroelectric projects are coming across the river Ganges and its tributaries… and then the diversion of the river. The freshwaters of the river are being diverted away from the main course, are being put into the canals. So, almost all the freshwaters of the river are being taken away through canals to agricultural fields. So hardly any water is left for the downstream towns. And then pollution. And also the river is being exploited in a number of ways… against the larger issue of development versus environment. And in case of India, the population, the rising population, exponential growth of the population, uncontrolled… Urbanization, industrialization along the river and even the river plains are being taken away for urbanization and industrialization. And also in many other ways the river is being exploited.” (pers. comm. 2009)

Trough its work, the KEF draws attention to this “totality” or “big picture” of environmental health in the GRB, asking local water users, factory owners, and government officials to consider not only how to reduce pollution in the river and mitigate its effects, but also how to ensure adequate stream flow, protect endangered species, reforest the riverbank and essentially rebuild a healthy ecosystem. It is this focus on the multiple challenges faced by the Ganges, the multiple threats to local environmental health and their interconnection, which distinguishes KEF’s approach. Jaiswal uses the term “holistic ecology” to describe their vision and believes that its widespread acceptance will promote the adoption of basin-wide multi-use and multi-institutional watershed governance.

With Jaiswal serving as Executive Secretary, the KEF is led by an advisory panel, or ‘Think Tank’, consisting of six members who are current or retired scientists and faculty with the National Environmental Engineering Research Institute (NEERI), Indian Institute of Technology (IIT-Kanpur), Christchurch College (Kanpur), and Eastern Washington University. This advisory panel informs, but does not directly guide, the
actions of the organization. Instead, the day-to-day activities are overseen by Jaiswal, who serves as the group’s primary representative and decision-maker. Indeed, during the months when he was recovering from heart surgery, the organization’s activities all but ceased. Jaiswal’s work is supported by a network of members drawn from friends, colleagues and local citizens, but whom even Jaiswal admits do not constitute an organizational membership. Instead, the KEF attracts volunteers and interns, mostly from abroad, who usually arrange to work on a particular campaign for a few weeks. Few of these intern-volunteers remain active with the organization in the long term. Their accounts of the Ganges or their time spent with the KEF do, however, constitute a segment of the organization’s website. Group together with environmentalist interviews under the heading, “Eco-Talk”, these accounts emphasize foreigner’s impressions of the river’s plight or draw readers’ attention to the universality of water pollution:

“The boat ride provided true insight into what is occurring to the river in Kanpur, and probably other river settlements in India. Once standing as a symbol for religion and health, the Ganga is destroyed and devoid of beauty. The beauty is replaced with trash, plastic bags, wads of human waste and city waste. I only wish the camera could record the stench that went with the sights -breath-holding instead of breath-taking. On the Kanpur side of the river, the direct discharge of untreated human and industrial waste is evident to the eyes and nose. At the site of the tanneries there was a tumbling waterfall of chemical discharge. The surrounding earth was stained a vivid blue, with a darker blue hue extending into the water. The stench now became that of a nauseating, lung irritating odor… How lucky some of us are to have clean water. Safe water should be available to everyone. My thanks to Eco Friends for their Clean the Ganga project.” – Dr. Elizabeth Guillette (KEF 2008)

“I have spent most of my life in Michigan, and have always been surrounded by water, everywhere. But Michigan, like India, has struggled with pollution and the abuse of its resources. Because of industrial pollutants, some of our native fish are now considered unsafe to eat because of the level of toxic chemicals, mercury in particular, that have accumulated in their bodies. The water level in the Great Lakes has been decreasing, and other states that have been abusing or depleting their own water resources now ask that our water be transported to them. In both Michigan Rivers and the Ganga, microscopic organisms called zooplankton have been recorded to have abnormal tumors, speculated to be the result of high levels of pollutants in the water. We have taken our access to clean water for granted, but we are abusing our most precious resource. India and the US can learn from each other, as the conservation of water worldwide is not a local, but a global imperative.” – Carrie Knowlton (KEF 2008)
These accounts by volunteers and interns often convey emotions of disgust or shame associated with the river. Many talk of a visceral reaction to common river scenes, of corpses being cremated, children swimming near floating trash, or effluent pouring out of drains into the river:

“Ganga looks like a huge open drain in Kanpur. On a visit to two villages outside of Kanpur I saw another sewage channel. This open drain, covered with white foam and stinking like the toxic cocktail which came out of the tanneries – clearly some of the effluent was mixed with the domestic sewage – is going out of town to the downstream villages… there is an unusual[ly] high rate of skin diseases among them. I saw people with rotten fingernails, people whose skin lost all colour and others with wound-like markings on their necks. They were complaining about high rates of tuberculosis, cancer, stomach and kidney problems and leprosy… I saw greenish water coming out of a hand pump. This time it's not the sewage but heavy metals in the soil that contaminate the water, mostly chromium… It is a barren place with multicoloured hills made of waste and some poor human creatures that make a living from these remains of the industrial production… But without any doubt the worst I've seen in Kanpur were the floating dead bodies in the river… The dead are not a major contributor to the pollution of the Ganga. But their sight is truly irritating and disgusting.” – Rainer Kellers (KEF 2008, emphasis added)

In addition to their web presence, volunteers are able to take on an active, though short-lived, role in the organization. One such young woman explained that her contribution to the group would be to shoot footage for a documentary on the KEF, and that the young man who came before her participated in organizing a riverside cleanup event.

Sharing duties between volunteers and KEF staff allows for the organization to engage in multiple programs or campaigns simultaneously. Another dynamic aspect of their activities is that the KEF is consistently circulating projects and engagements—last month they might have worked on a scheme to bring clean drinking water to a district affected by poor water quality, today Jaiswal might be sitting in on a meeting to redraft the city development plan, and next month Think Tank members and volunteers may visit local area schools to sponsor an art contest. Some of KEF’s ongoing activities include:

- Publishing (semi-)quarterly monitoring reports that assess both water quality and progress of GAP programs
- Sponsoring river clean-up and an adopt-a-ghat programs
- Educational outreach programs, workshops and contests for students
• Training of Ganga Praharis, or River Watchdogs, from people who live and work along the riverbank
• Public awareness-raising programs, including an “Adopt your street” program, and programs promoting the burial of corpses (rather than cremation)
• Public interest litigation (PIL), specifically promoting injunctions against industrial effluent and sand mining in the riverbed
• Media advocacy

The KEF has also created a Ganga Task Force (Ganga Vahini) to work in 20 rural villages near the city of Kanpur, where they organize public meetings, hearings and rallies.

In most of these campaigns, KEF staff and volunteers work closely with people affected by pollution, referred to as “stakeholders” in organizational discourse. These diverse groups, including boatmen, ghat dwellers, tannery owners, and virtually anyone in the city with water access or quality concerns, are embraced as essential to the efforts of the KEF, but are not invited to join the organization as a member or to participate in intra-organizational decision making processes. Even those ghat-dwellers who are trained by the KEF as “river watchdogs” do not become official members of the group. So, while the KEF engages in diverse activities, many of these ultimately take on the appearance of public education campaigns. For example, each year, the KEF organizes a multi-day ghat- and river-cleaning event that involves, among other things, rallying ghat-dwellers to help gather visible litter and corpses from the river and then bury them on the riverbank. While a clear case of “direct action”, in that the KEF mobilized people into participating in river cleanup, organizers see the real value of this event in its capacity to educate participants, onlookers, and public officials about the ills of placing bodies and trash into the river. Proof of the success of these efforts to model “right action” comes later, when KEF staff hope they will see the public adopting the same practices:

“…Ecofriends have been carrying out these kinds of campaign over the years… Earlier, people used to dump discarded clay items into the river. This year they buried those items and also the worship materials. So, there was a campaign there was, and some people they did. And maybe if this campaign is carried out, maybe in a decade or two this can be eliminated completely, this kind of practice.” (Rakesh Jaiswal, pers. comm. 2009)
“Through this campaign, we succeeded in garnering the support of the Ganga communities whom we reckon as the custodians of the river.” (KEF 2004)

According to one KEF member, these efforts to raise awareness are only marginally successful because, in Kanpur, people are already aware of the problem of pollution:

“People are sensitized and know what to do, but need to get into action… Everybody is aware. They’ll all say something should be done, but who will do, what they will [do], no one knows.” (pers. comm. 2009)

Another local activist agreed, stating that, “Everybody is aware. They’ll all say something should be done, but who will do, what they will, no one knows” (pers. comm. 2009). Both of these respondents agreed that education programs in Kanpur are less effective because people bathe in the city less frequently: only on rare holy days or when one has no other water source. Therefore, local people are more difficult to sensitize to the possible health risks of pollution. For this reason, a bulk of the KEF’s educational programs are targeted to young children. A member explains:

“Ecofriends is effective at the school level because it is difficult to convince other people… Younger generations have been abroad, [they] know that clean technology is do-able” (pers. comm. 2009).

However, their most successful tactic has been their Public Interest Litigation (PIL). This subset of the KEF campaign saw the heaviest activity in the mid- to late-1990s, after Rakesh Jaiswal wrote a letter to the Allahabad High Court. Jaiswal’s letter drew attention to the lack of implementation of GAP-Phase I in Kanpur, and singled out specific factories and drains that violated GAP programs. Over the course of the following year, the Court released a number of important orders that eventually led to closure of a handful of gross polluting factories in Kanpur.

Despite these successes, the KEF does not enjoy the notoriety relished by Mishra and the Sankat Mochan Foundation (SMF). Indeed, Jaiswal received death threats, not international awards, for his role in shutting down the offending industries in Kanpur. While being careful not to comment on Mishra directly, Jaiswal spoke of the challenges of competing against, rather than coordinating efforts with, Mishra and the SMF:

“He has been working I think since early 80s. I started almost a decade later and of course they are a big name also. And, Varanasi has an advantage because it is a cosmopolitan town, oldest town, religious town. People go there from all over the
world. And earlier, Ganges means Varanasi. So, we had to compete very hard just to keep Kanpur on the forefront. So, now when Ganges is mentioned, at least people talk about Kanpur also.” (pers. comm. 2009)

But, the KEF has become less active over the past decade since most of these achievements were made. In 2008, Jaiswal was hospitalized and in recovery from surgery for four months while the organization languished. Since then, the website has received few updates and, it seems, the KEF has garnered only minimal media attention. In response to a question about his future outlook, Jaiswal spoke like a man without hope:

“Truly speaking, pessimism. Miss, if I talk real, I do not see a hope. Because things have only worsened since I started working 15 years ago. The quantity of the water in the river and also the quality, it has gone down. The situation has only worsened. Maybe some miracle [pause, shaking his head]. I don’t know.” (pers. comm. 2009)

When asked what miracle he would like to see, Jaiswal identified two: that the government would calculate a new (and improved) minimum ecological flow at every station along the river that it would be monitored for compliance daily, and then bringing an end to the practice of allowing untreated sewage and industrial effluent to run directly into the river. While little progress has been made on the latter goal, the former has been one of the top priorities articulated by the newly formed National Ganga River Basin Authority (NGRBA).

The following pages discuss how the Kanpur Eco-Friends prioritizes these goals and how they attempt to reproduce their particular interpretation of the problem of pollution in the Ganges. This discussion draws upon an analysis of a variety of textual material produced by the KEF, including their organizational website and numerous published reports, as well as interviews with Rakesh Jaiswal, a KEF member, and another local anti-pollution activist conducted by the author in February 2009.

6.2.1 Holistic Ecology in the City of Industry: The KEF’s campaign for a new river

The KEF’s adoption of a holistic ecology perspective leads them to consider the ecological health of the river basin as a whole, and guides them away from confronting river water pollution as a stand-alone issue. As a guiding principle, the holistic ecology perspective also directs the organization’s interpretation of the problem of environmental degradation in the GRB as a direct outcome of the imbalance present between humans and their natural environments. Water pollution is therefore understood as just one
manifestation of the imbalance between humans and nature present in the GRB. While this imbalance is not inevitable or universal, it is described as common in urban environments where the concentration of people and industry over-tax local resources and the environment’s natural ability to absorb waste and appropriate measures are not taken to reduce this pressure:

“With increasing economic and industrial growth, in many countries the amount of waste produced grows in direct proportion to growth of GNP and development, and the waste becomes a problem if adequate environmental protection measures are not taken during the development process.” (KEF 2008)

According to the organization’s website, it is both the concentration of people and industry and their “rapid growth [which] has caused large-scale pollution of the rivers and other water bodies of India” (Ganga and GAP on website). Pollution, referred to in organizational discourse as waste from factories and human settlements, cannot therefore be addressed on its own, but requires a comprehensive response to the problems associated with the overuse of resources and the overproduction of waste.

The KEF’s holistic ecology approach is striking similar to systems science or systems ecology, in that it encourages examination of the river at a basin- or watershed-wide scale and draws attention to the complex systems of inputs and outputs that make up the GRB ecosystem. Organizational discourse makes use of this language of inputs and outputs, arguing that environmental degradation occurs when one falls out of balance with the other. In the GRB, this imbalance is caused by both the overproduction of inputs to the river (more domestic and industrial waste than the river can process or dilute) and the overuse of river outputs (too much water is withdrawn from the river for agriculture, wildlife and water quality are disturbed when sand and silt are mined from the riverbed). But the politics associated with water use and management, as well as water quality assurance, are also regarded as ecosystem inputs in their own right:

“River Action Plans can be considered as one of the several inputs that are needed to keep the towns and rivers clean. Other inputs, like management and handling of garbage and slums, regular operation & maintenance of sewerage systems and provision of adequate number of toilets for the masses to minimise the practice of open defecation, minimisation of use of rivers for cattle wallowing etc. are the primary responsibilities of the respective local self-governments. Unless concurrent measures are taken to address all these issues, full benefits of the river… cannot be realised.” (Jaiswal 2007, 23)
A comprehensive response to ecosystem degradation therefore involves balancing inputs and outputs, including management and policy responses.

In promoting a comprehensive response to river water management, the KEF asks local residents, politicians, factory owners and other “stakeholders” to come together in creating a new vision of the river. This vision is not something that the KEF seeks to dictate, but one that they believe should be drafted by all stakeholders and should account for the many various uses of the Ganges. In an interview, Jaiswal explained that river water management and pollution abatement efforts in the GRB have failed because there is no comprehensive vision of the river, and because the plans that currently exist prioritize certain type of river water use or values, for example, its use as a holy river or its value as a clean river. But, Jaiswal argues that these plans fail because they do not consider these multiple aspects, purposes and incarnations of the Ganges. Because politicians see only the goal of a clean river, and not an agricultural river or an industrial river, plans like the GAP ignore the other demands that are placed on the system and are subsequently doomed to fail:

“There is not one single reason which can be attributed to the failure of Ganga Action Plan. First, we do not have a vision for the river. Still we do not know what kind of river do we want and what’s practical, what is achievable. So first, we should have a practical plan, what kind of river do we want? And it is not impossible, we have the resources, we have the talent, we have the competence, we have the science and technology. So, we are emerging [economically]. We have joined the nuclear club, the space club. So why can’t we clean our river? So first we should have a clear vision, then we should have a plan, and then a commitment.” (Jaiswal, pers. comm. 2009)

“Before any action can be initiated, all concerned should start thinking in terms of a new vision for Ganga. How do we want Ganga to be and what can be done to achieve that vision is the question posed to all of us. A new vision for a pristine and pure Ganga has to pour forth and translated on the ground. A new vision, which needs churning of the spirit and mind. A new vision that can inspire the masses to action. A new vision that needs to reconcile the competing demands on the precious waters of the river with sustainability. It needs to think of the river as one organic entity where tinkering in one- part affects the entire body of the river. A new vision which believes that if we as humans wish to survive, Ganga needs to survive. The eternal Ganga today, needs new heroes and new voices. A whole new approach is required to restore the river.” (Jaiswal 2007, 48)

There are a number of similarities between the type of comprehensive vision promoted by KEF and the new approach to river management being ushered in by PM
Singh and the National Ganga River Basin Authority (NGRBA). Both approaches advocate a basin-wide scale of planning and the need to address issues of water quantity in addition to water quality by maintaining “minimum ecological flows” in the river. More importantly, they share a desire to replace or subsume the “piecemeal” approach to river management that has heretofore characterized the GoI’s treatment of the Ganges. While water quality management and pollution abatement are overseen by the CPCB under the Ministry of Environment and Forests, a host of other government bodies and offices also regulate some aspect of the river or the use of its waters: The Ministry of Agriculture is responsible for regulating the use of pesticides and fertilizers that contribute pollutants to the river through agricultural runoff; The Ministry of Power (and to some degree the Ministry of New and Renewable Energy) is able to plan hydropower projects that can impact the flow and the course of the river; The Ministry of Urban Development establishes laws and policies that dictate where settlements can be constructed and what infrastructure must be in place; The Ministry of Textiles regulates the textile industry, including standards related to the treatment and processing of material that can produce effluent; The Ministry of Micro, Small and Medium Enterprises, along with The Ministry of Heavy Industries and Public Enterprises, oversee various size industries and address issues related to production standards and profitability; The Ministry of Tourism can promote certain destinations and leverage political pressure on behalf of the growing tourist industry; and then The Ministry of Water Resources actually oversees river water management.

Of course, the point is that, even when restricting our list to Central ministries (and leaving out the numerous subsidiary departments and programs they oversee as well as any state or municipal agencies), there are too many cooks in the proverbial kitchen that are each able to enact policies or sponsor programs that can have a significant effect on the ecology of the river and on the success of efforts to improve water quality. Jaiswal and the KEF argue that this complexity actually leads to inaction or solely symbolic action, rather than the flurry of activity that one might expect:

“Planners in independent India have approached the river and its pollution with frightening ad-hocism. Adherents of the existing developmental model in India, still consider the pollution of the river as inevitable, also perhaps as an acceptable cost in the process of development. Ganga waters have been freely diverted and
dammed for a myriad reasons, not least on account of powering a so-called Green Revolution in agriculture. Unplanned urbanization and industrialization together with the population boom have extracted a very heavy price from the river. The waters of Ganga have been and continue to be treated as just another input, an economic resource, to turn the mighty wheels of development. The western model of development has been and continues to be blindly, almost slavishly, imitated in India sans the safeguards.” (KEF 2008)

“At Kanpur, the pollution load from both the municipal as well as industrial sources is significantly large and the dilution capacity of the river is severely limited. As a result, the desired improvement in the river water quality has not been achieved at Kanpur. However, instead of a comprehensive, sustained and intensive attack on pollution in the river, action could not proceed beyond taking of symbolic steps. There exists a wide chasm between the promise of Ganga Action Plan and the reality of millions of litres of all kinds of pollution meeting the river every single minute. Inaccurate, partial and self-laudatory reports have become the norm but do precious little to make significant forward movement on reversing the flow of pollution in the river.” (KEF 2008)

Jaiswal argues that official efforts, like the GAP, to prevent and abate pollution in the Ganges are embarked on with genuine intentions, but these are gradually eroded as planners are faced with the challenge of needing to balance the river’s many uses:

“The plan [GAP] itself was excellent. Those who conceived and conceptualized the idea were sincere and honest. Had there been an honest implementation of GAP, the story would have been different, Ganga would have looked different. The enthusiasm waned with the passage of time and GAP became just one of the government projects. The merger of GAP with NRCP in 1996 took the sheen and importance away from GAP. GAP is no longer an exclusive river cleaning program. No one is bothered about the Ganga cleaning. Ganga also gets some money from the government every year but this is only enough to keep the GAP alive. No body knows how many phases or years would be needed to clean the Ganga. There is no time bound plan, no target, no vision, no commitment. Ganga can not be cleaned like this. We need drastic steps, bold decisions and a visionary and committed leadership. GAP is a dead horse, and there is no point in flogging it any more.” (KEF 2008)

“The objective was to stop the pollution and make the river clean… Later the objective was defined as improving the river water quality to acceptable standards. Acceptable standards became bathing class standards. When this could not be achieved, the bathing class standards were diluted for GAP. Even the diluted standards could not be met, and then the objective became to reduce the pollution load on the river. This objective was the simplest and easiest to achieve… Now the objective is to maintain the wholesomeness of the water quality of major rivers. The objective seems to be overly ambitious, impractical and confusing. The word “Wholesomeness” has not been defined. We need to set
an achievable objective in unambiguous terms. This should be the first and foremost priority.” (KEF 2008)

By encouraging GRB stakeholders to reconsider and reformulate their collective vision of the river, Jaiswal and the KEF are really asking people to rethink what kind of relationship they want to have with the river in its many capacities as goddess, mother, cultivator, or industrial powerhouse. They also draw critical attention to the question of whether the Ganges is a national resource to be tapped in the pursuit of economic development, or whether she is a part of the nation’s heritage and dominant culture that should be protected. In this way, the KEF shows us that the river is more than mother, god, or habitat. She is multitudinous. But, in their efforts to promote an holistic view of the Ganges, KEF members must contend with, and ultimately address, her use and prioritization as a goddess.

