

Community and participation in water resources management: gendering and naturing development debates from Bangladesh

Farhana Sultana

Community and participation have become popular in development discourse and practice, particularly in the global South and in relation to water resources management. Greater involvement of people in decisionmaking, implementation and evaluation of water management practices is expected to increase efficiency and equity in water projects. However, scholars have pointed out that such discourses are often problematically used and idealised, leading to the exacerbation of gender, class and other social differentiations. Drawing from a case study of drinking water contamination by arsenic in Bangladesh, this article examines the mobilisation and outcomes of participation and community in water provision and arsenic mitigation. Water hardship, conflicts and marginalisations are found to be products of social processes (that are gendered, classed and spatialised) as well as natural processes (local geohydrology, depth of arsenic sediments), in addition to the very ways that community and participation are conceptualised and practised. Nature/water comes to play a critical role in the ways that development interventions play out, thereby complicating the general debates around community and participation. This article seeks to problematise the ways that considerations of both the roles of nature and gender power relations can be more critically and productively engaged in development geography. As such, the article brings together debates in nature–society geography and development geography to argue that scholars studying community and participation need to pay greater attention not only to gender and spatial power relations, but also to the importance of geographical locations and the agency of heterogeneous nature in the ways water management and development interventions fail and succeed, and are thereby critiqued. More adaptive, reflexive and inclusive development realities that are simultaneously embedded in society and nature may then be envisioned, and more nuanced understandings of nature-in-development enabled.

key words community participation gender water arsenic Bangladesh

Department of Geography, Maxwell School of Citizenship and Public Affairs, Syracuse University, Syracuse, NY 13244, USA
email: sultanaf@syr.edu

revised manuscript received 14 December 2008

Introduction

Community and participation have permeated development discourses and practices in the global South. This is particularly prominent in the rural water sector, where there has been a shift from

state-led, technocratic water resources management programmes to an increase of 'participatory' and 'community-based' water resources management (Ahluwalia 1997; Mehta 1997). Such shifts have come in the wake of criticisms of large-scale infrastructure-focused water development projects that

have had negative social and environmental impacts (McCully 1996). Emanating from the participatory development models of the 1970s and 1980s, where civic participation and ownership of development endeavours were seen to result in better outcomes of the projects, participatory community-based water management projects have become popular as ways for states, international donors and NGOs to attempt to pursue 'sustainable development' (Nelson and Wright 1995; Chambers 1997; Agarwal 2000; Cornwall 2000; Agrawal and Gibson 2001). Thus, there have been changes in the governance of water resources from state-controlled and managed to a focus on community-based institutions and less direct state responsibility. Indeed, scholars such as Bardhan have recently argued that 'Water reform in the sense of building or promoting such community institutions of cooperation is at least as important as land reform in rural development' (2001, 247).

Despite their popularity, there are several problems with discourses and practices of participation and community in water resources management. Gendering such approaches further exposes both conceptual and practical limitations of the concepts. Water management schemes that generally see communities as homogeneous entities can overlook complex realities where access to and control over water resources vary by multiple, interlocking and hierarchical systems of differentiation. Similarly, participation involves processes of inclusion, exclusion, negotiation and resistance, which are insufficiently understood or addressed. In this article, I argue that not only are gender and class relations important in assessing how notions of community and participation must be extended, but that geographical location and nature/water play important intersecting roles in local water resources management projects and institutions. The article accomplishes this by engaging with broad bodies of literature that have not erstwhile been brought together to better elucidate nature–society relations in the context of development: the sophisticated and abundant debates on nature–society interactions in/outside of geography (e.g. Bakker 2004; Latour 2004; Castree 2005), and those in the development geography literature on participation and community (e.g. Agarwal 2001; Cooke and Kothari 2001; Hickey and Mohan 2004). As I detail below, critical geographical contributions to development debates can be made by engaging with nature–society literatures to highlight the roles of nature in

development processes.¹ These engagements are then furthered by attention to the ways that gender and spatiality come to inflect the very understandings of processes of nature-in-development, to elucidate that geographical debates about nature–society are always embedded in not only geographical locations and heterogeneous natures, but also in social and spatial complexities. Such an examination underscores the ways that both nature and society consolidate and disrupt the discursive thrusts of community and participation that are understood and operationalised in development endeavours.