6.2.2 Pointing out a Paradox: The KEF’s campaign against ritual bathing

When KEF members talk about the practice of ritual bathing, they refer to what they perceive as a paradox – people polluting the very river that they worship:

“When we attempt to reconcile the significance of the sacred river in the past to its present reality, a most tragic paradox is encountered. Ganga today is being worshipped and defiled simultaneously. In fact, at most times, the process of worship itself has a polluting influence since bulk of the worship materials are disposed off in the river in ugly non-biodegradable polythene bags and in other unthinking ways. Today Ganga is the natural home and recipient of half burnt dead bodies, unclaimed bodies, animal carcasses, washermen's points, dairies and cattle bathing points, garbage from the slums, open defecation along the river and domestic and industrial effluents of all kinds. Whatever remains of the endangered species of dolphins and the turtles are openly poached. The coexistence of worship and defilement of the Ganga defies logic and reason and leaves most observers confused.” (Jaiswal 2007, 47)

“It can only be an irony of history that with the passage of time this mighty river is today a victim of defilement and pollution by the very human race that finds sustenance by it.” (KEF 2008)

In KEF discourse then, bathing and river worship are described as both causing pollution, by contributing waste and contaminants to the water, and preventing people from taking action against pollution, by convincing them that the river is a great purifier and unable to be polluted. While the organization engages in a variety of activities, it is their struggle to
end the practice of bathing and the belief in the holiness of the Ganges that is granted discursive priority. This aspect of the organization’s work is also the most controversial.

One of the main links on the Eco-Friends homepage takes readers to a section on the “Significance of Ganga” (KEF 2008). Here, the KEF describes the origins and divinity of Ganga, worship of the river as a goddess, and the significance of the river in Indian civilization. Throughout the page, practices of river worship are referred to as “ancient traditions” and “ancient superstitions” that, while shaping “Indian civilization”, seem nonetheless outdated or backward. Worship of the Ganga is also described in the third person, separating the writer (and reader) from those who perform the ritual practices of bathing in the river or drinking ganga jal:

“Many Indians depend on this great river for their physical, psychological and spiritual sustenance.” (ibid.)

“[P]eople have a great belief in her powers of healing and regeneration.” (ibid.)

“[Ganga] is deeply mingled with the Indian psyche and ethos.” (ibid.)

The implication here is that KEF members neither share nor promote these beliefs, and interviews with Jaiswal and another KEF member bear this out. Jaiswal describes river worship as a “polluting social practice” that started in ancient times and became perverted over the years:

“So, it is an important river and at least 800 millions hindus worship this river. And they have tremendous faith… its not just a river, but its a deity or goddess for hindus. They have a lot of faith [in] that, and this belief that river is a deity, ganga is a goddess, and if you put anything into it, it will clean it. That river Ganges is a cleanser par excellence, this belief has done the damage most. Because this belief got distorted over the years. Like, people having this kind of belief started dumping dead bodies into the river. They also worship the river and put a lot of worship materials. And also anything, they simply put into it believing that the river will clean it. So, this religious belief has also done the damage.” (pers. comm. 2009)

So, not only is bathing identified as a cause of pollution, it is targeted as both wrong, because beliefs and practices have been distorted, and the source of greatest damage to the river. The KEF’s response to this perceived contradiction of river worship and pollution involves an educational campaign to end bathing practices associated with worship of the Ganga. In order to achieve this goal, KEF members believe that Hindu
devotees must abandon their religious beliefs and adopt a scientific or ecological view of the river, or at least concede that the river is no longer a goddess:

“The Ganga devotees who consider the river as a cleanser par excellence and treat Ganga as a deity who gives salvation need to be taught that Ganga has lost its divine role, Ganga has lost its cleansing properties and Ganga herself needs salvation… Do we need some super-salvation that we need to wash our sins along with our bodily filth in the river?” (Jaiswal 2007, 48)

The specific programs associated with this aspect of the organization’s work include educational programs held in schools that emphasize scientific interpretations of the pollution issue, community workshops that emphasize the negative impacts of bathing and river worship, a community burial program in which corpses are removed from the river and buried on the sandy banks and people are encouraged to bury (rather than create) the recently departed (see Figure 6.3). But, when KEF members undertake these programs, they are careful to emphasize the negative environmental impacts from practices of ritual bathing, idol immersion, cremation and corpse immersion, rather than the health risk that is posed to people who live along the river and participate in these activities. People are therefore encouraged to make a selfless sacrifice in abandoning, or no longer acting on, their religious beliefs by bathing in the river, rather than understanding this action as a self-serving effort to protect one’s health. A KEF member explained that, for most Kanpurites, the health risks associated with bathing and water use are ontologically tied to the factories. In other words, if people are asked not to bathe in order to protect their health, they may not comply because of a perception that the health risk is posed by factories and not people’s practices. If however, people are shown that their activities damage a river they love, they may be willing to relinquish or substitute those activities and the beliefs upon which they are based. The member emphasized that “there are two separate issues in Kanpur: the sacredness of the river and the factory issue” and these must be kept separate in order to encourage local engagement in anti-pollution activities.

There is also pragmatic aspect to this work, as an anti-bathing campaign is easier to undertake (and more likely to be successful) in Kanpur, where many people have already abandoned the practice of ritual bathing in the river. One local activist explained that, “The river is too polluted. The local arrangement has been to canalize water for
bathing and cremation, but pollution is common knowledge, so no one bathes in the river” (pers. comm. 2009). Instead, people who have the resources are able to go upstream, usually to Bithoor, to bathe and worship the river. There, the Ganges can be sacred, whereas in Kanpur, there is no space for a sacred river in a city where “nothing is holy anymore” (ibid.). A KEF member agreed with this sentiment, saying that an anti-bathing campaign must be site-specific and would not be successful in other places on the river. Saying, “In Varanasi, they are fanatic. In Kanpur, we are not so concerned with religion”, this member (pers. comm. 2009) explained that Kanpur is a city of industry and education, and not a religious city. Ending the practice of bathing in Kanpur, then, is seen by this member as a localized effort only. However, KEF discourse and Rakesh Jaiswal argue that it is a basin-wide vision for a new relationship between people and the river that is based on a scientific, rather than spiritual, worldview.

“But I believe that even this ritual bathing, people those who go to the river just to have a dip in the river, they also pollute the river. And it is a scientific fact, when we take a dip in the river we shed some organic pollution and some bacterial pollution in the river. So everyone who goes to the river washes themself or selves contributes towards the pollution – and this is scientific fact and these are scientific findings… Why can’t we be honest and warn people that Ganga waters
are not worth bathing and drinking? Instead of admitting the facts and telling the truth, our top level politicians go to such events, express their solidarity and deepen the superstition of the people by taking a dip in the river.” (Jaiswal, pers. comm. 2009)

Whether it is coordinated in Kanpur or other sites on the river as well, there exists significant doubt about the practicability of an anti-bathing and anti-worship campaign in a country with 800 million practicing Hindus who come to the river by the tens of millions each year to bathe and worship. But Jaiswal believes that it is possible to change these practices, given enough time:

“It is [a] problem you see, practices take a lot of time in evolving. Maybe it took thousands of years. These practices have evolved over the years, even the worshipping or the way people worship the river. So, these are the practices, bad or good. So, if it took hundreds or thousands of years getting evolved, it would also take years, maybe some decades, in getting eradicated. But now people realize- there is some awareness. Now, there are some good practices. At some places people — I wont say that this practice has been eliminated completely — but there has been some change. Like, in Kanpur, those bodies which were earlier being floated in the river are now being given burial along the river. Its being done in Kanpur and at some other places also. And uh, this year there was a big campaign, and Eco-Friends have been carrying out these kinds of campaign[s] over the years: That we should not pollute the river, Miss. We should not throw even the worship materials. That also causes pollution… contributes toward the pollution of the river. So this year like earlier people used to dump discarded clay items into the river, this year they buried those items and also the worship materials. So there was a campaign there was, and some people they did. And maybe if this campaign is carried out, maybe in a decade or two this can be eliminated completely, this kind of practice.” (pers. comm. 2009)

From a social movement standpoint, the logic of risking alienation of one’s potential support base by demonizing their most sacred identity-forming cultural beliefs and practices is questionable, especially when the success of this campaign may, at best, achieve the elimination of only a small percentage of the pollutants in the river\textsuperscript{lx}. Indeed, the KEF even supports criminalization of people’s religious activities in order to further the goal of cleaning the river:

“Those who are found polluting the river should be punished on the spot like those violating the traffic rules are punished. This will be an effective deterrent. This will also increase the use and acceptability of the GAP assets like electric crematoria and public lavatories [because people outlawed from using the river directly would have no other recourse].” (Jaiswal 2007, 46)
But, as one KEF member pointed out, success may not be the main goal or purpose of the anti-bathing campaign. They explained that through the campaign, people are made aware of their activities’ negative effects on the river, then, “when people become sensitized, then they will care… when they are sensitized and [it is] known what [they need] to do… [it will be easier] to get them into action” (pers. comm. 2009). While this member does think that religious practices will eventually change, this is seen as the outcome of education and social advancement in society, and not the effect of the KEF’s campaign. Instead, the anti-bathing campaign, they hope, will get Ganga worshippers involved in the broader efforts to clean up the river by breaking through a wall of apathy that exists when encountering a seemingly insurmountable task: “The average man has no real power, no real influence and [no real place in NGOs or other organizations that] have their own politics, their own hierarchy” (pers. comm. 2009). By teaching people that their activities have an impact, this KEF member hopes that people along the river will adopt an ecological, if not environmental mindset. This could inspire people to start making smaller, incremental changes to their activities that may eventually build to a more meaningful engagement with anti-pollution politics in the GRB. Either way, they aim to breakthrough a wall of apathy that separates environmentalists in the KEF from their potential constituents:

“The painful reality still remains that environmental concerns in India continue to be the burden of a few green crusaders with the vast majority just plainly looking on. A serious erosion of faith has entered the psyche of the masses, gripping all with the thought that “nothing can be done”. The rapid rise in the pollution of the river has been accompanied by (and also because of) mass apathy. Pollution and public concern of Ganga seem to exist in inverse ratios. If ever any crisis meant an opportunity to make a difference, it could not be truer than is the case for Ganga. The distressed river beckons all to come to its rescue.” (Jaiswal 2007, 47)

For Jaiswal, the anti-bathing campaign is also an opportunity to point out the complicity of religious leaders and mass bathing event organizers in the very production of pollution that they claim to oppose. He relayed a story about attending an Ardh Kumbh celebration in Allahabad, where he met with religious leaders and other anti-pollution activists in hope of building networks through which they could coordinate action:

“We talked about the river issue… but they had an affiliation with a political party, the VHP\textsuperscript{31}… so they picked up the issue and there was a rally… and all the religious leaders, who were also politicians, they all participated [with all of their
associated political parties and organizations]. But, in ’98 they won the election and then they dumped the issue… I think it was their duty. Because they have been talking about the river, they also have a lot of faith. Most of the ashrams, or most of the religious leaders stay along the river, they have their ashrams along the river. So, they should have taken up this issue long before. And also I am skeptical because, will they ever oppose such congregations like Magh Mela, Ardh Kumbh? Will they care that, what happens during the Magh Mela? If they say that not even a drop of sewage should go into the river, will they take care what is happening to the shit there, in the riverbed, where the [drain from the temporary Mela settlement] comes out?” (pers. comm. 2009)

For Jaiswal, these mass bathing events pose the real threat from religious worship of the river. Calling festivals like the Melas, “government sponsored organized pollution”, he points out the irony of bringing millions of people together to bathe in the river, to live in makeshift townships on its shores, and to fill its waters with their refuse and excreta that flows downstream, only to then protest when the water coming from upstream (from Kanpur) is not adequate for bathing. For Jaiswal, this is proof of the lack of commitment of religious leaders and politicians afraid to challenge the Hindu-majority status quo by questioning bathing and other religious practices, but who nonetheless want to enjoy the praise and political support often heaped upon those who declared themselves saviors of the Ganga. The next section turns to Allahabad in order to understand who these religious leaders are, how they come together to organize anti-pollution protests during these religious festivals, and how their vision of the river and the pollution knowledge they reproduce differs from that of Jaiswal and the KEF.

6.3 Allahabad: “Spontaneous” Protest at the Holy Confluence

Nearly every year for the past decade the Sangam at Allahabad has become a site of protest. Religious leaders, sadhus, sants, kalpvasis and devotees of the goddess Ganga refuse to take part in the ritual bathing that is the hallmark of the annual Kumbh/Adrh/Purna/Magh Mela celebration. Their methods of protest vary from sit-ins and forming human chains on the riverbank, to petitions and written appeals to the government, fasting, and using the media to share grievances with a national audience. But these efforts are not meant to protest pollution of the river per se, but rather are an expression of demands that the government fulfill what protestors see as its duty to provide bathing-quality river water to the Sangam in order to accommodate the needs of
pilgrims and worshippers. Mela protests are portrayed in the media as spontaneous events inspired by bathers’ visceral reaction to the visibly poor quality of water at the Sangam. Participants are therefore difficult to identify because they are not part of a cohesive organization. Rather, the group is largely made up of extra-local priests and pilgrims who have come to the Sangam to take part in the Mela celebrations. While these participants are led or inspired by a core constituency of important religious leaders, local priests and activists, the group otherwise lacks the continuity of a sustained anti-pollution organization with an established leadership or membership.

The annual demonstrations held at Allahabad can be thought of critically as both seasonal, as discussed below, and opportunistic. Anti-pollution activists, including religious leaders and academics, are able to exploit both the particular context of the Sangam and the immediate circumstances surrounding the Mela in order to stage a successful protest and appeal to the widest possible audience. To begin with, during the month of Magh, tens of millions of pilgrims are already flocking to the banks of the Ganges in order to participate in the Kumbh Mela festivities and to conduct the ritual bathing with which the event is most associated. This shared purpose gives the group a collective, though fleeting, identity and a shared set of interests. While they are not part of an official organization, they are not entirely disorganized, due to the preexisting structure of the Mela event. For example, on Mauni Amavasya, the day of the new moon in the month of Magh and the most auspicious time to bathe at the Sangam, religious leaders and sadhus, or itinerant ascetic monks, are supposed to be the first people to bathe in the river. They form a procession down to the riverfront that is well covered by both domestic and international media, both because of the nature of the event itself, and because the sight of hundreds or thousands of partially- or completely-nude priests filing their way through millions of pilgrims down to the waterfront to bathe at sunrise is always a particularly photogenic moment (see Figure 6.4a-d). This group of holy men, along with other religious leaders, form a core contingency that has sustained attendance at the Mela. Many are “professional” holy men who come to the Mela every year. They are able to plan and coordinate activities in an organized manner and, on reaching the waterfront, can refuse to bathe or form protest lines that quite literally bar other bathers from entering the river. Of course, social norms and social pressure, more than the
physical blockage provided by these bodies, stops other bathers from breaking what can be interpreted as a picket line formed by observant priests.

In terms of social movement organization then, these religious leaders are able to take advantage of the particular context and circumstances of the Mela at the Sangam during Mauni Amavasya to form an “instant” or “spontaneous” protest, without necessarily having to disseminate a message among the pilgrims and inspire or outrage
people into agreeing to participate in their direct action campaign. While the Mela-Sangam context has been used before as a political platform, and could be manipulated in order to mount a protest on virtually any issue, the temporary community created among pilgrims (who not only participate in shared bathing activities but also often camp on the riverbank in the Mela settlement), fosters a shared concern with river water affairs, particularly the quality of river water and the possible health risks associated with exposure to or ingestion of ganga jal. This shared concern is amplified by the efforts of individual activists, some of whom use the occasion to declare a fast or to issue statements to the government demanding action. One local activist, Dr. D.N. Shukla of the University of Allahabad, takes advantage of the opportunity to assemble an exhibition about water pollution in the Ganges and Yamuna that is staged each year in a large tent at the festival grounds. Funded by the University of Allahabad, the display includes a history of the Ganga, a diorama of the river’s course, and an interactive display of “microscopes, slides, and transparencies” that allow visitors to see first hand the “impurities of the water” (Shukla 2009, 3). The exhibition distributes pamphlets “with the purpose [to help devotees] realize their own relentless activities are… dangerous for their ‘Ma Ganga’ and [to instruct them on] what they can do for their mother” (ibid.). Displayed each year since 1981, the goal of Dr. Shukla’s exhibition is to “motivate [the] general public to join [anti-pollution activists] in this pious mission [to save the Ganga] and to attract the attention of our Government on those issues” (Shukla 2000).

Taken as a whole, these efforts turn from what appears to be disorganized protest to taking on characteristics of a more sustained, if still unofficial, form of collective action. The following pages attempt an analysis of the pollution knowledge being reproduced through these disparate activities, focusing on how the seasonal nature of the protests at Allahabad elicit an equally seasonal response from state and central authorities. This analysis draws primarily on media coverage of anti-pollution demonstrations held at the Sangam site in Allahabad. A list of media sources is included in Figure 3.1. These are supplemented by excerpts from surveys and interviews with local water users and analysis of a pamphlet produced by a local anti-pollution activist Dr. D.N. Shukla. While these provide a less rich pool from which to attempt a reading of activists’ pollution knowledge, some insights are nonetheless possible.
6.3.1 Sustained Disorganization: From Seasonal Protests to Anti-Dam Politics

Unlike a truly transitory group of protestors coming together in opposition to a solitary issue or problem, the events at Allahabad are better understood as a seasonal recurrence, which parallels both the seasonality of the Kumbh Mela celebrations during the month of Magh, and the seasonality of river water quality, which is worst during the winter due to low water levels in the river. The seasonal nature of these protests affects both the composition of the group of protestors and the subsequent nature of the pollution knowledge that they reproduce, especially as it relates to their anti-dam agenda. First, the Kumbh Mela festival draws millions of people from around the country, and even the world, to come to the Sangam each year. Even for those few who return each year, their material relationship with the river often lasts no longer than the 30 to 40 days of the Kumbh Mela celebration. This material relationship is defined by the activities associated with the Mela: pilgrims will worship and bathe in the river, drink from the water, and dispose of both items of worship and waste into the river. For the protesters, then, river water quality must be able to meet these needs for only the period of the Mela celebration. This has an impact on the nature of protests, and pollution knowledge, in Allahabad because Mela protesters are not directly connected to or invested in local issues or concerns related to river water, like excessive extraction for irrigation or the functionality of sewage treatment plants. As non-locals, most protestors are also less vested in promoting or protecting a healthy or robust local environment.

The seasonal nature of protestors’ material relationship with the river, while inspired by reverence, influences the nature of their grievances and demands. They identify the problem of less-than-bathing standard water quality as a result of the government’s inability to stop waste from flowing into the river or allow for the river to flow unimpeded. They demand that river water quality be restored to bathing standards for the Mela, and especially Mauni Amavasya, but are not vested in ensuring that water quality remains at that level for the remainder of the year. They identify the government, especially the Ministry of Water and the Central and UP State Pollution Control Boards, as the parties responsible for both ensuring adequate water quality in the Ganges and for responding to protestors’ demands. As one monastery leader told a crowd of thousands of
worshippers at the 2007 Mela, “The government has promised us they would keep dirty water from flowing into Mother Ganges but it’s still being done” (Sullivan 2007).

The Mela activists articulate their grievances through a number of tactics, including press releases and open letters to the GoI or CPCB, and legal action, in addition to their direct action sit-ins and stop-bathing campaigns. But, the responses their activities elicit from these authorities are also temporary or seasonal in nature. For example, in anticipation of the 2007 Mela, Swami Chaitanya Bhramachari from Mizrapur, a town located between Allahabad and Varanasi, filed a petition with the Allahabad High Court demanding bathing-quality water at the Sangam during Magh. The court ordered a three-tiered response, including releasing 1,000 to 2,500 cusecs (cubic feet per second) of river water from upstream reservoirs, temporarily stopping effluent discharge from Kanpur tanneries, and temporarily plugging and redirecting sewage drains in Allahabad (Singh 2007). This response is characteristic of the government’s reaction to Mela protests, or even the threat of Mela protests. Improvements in water quality are secured by opening reservoirs located upstream from Allahabad in order to release enough water that the level of the river at the Sangam increases and pollutants in the water are diluted. Protestors then resume their bathing activities, but the reservoirs do not remain open. The closing of the reservoir mirrors the closing of the Mela itself, and local water users benefit little from the temporary increase in water quality.