The analysis is based on extensive research conducted in areas of rural Bangladesh that are facing acute drinking water crises from arsenic contamination of groundwater sources.² Fieldwork was carried out between 2003 and 2005, involving participant observation, case studies, focus group discussions and 232 in-depth interviews with men and women in 18 villages of four arsenic-acute districts, with a focus on the various water projects being implemented by different types of organisations (state, international donors, NGOs, research institutions) (for greater detail see Sultana 2006 2007a 2007b 2007c). At present, an estimated 35 million people in Bangladesh consume poisoned water because naturally occurring arsenic (from aquifer sediments) is present in groundwater pumped up by tubewells, which are widely used for both drinking water and irrigation purposes. While the introduction of tubewells was deemed a development success, as 'safe' groundwater reduced mortality and morbidity from pathogen/microbial surface water sources historically used for drinking water, the discovery of arsenic and subsequent poisoning have resulted in drinking water crises in recent years.³ Arsenic's unpredictable spatial heterogeneity in the aquifer (due to minor differences in Holocene deposits) is reflected in the spatial heterogeneity of contaminated tubewells (i.e. there can be contaminated and uncontaminated tubewells within a few hundred feet of each other, and entire villages may have only contaminated tubewells, or have few uncontaminated ones, which may be spatially clustered at a variety of scales, and often quite dispersed in pattern on the landscape). Arsenic primarily occurs in the shallow aquifer, where the vast majority of the tubewells can affordably draw water; a few rich households can afford to drill into the deep aquifer, where there is little or no arsenic. As a result,

there is greater hardship in availing safe drinking water, and greater conflict over safe water in many areas (Sultana 2007a 2007b). In order to address the water crisis, arsenic mitigation projects are currently being implemented by organisations throughout Bangladesh to provide safe/alternative water supplies.⁴ These projects generally mobilise discourses of community and participation in water management institutions. This article problematises some of the failings and challenges in the conceptualisations and practices of community and participation, and explicates how they are simultaneously geologically/naturally' and socio-spatially embedded, where processes of water management produce inequalities and differences in safe water usage, access and exposure to arsenic.

The article is laid out as follows: I first briefly but critically review the community and participation debates, then move to gender and spatialise such debates. I then engage with nature–society scholarship to highlight the contributions this can make to development literatures and better explain nature-in-development. I weave in such insights into the discussion on the water crisis in Bangladesh to flesh out the value of bringing together these insights, and conclude with reflections on how further fruitful engagements may be explored.

Community and participation in water management⁵

Scholars have debated the controversial issues surrounding the ways that community and participation have been conceptualised, mobilised and deconstructed in natural resources management and development literatures (Leach *et al.* 1997; Guijt and Shah 1998; Agarwal 2001; Agrawal and Gibson 2001; Cooke and Kothari 2001; Hickey and Mohan 2004; Williams 2004). Despite critiques of exclusions, captures and marginalisation, the considerable staying power of notions of community and participation in development policies has resulted in a proliferation of community-based and participatory projects throughout the global South. In the water sector, creating water user committees as part of community-based water resources management plans are common, whereby the committee is responsible for representing communities/villages in managing water structures and decisionmaking at the local scale (Ahluwalia 1997; Mehta 1997; Bardhan 2001; Meinzen-Dick and Zwartveen 2001). Committee members often are assumed to have common

interests and goals, overlooking social difference and heterogeneity of communities as well as environments (Leach *et al.* 1997). While development project planners may acknowledge the problems that exist, project implementations often treat communities as territorially defined intact wholes within the remit of the projects. Ahluwalia argues that different water users often have different interests and that inter-group conflicts tend to be suppressed, such that 'in name of social cohesion the interests of the less powerful are forgone and existing inequalities are reinforced' (1997, 33). Similarly, Mehta (1997) argues that viewing community ahistorically, as well as out of its social and political context, can reinforce existing asymmetrical social/power relations. Thus, notions of community being inherently egalitarian are problematic (see also Zimmerer 2000; McCay 2001; Page 2003; Staeheli 2003).⁶ Mosse (1997 2003) argues that the social and power relations that play out in water management can challenge notions of democracy and equity that are increasingly embodied in national water development policies uncritically espousing community and participation. Thus, while notions of community in water management may be externally defined by implementing organisations (e.g. local or extra-local NGOs, donors, states), they are implemented through local power relations, where different people with various strengths and weaknesses based on their structural position in village society will negotiate their positions within such projects vis-à-vis the costs and benefits in the context of their overall lives and livelihoods. As a result, it is important to look at the ways that community institutions operate in creating boundaries, exclusions, inclusions and regulation.

The second popular discourse, related to that of community, is participation. Community members are expected to participate in projects in order to enhance equity and efficiency, as well as to feel greater ownership towards projects, which is also expected to lead to better water resources management and greater ecological sustainability.⁷ Participation invokes notions of inclusion, of people's abilities to make decisions, and to voice opinions/concerns that are heard (Agarwal 2001; Cooke and Kothari 2001). As such, participation is linked to notions of deliberative democracy (Hickey and Mohan 2004). Cooke and Kothari (2001) posit that participation has become hegemonic in development discourses, yet generally conceals the processes of unjust and illegitimate exercises of power. Agarwal (2001) further argues that participatory

institutions are often socio-economically inequitable and perpetuate unequal relations of power.⁸ While Ribot (2000 2004) argues that locally accountable representatives can be sufficient if not everyone can participate, this accountability is often a problem as there can be elite capture and corruption of the projects and its benefits. Downward accountability may be lacking in projects, although there is meant to be greater sharing of powers and resources with all members who are meant to benefit from the project (Platteau and Gaspart 2003; Platteau 2004). Networks of relationships of reciprocity and livelihoods may also mean that people make decisions to support dominant institutions and not challenge them (Peters 2000; Cleaver 2003). Traditional notions of participation in village life are often worked out through patronage systems and kinship structures. It is within such unequal set-ups that participatory water management projects often embed themselves and thereby perpetuate cycles of inequality. As a result, participation is a process that involves conflict and consensus, within broader historical factors and constraints, and not just a mechanism to facilitate project success or a set of techniques, although this is primarily how it has been treated in most development projects.

Gendering and spatialising community and participation

Furthering these debates are contributions made by scholars who have looked at either the gendered dynamics of community/participation and/or the spatialities of the processes of community/participation. I argue that it is important to look at these issues simultaneously, in addition to paying attention to the roles and spatialities of nature (as developed in the next section). By undertaking a gender analysis, Cleaver and Elson (1995) expound that community water management schemes may not be equitable and lead to further marginalisation of poorer women in accessing water. Gendered analysis allows for understanding structural inequalities in community and household resource use and allocation. Women's and men's involvement in community projects have to be assessed in terms of their decisionmaking powers and the benefits accrued to them in various forms (Rico 1998; Agarwal 1997 2000; Cleaver 2000 2001 2003; Coles and Wallace 2005). If the beneficiaries/participants are conceptualised along certain criteria, then groups of people may be targeted, for example 'women'. In

such instances, it is likely that women of any background can be assumed to be representative of the different groups of women, and differences between women in a locality get overlooked or obscured in the project. Blindly assuming that having rich or elite women participate in the project leads to 'gender mainstreaming' can be problematic, as exclusions and privilege may become institutionalised.⁹

While adding women to a project may seem to address gender issues stipulated in project documents, it does not necessarily address power issues between men and women, and among different women. Gendered subjects experience simultaneous processes of inclusion and exclusion based on other social processes, and thus it is not possible to generalise across all women or even men (Jackson 1999; Cornwall 2003). Social relations of class, kinship, marriage and household relations can all complicate the ways that people experience exclusion and inclusion. There may be a range of different lines of connection and differences that situate women differently from each other, and the myth of female solidarity thus does not hold up to the ways that women may choose to pursue different desires, connections and needs (for example, not all women in a neighbourhood may be similarly exposed to contaminated water or have similar water needs). In water management, however, some more clear patterns of exclusion do emerge, vis-à-vis men excluding women in decisionmaking roles, and men and women of wealthier households excluding people of other households from accessing their safe water sources. What is evident is that it is not just women but many poor and marginalised men are also excluded, which is often not captured by only focusing on women (as demonstrated in the case study section later in this article).

Participation is often portrayed as increasing the 'empowerment' of women, but recent evidence suggests that many women are disempowered and marginalised in the process (Cornwall 2000; Agarwal 2001). The critical assessment of how participation is conceptualised and a gender perspective on who participates, in what capacity, to what effect and with what means, is important in understanding the outcomes of participatory management institutions being set up as the solution to water resources management problems as well as achieving problematic notions of 'empowerment'. For instance, women's participation in the process of planning or decisionmaking regarding water resources,

generally seen as a male domain, is constrained by gendered responsibilities (both productive and reproductive), time, costs, as well as local norms of what is deemed appropriate gender behaviour (Elson 1995; Cornwall 2003). Agarwal (2001) posits that seemingly participatory institutions can exclude people through 'participatory exclusions' that can individually and interactively constrain a woman's participation in water resource management. These are: rules of entry, social norms of women's behaviour and actions (e.g. speaking in public forum, gender division of labour), social perceptions of women's abilities, entrenched territorial claims by men, personal endowments and attributes of women (e.g. education), and household endowments and attributes (e.g. class).

Furthermore, participation is a spatialised process, taking place in specific spaces and places, which are gendered. As a result, spatialised subjectivities can discourage people from speaking in public, and people may perform differently in different spaces (also Kesby 2005 2007). For instance, when meetings take place in bazaars or market places, it is more difficult for women to attend meetings (as these are gendered spaces for men). Public space and decisionmaking in participatory development projects in many places also exclude women largely due to notions of appropriate feminine behaviour as well as practices of *purdah* (varied practices of veiling and seclusion that curtail women's mobility as well as public behaviour). Given that participation activities are largely conducted in public spaces, or what are perceived to be public activities of decisionmaking and sharing opinions, notions of femininity and masculinity can be challenged when women and marginalised men are involved. This results in both women and men being uncomfortable with projects that attempt to have participatory planning sessions or public committee meetings. These gendered subjectivities and identities are shifting, contested and rethought in development projects so that they make sense to each individual in what it means to be a 'good' man or woman, husband or wife, son or daughter, within the contexts of other factors, experiences and goals in their lives. Thus, women's mobility and autonomy, as well as decisionmaking powers, are spatially curtailed in addition to the socio-cultural ideologies of their capacities and rights to participate in decisionmaking fora. Such participatory exclusions can be powerful in highly unequal and patriarchal settings (see also Sultana 2009).