While this is a solution of sorts to the immediate problem, it makes a minimal contribution to actually improving water quality in the Ganges or serving the interests of local people, whose lives are affected by pollution throughout the remainder of the year. Indeed, one could argue that in demanding the release of reservoir water during the Mela, protestors are actually acting against local water use needs, because there is less water left in the reservoir upstream to provide for local needs until the water level begins to rise after monsoon rains finally come to the region, some four or five months after the protests cease. Because the response to anti-pollution protests during the Mela is short-lived, and does little to serve the needs of local water users, many Allahabadis are critical of the Mela protests:

“Usually no [work is done about pollution] but, only during Mela when VIPs come.” (boatman, pers. comm. 2009)
“Pollution increases in December-January, and rallies do too. But the government doesn’t listen and much money is taken out but nothing is done with it.” (male barber, pers. comm. 2009)

Even one sadhu agreed with these critiques, demonstrating that the Mela protestors may not be serving their, or the river’s, best interest by staging only seasonal protests: “The government listens to us during the Kumbh Mela… But unfortunately, when it is over they tend to forget us” (Sadhu leader, quoted in Sullivan 2007). Indeed, the seasonal nature of the Mela protests means they have little immediate effect on efforts to solve the protracted problem of pollution in the river. By turning water quality in the Ganges into a seasonal issue, protestors may be doing more damage than good to the sustained anti-pollution movement. The grievances associated with poor water quality in the river are turned into a short list of single-issues that call for a very circumscribed set of responses. More importantly, the relative success of these activists in drawing the attention of both media and government officials means that their activities actually impact the larger discourse surrounding pollution in the Ganges, shifting focus from issues of water quality to those of water quantity.

Because water quality at the Sangam is temporarily improved during the Mela by the release of reservoir water, participants in the protests have come to question the necessity of dams and reservoirs on the river during the rest of the year. The identification of dams as a source of pollution, or at least problems with poor water quality in the GRB, turns the anti-pollution struggle into part of the wider anti-dam movement in India. By associating their struggle with that of other anti-dam activists, like the well known campaign against the damming of the Narmada River, Mela protestors are able to tap into a pre-existing discourse that critiques the Indian government for prioritizing large scale development over local interests and for the desecration of India’s sacred rivers. It also allows anti-pollution activists to strategically link the audiences of the two campaigns while broadening the appeal and resonance of their own messages through association with a better-established and more recognized social movement. This strategy seems to have produced some measure of success, as many water users at Allahabad, as well as downstream in Varanasi, clearly shared the view that dams, especially the Tehri Dam, are the source of water quality problems in the GRB:
“Tehri Dam has reduced the flow of water, resulting into the increase of pollution downstream.” (male construction worker, Allahabad, pers. comm. 2009)

“Tehri dam is the problem, it has reduced the water flow.” (male boatman, Allahabad, pers. comm. 2009)

“[The river] used to come direct, but now it is stopped by Uttarkashi dam.” (male worshipper, Varanasi, pers. comm. 2009)

“Since Tehri Dam has come up, pollution has become worse.” (boatman, Varanasi, pers. comm. 2009)

“The Tehri Dam stopped the power of the river… If they stop the Tehri Dam, it would be clean.” (male laborer and farmer, Varanasi, pers. comm. 2009)

“Pollution is a problem because of Tehri Dam. If they opened [the] dam, pollution would not be a problem.” (male barber, Varanasi, pers. comm. 2009)

The anti-dam agenda is also more consonant with Hindu religious interpretations of the river as a purificatory goddess. Activists maintain that the Ganga is sacred and retains her ability to purify. However, this power is held back or inhibited by the construction of dams. Unlike the religious discourse of the Sankat Mochan Foundation, which asks water users to change their activities based on a reevaluation of their relationship with the river as goddess, the anti-dam discourse of Mela activists requires neither the reevaluation of religious beliefs nor any alteration or adaptation of river water use practices. Instead, devotees of Ganga are asked to join in protests and use their political and social influence to pressure the state to remove dams and other impediments on the river. Once this single, though heady, goal is accomplished, the river will have full control of her powers and will be able to cleanse herself once again.

The Mela protests are unique in that they take advantage of the context specific to the Sangam during Magh to draw attention to problems of water quality and quantity in the Ganges. Their success is evident in their sustained ability to extract an immediate, if only temporary, response from the government officials whom they hold responsible for ensuring the river meet bathing quality standards. They are also able to use this context to garner a great deal more domestic media attention than their organized counterparts in Varanasi and Kanpur. While their lack of organization and official leadership means that these activists are not able to articulate and reproduce a cohesive pollution knowledge to the same degree as their counterparts, it does mean that they are able to avoid some of the pitfalls of organization. Their independence from donors or foreign funding enables them
to evade critiques associated with profiteering from participation in civil society anti-pollution politics. They also do not have to concern themselves with orienting their efforts to a foreign audience or building partnerships with international institutions or organizations to further their goals. Because of the circumstances in which their protests are orchestrated, they also have immediate access to a much larger audience than either the SMF or KEF. Mela activists therefore have a better opportunity than their counterparts to reproduce their specific brand of pollution knowledge not only at the local scale, but at the national scale as well, since most pilgrims to the Kumbh Mela are extra-local. The final pages of this chapter turn to an examination of the differences between the anti-pollution activism taking place at each of the three study sites, and concludes with an examination of the barriers to inter-organizational coordination and a discussion on whether a “true” anti-pollution social movement exists or is emerging in the GRB.

6.4 Organizations, protests, and movements: Structures of resistance in the GRB
The pollution knowledge being reproduced by each of the groups introduced in the preceding pages reflects a place-based, often localized, understand of and relationship to the problem of pollution in the Ganges River. In Varanasi, the SMF reinterprets and reframes traditional ways of knowing and interacting with the river in their effort to convince local water users and pilgrim-tourists to change their water use practices. They adopt the language and concepts dominant in preexisting Hindu religious dogma, and reinterpret these in order to convince water users to change their interactions with the river, not the underlying beliefs on which these activities are based. While their failure to merge this faith-based aspect of their worship with the scientific discourse they speak with government officials may ultimately marginalize local water users from the decision-making process, they are nonetheless able to take advantage of their strategic location in one of the nation’s top tourist destinations to build valuable bridges with foreign donors and collaborators. These efforts have been successful in bringing attention of international press and like-minded foreign environmentalists and environmental NGOs that have helped the SMF to pressure state authorities into considering alternate sewage treatment technologies.
On the other hand, the KEF is able to articulate a more unified system of knowing and acting with river water pollution. But, their promotion of holistic ecology attempts to supplant core religious practices, like bathing and cremation, through which local water users relate with and worship the river. In their view, these ways of seeing and knowing the river prevent the recognition of pollution and contribute to the degradation of river ecology. While the KEF maintains that replacing this pollution knowledge with one based on holistic ecology will directly reduce the pollution load in the river and inspire local people to act as environmental agents in protection of the river ecosystem, they run the risk of alienating local water users and of reducing the wider debate over river water quality to a simplistic conflict over religious beliefs and practices. However, their location in a major industrial center leads the KEF into direct confrontation with both the state and local factory owners over the prioritization of the government’s industrial development agenda over commitments to ensure the protection and conservation of natural resources. They act as a valuable watchdog in the industrial heartland of the GRB.

Finally, Mela activists draw attention back to demands for a river that meets water quality standards reflective of public water use practices. But, their inability to sustain a protracted or organized campaign allows the state to meet their immediate demands without engaging broader concerns over pollution and water use in the GRB. While the seasonal nature of their protests marginalizes local water use needs, they are able to reach a national audience through media appeal and dissemination of their message among extra-local pilgrims. The disorganized protestors at Allahabad may then show the most potential for sparking a truly nation-wide broad based anti-pollution movement.

Although each of the three groups included in this study is working toward a shared goal to reduce or remove pollution from the river, their structures, methods and, of course, the pollution knowledge they reproduce in their efforts to achieve these goals differs significantly. The place-based nature of these respective efforts becomes a barrier to inter-organizational coordination, as groups not only emphasize different aspects of the problem or propose different solutions, but also as they struggle against one another for primacy and to bring national political and media attention to their local struggles. If we return to the question of whether an anti-pollution social movement currently exists, or is emergent, in the GRB, the divergence between these three groups leads us to an initial
negative conclusion. Three main areas of dissent are worth discussion: the contradictory prescription each group advocates for pollution abatement, each group’s localized conception of the problem, and the leader-oriented structure of the organizations.

First, each group promotes different solutions to the problem of pollution in the Ganges and these solutions often contradict one another. The clearest example is the KEF’s lobby against ritual bathing in the river. Just as the KEF attack this practice, the SMF and Mela activists defend bathing as a core water use activity in the region. While KEF members rail against the negative environmental effects of bathing in general, and mass bathing in particular, the KEF and Mela activists draw upon bathing populations as their core constituents and fight to protect their water use rights. The act of bathing, in particular, is used by SMF members as a point of inspiration, through which the organization attempts to tie water users’ devotion of the Ganga with their observational and experiential knowledge of pollution. As a religious leader, Mahantji is careful to point out that bathing or washing in the river during ritual or religious practice does not cause or create pollution:

“Other people view people’s bathing as pollution. In this sense, fish in the water, birds flying over and shitting in the river cause “pollution”. Any of these things can be viewed as pollution, but they are not.” (pers. comm. 2009)

For Mela activists, bathing becomes the basis upon which their temporary community identity is formed, as well as the method of water use that they struggle to protect, and for which they aim to improve water quality. As long as the KEF continues to fight against the practice of bathing, while the other groups defend it, it is unlikely that these groups will be able to come together in order to create a shared, cohesive vision around which to structure social movement frames or build a broad-base of popular support.

Second, each group views the problem of pollution in the Ganges as localized to their city. Even when the KEF or SMF advocate a basin-wide policy approach, they simultaneously lobby for their city to be the first, or best funded, site for pollution abatement investment. SMF members advocate that Varanasi should be the center of any anti-pollution movement, as they maintain that water quality is worst in that city. Dr. Mishra is just as adamant that his city of Varanasi be prioritized in abatement efforts. While conceding that Kanpur may be the source of pollution, he argues that Varanasi is the city with the worst water quality and that it therefore deserves to be the site that
develops the *solution* to pollution problems in the GRB. In support of this position, he argues that the SMF itself is cause enough for the city’s prioritization in abatement efforts. Shortly after discussing the SMF’s lack of coordination with the KEF, Mishra stated, “No one else in Kanpur or Allahabad is doing anything… [there are] no other NGOs other than the Sankat Mochan Foundation” (pers. comm. 2009). For Mishra, the KEF’s activities and the Mela protests are not sustained or successful enough to take on the role as advisor or public representative to the state. For Mishra, other civil society efforts in the GRB “just critique and protest” and do not “suggest alternative proposals” or provide a sustained movement against pollution in the river. KEF members similarly maintain that pollution must first be engaged in Kanpur, as the city produces more pollution than any other in the GRB. Rakesh Jaiswal of the KEF argues that, “If you don’t clean Kanpur, there is no point in cleaning at Allahabad or Varanasi. So, priority should be accorded to Kanpur” (pers. comm. 2009). Some Mela activists also argue that Allahabad should be home to any official anti-pollution organization, as the greatest protests are staged at the Sangam.

The insistence that each group’s own city deserves prioritization in the fight against pollution prevents organizations from either adopting a basin-wide approach and becoming a supra-local NGO, or building meaningful relationships with other NGOs in order to formed a broad-based anti-pollution movement. In its most extreme, this localization takes on a similar appearance to NIMBY (“not-in-my-backyard”) environmentalism. Prior to the approval of their AIWPS proposal for alternative sewage treatment, the SMF was advocating for a massive waste diversion program, which would have involved building trenches along the riverfront in order to capture sewage being released from drains into the river. The trenches would empty back into the river without treatment, but only downstream from the city. As Dr. Mishra explained, diverting sewage downstream would protect the city of Varanasi, as well as its bather-worshippers, from exposure to pollution. When asked about the people downstream, Mishra defended the proposal, saying that those people already have to deal with sewage and pollution, and diversion of this material through the city would not negatively impact the villages downstream. He was clear in maintaining that the SMF was there to protect the interests of city, the ghats, and river worshippers, and not all water users along the river.
Third, each group portrays their leader(s) as saviors of the river and concentrates power among this dynamic leadership. While media accounts abound which portray and name Dr. Mishra as “savior” of the Ganges, this is an image that the SMF actively reproduces. The organization’s website repeatedly references his personal accomplishments, including his receipt of the Rio UNEP Global 500 award in 1992 and his selection as one of the Heroes of the Planet by Time Magazine. The SMF capitalizes on Mishra’s fame in order to draw attention to their organization. In an interview with one SMF member, he asked with surprise, “Don’t you know?! Mahantji is one of India’s preeminent environmentalists. He has been in many magazines. He was one of Time Magazine’s Top 100 People for his work to save the Ganga” (pers. comm. 2009). This focus on the accomplishments of one individual, rather than a large and dynamic organization, mean that power is often over-concentrated in leadership positions, that potential members are marginalized into a faceless crowd of supporters, and that anti-pollution groups lack the resiliency necessary to mount a longstanding campaign against pollution of the river. As one SMF member (pers. comm. 2009) explained this emphasis on the accomplishments of one individual, rather than the group, actually detracts from the organization:

“Sankat Mochan Foundation’s not famous, only Mohantji is famous. He is a famous person, a global person… If you search on Google, you find many [hits] for Mahntji. Search Sankat Mochan Foundation and you will only find maybe 20 pages.”

While the SMF is most direct in its portrayal of Dr. Mishra as “savior” of the Ganges, Rakesh Jaiswal and the religious leaders of Mela protests are frequently portrayed as solitary soldiers in the war against water pollution. Imagery on both the SMF and KEF websites support this interpretation, showing Mishra and Jaiswal confidently leading campaigns, speaking to groups of supporters, and sitting in on high-level political meetings (see Figure 6.5 and 6.6). In this way, organizations like the SMF and KEF run the risk of “becom[ing] guardians of their [leaders’] own power rather than their original revolutionary cause” (Michaels 1959, 127). These groups’ focus on their dynamic leadership also means that few accomplishments are made without the direct intervention of these individuals. As mentioned above, the KEF organized no activities or events during the period that Jaiswal was recovering from surgery. Without successors, or the
6.5 Rakesh Jaiswal pictured with clean-up campaign volunteers (KEF 2008)

Figure 6.6 Mishra speaking of World Water Day (SMF New Website)
ability to “routinize” Mishra and Jaiswal’s dynamism, these organizations run the risk of dying off without their presence (Weber 1954).

Because the activities and pollution knowledge being reproduced by these groups is so drastically different it is unlikely that they will be able to identify enough shared perspectives or common ground from which to bridge their framing practices and form a shared social movement identity. Instead, in order for these disparate groups to build a coalition that could form the basis of a larger social movement, one or more of these groups would need to take the unlikely step of relinquishing the primacy of their pollution knowledge, their location, and their leadership. If these groups choose to coordinate their activities or attempt to form a broader social movement organization, they will ultimately need to set aside their different interpretations and prescriptions. Because the pollution knowledge reproduced by these groups is not only dissimilar, but actually contradictory, they may have to adopt a sort of strategic essentialism in order to achieve their goals (see Spivak 1987). This would involve setting aside their differences and agreeing on some simplified, essentialized pollution knowledge that could, even temporarily, form the basis of a social movement ideology. Success will also rest on these groups’ ability to find meaningful ways for the wider public to become involved in anti-pollution politics, beyond their passive presence at protests and rallies.
CHAPTER SEVEN
PUBLIC DISCOURSE AND THE EFFECTS OF POLLUTION KNOWLEDGE:
WATER USE ACTIVITY IN THE GANGES RIVER BASIN

Previous chapters have discussed the efforts of various institutions, organizations and groups in reproducing pollution knowledge. This chapter shifts focus by exploring the pollution knowledge(s) of diverse water users, broadly defined, and the variation in the multiple contents, sources, and activities associated with pollution knowledge among water users in each of the three study sites. It presents results of the survey conducted among water users in the three study sites of Kanpur, Allahabad and Varanasi (see Appendix A), illuminated by insights from follow-up interviews with water users. In addition to exploring information, ideas and values associated with the pollution knowledge of water users, the survey also assessed effects of pollution knowledge on individual and group activity; both in terms of the influence of PK on water use activities and political activity, defined in this case as participation in anti-pollution NGO or protest activity and political opinion toward abatement efforts. While voting habits were not directly assessed through the survey instrument, it was assumed that political opinion or approval of government abatement efforts can translate into support or disapproval for individual government offices or institutions, and perhaps even voting patterns.

The findings of this survey challenge the validity of assumptions made by both government and NGO members that decision-making and water use or political activities of river basin water users are based on a lack of knowledge or inadequate information related to pollution of the Ganges River. The evidence presented in this chapter supports the argument that, instead, that people are well aware of the problem of pollution, its multiple sources, and the risks it can pose to human and environmental health. It also shows that there are significant differences in the way in which pollution is conceived of, addressed, and related to at each of the three study sites, which may reflect the differing context in which pollution knowledge is construction and/or the efforts of NGOs and anti-pollution organizations at each of these sites.

Findings for ten main elements of the survey data are presented and discussed at the aggregate level, as they vary by site, and attendant patterns that emerged when data
were analyzed by age, gender, and other factors. As a whole, the survey sample was relatively small, with only 121 respondents at three study sites. Among these respondents, women were underrepresented, at only 21.49% of the study population. In terms of the age of respondents, younger age groups were better represented in the sample, with 38.02% of respondents between the ages of 18 and 29 years, and 43.80% between 30 and 49 years. Only 13.22% of respondents were between 50 and 65 years and only 4.96% over the age of 65 years (see Figure 7.1). In terms of marital status, 70.25% of respondents reported being married, compared to 29.75% of unmarried respondents. In terms of residence, an overwhelming majority of respondents (76.03%) reported that they reside in the city in which they were surveyed, compared to only 8.36% who reported living elsewhere in the state of Uttar Pradesh and 13.22% who reported living out of state (see Figure 7.2). No respondents reported an international residence.

Finally, literacy rates among the sample population were relatively high, with 71.07% of respondents reporting regular newspaper reading habits. Among the 71.07% of respondents who reported newspaper reading habits, *Dainik Jagran*, a Hindu-language paper, was the most commonly read, with 32.23% of respondents reporting it as the newspaper they read most often. *Amar Ujala* was the second-most popular, with 14.88%
of respondents reporting frequent usage. The most widely read English-language newspaper was the Hindustan Times, popular among 8.26% of respondents. Findings related to the most widely read newspapers among respondents are illustrated in Figure 7.3. The following pages present the results of the survey and discuss trends revealed by the data.

7.1 Pollution Knowledge and Pollution in the Ganges River
One of the primary questions assessed through administration of the survey questionnaire was, “Is there pollution in the Ganges River?” Respondents were prompted to answer with a reply of “yes”, “no” or “unsure”. They were then prompted to provide open-ended responses to the follow up questions, “So then, what is pollution?” and, “Where does pollution come from?”. Responses to these follow-up questions are discussed in the next sections of this chapter. The question, “Is there pollution in the Ganges River” was worded carefully to avoid asking whether the Ganges River is polluted. The latter wording would likely have implied to some respondents that the Ganges exists in a state of pollution, which may contradict some religious interpretations of the river as infallibly pure. Instead, asking whether pollution is in the river allows for respondents to positively
affirm the existence of pollution suspended in the river while hopefully avoiding any connotation that the river exists in a polluted state of being. The wording of this question may account for differences in findings from previous studies (see Alley 2002).

Overall, a vast majority of respondents answered this question affirmatively. Of all respondents surveyed, 78.51% or 95 respondents indicated that yes, there is pollution in the Ganges River. Only 17.36% or 21 respondents answered negatively, indicating that no, there is not pollution in the Ganges River. Five respondents, or 4.13% of the sample population, were unsure in their response to this question. Between the three study sites, findings were somewhat mixed. The site with the highest affirmative response rate was Kanpur, with 90.48% of respondents indicating that yes, there is pollution in the river. None of the Kanpur respondents indicated an unsure response, leaving 9.52% negative responses. Next, Varanasi was just above the average with 80.70% affirmative and 12.28% negative responses. Varanasi had the highest rate of unsure responses, at 7.02%. Finally, affirmative response rates were lowest in Allahabad, at only 69.77%. With only one unsure response, the remaining negative responses accounted for 27.91% of the Allahabad study population. Results across sites are presented in Figure 7.4.