Greater attention to both gendered identities and agency are thus important in understanding how and why men and women participate in water management projects or not (see also Resurreccion 2006; Sultana forthcoming). Thus, women can manoeuvre through patriarchal structural forces in resisting, challenging and reproducing power relations that operate in the ways that participation plays out in water management. Heeding subjectivities of femininity and masculinity that are associated with activities of participation helps explain why different people relate to community participation in the ways they do. Partaking in water projects is bound up with sensitivities beyond the 'rational' water user that is assumed in participatory development projects, where water users are expected to automatically want to participate and do so with unified and collective identity. This is generally not the case. People display varying opinions and agency in the ways that water projects function in their locality, and what it means in their own access to safe water. Such realities are not just socio-culturally defined, but also inflected by various understandings of water contamination and relations to water. This is where a closer attention to nature/water comes to make a difference.

Naturing community and participation: the difference that nature makes

Scholars studying the ways that nature–society relations operate have generally not engaged with the development literatures discussed above. Critical studies of nature–society relations consist of a large body of knowledge, and different strands of scholarship permeate current academic writings where rich theoretical debates explore the different ways that nature can be understood and theorised. For instance, recent critical writings have looked at the social construction of nature (e.g. Braun and Castree 1998; Castree and Braun 2001), nature's relational ontology and materiality (e.g. Haraway 1991; Whatmore 2002; Bickerstaff and Walker 2003; Bakker 2004; Bakker and Bridge 2006), socio-natures in capitalist systems (e.g. Harvey 1996; Swyngedouw 1999 2004; Loftus 2007), and actor-network theorisations of nature (e.g. Latour 1993 2004; de Laet and Mol 2000; Gareau 2005) (see Castree 2005 for an excellent overview of the debates). My goal is not to evaluate or rehearse these debates, but to emphasise that attention to nature can enrich existing debates around community and participation, which have largely focused

on social relations. By engaging with nature's heterogeneity, uncertainty and contradictions, more nuanced understandings of community, participation and development processes may be envisioned. Ontological attention to nature and nature's 'lively materiality', while contentious (cf. Boyd *et al.* 2001; Goodman 2001; Sneddon 2007), allows for greater understanding of ways that different natures (or components of nature) can come to inflect and influence the ways that development plays out.¹⁰ Such close attention can elucidate better nature-in-development in any context. As Mitchell points out, 'the nonhuman agencies enter into human partnership not just as passive elements to be costed and arranged, but as dynamic and mobile force with their own powers and logics' (2002, 299). Agential nature (in this case arsenic and un/contaminated water) thus comes to disrupt and shape narratives of success vis-à-vis community/participation in development endeavours, and becomes an unexpected co-participant in water management and development processes.

Swyngedouw's (1999 2004) articulations of the agency of water pose central questions from which scholars are debating the role of water in social development (e.g. Bakker 2004; Loftus 2007; Loftus and Lumsden 2008). Social water or hybrid water, which incorporates both the social/political and material aspects of water, have been highlighted in such research. In taking these debates to the community/participation literatures, I focus attention on the ways that different types of water, their materialities (e.g. with and without arsenic in water) and spatialities come to influence the very processes of water management and notions of community/participation. Much of the literature within development geography tends to ignore or thinly heed nature's agency, materiality or heterogeneity, and generally treats nature in one of two ways: as a source of raw material/resources in resource management (where nature is largely benign, static or a stage upon which human social agency is enacted), or as a source of danger, where nature is often hostile or unsafe as in hazards studies (for more detail see Blaikie *et al.* 1994; Peet and Watts 2004). Taking inspiration from the arguments made by Leach *et al.* (1999) and Leach (2008), who urged greater attention to nature's heterogeneity in development thinking, I highlight the contributions that critical geographical research in nature-society relations can bring to development geography by looking at the ways that nature/water come to