7.1.1 Pollution Knowledge by Age

Affirmative response rates among age groups varied from 73.58% of 30-49 year olds, 75% of 50-65 year olds, 83.33% of 65 and older, and 84.78% among 18-29 year olds. These results varied slightly between study sites, with those 65 and older having the
highest affirmative response rate (100%) in Varanasi, followed by 18-29 year olds and 30-49 year olds, each with 80% affirmative responses. In Varanasi, respondents age 50-65 had the lowest affirmative response rate of 77.78%. Responses were relatively consistent in Allahabad, with an affirmative response rate of 100% among those 65 and older, 85.71% among 18-29 year olds, 66.67% among 50-65 year olds, and only 59.09% among 30-49 year olds. In Kanpur, affirmative response rates were higher among nearly all age groups, with 100% among 18-29 and 50-65 year age groups and 90.91% among 30-49 year olds. The oldest age group, 65 years and older, had the lowest affirmative response rate at only 50%. However, unusually high and low affirmative response rates among 65 year and older respondent groups is most likely an effect of their low representation among the survey group. Of the 121 survey participants, only six people (under 0.05%) identified themselves as members of the 65 year and older age group. Responses by age group for all sites are illustrated in Figure 7.5.

7.1.2 Pollution Knowledge by Gender

Across the survey sites, responses varied more by the gender of survey participants then by age. Among males, 82.11% answered affirmatively that there is pollution in the river, whereas only 65.38% of females answered affirmatively. Female
respondents were also more than twice as likely as their male counterparts to provide an unsure response to this question, with an unsure response rate of 7.69% among female respondents and only 3.16% among males. Consistent with overall survey findings, affirmative responses were lowest among females at Allahabad, at only 55.56%, where male affirmative responses were 73.53%. Interestingly, while male affirmative response rates were highest in Kanpur at 94.44% (where affirmative responses among females were only 66.67%), female affirmative response rates were highest in Varanasi at 71.43% (where corresponding rates among males were 83.72%). Survey results categorized by gender are illustrated in Figure 7.6.

7.1.3 Complications of Pollution Knowledge

A number of respondents paused, hesitated or were unable to give a simple polar (yes/no) answer to the question of pollution in the Ganges. As one Muslim weaver in Varanasi summarized, “The Ganga is both polluted and also clean” (pers. comm. 2009). In this way, simple polar responses were insufficient for some respondents to explain the state of pollution or water quality in the river. Other respondents indicated that, while there is no pollution in the river, water quality is nonetheless a problem. For one male barber from Allahabad, it was important that he expressed his awareness of the issue of

Figure 7.5 Response by age, "Is there pollution in the river?"
pollution, even while dismissing its existence: “There is no pollution in the river, but I know about it and am concerned for the river” (pers. comm. 2009). Still other water users indicated that the mystical or chemical properties of the river prevent the river from becoming polluted or destroy any pollution that enters its waters. As one male tannery worker in Kanpur explained, “There is bacteriophage activity in the Ganga that is not in other water, or tap water.” (pers. comm. 2009). Other respondents argued that while the river once had the power to cleanse itself, that ability is now limited or curtailed: “[The Ganga] is a pure river, but no longer. Its spiritual power is no more” (Serviceman, Varanasi, pers. comm. 2009). The tension that exists between observations of poor water quality and belief in the Ganges’s ability to cleanse and purify are explored in the following excerpt from an interview with a seasonal farmer in Varanasi:

SBK: How old were you when you first came here, to the river?
Farmer: (pauses, laughs) I don’t know. No more than that (points to a small child, about a year old, standing near us). You see, we people were born with the river, we have always been here. As long as I can remember.
SBK: So, you bathe in the ganga then?
F: Yes, of course.
SBK: …and you drink ganga jal?
F: (laughs) Yes. We use the water for everything: bathing, drinking, cooking, washing. You see (motioning with a sweep of his hand), there is no other water here.
SBK: So, since your childhood, has the river changed, does the water look different?
F: Yes, but people’s mind has changed, not the river. It is the way that you look at it, if it is dirty or pure. Otherwise, it’s always pure. Gangaji is here to save the world.
SBK: Why do some people say there is pollution in the Ganga?
F: Because we can see the dirt in the water. People shouldn’t throw dirty water, sewage water, into the river. (pers. comm. 2009)

7.2 Pollution Definitions and Content

After answering yes or no to the question of whether there is pollution in the Ganges River, respondents were asked an open-ended question, “So then, what is pollution?”. While all respondents were asked this question, regardless of their response to the previous question about the existence of pollution in the river, 17.36% of respondents did not reply or were unsure in their response. Another 2.48% replied that there is too little (tora) pollution to say what it is, or that the river is clean or “can’t be contaminated” (male teacher, Allahabad). Among the remaining respondents, recurring replies were categorized into the following themes:

- sewage and drains
- dirt and dirty water
- garbage and trash
- factories and industrial waste
- polyethylene bags/plastics
- flowers and garlands
- chemicals
- soaps and detergents
- religious and puja materials
- air pollution
- bodies and ashes
- urban and city waste
- bathing
- people

An additional category of “other” was created for all single-occurrence responses, including farm runoff, spit, insects, population increase, fishes, dumping, soil pollution, and “everything”.

At the aggregate level, ‘sewage and drains’ received the highest rate of mention, with 42.27% of respondents making reference to sewage, sewer water, toilets or latrines, informally to “shit” (female student, Allahabad) or “pee” (boatman, Varanasi), and more specifically to “dirty water from sewers without treatment” (businessman, Allahabad).
Next, the categories of ‘garbage and trash’ and ‘factories and industrial waste’ received the second highest rates of mention at the aggregate level, with 28.87% of respondents each. Among respondents who referenced factories or industrial pollution, 25.00% identified a particular cite or location of industry, including Kanpur, Agra, and Naini (an industrial outpost across the Yamuna River from Allahabad). The fourth most frequently mentioned category was ‘polyethylene bags and plastics’, mentioned by 14.43% of respondents. Next were ‘flowers and garlands’, mentioned by 13.40% of respondents, followed by ‘dirt and dirty water’, mentioned by 11.34% of respondents. The remaining categories of responses were referenced by less than ten percent of respondents.

7.2.1 Pollution Definitions by Site

Responses to the question of what is pollution varied significantly between sites. In Varanasi, a majority of respondents (59.18%) mentioned sewage or sewer drains. The next most frequently mentioned categories were garbage and trash (32.65%), flowers and garlands (20.41%), polyethylene bags and plastics (14.29%), dirty/dirty water and bodies/ashes (12.24% each), and soaps/detergents and bathing (10.20% each). Among Varanasi respondents, rates of mention for ‘factories and industrial waste’ were far lower than the other two sites, with only 4.08%, compared to 46.67% in Allahabad and 66.67% at Kanpur. However, rates of mention were significantly higher in Varanasi for ‘sewage and drains’ (59.18% compared to 26.67% in Allahabad and 22.22% in Kanpur), for ‘flowers and garlands’ (20.41% compared to 6.67% in Allahabad and 5.56% in Kanpur), for ‘bodies and ashes’ (12.24% compared to 6.67% in Allahabad and 5.56% in Kanpur), for ‘bathing’ (10.20% compared to 0.00% in both Allahabad and Kanpur), and for ‘soaps and detergents’ (10.20% compared to 6.67% in Allahabad and 0.00% in Kanpur). These differences are likely the product of Varanasi’s unique characteristics as a holy city and popular pilgrimage site for bathing, worship, and the immersion of ashes. They also may reflect the lack of a large industrial presence in the city, or perhaps the success of educational programs that have focused on popularizing the idea that sewage is a primary source of river pollution.

In Allahabad, few notable divergences occurred with rates of mention from the other two study sites. Often, rates of mention from Allahabad fell in between or in line with the other two study sites. Allahabad did exhibit the highest rates of mention for the
categories of ‘dirt and dirty water’ (13.33% compared to 12.24% in Varanasi and 5.56% in Kanpur), ‘garbage and trash’ (33.33% compared to 32.65% in Varanasi and 11.11% in Kanpur), and ‘polyethylene bags and plastics’ (16.67% compared to 14.29% in Varanasi and 11.11% in Kanpur). Interestingly, Allahabad was the only site where respondents specifically identified people as a source of pollution, at a rate of 6.67%. Ambiguous references to people included, “local people” (female teacher, Allahabad) and, “people bring it” (female student, Allahabad). But, these were not the only mentions of people-caused pollution. References to “people” that were listed under other categories included, “locals dumping waste along the coast” (male construction worker, Allahabad), “public washing” (female artist, Varanasi), “people washing and people toilet in the river” (male worshipper, Varanasi), “people are responsible, they bring garbage” (male student, Allahabad), “people dump garbage” (businessman, Allahabad), and “Basically, at sites, because they are illiterate, people throw wastage. But, the water is drinkable” (male student, Varanasi).

In Kanpur, as discussed above, rates of mention were slightly lower for responses related to religious and puja materials, flowers and garlands, bathing, and dirt and dirty water, as well as garbage and trash. Rates of mention were highest in Kanpur among four categories: ‘factories and industrial waste’ (66.67% compared to 46.67% in Allahabad and 4.08% in Varanasi), ‘urban and city waste’ (16.67% compared to 0.00% in both Varanasi and Allahabad), ‘chemicals’ (5.56% compared to 2.04% in Varanasi and 3.33% in Allahabad), and ‘air pollution’ (5.56% compared to 3.33% in Allahabad and 0.00% in Varanasi). Again, these patterns may very well reflect specific issues related to the characteristics of Kanpur as a large industrial urban center, with significant chemical and air pollution. It may also reflect weaknesses in author-identified categorizations or differences in speech or terminology between sites, as “urban and city waste” may refer to sewage, garbage, or industrial effluent. Results for all sites and categories are illustrated in Figure 7.7.

7.3 Sources of Pollution
After providing a response to the question of what pollution is, respondents were asked another open-ended follow up question, “Where does pollution come from?” For this
question, 19.00% of respondents either did not answer, or answered that they were unsure or didn’t know. Among the remaining respondents, answers were organized into the following categories:

- “the city” or “cities”
- specific cities and “outside of the city”
- upstream
- drains or sewers
- tanneries
- factories
- ghats, burning ghats
- religious practices
- people or locals
- “everywhere”

Again, an additional category of “other” was created for all single-occurrence responses, including villages, washing, buffalo, and the “Muslim dying clothes district”.

At the aggregate level, the most commonly identified source of pollution was the city of Kanpur, which was mentioned by 26.53% of respondents. The second most frequently identified source was unspecified “city” or “cities”, mentioned by 22.45% of respondents. Other popular responses were the city of Varnasi, and ‘drains or sewers’, each mentioned by 19.39% of respondents, and other cities, including Bithoor (about...
18km upstream from Kanpur), Kannauj (83 km upstream from Kanpur) and Haridwar (Uttar Pradesh) which were mentioned by 14.29% of respondents. Once again “people” or “locals” were a popularly identified source of pollution among respondents, with a 15.31% rate of mention. One of these respondents argued that people both produced pollution and were actively involved in its prevention: “[Pollution comes from] people taking bath[s], spitting, toilet[ing] in Banaras. People try to stop them, but they don’t listen” (female homemaker, Varanasi). Another person similarly argued, after complaining about people who throw trash directly into the river, “We live here and always tell people not to throw trash” (male tailor, Varanasi). Yet another respondent doled out the responsibility more evenly: “[pollution comes] from us” (female student, Allahabad).

7.3.1 Sources of Pollution by Site

In both Varanasi and Kanpur, respondents identified their city as the source of pollution with a higher frequency than other sources. In Varanasi, 37.25% of respondents identified their city, compared with 61.11% of Kanpuri respondents who mentioned their city. Understandably, in Kanpur, the study site furthest upstream, respondents only identified their city and “other cities” (27.78%). In Allahabad, however, respondents mentioned Kanpur at a much higher rate (27.59%) than they mentioned their own city (17.24%) or “other cities” (13.79%). Furthest downstream in Varanasi, respondents identified their city (37.25%), Kanpur (13.73%), Allahabad (5.88%) and “other cities” (9.80%) most frequently. Kanpur and Varanasi were the only study sites where respondents indicated that pollution comes from “upstream”, at a frequency of 22.22% and 7.84%, respectively. Additionally, 7.84% of Varanasi respondents answered that pollution came from “outside of the city”. Overall, 7.14% of respondents argued that pollution comes from “everywhere”.

In Varanasi, respondents had the highest rate of mention of drains and sewers, at 21.57%, compared to 20.69% in Allahabad and 11.11% in Kanpur. As with the previous question, this rate may have been influenced by the prevalence of sewage pollution at Varanasi, media attention to the problem of treatment plant failure, or the efforts of educational programs. Respondents in Varanasi also had the highest rate of mention of ghats, specifically the burning ghats, at 13.73%, compared with only 3.45% in Allahabad.
and 0.00% in Kanpur. The lower rate of ghat mention in Allahabad may reflect the lack of riverside ghats at some of the main bathing areas. However, in Kanpur, ghats are prevalent along the riverfront and yet received no mention by respondents. In Varanasi, “people” or “locals” again received high rates of mention among respondents, at 17.65%, compared to 17.24% in Allahabad and only 5.56% in Kanpur. These statistics may reflect respondents’ own view of responsibility for the creation of pollution, or may reflect Varanasi and Allahabad’s standing as centers of religious pilgrimage and river-based worship, where local water users often observe tourists, pilgrims and other worshippers contributing to contamination of the river.

In Allahabad, religious practices or worship had the highest rate of mention across sites, at 3.45%, compared to 1.96% in Varanasi and 0.00% in Kanpur. These rates were surprisingly low across sites, especially considering the efforts of governmental and non-governmental programs to raise awareness of the environmental impacts of religious activity and to curb religious water use, especially in Kanpur and Varanasi. Respondents in Allahabad also had the highest rate of mention for “the city” or “cities”, at 34.48%, both when compared to other categories at this site and when compared to other sites, where “cities” were only mentioned by 19.61% of Varanasi respondents and 11.11% of Kanpur respondents. In Kanpur, respondents were less likely to identify unspecified “cities”, but were much more likely to identify their own city as the source of pollution (61.11%), or other nearby cities, like Bithoor or Kannauj (27.78), or from “upstream” (22.22%). Kanpur also had the highest rate of mention for both tanneries (11.11%) and factories (16.67%), compared to 9.80% and 5.88% in Varanasi, and 6.90% for both categories in Kanpur. Overall, Kanpur and nearby sites received high rates of mention across the study sites. In a follow-up interview with a worshipper in Kanpur, he argued that people identify the city as a main source of pollution because water quality is the poorest in the city and that the pollution in the river is more easily visible that in other cities. Another worshipper indicated that the concern with industrial pollution and water quality in Kanpur is exaggerated by biased media accounts. In an interview with a manager of a Kanpur leather factory, he claimed that tanneries receive unfair attention from media, politicians and NGOs because, “they are owned and staffed by Muslims… Muslims in Kanpur are wealthy because of the leather tanning industry, so the Hindu
government focuses on tanneries, even though there are only a small portion… of the problem” (pers. comm. 2009). Survey results are illustrated in Figure 7.8.

7.4 Observations of Change over Time

Because direct observation and experience are believed to influential in the formation of pollution knowledge, the survey questionnaire was designed to assess water users’ observational experiences with the river. Survey respondents were first asked how many years ago they first came to the river. Two follow-up questions then asked respondents to indicate a simple polar (yes/no) response to whether the river water had changed since that first visit and, for those who provided an affirmative response, an open ended question asked them to identify how the water had changed. These questions were asked early on the questionnaire, before the word “pollution” was mentioned, in order to reduce the chance that respondents would already know the purpose of the survey and would be

Figure 7.8 Rate of response by category and site, "Where does pollution come from?"
influenced by its focus on issues of water quality and pollution knowledge and abatement. The questions were also carefully worded to ask respondents to identify whether and how the river water had changed since their first visit, and not how water quality or pollution in the river had changed over time. Only respondents who indicated that they had first come to the river ten years ago or more were included in the analysis of this question, so that judgments of change in river water would reflect a relatively lengthy period of observation. Of the 121 respondents, 79 individuals or 65.29% of the study sample reported having first come to the river more than 10 years ago. Of those, 82.28% confirmed that, yes, the river water had changed. While the percentage of affirmative responses were relatively consistent at Varanasi (80.49%) and Allahabad (79.17%), 92.86% of respondents from Kanpur reported observations of change in river water since first coming to the river more than a decade ago.

Respondents who indicated that they had observed change in the river water since their first visit, ten years ago or more, were asked to explain how the river water had changed. Nearly a quarter (23.08%) of these responses were relatively neutral observations about seasonal changes in water levels, the construction of upstream dams and their affect on the flow of water or the course of the river, or general observations that the river had “just changed”, or only experienced “small changes”, or in one case that “everything changed, in the Yamuna too” (retired priest, Varanasi). Among respondents who described changes in the river water, 15.38% had generally positive assessments of this change. Their comments indicated that the river water is simply cleaner now than it was before or that there had been general “improvement” in the water quality. Some of these respondents reported specific observations, including:

“[The river] is more clean now, people take more baths.” (Unemployed male, Varanasi)

“Earlier, lots of garbage used to float; now no more.” (Male Dhobi, Varanasi)

Nonetheless, a majority (61.54%) of respondents who reported observing change in river water over ten or more years indicated that this change involved a decline in water quality. Many of these respondents specifically mentioned pollution, saying that the river is now “polluted” or is not as clean as it used to be or is “dirtier” than it once was. Others reported visual evidence of deteriorating water quality (including dirtier
looking, “blackened” water, a “whiteness” or a “pale yellow” color in the water, or increased garbage floating in the water). Again, some respondents’ observations were more specific:

“Pollution increased. Previously one could drink; now there is less water too.” (Businessman, Allahabad)

“[Now there is] too much impurities by industries.” (Male Teacher, Kanpur)

 “[The water is] more dirty, because of tanneries.” (Male Electrician, Kanpur)

“[Now there is] more pollution, more people bathing.” (Boatman, Varanasi)

“Now it is more dirty, everyone is throwing garbage now.” (Female Homemaker, Varanasi)

“Before there were no skin effects. Now, much skin problems.” (Male Farmer, Varanasi)

“In childhood, you could see a paisa at the bottom of the river, now [you see] industrial chemicals from Kanpur.” (Retired Male, Varanasi)

“Now I don’t want to drink the water because it is so dirty.” (Male Sweetmaker, Varanasi)

“It was more clean and green earlier, now it is black and dirty and people wash their buffalo.” (Male Dhobi, Varanasi)

“Dead bodies used to float, but now you can’t see [them].” (Businessman, Varanasi)

Two Likert-scale questions were included in the survey in order to further explore and cross-check water users’ observations of change in the river. Question M2 asked respondents to indicate a scale of agreement with the statement, “There is more pollution in the river now then ever before” and question M6 asked, “There is less pollution in the river now than 10 years ago”. Because question M6 provided a cross-check to responses provided to question M2, they asked nearly identical questions asking water users to reflect on changes in river water pollution over time. While most respondents consistently answered both questions, the rate of no response to question M6 (42.15%) was significantly higher than that to question M2 (28.93%), because many respondents recognized the repetition and declined to provide an answer to the second cross-check question. A majority of respondents (51.24%) indicated agreement or partial agreement with statement M2, “There is more pollution in the river now then ever before”, but did so at higher rates than they registered disagreement with statement M6, “There is less
pollution in the river now than 10 years ago” (34.71%). Only 14.05% of respondents registered some degree of disagreement with statement M2, compared with 56.20% of respondents who registered some degree of agreement with statement M6. This indicates that, among water users who first visited the Ganges at least 10 years ago, a majority of respondents report observing an overall increase in river water pollution.

### 7.5 River Water Use Practices

In order to assess river water use practices of survey participants, a number of open-ended, simple polar (yes/no), frequency and Likert-scale questions were included in the survey questionnaire. Respondents were first asked two open-ended questions, “For what purpose did you come to the river today?” and, “For what purpose do you most often come to the river?”. For an overwhelming majority of respondents, the answers to these questions were the same. So, only the statistics for the first question will be discussed here, to prevent repetition. Across sites, respondents identified four main purposes for coming to the river: for religious worship or rites, to bathe, to work (including farming, boating, dung collection, shop keeping and other), or for leisure. Interestingly, work was the most popular response, with about one third of respondents (33.88%) identifying this purpose. Next, 14.05% of respondents identified leisure activities as their reason for coming to the river, followed by 12.40% for bathing and 9.09% for religious worship or rites. It is important to note here that bathing could refer to bathing for health or cleanliness as well as bathing for religious purposes. Other notable uses include travel and tourism at 7.44%, walking at 4.96%, washing at 4.13%, *dekne* (to look at or see the river) and *darshan* (to behold a deity) at 4.13%, and “because I live here” at 3.31%. Other responses with infrequent mention include fishing, cremation or immersion of ashes, and water collection.

Response rates varied notably between sites. While work was a significant reason for coming to the river at all sites, leisure was the highest rated reason in Kanpur at 28.57%, where work was identified by only 23.81% of respondents. Both religious and bathing uses were highest among respondents in Varanasi, where religious use was identified by 12.28% of respondents (compared to 9.52% in Kanpur and 4.65% in Allahabad) and bathing was identified by 21.05% of respondents (compared to 6.98% in
Allahabad and 0.0% in Kanpur). Conversely, rates of leisure identification were highest in Kanpur at 28.57%, compared to 16.28% in Allahabad and only 7.02% in Varanasi. Varanasi was the only study site at which either washing (8.77%) or fishing (1.75%) were mentioned by respondents. Allahabad was the only site where activities related to cremation and the immersion of ashes was reported (4.65%). Results are illustrated in Figure 7.9.