inflect and constitute development processes. In problematising discourses of community and participation, attention to nature's uncertainty, dynamism and contradictory actions (beneficial and harmful) can explain why certain community/participatory projects operate in certain ways or fall apart altogether. The locations of specific kinds of nature (e.g. arsenic deposits versus safe parts of the aquifer) and their spatiality can greatly influence not only the ways that water access is organised and institutions developed, but the ways that certain vulnerabilities are exacerbated while others are spared arsenic poisoning (i.e. the ways people come to understand and relate to un/safe waters). Similarly, heeding the heterogeneity of nature and its spatiality can influence whether or not people partake in externally-driven/funded community water projects, or whether they subvert such projects by installing their own tubewells to access safe water (if they are geologically or financially able to do so), thereby reducing the transaction costs, politics and difficulties involved in being part of a community project (see also Sultana forthcoming). The distribution of arsenic in the aquifer, which is quite random and uncertain at the different depths that tubewells can operate at, thus comes to influence the ways that people organise around water management institutions or not. As a result, closer attention to nature complicates narratives of community and participation, and the ways that such discourses operate on the ground. Borrowing loosely from Latour's notion of 'actants', arsenic can be seen as a deviant actant that comes to disrupt development discourses of community and participation, and influences the ways that such notions are negotiated and practised in water projects. In that sense, water becomes an 'uncooperative' resource (cf. Bakker 2004).¹¹ Such complexities and disruptions/coalescences are demonstrated in the next section, where arsenic, tubewell technologies, gender/social relations and space all come together to create hydro-social assemblages that are often overlooked in accentuating positive impacts of community-based participatory water development projects in waterscapes under crisis.

Arsenic mitigation and water management projects in Bangladesh

Nearly all of the arsenic mitigation projects studied in this research were promoting community-based participatory water management options in order

to address the acute drinking water problem. It was found that local people were less involved in actual selection of technology (such as deep tubewells, dug wells, rainwater harvesting technologies), conceptualisation, fund mobilisation or decisionmaking about management, and more so in site selection, collection of fees and construction of infrastructure. While such involvement varies across different projects, what was noticeable is that there is greater investment and attention given to technology and physical infrastructure and less on the social organisation and management institutions by the implementing organisation (see Narayan 1995; Crow and Sultana 2002). The main criteria by which most arsenic mitigation projects proceed are: explicit interest from the local community in having water technologies/options, agreement to invest in costs and construction (along some criteria of 5–15% of capital costs and 100% of maintenance costs), and commitment to self-regulate user access and control. However, there is usually little follow-up beyond the physical construction and initial fund collection by the implementing organisations.¹² At the village level, arsenic committees or water user committees are often set up as the local management institution for the projects. In some instances, these committees are set up ad-hoc by implementing agencies in order to get arsenic mitigation projects started up; in other instances, existing village groups are tapped into. In the majority of cases, people were asked to form groups on their own, or recommend others to join, and this type of group formation is generally understood to form the 'community' for the project, as well as those who will 'participate' in it. In many projects, since users are usually seen as household units, it is the household head whose name is on the list of users. Since this is most likely to be a male head, the committees end up involving men. Thus the rule of entry ends up discriminating the actual users (i.e. women and girls who fetch the water or manage it at the domestic level). Community projects also require certain skills such as literacy, numeracy, organisational and networking/people skills, which can also be lacking in many areas, or taxing on the few who have the skills in their areas. Thus there are limits to local capacities, as the numerous community projects on-going in any given area can often involve the same people, thereby overburdening them with work, contribution of time and resources for the various projects.

In the committee, on paper there are generally several membership posts: users, a secretary, a treasurer, and in some instances a chairman. These members are supposed to be engaged in the implementation of arsenic projects in their area, or at least be responsible for the running (operation, maintenance, fee collection) of the water project with which they are affiliated. A caretaker is sometimes chosen from among those on the committee and is responsible for looking after the maintenance of the water technology and ensure only official members obtain water from the source. However, several projects involved the implementing organisation freely donating water technology without forming committees or groups. These organisations generally did not require financial contributions, and expected that local people would sort out management and maintenance issues on their own. Many of these donations were seen on the land of influential and wealthy households, although some were also specifically targeted and given to households with arsenicosis (arsenic poisoning) patients, or where there was a large cluster of contaminated tubewells. Given the difficulties in mapping the exact location of arsenic in the aquifer, the criteria that organisations often follow involve looking at contamination levels in individual tubewells, and the spatial clustering of unsafe tubewells (which is a product of both natural distribution of arsenic in the aquifer and local geology, as well as human settlement patterns and historical placement of tubewells). Government attempts to inform people about arsenic levels in their tubewell water has been to paint red those tubewells with contamination levels above 50 micrograms/litre (the Bangladesh government standard of allowable arsenic levels) and paint green those tubewells with arsenic levels deemed safe for human consumption (i.e. below 50 micrograms/litre). These act as visual markers of safe/unsafe water sources, in a binary system that does not inform people of the seasonal variations in arsenic concentration nor the actual concentration of arsenic in their water (which in some instances are at much higher and lethal levels such as 1000 micrograms/litre compared to 51 micrograms/litre, although both tubewells would be painted red).¹³ When more than 80 per cent of the tubewells in a village are identified as being contaminated and painted red, external organisations are more eager to implement projects and have greater access to donor funding.

The notions of participation and community among implementing officials largely consisted of following guidelines that project documents had already articulated, often under assumptions of spatially clustered arsenic-afflicted households with equal water needs – i.e. spatially identifying communities where participation in water projects would occur was the primary goal of the project officials. In order to have the quickest and optimal outcome in terms of project delivery schedules, officials generally contacted the village leaders or elders and worked through them. Very few officials felt the need to operate otherwise. However, all projects articulate participation of the poor and equitable water use. When community groups are formulated along traditional lines of kinship or power hierarchies, there is tendency for marginalisation and elite capture, which have been identified as serious problems in implementing community water projects. One NGO worker commented about elite capture and the undemocratic nature of water committees: 'We have to work with the rich and powerful in the villages, or we wouldn't be able to work at all.' As such, devolution of power to community needs to account for the political processes involved, multiple interests and actors, power relations, and different institutions and networks that influence interactions (cf. Ribot 2004).

It is possible that pre-existing groups (e.g. micro-credit scheme groups) enable people to organise around water or share water more readily, as pre-existing disagreements or frictions may have been resolved for the group to function. Some water projects have utilised such groups, often due to the ease of working with existing power structures and groups, so that less investment has to be made in social mobilisation and group formation, thereby minimising time/energy/costs as well as reducing potential for conflicts. Such approaches tended to reinforce existing power relations, often along kinship hierarchies or agricultural patron–client relationships, which had played a role in the formation of various village-based groups. The water projects thus did not necessarily reach those who were in arsenic-acute neighbourhoods or areas that did not already have pre-existing groups or were not supported by a local powerful elite. Research has indicated that many poor households are left out of the micro-credit schemes (due to their lack of capital and collateral) (Montgomery 1998), and thus water projects that operate through such pre-existing groups run the risk of leaving out those who may

About 15 women were present for the focus group discussion. They were very eager to share their stories and lamented that they were particularly suffering the hardship from arsenic in their *para* (neighbourhood). A few of the women had just returned from fetching water from a nearby pond. The only tubewell nearby was painted red. The women were worried about drinking water from the unsafe tubewell and had reverted to using unsafe pond water. Only two of the women walked the mile or so to the mosque to get water from a green tubewell. One young woman openly said that her family continued to drink from the red tubewell; several other women also concurred at that point. They said that it was too far away to go to get water, it involved walking along the main road to the mosque, where there was a lot of crowding, and it was hard for them to leave children behind to go for so long. They were upset that other *paras* had community deep tubewells, obtained through a local project, but they had not been given one. They tried to raise enough money (5000 Taka¹⁴) to give to the Chairman to get a deep tubewell from the government [under cost-sharing schemes to obtain deep tubewells that were community owned and managed]. But they were only able to raise 2500 Taka as the people in the *para* are so poor. As a result, they were not able to secure a safe water source for their vicinity. One woman commented 'We cannot afford to pay the fees to join the water user association in the next *para*, or install our own deep tubewell. What can we do but drink contaminated water?' One upset young woman at this point lamented '*Amra eyi pani khaiya morum, tao eyi pani khaito hobe*' ('We will die from this water, but still we have to drink this water').

(Author's fieldwork notes, December 2004)

Box 1 Marginalisations, exclusions and communities

actually need assistance. Such dilemmas are captured in Box 1.

About 63 per cent of the 232 households interviewed in this study claimed to be using water from some sort of community-based drinking water option. The ones who said they were not using a community water source were generally using their own source or one belonging to someone else nearby. Often, people were not sure if the source they were using was community-based or private (as community sources easily become privately owned/claimed), and thought that it belonged to the household whose land it was on. Thus, in many cases it was seen that what was

thought to be a private water source was actually not (e.g. obtained through the government scheme with multiple households on paper but 'owned' by the household that paid the deposit money). Similarly, in some instances people argued that they were taking water from a source that was community-based, although it often felt like it was singularly owned.

In places where community water projects were operating relatively well, the general opinions of those involved in the project were: the need to increase the number of water options available, reduce the number of households dependent on each option, reduce costs involved, and configure better ways to share the water. However, among most water user group members, there was general satisfaction that they had somewhat better access to a safe water supply, even if they had to pay for it. But a majority of the women involved in these projects did raise complaints that the water sources are often not maintained, that the people on whose land it is on tend to monopolise the source and often treat it as their personal source, and that there are crowding and time factors involved, as well as conflicts and arguments at/over water sources (see also Sultana forthcoming). While outright denial of safe water may be less common, at what cost (both literally and figuratively) water is fetched are factors that are important for many households.¹⁵ Water–society relations are also inflected by gender sensitivities in that even if a household's water source is contaminated with arsenic and deemed unsafe, concerns of women/girls venturing far or into public spaces to get safe water from community water sources often result in families continuing to consume unsafe water (see also Sultana 2009). This can happen even if the household is officially within the reach of a participatory community water project, thereby undermining the goals of a project to provide safe water to all project users.