7.5.1 Bathing and Drinking Activity

In order to focus on water users’ activities bathing in or drinking water from the river, respondents were asked simple polar (yes/no) questions about whether they have ever bathed in the river or drunk ganga jal. Each of these queries was followed by frequency questions, asking respondents to identify how often they participate in each of these activities (daily, weekly, monthly, yearly, or less than yearly). Results indicated a high rate of participation in both bathing and drinking activities. Across sites, 88.43% of respondents disclosed that they have bathed in the Ganges at some point and 84.30% indicated that they have drunk ganga jal. However, rates of participation in these activities varied significantly between the three study sites. Varanasi had the highest rate of affirmative responses for both categories, with 94.74% respondents participating in bathing activities and 91.23% participating in drinking activities. In Allahabad, these
rates decreased to 88.37% bathing and 81.40% drinking. Rates were significantly lower in Kanpur, where only 71.43% of respondents indicated that they participate in either bathing or drinking activities. Rates of bathing and drinking participation across and between sites are illustrated in Figure 7.10.

In most cases, respondents who reported participation in bathing activities also reported participation in drinking activities. All female respondents in Allahabad participated in both activities, as did 97.56% of male participants in Varanasi. However, these rates were lower among males in Allahabad, females in Varanasi, and among all respondents in Kanpur. Only 83.87% of males in Allahabad and 76.92% of females in Varanasi participated in both bathing and drinking activities. In Kanpur, these rates were 83.33% among males and 33.33% among females. Stark gendered differences may be the result of lower female participation in the survey overall, or it may be indicative of other influences, such as high female workload or domestic water collection responsibilities. Lower rates of participation in drinking activities likely reflects that many water users at each study site have access to alternate sources of drinking water, and not alternative
water sources for other uses (bathing, washing, etc.). Many respondents indicated that they do not drink river water specifically because tap water is otherwise available:

“The water is clean, but I do not drink [it] because tap [water] is available. Only people coming from far places [to worship] drink the [river] water.” (Retired female, Kanpur)

“[It is] not necessary to treat or boil [ganga] water, because tap water is available [for household use].” (Male service worker, Kanpur)

Other respondents indicated that, while daily bathing in the river is permissible, river water should only be drunk occasionally, on auspicious religious dates:

“Water is not meant for drinking every day, only on special occasions.” (Male student, Allahabad)

Still others admitted that it was the quality of the water itself that prompted them not to drink:

“Now, I don’t want to drink the water because it is so dirty.” (Male sweetmaker, Varanasi)

“Pollution has increased in the river. Previously, one could drink, but now… [shakes head].” (Businessman, Allahabad)

“We don’t want to drink, but we drink out of faith… Religious [tradition] says we should [drink ganga jal], but it isn’t safe.” (Retired male priest, Varanasi)

“People shouldn’t drink [ganga jal] at all.” (Male worshipper, Kanpur)

A number of patterns emerged from the survey data related to participants’ water use practices. First, findings indicate a gendered dimension of participation in different types of water use, with men drinking river water at higher rates than women and more women participating in bathing than drinking river water. Women in Kanpur reported strikingly low rates of participation in drinking water activities, which may reflect a number of influences, including poor water quality in Kanpur, greater concern with health and wellness among women, improved access to alternative water sources among women, and more time spent at the river conducting housework. However, few women or men reported collecting river water for household use other than puja. This shows that the river is a valuable resource for work outside of the home (used for washing laundry, herding, fishing, etc.), but is not often collected in these cities for use in cooking or non-ritual drinking at home. This may reflect broadly held perceptions, especially among
water users in Kanpur, that river water is generally not safe to drink and could pose some risk to human health, depending on the qualities of the person drinking.

7.5.2 Bathing Activity and Frequency

Across the study sites, more respondents reported having bathed in the Ganges than having drunk ganga jal. In general, rates of bathing participation increased with age. Among 18-29 year olds, 80.43% of respondents indicated having bathed in the river, compared with 94.34% of 30-49 year olds, 87.5% of 50-65 year olds, and 100% of those 65 years and older. This general trend held, with minor variations, among respondents at each of the three study sites, as illustrated in Figure 7.11a. In terms of gendered differences in bathing participation, little differentiation appeared at the aggregate level, with 88.46% of females and 88.42% of males indicating participation in bathing activities. A gap in gendered bathing practices appeared at the individual site level. Gendered differences were most distinct in Kanpur, where 100% of females reported participation in bathing activities, compared to only 66.67% of males. In Allahabad, gendered differences in bathing participation were less marked, with 77.78% of females and 91.18% of males indicating having bathed in the river. These gaps were virtually non-existent in Varanasi, where 92.86% of females and 95.35% of males participated in bathing activities. The lack of a gender gap in bathing participation in Varanasi may be attributable to the larger sample size, or to a higher rate of pilgrim participation in the study at that site. The large disparity in bathing participation between men and women in Kanpur, and to a lesser degree in Allahabad, may reflect lower rates of participation in religious water user activities. This trend seems significant and deserves further investigation.

In terms of the frequency with which water users participate in bathing activities, the highest percentage of respondents (43.40%) indicated that they bathe in the river daily. However, in Allahabad, a significant number of respondents (47.37%) reported infrequent use of either one per year or less. These findings may be expected at a site of annual or semi-annual pilgrimage. In Kanpur, bathers’ activities were significantly less frequent, with few respondents (6.67%) reporting daily activity and the highest percentage of respondents (40.00%) reporting monthly activity (see Figure 7.11b). This indicates that water users in Allahabad and Kanpur bathe in the river far less frequently
than their counterparts in Varanasi. This pattern may reflect lower rates of religious water use in Allahabad and Kanpur, higher proportions of seasonal or event-based bathers, the existence of an alternate source of bathing water, or may be the results of a more widely held apprehension that water quality in Kanpur is not suitable for bathing.
7.5.3 Drinking Activity and Frequency

While fewer respondents reported drinking *ganga jal* than bathing in the river, a significant number of respondents (84.30%) reported drinking river water. Similar to bathing activities, engagement in drinking activities generally increased with age. This trend was most evident at Allahabad, where 71.43% of 18-29 year olds reported drinking activities, compared to 86.36% of 30-49 year olds, 83.33% of 50-65 year olds, and 100% of those 65 and older. This trend also held among the first three age groups in Kanpur, where 57.14% of 18-29 years, 90.91% of 30-49 year olds and 100% of 50-65 year olds reported participation in drinking activities. However, neither of the two respondents aged 65 and older reported any engagement in drinking activities. Again, this may be due to the small representative sample size of this age group, or to other influences discussed later in this chapter. In Varanasi, the trend towards increased participation with age generally held true, with the exception of the 30-49 year age group, who reported higher rates of participation at 95.00%, compared to 88.00% of 18-29 year olds, 88.89% of 50-64 year olds, and 100% of participants age 65 and older. Findings related to the rate of drinking activity participation by age group are illustrated in Figure 7.12a.

At the aggregate level, females reported lower rates of participation in drinking activities, at 76.92%, than males, at 86.32%. Gendered differences in drinking participation rates were more significant at the individual site level in Varanasi, where females reported rates of 78.57% and males reported 95.35%, and Kanpur, where females reported rates of only 33.33% drinking participation in comparison to 77.78% of males. Only in Allahabad were female drinking participation rates, at 88.89%, higher than their male counterparts, at 79.41%.

In terms of the frequency with which water users engaged in drinking activities, nearly half of all participants who reported participation in drinking activities, or 48.04% of those, indicated that they drink *ganga jal* daily. Daily water drinking practices were dominant in Varanasi, where 61.54% of respondents reported daily drinking, compared to only 15.38% of respondents who reported weekly drinking, and less than 6% of respondents reporting drinking activities at monthly, yearly, and less than yearly frequencies. In Allahabad, however, only 37.14% of respondents reported daily drinking activities, with 28.57% reporting less than yearly drinking of *ganga jal*, while other
frequencies achieved less popularity. In Kanpur, respondents reported drinking activities across frequencies, with 26.67% reporting daily drinking, 20.0% drinking weekly, 26.67% drinking monthly, 26.67% drinking yearly, and no reports of less than yearly drinking. Frequencies of drinking across and between sites are illustrated in Figure 7.12b.
7.5.4 Water Collection

In order to understand the use of river water collected at the riverside and used at other locations, respondents were asked to identify whether they take water from the river and, if so, how it is subsequently used. Only 68.60% of respondents reported taking water from the river, with little variation in water collection participation rates across sites. Rates were highest in Allahabad, where 72.09% of respondents reported water collection activities, compared to 71.43% in Kanpur and 64.91% in Varanasi. A vast majority of those respondents who participate in water collection activities, 91.57%, reported that the water was used for *puja*, worship, or other religious rites in the home. Other reported uses include drinking, washing, cooking, sharing with family or others, treating illness, purification of the household or other items, and general uses or “everything”.

7.5.5 Risks of River Water Use

Respondents were asked a number of Likert-scale questions (5-point scale with responses between disagree and agree) to assess their view of the relative risk or safety of drinking *ganga jal*. The three Likert-scale statements were: “It is safe to drink water directly from the river”; “People should boil or treat *ganga jal* before drinking it”; and, “Drinking river water may make some people sick”.

A majority of respondents, 54.55%, indicated agreement with statement M1, “It is safe to drink water directly from the river”, while 30.58% indicated disagreement with the statement. The study site with the highest rate of agreement was Varanasi, where 63.16% of respondents indicated agreement with the statement, compared to 51.16% at Allahabad and 38.10% at Kanpur. The site with the highest rate of disagreement was Allahabad, where 41.86% of respondents indicated disagreement with the statement, compared to 38.10% at Kanpur and 19.30% at Varanasi. Responses to statement M1 are illustrated in Figure 7.13. While most respondents agreed with the statement, many people expressed concern that the safety of river water drinking was relative and varied according to the site where water was collected or the immunity of the individual involved. Some water users stated that river water is safe to drink only when it is collected from the center of the river, and not from the banks [where most people collect water from the *ghats*]:

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“It is not safe [to drink water from the river] at the banks, but in the center.” (male teacher, Allahabad)

“It is safe to drink from the middle of the river only.” (male student, Allahabad)

Others indicated that the water must be moving in order to avoid collecting contaminates:

“Flowing water is safe and pure. Not like a covered well.” (male weaver, Varanasi)

“Drinking *ganga jal* cannot make people sick because the water is flowing.” (unemployed male, Varanasi)

For many water users, the safety of river water consumption rests more on the qualities or background of the drinker and less so on the qualities of the river. Many respondents indicated that people of faith or pure intentions, or those who have lived at or near the river for years, were not at risk of becoming ill from drinking river water:

“People living by the river have immunity.” (male service worker, Kanpur)

“We [boatmen] drink and are safe and healthy.” (boatman, Varanasi)

“I don’t know about other people, but we drink the water and don’t get sick. Without taking daily baths in *ganga* we don’t feel good. She is our mother, our father, our God. She is our mother. If we don’t drink the water, we wont get peace.” (V38)
“It is so polluted now, we don’t want to drink [the water]. For some people, randomly, they might get sick.” (female homemaker, Varanasi)

In a follow-up interview with one worshipper from Kanpur, he explained that, even where tap water is available, it also comes from the river. So, he argued, many people assume that, if tap water comes from the river, then river water must also be safe for consumption. This argument was reiterated by a boatman from Varanasi who stated, “Tap water is ganga water, so it must be safe [to drink]” (pers. com.). Other water users point out that there are few other water sources available, so the relative safety of any particular water source becomes moot:

“Is it safe to drink from the river? No, but [there are] no good options.” (fisherman, Kanpur)

For statement M5, “People should boil or treat ganga jal before drinking it”; responses varied significantly between sites. Across sites, 43.80% of respondents disagreed with the statement, while 30.58% indicated agreement. Rates of disagreement were highest in Allahabad, where 53.49% of respondents indicated disagreement with statement M5, compared to 43.86% in Varanasi and only 23.81% in Kanpur. Interestingly, rates of agreement with the statement were also highest at Allahabad, where 34.88% of respondents indicated agreement with statement M5, compared with 33.33% in Kanpur and only 26.32% in Varanasi. Statement M5 also had the highest rate of unsure responses of all Likert-scale questions, with an average of 9.09% of respondents indicating uncertainty in their response to the statement. Responses to statement M5 are illustrated in Figure 7.14. In follow up interviews, water users who indicated that river water should not be boiled or treated explained:

“[People do not need to boil or treat ganga jal before drinking it] because it is autofiltered by the river.” (female home maker, Kanpur)

“… [T]he water has a tendency to clean itself, so this is not necessary.” (male priest, Kanpur)

Other water users again argued that, while boiling or treating the water would be preferable, people lack the means or resources to do so:

“We should treat ganga jal, but there is no facility to do so.” (male barber, Allahabad)

“I am working. I will drink water here, not go somewhere else [to find water].” (male dhobi, Varanasi)
“People should filter [the water], but poor [people] can’t.” (female dung collector, Varanasi)

For statement M8, “Drinking river water may make some people sick”, a majority of respondents, 53.72%, indicated disagreement with the statement, while only 23.14% indicated agreement. The study site with the highest rate of disagreement was Allahabad, where an overwhelming 60.47% of respondents disagreed with statement M8, compared with 50.88% at Varanasi and 47.62% at Kanpur. While rates of agreement were markedly lower at each of the three study sites, with 33.33% in Kanpur, 25.58% in Allahabad and 17.54%, agreement rates become more significant when respondents who selected both an “agree” response and a “somewhat agree” response are tabulated together. When combined, “agree” and “somewhat agree” responses are as high as 42.86% in Kanpur and 28.07% in Varanasi. It is therefore interesting to consider that in Kanpur, water users are nearly divided on whether they disagree or agree in some measure with the contention that drinking water from the Ganges may make some people sick. Responses to statement M8 are illustrated in Figure 7.15. Again, in follow-up interviews, many water users argued that the likelihood of one becoming sick from drinking ganga jal depended more on the qualities of the individual than the properties of the water:
“Naturally, people need to be concerned, but only those not accustomed can become ill from drinking *ganga jal.*” (male farmer, Varanasi)

“Sick people should consult a doctor before drinking.” (unemployed male, Varanasi)

“It [*ganga jal*] will soothe some, make other sick.” (female homemaker, Varanasi)

“[People may get sick] if they have never drank before.” (male tailor, Varanasi)

Others people pointed to inconsistencies between the contention that the purity of *ganga jal* prevents its drinkers from becoming ill and the real observations and lived experiences of those who have become ill from drinking river water:

“According to religion, drinking [*ganga jal*] could not make one sick. But, according to experience, one can see otherwise.” (Serviceman, Allahabad)

“Of course, lots of people get sick.” (Male Student, Varanasi)

### 7.6 Satisfaction with Abatement Efforts

Rather than assessing water users’ awareness of abatement programs, the survey questionnaire was designed to evaluate levels of satisfaction with whatever abatement...
efforts they are familiar. Respondents were asked a Likert-scale question (T5), “How satisfied are you with current efforts to address pollution in the Ganga?” and asked to rate their level of satisfaction on a five-point scale from “very dissatisfied” to “very satisfied”. Respondents were not given a definition for “current efforts” or told whether this question referred to state-sponsored, institutional, NGO, or other “community” or individual endeavors. This wording reflects the assumption that water users may not distinguish between state or local government and local or international NGOs, and instead were encouraged to think about any anti-pollution programs or activities as part of a larger effort to address pollution in the river.

For both aggregate level data and individual site data, respondents’ satisfaction levels chart as an inverse bell curve, with the highest rates of responses at the “very dissatisfied” and “very satisfied” extremes (see Figure 7.16). At the aggregate level, nearly an identical number of respondents identified themselves as “very dissatisfied” or “very satisfied”, with 28.10% and 28.93% respectively. Aggregate responses for “dissatisfied” and “satisfied” also closely paralleled each other, at 16.00% and 20.00%, respectively. The lowest rate of response at both the aggregate level and at most sites was the “neutral” option, with only 4.00% of responses. Kanpur was the only site that broke from this trend, with responses that charted nearly evenly across the response scale, with 19.05% of respondents in each of the five categories, except “dissatisfied”, which was indicated by only 14.29% of respondents. The difference in Kanpuri responses may reflect the smaller sample site at this location, or hint that water users in this city are generally more ambiguous about their feelings toward current abatement measures.

In follow-up interviews, water users from Kanpur spoke more of the role of tanneries in abatement efforts and of the gap that exists between law and practice in terms of water treatment and sanctions against polluting agencies. One fisherman explained that, “policy is good, but implementation is bad”, while a tannery worker argued that the regulations that have been made to control pollution are, “not sincere work”, because there are few mechanisms in place to ensure that people and companies submit to those regulations (pers. comm. 2009). Another male worshipper in Kanpur stated that regulations fail because, “tanneries are making no effort” to follow them (pers. comm.
One Kanpuri boatman explained that there is sufficient attention to the problem by government officials, but that this attention fails to translate into action:

“The DM [District Magistrate] has come here to Sirsaya Ghat and Prime Minister Singh. He came on a tour to Sirsaya Ghat and Kanpur. So, yes, it is a very big problem… Even the politicians and political parties say they want to clean the river, but they will only talk. No one takes action… [There is] no motivation for action. People benefit too much from just talking.” (pers. com.)

Sentiments that government officials are not sincere in their efforts to clean up the river were shared at all three study sites. Many respondents spoke of the lack of work or commitment by various scales and branches of government:

“The nagar nigam [municipal government] should do more.” (homemaker, Kanpur)

“Sometimes local government does something but it is not enough.” (male electrician and farmer, Varanasi)

“The government doesn’t do anything. Local people stop pilgrims from [littering and polluting on the ghats].” (Boatman, Varanasi)
“Lots of money from the state government is eaten by officials. How can I support [efforts to clean the river] when no one is doing a good job?” (male student, Varanasi)

“People are doing nothing, governments are doing nothing.” (male businessman, Allahabad)

“Their [government officials] souls are dirty, how can they clean [the river]?” (male dhobi, Varanasi)

Many respondents shared the attitude that government-sponsored efforts to improve water quality are not successful. However, many of those attributed this failure to a lack of public participation, commitment or awareness:

“The government is doing, but people are making it difficult.” (female dung collector, Varanasi)

“Current efforts to clean the river are not successful due to illiteracy and apathy of [the] public.” (male government service worker, Kanpur)

“The process of cleaning up the river is coming along, but doesn’t work if citizens do not cooperate.” (male teacher, Kanpur)

“The government can supply the scheme, but implementation must be done by ham log [we people].” (male teacher, Kanpur)

“The government has been doing its best, but participation is poor.” (male student, Allahabad)

One boatman from Varanasi explained that local officials, like the District Magistrate, have little ability to affect change on their own, but have to petition local people to help clean ghats or clean trash from the river. He argued that, while state and central governments are investing in abatement programs, the money isn’t being used well and isn’t available to local officials. Therefore, local people are less likely to following laws and regulations being implemented by the government. Others expressed greater approval of current efforts and some optimism that recently renewed commitments to clean up the river may prove successful:

“Half is done, half it [the government] will do.” (male barber, Varanasi)

“A few months back, [the Ganges was] declared “National River”. So, perhaps [now] they will do [the work of cleaning up the river].” (Businessman, Varanasi)

“Government is going a good job because the government funds NGOs and religious groups who are making an effort. These efforts should be appreciated.” (male farmer, Varanasi)
7.7 Responsibility for Pollution Abatement

In order to assess what institutions, organizations, or individual(s) water users identify as responsible for pollution abatement, respondents were asked, “Who is most responsible for dealing with pollution in the Ganga?” (T1). Responses were organized under eight categories:

• Central government
• State government
• Local government
• Religious groups or leaders
• Pilgrims
• NGOs
• Industry
• Other

Respondents were able to select single or multiple responses, but were encouraged to focus on identifying those who are most responsible for pollution abatement. Across sites, the category that received the greatest rate of response was “other”, in which 41.32% of respondents mentioned the public, the people, sub log (‘all people’) or ham log (‘we people’) as most responsible for dealing with pollution in the Ganges. In follow-up interviews, water users explained that the public is most responsible for the river, because efforts by other agencies are less likely to succeed with public support, or because only the public’s best interests are served through river clean up:

“What can the government do by itself? There has to be support by the people.” (Businessman, Kanpur)

“Everyone is responsible, but no one does anything. Ganga would be responsible, the river would be clean.” (male carpenter, Varanasi)

“I clean this ghat because it is my ghat. But no one comes to clean those ghats [points upstream].” (female homemaker, Varanasi)

“The public must do something, because government owns a factory and only does work on religious holidays [to gain publicity during festivals].” (male priest and temple caretaker, Kanpur)

“Religious leaders started the anti-pollution campaign, but we people are responsible. Because, from religious point of view, the river doesn’t support the formation of bacteria and germs and is safe to drink.” (male electrician, Kanpur)

Central and state government also received relatively high rates of mention as entities responsible for taking care of the river, with 19.01% and 20.66% across sites, respectively. Next, local government was mentioned by 15.70% of respondents. Some variation existed in responses between sites. In Allahabad, each scale of government
received the highest rate of mention among the three sites, with the Central government mentioned by 20.93% of respondents (compared to 19.30% in Varanasi and 14.29% in Kanpur), State government mentioned by 32.56% of respondents (compared to 17.54% in Varanasi and only 4.76% in Kanpur), and local government mentioned by 16.28% of respondents (compared to 15.79% in Varanasi and 14.29% in Kanpur). While governments and their agents were often identified as responsible for the river, many respondents expressed some concern that duties are not clearly shared between various scales of government:

“The central government writes policy and the state [government] does, can do, the work. They have started now, but I don’t think they’ll fulfill.” (A23)

“The newspaper talks about pollution, but there is no government response… The central government needs to take care because it is a national problem, it affects the nation…but there is no government response.” (male student, Varanasi)

Less than ten percent of respondents identified no response, “all of the above equally”, religious groups, pilgrims, industry, or NGOs. In Varanasi, both religious groups and pilgrims were mentioned by 5.26% of respondents, while these two categories received little or no mention in Allahabad and Kanpur. Kanpur and Allahabad were the only sites where respondents identified industry as most responsible for dealing with pollution in the Ganges, with 9.52% of respondents in Kanpur and 4.65% of respondents in Allahabad. Allahabad was also the only site where respondents mentioned NGOs, though at the rate of only 2.33%. Nonetheless, this is notable, as Allahabad is the study site with the least organized and durable anti-pollution NGOs. In terms of “Other” responses, 12.28% identified boatmen specifically as the ones most responsible for dealing with pollution in the river. One respondent explained, “the boatmen [are responsible], they are here around the clock” (male designer, Varanasi). Another woman, the wife of a boatman, critiqued their practices, “They clean the ghats, but just dump it into the middle of the river” (female homemaker, Varanasi). Another 5.26% of respondents in Varanasi mentioned Mahantji, leader of the Sankat Mochan Foundation by name. Another religious leader, Baba Ram Dev also received mention by one Varanasi respondent who credited his efforts for, “creating awareness among people” (female homemaker, Varanasi). Results for all sites are illustrated in Figure 7.17.
The survey questionnaire also assessed water users’ awareness of the two NGOs included in this study. Respondents were asked, “Have you heard of the following anti-pollution groups or non-governmental organizations?” and were prompted to provide a simple polar (yes/no) reply to “The Kanpur Eco-Friends” and “Sankat Mochan Foundation”. For all sites, only 18.18% of respondents reported familiarity with the Kanpur Eco-Friends (KEF), compared to 41.32% of respondents who reported familiarity with the Sankat Mochan Foundation (SMF). Not surprisingly, these results varied significantly between sites. In Varanasi, where the SMF is located, 57.89% of respondents identified awareness of this organization, compared to 12.28% of respondents who had heard of the KEF. In Allahabad, 30.23% of respondents reported having heard of the SMF, compared to 20.93% who had heard of the KEF. In Kanpur, where the KEF is located, 19.05% of respondents were aware of the SMF, compared to 28.57% who had heard of the KEF. On their face, these results indicate that the SMF is a better-known organization than the KEF, especially outside of Kanpur. However, respondents seemed to have a difficult time distinguishing the Sankat Mochan Foundation from the Sankat Mochan Temple, which may have contributed to these higher rates of recognition among respondents.
When examined by age group, younger respondents were generally more aware of both NGOs than older respondents, with the significant exception of 66.67% of respondents 65 years and older in Varanasi who were aware of the SMF and 50.00% of respondents 65 years and older in Kanpur who were aware of the KEF. Again, these results are likely skewed by the smaller sample populations of those aged 65 and older. Nonetheless, it may be notable that other than these cases, respondents aged 65 and older reported 0.00% familiarity with organizations outside of their home town. Otherwise, rates of awareness of the SMF were relatively well distributed across age in Varanasi. Rates of SMF awareness increased with age between 18 and 65 years in Allahabad, where only 14.29% of 18-29 year old reported familiarity with the SMF, compared to 36.36% of 30-49 year olds and 50.00% of 50-65 year olds. In Kanpur, familiarity with the SMF decreased with age, from 28.57% among 18-29 year olds, to 18.18% among 30-49 year olds and 0.00% among those 50-65 years old. Across all three study sites, respondents aged 50-65 years reported the highest rates of awareness of the SMF, at 56.25%, compared with 41.51% of 30-49 year olds, 36.96% of 18-29 year olds, and 33.33% of respondents 65 years and older. These results are illustrated in Figure 7.18.
Rates of respondents’ reported familiarity with the KEF were generally lower than that of the SMF. Across sites, 30-49 year olds reported the highest rates of familiarity with the KEF, at 26.42%, compared to 16.67% of 65 year and older, 12.50% of 50-65 year olds, and 10.87% of 18-29 year olds. In Kanpur, familiarity with the KEF generally increased with age, from 14.29% of 18-29 year olds to 36.36% of 30-49 year olds and 50.00% of those 65 and older. However, no 50-65 year olds in Kanpur reported familiarity with the KEF. In Allahabad, only 18-29 years olds and 20-49 year olds reported awareness of the KEF, at 21.43% and 27.27%, respectively. In Varanasi, awareness of the KEF again increased with age, from 4.00% of 18-29 year olds, to 20.00% of 30-49 year olds, and 22.22% of 50-65 year olds. These results are illustrated in Figure 7.19. While higher rates of familiarity with both NGOs were predicted among younger populations, both organizations were better known among older populations.

When viewed terms of gender, rates of NGO recognition varied significantly between females and males. At the aggregate level, only 11.54% of females reported familiarity with the KEF, compared to 20.00% of males. Rates of SMF recognition were also lower among females, at 30.77%, compared to 44.21% among men. Gender
differences were most significant in Kanpur, where 0.00% of females reported familiarity with either organization, compared to 33.33% of males who reported knowledge of the KEF and 22.22% of males who reported knowledge of the SMF. Rates of NGO recognition were also higher among males in Varanasi, where only 7.14% of females reported familiarity with the KEF, compared to 13.95% of males, and 42.86% of females reported familiarity with the SMF, compared to 62.79% of males. While men also reported higher rates of SMF recognition in Allahabad, at 32.35% compared to women at 22.22%, women reported slightly higher levels of KEF recognition in Allahabad, at 22.22% compared to 20.59% among men. These results are illustrated in Figure 7.20.

7.9 Protest Activity

7.9.1 Anti-Pollution Activity

In addition to assessing water users’ ideas and opinions about pollution, pollution abatement, and the relative risks and benefits associated with direct water use, the survey questionnaire was also designed to explore waters’ participation in anti-pollution protest activity. Respondents were asked a simple polar (yes/no) question, “Have you ever
attended or participated in an anti-pollution activity, such as a protest, rally or meeting?”. At the aggregate level, one third (33.33%) of respondents reported participation in some sort of anti-pollution activity. In informal follow-up interviews, many of these respondents reported participating in activities associated with World Water Day, often organized through schools, or with various aspects of adopt-a-ghat type programs, in which local residents commit to cleaning up and caring for a particular ghat. Individual site-level data revealed significant variations in rates of protest participation. Varanasi respondents reported the highest rates of protest activity, with 45.61% of respondents indicating some involvement, compared to 25.58% in Allahabad and 23.81% in Kanpur. When examined in terms of gender, men reported higher rates of protest participation than women at every site. In Varanasi, 48.84% of men reported participation in protest activity, compared to 35.71% of women. In Allahabad, males reported participation at a rate of 29.41%, compared to 11.11% of women, and in Kanpur, 27.78% of men reported participation, compared to 0.00% of women. See Figure 7.21.

When examined in terms of age, anti-pollution activity participation rates at most sites tend to increase moderately with age, peak during the 50-65 age range, and decline among those 65 years and older. In Varanasi, however, reported rates of participation
increased steadily with age, from 36.00% among 18-29 year olds, to 50.00% among 30-49 year olds, 55.56% among 50-65 year olds, and 66.67% of respondents aged 65 and older. In Allahabad, participation rates were relatively low among 18-29 year olds, at 21.43%, and decreased slightly to 18.18% among 30-49 year olds, only to peak at 50.00% among 50-65 year olds. In Kanpur, participation rates among 18-29 year olds were also relatively high, at 28.57%, compared to 27.27% among 30-49 year olds. No survey respondents in Kanpur over age 50 reported participation in anti-pollution activities, and no respondents over age 65 reported participation in Allahabad. These results are illustrated, along with aggregate data as a reference, in Figure 7.22.

7.9.2 Support for Anti-Pollution Activity

In the survey questionnaire, respondents were further asked to reflect upon their degree of support for pollution abatement efforts by answering two Likert scale questions: “I support efforts to reduce pollution in the Ganga” (M4) and “People should be more concerned about pollution in the Ganga” (M9). Respondents were encouraged to indicate their degree of agreement or disagreement with these statements on a five-point scale ranging from “disagree” to “agree”. For both statements, 17.36% of respondents
registered no answer or reply. For statement M4, “I support efforts to reduce pollution in the Ganga”, a majority of respondents indicated agreement, at 60.33%, compared with only 14.05% who indicated disagreement with the statement. Across sites, Varanasi respondents indicated the highest rate of agreement, at 70.18%, compared to only 5.26% who indicated disagreement. Respondents at Kanpur registered the second highest rate of agreement with statement M4, at 66.67%, compared to only 4.76% who indicated disagreement. Interestingly, respondents in Allahabad registered the lowest rate of agreement with the statement, at 44.19%, and the highest rate of disagreement, at 30.23%. These findings are illustrated in Figure 7.23.

The relatively low rates of agreement with the statement, “I support efforts to reduce pollution in the Ganga” among Allahabadi respondents may reflect similar lower rates of affirmation that there is pollution in the river, as discussed in section 7.1. Results may also be related with the lack of significant anti-pollution NGO activity at Allahabad, which may promote the broadly held perception that there are few opportunities for public involvement in such activities, or that poor people have more significant problems than river water pollution with which to contend. A number of respondents expressed such frustrations:

Figure 7.23 Response to statement M4: “I support efforts to reduce pollution in the Ganga”
“I was involved in [ghat] beautification action… I wish to support [efforts to reduce pollution in the Ganga], but [there is] little opportunity [to do so].” (male architect, Kanpur)

“I support efforts to clean reduce pollution in Ganga. But one can’t do so alone.” (male driver, Kanpur)

“Without government initiative, people can’t do the work on their own… and the government people only want bribes.” (male service worker, Kanpur)

“I do [support efforts to reduce pollution in the Ganges], but I need livelihood. I am a poor man, too busy.” (male sweetmaker, Varanasi)

For statement M9, “People should be more concerned about pollution in the Ganga”, a majority of respondents indicated agreement, at 69.42%, compared with only 3.31% who indicated disagreement. This general trend held across sites, with the highest rate of agreement in Kanpur, at 76.19%, compared to 72.09% in Allahabad and 64.91% in Kanpur. While rates of disagreement never exceeded five percent at any site, a number of respondents in both Allahabad (9.30%) and Varanasi (5.26%) responded neutrally to the statement. These findings are illustrated in Figure 7.24. Again, frustrations with the possible outcomes of such concerns, or disagreements over who should be concerned about river water pollution and the appropriate form such concern would take were expressed by many respondents:

“People talk a lot but there is no change. People get upset when we talk about pollution. Local people, ghat people try [to do something] but are not allowed.” (male dhobi, Varanasi)

“What can the people of Banaras do alone? All the people of India should do something about this.” (male student, Varanasi)

“[To clean the river] need more efforts; a regime change or revolution [is needed] to keep ganga pure.” (male student, Varanasi)

**7.10 Sources of Pollution Knowledge**

While determining where water users’ pollution knowledge comes from and how it is formed is a complex task, the survey questionnaire was designed to make a tentative assessment of the various sources from which people identify having learned or heard about water pollution. Respondents were asked the question, “Where have you learned or heard about pollution in the Ganga?” Rather than allowing for open-ended responses, the questionnaire was designed to provide a set of cues or prompts of possible sources of
pollution knowledge, including newspapers, television, radio, school, family or friends, rallies or fairs, and religious leaders or temples. These prompts were read to respondents without the intention of leading their replies, but rather with the assumption that it would be easier to provide a list of categories to which water users’ could essentially respond, ‘yes, I have learned or heard about pollution from that source’. Without these prompts, it could be difficult for respondents to identify the multiple sources from which their knowledge was informed. As a parallel, if one were asked, “Where did you learn about global warming?”, a single source may be difficult to identify and an honest answer might be structured something like, “I don’t know—everywhere. I guess in school, and it just seems everybody talks about it.” It can be much easier, then, for respondents to answer a question such as, “Where have you learned or heard about pollution in the Ganga? In the newspaper? In school?”

In addition to the predetermined response categories, respondents were asked to identify other sources of pollution knowledge in an open-ended “other” category. However, after a review of the predetermined response options, only 8.26% of respondents added their own “other” answers. “Other” answers included: no one (2.47%),
the public or locals (2.47%), school children (retired male priest, Allahabad), “we just learn by ourself” (female homemaker, Varanasi), “I’ve seen personally” (male animator, Allahabad), and, “Everybody writes about it, talks about it, but no one does anything about it” (male carpenter, Varanasi). An additional 9.92% of respondents provided no answer or were unsure.

Among the predetermined response categories, ‘family and friends’ was most frequently identified by respondents as a source of pollution knowledge, with 69.42% of respondents. Television (65.29%) and newspapers (62.81%) also received high confirmation rates. Religious leaders and temples (49.59%) and the radio (42.15%) were identified by less than half of respondents. Interestingly, school was only identified by 35.54% of respondents, which may reflect only the relatively recent incorporation of environmental and pollution-related education into curriculum. The least identified category was rallies and fairs, which was confirmed by only 4.13% of all respondents.

At the individual site level, these general trends held, but with some notable variations. Varanasi respondents were less likely to identify family and friends, newspaper, or television as sources of pollution knowledge than were respondents at other sites. They were, however, more likely to identify religious leaders or temples as sources of pollution knowledge, which were confirmed by 54.39% of respondents, compared to 47.62% in Kanpur and 44.19% in Allahabad. This may reflect the status of Varanasi as a holy city, or perhaps a higher degree of involvement by local religious leaders in anti-pollution politics. In Allahabad, respondents had the highest rate of identification for family and friends (74.42%), radio (53.49%), school (46.51%) and rallies or fairs (6.98%). Allahabadi respondents were also least likely to identify religious authorities or temples as a source of pollution knowledge (44.19%). Again, this may reflect a lower level of involvement among religious leaders in anti-pollution activity, or it may reflect the seasonal and extra-locally supported nature of anti-pollution protests in Allahabad.

In Kanpur, respondents were much more likely to mention either newspaper (76.19%) or television (71.43%) as sources of pollution knowledge and far less likely than respondents at other sites to identify either radio, school or rallies and fairs as sources of pollution knowledge. This data demonstrates that while family and friends are
significant sources of pollution knowledge at all sites, traditional forms of media, like newspaper and television, are more commonly cited as sources of pollution knowledge in Kanpur, whereas school and rallies or fairs were more commonly identified by Allahabadi water users, and religious leaders and temples were commonly identified by Varanasi water users. These data may reflect some of the efforts of local anti-pollution organizations, which are led by religious leaders and associated with temples in Varanasi, organize active media campaigns in Kanpur, and host educational tents during the Kumbh Mela celebrations in Allahabad.

It is important to note here that the wording of the question, “Where have you learned or heard about pollution in the Ganga?” and the use of pre-determined response categories may have limited the findings of this section of the survey, as respondents were urged to identify external sources of pollution knowledge from which they have learned or heard about pollution, and not encouraged to think about how they have come to know pollution in a broader sense. Therefore few respondents discussed visual and experiential ways of knowing pollution (seeing or touching pollution in the river), despite those sources of pollution knowledge being referenced elsewhere in the survey. Future use of the survey instrument should therefore be preempted by revision of this question and elimination of the pre-determined response categories.

7.11 Themes in GRB Water Pollution Knowledge

While the findings of the survey are limited by the small sample size, especially among women and older age groups, they nonetheless allow for the identification of major themes and trends in water users’ pollution knowledge in the GRB. A few of these are discussed here.

7.11.1 “No One Does Not Know”: Destabilizing Claims of Public Ignorance

Findings reveal that an overwhelming majority of the water users surveyed understand that there is pollution in the Ganges River. In fact, many water users expressed surprise at the idea that anyone living along the Ganges would not recognize that the river is polluted:

“Everyone here knows the River is polluted. Have you met anyone who says it is not?” (Male Tannery Consultant, Kanpur, 2008)
“Everyone should have knowledge of [problems of pollution in the Ganges] nowadays. This [the Ganges] is mother. This is God.” (Businessman, Kanpur, 2009)

These respondents drew attention to the idea that there is little room for plausible deniability when it comes to pollution in the Ganges: it can be seen, smelled, touched, and the effects of its existence experienced as illness in and on the body. This finding is significant because of the claims made by government officials, and some NGOs, that most water users in the GRB are unaware of the problem of pollution. It is this claim, as discussed in previous chapters, that undergirds claims that educational and awareness-raising programs are necessary before GRB water users can participate fully in pollution abatement programs and policy making.

While the plausible deniability of pollution is diminished through its ability to be experientially known, not all pollution is easily sensed in this way. One of the vexing qualities of water pollution, in particular, is that contaminates that can be diluted (or partially diluted) are difficult for the average water user to detect or discern without complex instrumentation. Unlike air pollution, which is often easily detected (at least at point sources) as clouds of billowing smoke or as sooty surface deposits, water pollution can be easily masked from the casual observer by diluting polluted water with freshwater. Water users who depend on sensory identification of pollution therefore understandably take notice of pollutants that do not dilute well, such as trash and plastics, or that can be identified before their introduction into river water, such as drain effluent. Indeed, a majority of the water users survey described pollution as sewage, trash and factory or industrial waste. Follow up interviews with water users suggest that it is indeed the visibility of these types of pollution, in addition to their ubiquity, that allows their easy identification: trash is seen floating in the river and drains are seen dumping sewage and industrial waste directly into the water.

But, as much as sensory ways of knowing pollution allow for the easy identification of some pollutants, it can also mask the existence of others. Officials in Varanasi have taken advantage of this shortcoming by promoting programs that remove only floating detritus and other undissolved solids, like human and animal corpses, floating garbage, and polyethylene bags. The goal of these programs is to eliminate those pollutants that are easiest to detect and most likely to offend the senses, so that people
(especially tourists and pilgrims to the city) are less concerned about the cleanliness and quality of the river water. The relative success of these programs may have led some respondents to report improved water quality based on their visual observation of lower levels of these floating pollutants. While only a minority of respondents in Varanasi reported improvement in river water quality over the past decade, those who did so spoke specifically of lower levels of floating waste, especially corpses, which were commonly visible in the river ten years ago. Respondents who reported reduced water quality in the Ganges often cited experiential or transferred (learned), rather than visual, evidence. One man related that he had bathed in the river his entire life. He remembered the water being clear and more plentiful when he was young, but spoke emphatically of the rashes that now appear all over his body after bathing in the river. Other water users spoke of exposure to river water that discolored their hands or made them ill, or cited increased media or political attention as proof that water quality is diminishing.

7.11.2 Religious versus Secular Pollution Knowledge: Disputing a Dichotomy

As discussed in Chapter Two, most conventional studies of pollution knowledge and politics in the GRB portray a rigid dichotomy between religious and secular or scientific understandings of water pollution. While some scholars argue that this relationship prevents those who embrace religious interpretations regarding cleanliness and purity in the river from comprehending the science behind issues of water quality (Alley 2002), others maintain that water users are able to comprehend both religious and secular understandings of pollution, but must maintain an ontological separation between the two when drawing upon this knowledge to inform water use and political activity (Haberman 2006). According to these interpretations, individual water users are able to adopt one of the two interpretations and reject the other (believing, for example, that the river is polluted by raw sewage and industrial effluent and is not a purifying goddess) or accept and understand both, but choose one to inform water use activity (believing, for example, that the Ganga is a goddess, but following scientific explanations of the health risks posed by drinking ganga jal in the decision to boil water prior to ingestion). Examples of both of these possibilities did emerge in survey data. One male military officer in Varanasi provided a clear case of a water user who had abandoned religious interpretations of the river’s power to purify:
“[The Ganga was] a pure river, but no longer. Its spiritual power is no more.”
(pers. comm. 2009)

An autorickshaw driver from Allahabad exemplified the ability to understand both dichotomous interpretations, but relied on scientific measurements of water safety to inform his decision not to drink ganga jal:

“I am a religious person, so I must say this [that there is no pollution in the river]. But, ganga jal is not safe for drinking. Drinking water [from the tap] has been refined before and then supplied. So, if it is consumed in its natural form without being treated, then it is not safe.” (pers. comm. 2009).