The siting/location of a community water option is one of the critical issues that also requires negotiation between people and underscores various power relations that exist. Usually if wealthy households want to donate part of their land to install a community water option, they are instructed that they must allow access by other users. However, when the option is located inside the *bari* (homestead consisting of a cluster of a huts of families in the same kinship structure around a common courtyard), especially close to the dwelling huts, there are

Ali described how the different *paras* (neighbourhoods) of the village had struggled with the high levels of arsenic contamination in their tubewells. When the NGO came in and offered to install community-based options, such as dugwells, they had meetings to decide where to place it, how to form user groups, and how much to raise from who. Poorer people were asked to contribute labour if they could not give cash, and wealthier households generally gave more money. The ones who officially were involved with the project formed a user committee and have to give money regularly for operation and maintenance of the dugwell. He said that many people did not want to give money, or could not, and now wished they were a formal user, as not everyone is allowed to take water from the dugwell. The caretaker is the man on whose land the dugwell was built, and his family monitors unauthorised users and chases them away. Ali also proudly said that he and other neighbours played a big role in the location of the dugwell. As another *para* wanted it closer to them, Ali rounded up some of his neighbours and went to the meeting, and prevented the location being any farther away from his *para*. He was happy that it was in-between the two *paras*, but lamented that it was on the roadside, and he did not like his wife to go to get water from such a public place. As a result, he sent his 8-year old son most of the time to get water. When his son was asked about his experience in getting water from the dugwell, the child expressed dislike and said he had to jostle with women to get water and was made fun of sometimes by other children. Ali's wife Neela then commented that the dugwell should have been closer, as now she often resorts to using their own red tubewell and consuming arsenic-laced water. (Author's fieldwork notes, January 2005)

Box 2 Politics, locations and community water projects

greater access restrictions imposed by the landowner. Often people will debate and negotiate which spot is the best one for installing a community water source, but it is frequently overtaken by powerful families who dictate where the location should be (often donating their land or more money in order to control the project) (Box 2). The politics of locating a water source is further complicated by whether or not the location is arsenic-free, or if geologically it is financially feasible to drill for water to the depths needed to access safer water (given the uncertainty in the local geology and the variable depths at which safe water may be available). Social

power relations thus come up against nature's fragmented heterogeneity in negotiations over locating water infrastructure.

Reworking and renegotiating community and participation in water

Not all households feel the burden of safe water scarcity or arsenic poisoning in the same way in any given locality. In the territorial/spatial delineation or 'catchment area' of any community water project there may be owners of safe water tubewells, which complicates notions of the continuous presence of needy households in the project area. Such safe water sources can also offer alternative water options to other households in the vicinity, who can opt to get water from alternative water sources rather than the community projects. The heterogeneous contamination of arsenic in the aquifer results in the non-continuous presence of contaminated tubewells, thereby reducing the desires by many who have safe water access/ownership to invest any interest, money or time in the success of community projects or to participate in them. Dynamic social power relations of inclusion/exclusion as well as uncertainties and fragmentations in nature come to undermine community projects. As a result, the very discourses of participation and community that are supposed to bring people together to enhance equity and efficiency of projects may not come to fruition as expected, and are imbricated in the very relations people have with water (i.e. relative location to contaminated parts of the aquifer, having a tubewell that is deep enough to draw out safe water from the deep aquifer, or living in areas where there are no safe tubewells at all). Yet on the other hand, there are many areas that have acute problems with no safe water sources, but a community project may be quite far away or beyond the financial or social resources of the people in the locality to participate in existing water projects. Furthermore, the very presence of arsenic in groundwater (and then subsequently in tubewell water) determines whether external development projects come into an area in the first place. If there is insufficient concentration of contaminated tubewells in an area, organisations may not deem it necessary to introduce alternative safe water options or invest in the area at all.

In such ways, nature, spatial relations and social factors come to complicate the ways that people understand and experience community and partici-

pation in water management in their daily lives. As a result, what emerges is that water and arsenic consolidate and disrupt community and participation, whereby power relations and social realities are re/configured through hydro-social assemblages. While arsenic as a deviant 'actant' or an 'uncooperative' resource can be appropriated by some to their benefit (e.g. co-opting a water project) and cause immense suffering to others (e.g. those left out of projects), what emerges is that the heterogeneity of nature vis-à-vis arsenic and polluted waters comes to influence everyday social realities in nuanced ways, where daily, complex and geographically embedded struggles are lived and experienced differently in the context of development. The nature-society dialectic thus is closely inflected by both multifaceted social relations as well as complex hazardscapes of nature (where benign and harmful natures exist simultaneously) (cf. Mitchell 2002).