Findings from this dissertation research indicate that many water users are also capable of cognitive dissonance in their pollution knowledge, understanding both secular-scientific explanations of pollution as harmful, foreign contaminates dissolved or suspended in river water and religious interpretations of the river as inherently pure and drawing upon both to inform their water use activity. In order to account for the contradiction inherent in these interpretations, some water users have developed unique explanations for the existence of pollution in the river, describing the power of the river as having a “limit” or “ceiling” that has been surpassed, or as being diminished by the placement of dams on the river and the subsequent reduction of water levels and flow rates. Others argue that the sacredness of the Ganga, her purificatory powers, were meant only for the Hindu religious practices performed on her shores, and that it is through the introduction of alternative forms of water use (for irrigation, sewage disposal and industry) that the river has become polluted. In other words, the river does continue to purify waste from ritual bathing and idol disposal, for example, but not from factory effluent, as she is a river sent to cleanse the bodies and souls of people, and not of industries. In this view, industries and other non-religious uses need to be removed from the river before the river can cleanse herself.

7.11.3 From Knowledge to Action: Participating in Abatement Politics

When it comes to water users’ attitudes toward efforts to improve river water quality, a large divergence exists between those who are satisfied with current abatement efforts and those who are dissatisfied. Levels of satisfaction appear to be influenced by water users’ perception of who or what agency is most responsible for pollution abatement. Water users spoke with general approval of efforts made by the Central
Government to enact legislation and fund abatement programs. Even the GAP, a publicly criticized program, was admired as a good attempt fashioned by the Central government, but poorly implemented by state and local authorities. Poor implementation and corruption were common themes when water users spoke of their dissatisfaction with current abatement efforts. Accusations of corruption, incompetency and lack of commitment were levied toward government officials at every scale, but in both Allahabad and Varanasi, many respondents spoke approvingly of attempts by local and municipal officials to sponsor river clean up and *ghat* restoration programs.

Respondents who identified tanneries and industry as responsible for river clean-up expressed high levels of dissatisfaction with their work, arguing in one case that, “tanneries are making *no* effort [to address pollution]” (male worshipper, Kanpur). But, religious leaders received some credit from water users for inspiring abatement efforts and raising awareness among the public. While Sankat Mochan Foundation leader and priest Dr. Veer Bhadra Mishra received positive mention by only a handful of respondents in Varanasi, Swami Baba Ram Dev was also given credit for raising awareness of pollution in the river and drawing attention to the problems with corruption that stymie clean-up efforts. Boatmen received frequent mention as an interest group, the ‘sons of *ganga’*, who bear responsibility for caring for the river.

Interestingly, respondents scarcely mentioned NGOs as responsible for pollution abatement and exhibited only low rates of familiarity with either of the NGOs included in this study. Respondents in Varanasi exhibited greater familiarity with anti-pollution NGOs than their counterparts in Kanpur and Allahabad. Yet, one water user reported no knowledge of the Sankat Mochan Foundation even as he was surveyed at Tulsi Ghat in Varanasi, sitting about four meters away from the entrance to the organization’s headquarters. Among respondents who indicated familiarity with either the Sankat Mochan Foundation (SMF) or Kanpur Eco-Friends (KEF), most reported either a lack of knowledge of their campaigns, reporting in one case that the Kanpur Eco-Friends “was known, but now is not active” (fisherman, Kanpur), or denounced Mishra and the SMF as yet another corrupt group attempting to gain wealth and notoriety for cleaning up the Ganges River. This may help to explain low reported levels of participation in anti-pollution activities, such as protests, rallies and meetings. Among those respondents
reporting some activity, most were involved in international or multi-organizational events, like World Water Day protests, or community programs, like adopt-a-ghat efforts that are popular in Varanasi.

Despite low levels of participation in anti-pollution activities, most respondents indicated some support for these efforts. Indeed, most water users indicated that “ham log” or “we people” are most responsible for taking care of the river. But, respondents had a variety of explanations for why they had not become personally active in the struggle to clean the river. Water users expressed dissatisfaction with the lack of opportunities to become involved in anti-pollution campaigns and frustration with perception that their individual effort may not be enough to affect change:

“I was involved in [ghat] beautification action… I wish to support [efforts to reduce pollution in the Ganga], but [there is] little opportunity [to do so].” (male architect, Kanpur)

“People talk a lot but there is no change. People get upset when we talk about pollution. Local people, ghat people try [to do something] but are not allowed.” (male dhobi, Varanasi)

“Without government initiative, people can’t do the work on their own… and the government people only want bribes.” (male service worker, Kanpur)

“[I do not support efforts to clean the river] because no one is doing a good job.” (male student, Kanpur)

“No one ever came to make [a protest], so I didn’t get to participate. Someone should come and talk to the people.” (male retired priest, Allahabad)

“[To clean the river] needs more efforts; a regime change or revolution [is necessary] to keep Ganga pure.” (male student, Varanasi)

“[I support anti-pollution efforts], but one can’t alone.” (male driver, Kanpur)

Others argued that public involvement in anti-pollution politics is appropriate only at the smaller scale of personal activity. These respondents felt that making incremental changes to personal activities, like refraining from dumping garbage into the river, was a more appropriate action for most water users than becoming involved in NGOs, policy making, or public protest. This sentiment is similar to that expressed by “think global, act local” sloganeers, and mirrors ecological discourse in its reference to the river as home, house, mother, and god. The following excerpt from an interview with a farmer from Varanasi exemplifies some of these issues:
SBK: Many people, the government, some NGO groups here in Banaras, like the Sankat Mochan Foundation, are trying to clean pollution from the river. What do you think of these efforts?
F: They just eat the money, they don’t do anything. When the time will come, Mother Ganga will clean itself.
SBK: Until that time, is there anything people can do, people should do, to clean the river?
F: Only the boatmen take care of the river. They clean the garlands and other things. No one is doing anything to support them.
SBK: So, do you think the government is doing a good job of taking care of the river?
F: Raj to Assi Ghat, the government should change the direction of these drains. Government should put people to watch north of Assi to stop and pick up dead bodies and animals. Tehri Dam is making Ganga dry. The government should stop that dam. The river should be free from dams... You know, the river too has rights, like people. She has the right to be unimpeded.
SBK: And the people of Banaras, what should the people do?
F: Out of humanity, we should take care of Ganga. People should clean at the river every day just like they clean their homes everyday. If you do not clean your own home, it will be dirty. The river is like this, your home. (pers. comm. 2009)

These assertion that few opportunities exist for meaningful public participation in the broader anti-pollution politics of the GRB reinforces the argument advanced in Chapter Six, that few NGOs encourage active and meaningful public participation in either their organizations or wider civil society politics and that the few opportunities that are made available often require water users to passively participate in protests or support the goals of pollution abatement through small changes in daily activities, rather than involvement in policy making or program implementation. These and other themes that bridge the previous analyses are discussed at greater length in the following concluding chapter.
CHAPTER EIGHT
GEOGRAPHIES OF RIVER WATER POLLUTION AND
THE POLITICS OF PLACE IN THE GANGES RIVER BASIN

The river matters. It matters in the most general sense, as discussed in Chapter Four, as a source of water for the nearly three-quarters of a billion people who live on her shores, for the agricultural and industrial functioning of the nation, for the millions who worship and bathe in her waters, and for the health of human and non-human life that call her basin home. But, we have found here that the river matters in another sense as well. People relate to and through the river as a mobile water body. It matters that the river flows downstream, connecting people and cities in a uni-directional route. It matters that her course is strong and reliable and perceived as endless. When I place something into the river, I can know that it will be carried away, and I can know that the water that flows downstream will quickly be replaced by the river’s upstream flow. I emphasize this point in this concluding chapter, because if any one theme emerged from this extensive project it is that there is an upstream/downstream politics of pollution in the GRB that rests directly on the nature and characteristics of the river as a body of water. Were the Ganges a large lake or a sea, the politics surrounding her desecration and salvation would certainly take place in a far different manner. But because the Ganges is a river, the people and places along the river are connected, and the nature of this connection plays out in terms of both water use practices and pollution abatement politics.

For water users, the often unrelenting flow of large river systems can be perceived as drawing a continuous supply of new, ‘fresh’ water from upstream while carrying contaminated water downstream. This mobility of river water is influential in shaping pollution knowledge and water users’ understanding of their relationship to other people with whom they share the river. In terms of water use, many water users spoke of the perceived abundance of the river. Whatever water I remove from the river here is replaced by upstream flows, giving the impression of a continually renewable resource. In terms of pollution, a river’s mobility means that whatever I place in the water here is immediately whisked away downstream. This mobility of river water serves to mask the presence of pollution, seeming to continuously carry away or remove garbage, sewage,
and other contaminants. Seldom do I have to contend with the water use choices I make, or the pollutants I produce here. Rather, the quantity and quality of the river water at my location are determined by people and places upstream, and often far removed, from my location. This gives river water politics, like international water-sharing hydropolitics, an upstream orientation, wherein those located upstream often have the greatest decision-making and bargaining power, while those who are located downstream are often left at the whim of people making actions and choices upstream, and not locally.

The upstream-downstream politics of pollution has a profound affect on both the shaping of inter-organizational coordination among anti-pollution groups, and the seeming absence of anti-pollution civil society organization at certain sites along the river. First, beyond the differences in their ideologies and organization that were discussed in Chapter Six, upstream anti-pollution groups are less motivated to build coalitions with their downstream counterparts. Rakesh Jaiswal, leader of the KEF in Kanpur, the study site located furthest upstream, spoke with some frustration about the amount of funding attracted to Varanasi, and to the SMF, arguing that had the funds been invested in Kanpur, the entirety of the central GRB would have reaped the benefits. In terms of direct action campaigns then, upstream groups don’t see as many benefits from potentially supporting downstream collaborators. Many water users spoke of how this spatiality frustrated attempts to motivate broad-based public participation in pollution abatement efforts. This was especially true in Allahabad, where water users often spoke of feeling victimized by people creating pollution upstream in Kanpur and overshadowed by abatement investments being attracted by those downstream in Varanasi. In the words of one worshipper from Allahabad:

“Pollution comes from up there [gesturing upstream] in Kanpur and goes there [gesturing downstream] where it is really filthy… Why should we make an organization here?” (pers. comm. 2008)

The “missing movement” in the GRB, then, is at least partially attributable to the river itself, as its downstream motion lends itself to a politics of blame or impotency: the formation of a broad-based social movement can be stalled by a fixation on the problems created upstream and the inability to affect meaningful change through localized action.

The frustration that stems from the knowledge that mobile flows of river water carry pollution from upstream “away” to downstream clearly frustrates efforts to address
pollution at the local scale. As introduced in Chapter Seven, individual water users also expressed frustration over the perceived lack of alternate water sources and opportunities for meaningful participation in either abatement policy creation and program implementation, or the anti-pollution politics of local NGOs. One dhobi at work in Varanasi commented, “I make pollution. It comes from me” (pers. comm. 2009). He went on to explain that the caustic detergents and bleaches that he uses for washing clothes contribute to contamination of the river. While he expressed interested in changing this role, he explained that his actions were constrained by a lack of alternative water sources: He wants to wash clothes elsewhere, but there is no other publicly accessible tub or reservoir where dhobis can work. Other water users echoed similar frustrations, pointing out that public taps available throughout much of the city provide drinking water, but in an otherwise arid environment, there are few other options for washing, bathing, and other public use activities. As one water user exclaimed: “I have to shit somewhere” (male farmer, Varanasi, pers. comm. 2009). Few public restrooms and a lack of sewage infrastructure mean that, for many people living and working on the river, “somewhere” becomes the Ganges.\textsuperscript{lxv} Especially in large cities, where urbanization has compounded problems associated with sewage infrastructure, water provision, and the availability of both housing and land, many water users live seasonally in boats, temples or informal housing have few other options than the river for bathing, washing clothes, watering cattle, or using the restroom.\textsuperscript{lxvi}

This feeling of constraint, however, is not exclusive to water users, but emerged across interviews with government officials, tannery owners, religious leaders, and NGO members as well. Government officials expressed feelings of constraint in relation to their position in a large and ineffective bureaucracy with little funding allocated for actual program implementation. More than one official with whom I spoke said that their actions were limited to those that had been laid out by the state level agencies, and those agencies were in turn limited by the plans drafted at the central level. For most local officials, there are few opportunities to change how pollution abatement takes place on the ground. However, local officials are nonetheless viewed as having control over the programs they implement and the funding from which they draw. The division of responsibility between various agencies seemed to further add to officials’ frustrations.
One Jal Nigam worker explained that because he works at the local sewage treatment plant, people often assume that his office has some influence over the planning and funding available for the city’s sewage treatment infrastructure. But, he explained, most local officials are expediting agents only, and are not themselves involved in decision-making or planning processes. Their ability to affect change is also constrained by the gap between committed and available funding. Even with renewed commitment from the GoI and World Bank to fund a $4 billion clean-up program, no one really knows what the price tag of abatement will be. Each of the officials with whom I spoke agreed that current investment, current technology, and the current approach being implemented by the PCBs was grossly insufficient for the task at hand, and would address, at best, between 10 to 30% of the river’s pollution load.

Of course, this feeling of constraint was similarly shared by anti-pollution organization members, who may now be brought to the table to participate in decision-making practices, but who aren't really listened to as new policies and programs are drafted. Rakesh Jaiswal spoke of sitting in on many local PCB and Jal Nigam meetings where he is expected to attend and “represent” his organization passively. One SMF member also spoke of the constraint that emerges from their need to gain international support in order to be listened to or get the action they want. As he explained, the government will bow to international pressure and reports or recommendation by foreign activists and experts, and not to equivalent domestic authorities. This means that the SMF’s strategic partnerships become the organization’s lifeline and they are forced to cater their efforts to an international audience, even while they risk marginalizing potential local constituents and competing with other NGOs that could have otherwise become potential collaborators. In considering, then, the obstacles to anti-pollution social movement formation in the GRB, we must take into account not only the internally-produced divergence between groups (see Chapter Six), but also those external factors that pit these NGO and other groups in competition against one another for resources, media attention, and domestic support.

Pointing to these sources of conflict further draws our attention away from one of the central questions that inspired this research, *Is there an anti-pollution social movement active or emergent in the GRB?* While the tentative answer provided in
Chapter Six was negative, some insight may be gained from adopting the alternate question of: *What can be revealed about the wider politics of anti-pollution struggles in the GRB if we choose to identify these disparate efforts as a less-than-cohesive social movement?* If so, our constructivist approach and focus on environmental knowledge draws our attention to the dominant discourse surrounding “awareness” that is shared by government officials, tannery owners, anti-pollution NGOs and activists, as well as water users. If nothing else, their shared concern with public awareness alone confirms the thesis that environmental knowledge itself has become the site of struggle in environmental resource politics.

As has been emphasized repeatedly in the preceding pages, environmental knowledge not only shapes the politics surrounding resource use and protection, but it also becomes the site in which those struggles actively take place, as various groups attempt to reproduce their own unique, often place-based, framing of events. What did not align with this thesis, however, is how uncritical most groups were about their adoption of “awareness” as a core discursive construct. While nearly every interview participant emphasized the importance of awareness and awareness-raising activities, few people with whom I spoke were able to clearly articulate the goal(s) or purpose(s) of these activities. It was difficult to get any straightforward answer, from officials and NGO members alike, about what these awareness-raising efforts would ultimately produce. In most cases, “awareness” seemed to be an end in itself and, for at least one anti-pollution activist, a sort of self-perpetuating activity that could one day produce a tangible effect:

ME: What are awareness programs doing?
Ojha: They are good for people and help the success of our program.
ME: Yes, but exactly how?
Ojha: When people are aware, they will take right action.
ME: In exactly what way? Let’s take this fellow over here [pointing to farmer]. If we raise his awareness, if he becomes aware, what difference will it make, what would he do differently?
Ojha: If he is more aware he will be more concerned about pollution and will support our efforts. Then, we will have more power to make demands on the government and force change…

This exchange, forced on my part by my own frustration in trying to understand this core discourse of awareness, illuminates the importance of awareness-raising, knowledge-
reproducing activities as an aspect of wider political power. So, awareness and knowledge are ultimately about power. The act of claiming or labeling someone as unaware then becomes an act of reappropriating their power: someone or something else must now act on behalf of those who are unaware. Those labeled unaware also become in need of education: a system of knowledge must be reproduced onto those unaware people. So, in a single move, those people who are labeled unaware have their own ways of knowing effaced and delegitimized, lose the power to speak for or represent themselves, and become the subject of someone else’s knowledge reproduction. Whether or not “awareness” can be achieved is then nearly beside the point, because this act of knowledge erasure and reproduction is enough on its own to entrench or contest the power to speak for those who have been cast as mute.
ii A sadhu is a Hindu ascetic who has renounced worldly pleasures in pursuit of religious enlightenment. A sant is a Hindu or Sikh religious leader and teacher.

iii Highlighting an issue’s religious significance, adopting non-violent protest tactics, and publicizing the ascetic appeal of social and political leaders (often by fasting), are resistance methods successfully employed by many social, political, and environmental movements in India.

iv There are currently 29 Class 1 cities (population over 100,000), 23 Class 2 cities (population over 50,000) and about 48 towns along the Ganges (Sengupta 2006). Included in these are a three of the world’s 39 Megacities, with populations of 5 million people or more (Kraas 2006).

v In the Gangeatic region, an average of one person dies every minute due to diarrhea. Secondary health effects can also be caused by ingesting freshwater fish from the Ganges, which can contain concentrated levels of mercury and pesticides (Sampat 1996).

vi Environmental concern in India during the 1960s was concentrated primarily around the issue of deforestation, which was popularized by the activities of the well-known Chipko environmental movement that sought to change forestry practices in the Himalayan foothills. Starting in the early 1970s, a number of environmental protection acts were passed by the central government, including the Wildlife Protection Act of 1972, the Water Prevention and Control of Pollution Act in 1974, the Water Cess Act of 1977, the Forest Conservation Act of 1980, the Air Prevention and Control of Pollution Act of 1981, and the Environment Protection Act of 1986. Prior to these measures, laws governing natural resources had focused on issues of ownership and accessibility, rather than conservation or preservation (Singh 1994).

vii Interestingly, this classification system examines only how water extracted from the river is used, and all but completely overlooks the role of river water as a depository for waste of various types.

viii The CPCB survey of 25 towns and cities found that sewage alone accounted for 1340 million liters per day (mld) of pollutants being dumped into the Ganges River (IndLaw 2006).

 ix $32 million of the GAP Phase I budget funded farms around Varanasi where snapping turtles are being bred and trained to eat the flesh of corpses floating in the river (Himalayan Academy 1992).

x Prominent examples are the Sankat Mochan Foundation in Varanasi, the ECOFriends organization in Kanpur, and the “Save the Yamuna” (the largest tributary of the Ganges) organization in Delhi.

xi Eco-constructivism, based on the “social construction of nature” thesis, concedes the existence of “biophysical nature” as part of material reality, but argues that it is incomprehensible outside of socially constructed discourses on what this “nature” consists of, how it is understood, and how it is valued, all of which have material social and ecological implications (Demerritt 2002).

xii The project draws upon theoretical, as well as methodological, approaches developed in the disciplinary traditions of environmental perception, social constructionism, political ecology, social movement studies, and postcolonial feminism.

xiii The Yamuna is often associated with the Ganges in Hindu mythology and religious tradition as a sister river and goddess.

xiv Constructionism is attributed to Berger and Luckmann (1966), but has intellectual antecedents in the work of Plato, Marx and Kant (Barnes 2000). The concept of the “social construction of nature”, in particular, has gained significant purchase, as reflected in work by Demerritt (1994), Hacking (1999), Proctor (1998, 2001), and others. Unlike more radical forms of constructionism, the “social construction of nature” thesis concedes the existence of “biophysical nature” as part of material reality, but argues that it is incomprehensible outside of socially constructed discourses on what this “nature” consists of, how it is understood, and how that knowledge is constructed — all of which have material social, political and ecological implications (Demerritt 2002).

xv There was increased interest in both research on human perception and response to pollution, as well as case studies of extreme events, such as Love Canal or the Bhopal disaster, following the publication of
Rachael Carson’s (1962) *Silent Spring* and the 1952 London Smog that killed thousands of people (Kates 1995; McManus 2000).

Lipietz (1995) contrasts the *economos* to the *ecologos*, or language of meaning, adopted by political ecologists.

Alley earlier published a number of articles (1994, 1998 and 2000) that were later subsumed by her book (2002).

Alley (2002) was looking for evidence of a single movement of networked organizations that share an ideological orientation, but allowed for the possibility that individual branches of this movement could have various discursive frameworks to guide their collective action (49).

Environmental perception theory, as a branch of behavioralism, developed from critiques of positivist geography, but did not reject all positivistic techniques and theories. Positivist perspectives are reflected in environmental perception’s notion of external reality, in its use of quantitative methods (especially the survey), as well as in the search, by some, for cognitive process “laws” that could be “mapped” into behavioral models (Cloke *et al.* 1991).

White (1945) argued that perception is relevant to environmental management, because it allows for an analysis of the ways in which subjective decision-making occurs. His work shaped 20th century water management programs in the U.S., where he advocated for non-structural, or policy-based, responses to flood risks, based on his findings that people who live closer to an environmental risk have more accurate perceptions (Hinshaw 2006).

Saarinen (1966) argued that individuals exhibit selective memory when allowing past experience to influence current perceptions. In his work on drought perception, he found that farmers tended to place greater emphasis on drought-free periods and to repress memories of drought experiences. The term “prison of experience” was later coined by Robert Kates (1971) to describe the importance of past experience in the formation of perception.

Larimore saw culture as a limiting factor in the formation of environmental perception and conducted further research on the influence of cultural values on patterns of resource use (1969).

Although constructionist epistemological studies rarely attempt to measure the accuracy of knowledge, they are often concerned with distinguishing “valid” from “invalid” knowledge and identifying the processes that form this distinction. Much of the recent work on epistemology “has been inspired by Foucauldian notions of the relationship between power and knowledge” (McEwan 1998: 372). Foucault (1980) theorizes not so much what knowledge is, but how it is created and disseminated through an “economy of discourse”, and how it functions as a form of power.

Other research on environmental knowledge examines gendered differences in knowledge (Schmitz 1999; Briggs *et al.* 2003) and “traditional” or “indigenous” environmental knowledge (Sherry and Myers 2002). Traditional environmental knowledge (TEK) has received significant attention in literature on sustainable development, which seeks to explore “traditional” methods of understanding and interacting with the natural world and its resources (Williams and Baines 1993). While this research has produced influential findings (see Healey 1993), it suffers from a tendency to view all “traditional” knowledge systems as dualistically opposed to prevailing Western scientific methods of understanding and valuing the environment and fails to consider the complexity of environmental knowledges that often draw upon various systems of knowing (Agrawal 1995).

With this new political focus, increasing concern has grown over the possible marginalization of “ecology” in political ecology. For a discussion and assessment of this debate see Walker (2005).

As a major industrial city, Kanpur has services available for the translation of printed documents, used most often in contract negotiations. However, none of the services contacted were able to provide a translator who could accompany me in the field.

My husband, Travis Kedzior, accompanied me to India during the preliminary and main fieldwork periods. During the preliminary fieldwork, I found that his presence was often vital, as single men worshipping or conducting other activities along the river often expressed hesitance about speaking to me in public while I was unaccompanied. Even one male translator insisted on meeting with Travis before agreeing to work with on the project. During the main fieldwork period, I was twice instructed by
professional male interview participants to bring a male chaperone with me, or I would not be welcomed into their offices. On other occasions, Travis’ presence opened doors and helped me to gain access where none otherwise may have been granted. While it was essential that he was male, the fact that he was my husband meant that male participants in the study could act at greater ease with me. During one interview with a factory owner in Kanpur, when I revealed that Travis was my husband, the owner threw up his hands and exclaimed that things were now entirely different. He immediately invited us to stay for a tour of the compound, order tea and cookies to be brought, and leaned back with his feet on his desk, so noticeably relieved that he appeared to be a different person. Our visit was extended from one hour to three. On other occasions, participants questioned Travis about my research, why he was permitting me to conduct such work or to pursue a PhD, and were only willing to begin their interview with me after Travis had answered all questions to their satisfaction. As a foreign male, Travis has significantly more social purchase in many of the communities in which I work. However, his presence was not universally beneficial, and his company meant that I ran the risk of not being perceived as an independent or professional researcher or scholar in my own right. Therefore, Travis’ participation in the research activities was limited. He served only as a chaperone and conducted the business of introductions and negotiation with participants who requested or expressed interest in his involvement. I plan to explore some of the benefits and tensions of conducting research with family members in a later publication.

xxviii Low-laying mountain passes, such as the Khyber Pass, presented some of the only land routes into India, as the Himalayas and dense tropical forests of the northeast largely blocked other points of entry.

xxix Also known as the Indian Rebellion or Indian Mutiny.

xxx Bihar has the highest population density of any Indian state. Uttar Pradesh has the largest population in India and is, in terms of population, the largest sub-national entity in the world. Both states consistently rank among those with the lowest literacy, income, and sex ratios, as well as highest population growth rates (Census of India 2011).

xxxi Only 29% of India’s population lived in urban centers in 2001 (Census of India 2011).

xxxii Between 1991 and 2001, the urban population of the GRB increased from 88 million to 125 million people (TERI 2011).

xxxiii The 60,000km² of doab land between the Ganges and Yamuna Rivers is one of India’s most productive agricultural regions, generating about a third of the food consumed in the nation and employing about 70% of the local population (Rehm 2008).

xxxiv The term “cow belt” refers to the states of Bihar and Uttar Pradesh, where large Hindu populations have raised cattle for millennia. The region dominates the national economy in the production of livestock and associated goods, most notably dairy and leather products.

xxxv Early river-borne transport was later supplanted by rail transport, as the Ganges became largely unnavigable in the 20th century.

xxxvi The textile industry serves as a good example of a high water consumption industry in the GRB. Almost every step of fabric production requires water, including scouring, bleaching and dyeing the product. As each stage of production, fabric is re-washed with fresh water in order to remove chemicals applied during previous stages, and is then often disposed of without treatment. Production of one kilogram (1kg) of cotton fabric consumes between 272 and 784 kg of water, depending on processes and equipment used (AquaFit4Use 2010), and produces between 150 and 75 liters of wastewater for every kg of fabric produced (Jacob and Azariah 1998/2008).

xxxvii Some of the most flagrant polluters in the GRB are government-owned industries, including the Ordnance Factory in Kanpur and the Diesel Locomotive Works in Varanasi (Krishna 2004).

xxxviii Finding workers willing to handle and process animal products, particularly cattle, in a Hindu-majority population is a challenge faced by the leather tanning industry. Low-skilled Muslim laborers therefore perform most of this work. But, turn over is high, as workers are often able to find better employment after only a month or two of training (Tannery Cluster Consultant, Interview, Kanpur 2009). Industrial agglomeration therefore allows tanners to concentrate both skilled and unskilled labor by internalizing turn over within the cluster. Unfortunately, workers are not able to parley this situation into
higher or more competitive wages, as rapid population growth and urbanization in Kanpur floods the labor market.

The GRB experienced a 42% decadal population growth rate during the 1990s (TERI 2011).

PH is a measure of acidity and basicity that can indicate the presence of agricultural run off and acidic chemicals in water. Only extreme pH values are considered harmful for most living organisms. Dissolved Oxygen (DO) is a measure of how much water is being carried in a body of water. Low DO levels indicate the presence of bacteria in the water and decaying organic material, which can cause infection and illness in humans and other animals. Extremely low DO levels can lead to eutrophication, or the death of a river, which cannot support any life without oxygen. Biochemical Oxygen Demand (BOD) is a measure of the amount of DO consumed by matter in a water sample over five days and is used as an indicator of the amount of organic pollution in water (Chehalis River Council 2009). Fecal Coliform and Total Coliform are also important water quality indicators that indicate the presence of human and animal waste in a river.

It is important to note here that Indian water quality standards and river classification systems were developed by the Bureau of Indian Standards and are not in line with international guidelines recommended by the World Health Organization. For example, the World Health Organization recommends no more than 0-2 total coliform counts per 100 mL of sampled water (0-2/100 mL) in all treated or untreated drinking water and no more 126/100 mL for freshwater recreation and full-contact bathing. The CPCB and BIS allow for up to 50/100 mL total coliform in untreated disinfected drinking water and allow up to 500/100 mL in Class B bathing sources (MoEF 2009).

Of India’s 14 Prime Ministers, eight were elected from Uttar Pradesh, including the powerful Nehru family. Leaders of the Indian National Congress (INC) Party also frequently come from UP.

While service provision costs the local government tens of thousands of rupees each year, the value of the Mela fairs to the local economy is indispensable. Allahabad has a service sector economy, with about 2/3 of its workers employed in tourism and tourism related jobs (Allahabad City Development Plan). While tourism is the fastest growing sector of the local economy, the city is also an important center for banking, law, and education.

Water pollution identification and abatement legislation was first present in Colonial India during the late 19th century. The earliest anti-pollution laws developed in the wake of the Indian Revolution of 1857, following the transfer of power from the East India Company to the British Crown. Soon after, the Indian Penal Code was amended to authorize the punishment of anyone who knowingly befouled public water sources (Alley 2002). While this law prescribed fines and imprisonment for those who knowingly polluted water resources, its enforcement was often limited to cases of well water poisoning, and was rarely applied to problems relating to rivers or other “mobile” water flows (ibid.: 133). The 1882 Indian Easements Act was the first to address river water quality by providing landowners with legal protection from “unreasonable” pollution by upstream users (Environmental Information Systems). Public health was further safeguarded by the 1898 Criminal Procedure Code, which expanded legislation to encompass pollution by “omission” and negligence, in addition to intentional action (Agrawal 1994, 29). These laws were accompanied by minor acts and court orders that granted some compensatory rights to those who lost income from the poisoning or otherwise hazardous despoiling of fisheries and other bodies of surface water. However, while penal legislation allowed some individuals or groups to bring complaints or legal action in the courts, they did not establish procedures for monitoring pollution practices or a policy program through which authorities were able to actively govern the quality of water resources. These laws represent a practice of valuing water resources solely as a means for securing economic profit and ensuring public health. In this type of system, water polluters may be penalized for hindering the use of water to its fullest potential, but are rarely encouraged to adopt preventative measures aimed at protecting water quality.

India’s first legislation of water pollution as a health issue, rather than an environmental problem with health-related consequences, is not unique. In both Japan and the United States health concerns incited much of the public outrage and litigation that led to the drafting of early environmental protection laws.

This phenomenon was discussed an interview with a Kanpur leather tannery owner-manager, who confirmed that corruption was common among local officers with State and Central PCBs. According to the interview, factory managers are often able to bribe officials directly, by paying money to ensure
exemption or even substitute non-factory water samples during effluent tests. Factory owners could also leverage significant political influence by promising that factory workers would vote for or against particular political parties, or by threatening to fire workers and blame the regulatory will of those parties in an attempt to incite dissent among local voters (interview, 8 January 2009).

Following passage of the 1977 Water Cess Act, funding for Central and State PCBs was supplemented by income earned from industrial pollution fines and water use taxes.

In the same year, the Ministry of Water Resources was also created as a unit separate from the MoEF. The MWR was charged with developing and regulating water resources. Over the years since their creation, recommendations and programs instituted by the MoEF and MWR have often conflicted. Water development projects could be undertaken by the MWR without consult with the MoEF. This is often the case when units, like rivers, are not governed as entities, but are governed according to their productive uses and parceled or divided by use: The MWR governs agricultural and economic productivity of the river water, while the MoEF governs the ecological security of the river itself.

Vajpayee served an as Prime Minister initially for two weeks in the summer of 1996. Following two short terms of the Janata Dal Party from June 1996 to March 1998, Vajpayee and the BJP once again returned to power. Riding the tide of Hindu nationalism that followed the destruction of the Babri Mosque in Ayodhya, the BJP brought economically and socially conservative politics to the Central Government. Communal inter-religious violence following a fire that burned a train car in Gujarat in 2002 contributed to Vajpayee and the BJP’s loss of elections in 2004, which brought the Indian National Congress back to power.

While domestic environmental movements had challenged Central and State policies and programs since the colonial period, these efforts tended to be issue-specific and did not generally seek structural change in the policy drafting or implementation processes. In the decades immediately following independence, few citizen action groups were critical of the new government. Haripriya Rangan (1993) argues that this lack of protest against State-run activities may be because of the “considerable popular appeal” of “the idea of a postcolonial state working toward national development, stability, and progress” (169). The late 1960s and early 1970s saw a considerable resurgence of environmental activism in India, with the rising criticism of centrally planned forest and water resource management schemes and the growth of international environmentalism.

Applying an exchange rate of Rs. 47 to US $1.

Sankat Mochan translates in English as “removal of suffering”.

Hereditary head priest.

During my visits to SMF, I also found the educational center closed during morning and midday, understaffed, and stocked with pamphlets, brochures, and educational material printing primarily in English and clearly intended for foreign visitors or prospective donors. The only brochure seemingly directed to a local audience (and printed in Hindi) was a pamphlet for women on domestic and personal hygiene. Ahmed (1994) points out that the offices limited hours, particularly morning and midday closings reduces its accessibility by women and children. The organization has no Indian female staff, though I was told that many women (mostly worshippers at the Sankat Mochan Temple) participate in the ghat cleaning events as volunteers.

Because of the sensitive nature of power sharing between Mishra and SMF staff, SMF staffers requested to remain anonymous.

Sadly, organizational attempts to unite supporters through a campaign based on the promotion of Hindu-based unity seems to have led both to the exclusion of non-Hindus and to the propagation of anti-Muslim sentiment within the organization. While this issue was not addressed in my interview with Mishra, two staffers mentioned that the problem of pollution is rooted in an imbalance between Muslim and Hindu population and lifestyles. One SMF staffer argued, “The [sewage] drain… from Muslim area [is] a very dirty drain. In Hindu areas are clean drains—no any chemicals in any house. More chemicals in Muslim house, and more animals…. When you go on a Muslim street, big pollution and outflow to the drain. Because they have no faith in Indian… in India… Very big problem, because they are not believing in India… They are putting so many skin [meat and flesh into the drain]” (pers. com.). Later, when discussing the impact of the city’s growing population, the staffer again pointed to differences in population size and
lifestyle practices (especially diet) between Hindus and Muslims: “Everywhere Muslim big population… You go to a Muslim family, one person has eight sons… After two, three, four, 24 hours [vegetarian sewage] is turned to fertilizer… Sewage made by the Muslims, and some [non-vegetarian] Indians, has chemicals and artificial [components]” (pers. com.). These statements express communalist sentiments that are on the rise throughout India. In the case of the SMF, however, the promotion of religious unity as a solution to river water pollution may not only be contributing to local communal animosity, but it may also prevent the organization from rallying the support of local Muslim population (many of whom also have devotional relationships with the river), as well as discourage partnerships and collaborations with communities and interest groups further upstream (such as tannery owners and workers in Kanpur).

lvii The number of KEF staff, outside of the Executive Think Tank, varies significantly from year to year and is dependent upon funding. Jaiswal (pers. comm. 2009) explained that in one year, after receiving a Ford Foundation grant, he was able to hire a staff of fifteen. The following year, with funding absent, the staff shrunk to just one secretary.

lviii The highest court in the state of Uttar Pradesh.

lix When we met, Jaiswal explained that Mishra is senior to him and, as the head priest of the second largest temple in Varanasi, is very nearly beyond reproach.

lxi The VHP, or Vishva Hindu Parishad, is a right-wing civil society organization in India that promotes a vision of a Hindu (inclusive of Sikhs, Jains and Buddhists), rather than secular, India. The VHP are known for their relationship with the BJP (Bharatiya Janata Party, an important nationalist political party) and their involvement in the destruction of the Babri Mosque and associated communal violence at Ayodhya in 1992.

lxii The sadhu procession on Mauni Amavasya is one of the favored events at the Mela, drawing large crowds of people, especially foreign tourists and press. During the 1954 Kumbh Mela, hundreds of people died during a stampede that formed during the sadhu processional on Mauni Amavasya. Less than a few dozen people have also died during stampedes at Kumbh Mela celebrations in 1986 at Haridwar and in 2003 at Nasik (BBC 2010).

lxiii During the colonial period, the Kumbh Mela was a gathering place for pro-Independence politicians, who were able not only to congregate together, but also to get their message to a large number of people and raise support for the Independence movement.

lxiv The closed, simple polar, structure of these questions was challenging for a few respondents, as only yes or no responses were allowed. One bather said that yes, he bathes, but wanted to qualify that activity by stating that he only bathed on the far side of the river. Another respondent who confirmed that he drinks ganga jal wanted to clarify that he performed this activity “out of faith only”. A third respondent said yes, he drinks water, but not in Allahabad, where he was surveyed, only in Haridwar (a town further upstream where the Ganges exits the Himalayan foothills).

lxv Nationally, only 25% of India’s population has access to sanitation facilities and only 40% has regular access to a supply of potable water (Warn 2000).

lxvi In 2001, people living in informal, or slum, housing constituted 42.81% of the population in Varanasi, 32.32% in Allahabad, and 14.5% in Kanpur.

lxvii To put the task into perspective, imagine if none of the cities or towns in the Mississippi River Basin had sewage treatment infrastructure and the output of cities like Chicago (IL), St. Louis (MO), and Memphis (TN) poured virtually untreated into the river. Imagine then the herculean task of tearing up the streets of these and other regional cities in order to supply their residents with drinking water and sewerage. This would equate to about one-tenth of the work needed in the GRB.
APPENDIX A

GANGA SURVEY

<table>
<thead>
<tr>
<th>D1. Age:</th>
<th>18-29</th>
<th>30-49</th>
<th>50-65</th>
<th>65+</th>
</tr>
</thead>
<tbody>
<tr>
<td>D2. Gender:</td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D3. Marital Status:</td>
<td>M</td>
<td>UM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D4. Residence:</td>
<td>CITY</td>
<td>UP</td>
<td>O/S</td>
<td>INTL</td>
</tr>
<tr>
<td>D5. Occupation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D6a. Do you read any newspapers?</td>
<td>Y</td>
<td>N</td>
<td>D6b. If Y, which one most?</td>
<td></td>
</tr>
<tr>
<td>S1. For what purpose did you come to the river today?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S2. For what purpose do you most often come to the river?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S3. Have you ever bathed in the river?</td>
<td>Y</td>
<td>N</td>
<td>S3a. How often? DAY WK MO. YR &gt;YR</td>
<td></td>
</tr>
<tr>
<td>S5. Do you take water from the river with you?</td>
<td>Y</td>
<td>N</td>
<td>S5b. If Y, how do you use it?</td>
<td></td>
</tr>
<tr>
<td>E1. How many years ago did you first come to the river?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E2. Has the river water changed?</td>
<td>Y</td>
<td>N</td>
<td>E2b. If yes, how?</td>
<td></td>
</tr>
<tr>
<td>K1. Is there pollution in the Ganga River?</td>
<td>Y</td>
<td>N</td>
<td>K2. So then, what is pollution?</td>
<td></td>
</tr>
<tr>
<td>K3. Where does pollution come from?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K4. Where have you learned or heard about pollution in the Ganga?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1. Who is most responsible for dealing with pollution in the Ganga?</td>
<td>CENT-GOVT</td>
<td>STATE-GOVT</td>
<td>LOCAL-GOVT</td>
<td>RELIG GRPS</td>
</tr>
<tr>
<td>T2a. The Kanpur Eco-Friends</td>
<td>Y</td>
<td>N</td>
<td>T2b. Sankat Mochan Fndtm.</td>
<td>Y</td>
</tr>
<tr>
<td>T4. Have you ever attended or participated in an anti-pollution activity (protest/rally/meeting)?</td>
<td>Y</td>
<td>N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T2. How satisfied are you with current efforts to address pollution in the Ganga?</td>
<td>VDS</td>
<td>DS</td>
<td>A</td>
<td>S</td>
</tr>
</tbody>
</table>
GANGA SURVEY

Now I am going to read quotes of what other people have said about pollution in the Ganga. Please indicate whether you agree, somewhat agree, neutral/no opinion, somewhat disagree, or disagree with each of the following statements:

M1. It is safe to drink water directly from the river
   D  SD  N  SA  A

M2. There is more pollution in the river now than ever before
   D  SD  N  SA  A

M3. This town has more important problems than pollution in the Ganga
   D  SD  N  SA  A

M4. I support efforts to reduce pollution in the Ganga
   D  SD  N  SA  A

M5. People should boil or treat Ganga Jal before drinking it
   D  SD  N  SA  A

M6. There is less pollution in the River now than 10 years ago
   D  SD  N  SA  A

M8. Drinking river water may make some people sick
   D  SD  N  SA  A

M9. People should be more concerned about pollution in the Ganga
   D  SD  N  SA  A

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