In areas where severe arsenic contamination has resulted in community water projects being formally introduced, a variety of social power relations complicate the ways that community and participation are understood and practised, to which I turn now. A common theme emerged from discussions in my study regarding the management and operation of the community water projects, whereby many people did not know about community water projects properly, especially about their management mechanisms. Almost everyone had heard about the community arsenic mitigation projects, and group formation in their area, especially if being implemented by an active NGO, during early phases when information was disseminated. But the majority of people did not know exactly how the community-based options functioned or how they were defined. Often, the prevalent notion was that the person on whose land the option was located was fully responsible for it and that others did not need to be involved (i.e. they thought it was private property). In general, those not affiliated with projects were less aware of user committees or, if they were aware, most were not members. Generally, the rural elite and elders were key decisionmakers in user committees. In some instances, committee meetings were called and people were told of the water issues and concerns, but this was more a rarity than a norm. As a result, few people knew about or attended community meetings regarding arsenic mitigation projects and water management decisionmaking. Very few

community projects actually had functioning user committees where people actively participated and felt communal ownership of the water option.¹⁶ Furthermore, different notions of community and participation operating in water projects of different organisations in the same locality further complicated the issue (e.g. for some it meant making a financial contribution, for others it meant becoming a member of the project group, and sharing in decisionmaking). Often the same people represented the community in the different projects, and different approaches and modalities of operation under the same rhetoric can create confusion. In the end, what was apparent was that overall the men were more interested in getting technologies and the financial aspects of arsenic projects, with the assumption that issues of access, use and conflict would be borne by women (see also Sultana 2007a forthcoming).

Instant validation of participation is seen when some people show up at any meeting – even if at various stages of the meeting, or if they leave at various times during the meeting, whether they have actually listened to the discussion, or said anything – as physical presence is generally understood to imply participation. Usually, on paper a large number of people's names are included as committee members, but there are often few who attend meetings or feel they are actually members of the project; also, there is little, if any, record-keeping of meetings and how/what decisions were made. While the flexibility of rules can allow for faster action, it is also open to different interpretations and control by the powerful. In most of the community projects, few formal meetings were held as people didn't feel that there was a need if the water option was functioning, fees were collected and there were no major conflicts to resolve. Costs of meetings and participating were factors that influenced this: these can be in terms of time spent, loss of income from loss of time,¹⁷ overcoming social barriers, and perceived risks of upsetting existing social hierarchies. Also, a sense of abandonment and powerlessness can further complicate the participation of those who feel marginalised at meetings. Thus, not everyone can or wants to participate, or at least not in the ways that are publicly articulated in the projects. The majority of the 232 individuals interviewed, both men and women, mentioned that they do not want to go to meetings at all, as they feel that their voice will not be heard, or that the decision of the more educated elite and

powerful is sufficient. In some instances, people said they didn't want to challenge authority as they wanted to benefit from projects in whatever way they could. Meaningful participation may not result even when people are able to attend meetings, due to existing power structures and social norms on who can speak, when and how. Many poor households thought that some financial or labour contribution is sufficient participation, and that decisionmaking should be left up to others. Nonetheless, the majority of the people were interested in having some voice and sharing their opinions in the ways that water management affected their lives, but were less certain how to enact this. For households with contaminated water sources, it was a critical concern, whereas for those with easier access to alternative safe water sources, there was less concern.

What was notable was that just setting up a committee and having meetings does not address issues of subordination, marginalisation or vulnerability (also Cleaver 2001). The rights of excluded and marginalised peoples cannot be redressed by sitting in at meetings or being formal members of water groups, although it can ensure water security to some extent (which is important for household reproduction and livelihood needs). Thus, people make trade-offs between maintaining power structures for overall livelihood needs and having access to safe water, whether they participate or not. Cleaver posits that

Non-participation and non-compliance may be both a 'rational' strategy *and* an unconscious practice embedded in routine, social norms, and the acceptance of the status quo. (2001, 51; emphasis in original)

Thus, meaningful participation does not come to fruition from the problematic way it is conceptualised, implemented and circumvented.

The meanings of participation in different contexts and spaces, and in relation to other people present, greatly influence how people understand and operationalise participation. The public nature of the spaces of participation and decisionmaking often reinforce social norms of who can and cannot speak up. Most women and many poor and marginalised men often do not feel comfortable speaking in public spaces. Being seen to voice an opinion that may challenge existing power structures or ideas about water management is often deemed to be risky by those who need to maintain various kinship and social networks for livelihood

needs. Furthermore, class mentalities often position less powerful or poorer men at a disadvantage as they are often expected to go along with more powerful or wealthy patrons. While many may be resigned to this arrangement and accept the outcomes, some did wish they had more agency.

It is important to look closely at gender relations in this context, as issues of power and powerlessness can occur among both men and women (Cornwall 2000). Power relations manifest themselves between and among men and women along a variety of social axes. For instance, many poor and landless men felt helpless in the face of safe water scarcity or arsenic poisoning, yet were not in a position to obtain their own safe water source. They were also often left out of decisionmaking processes in water management. While some of the men who were members in committees said that they were comfortable sharing their ideas and opinions, many said they just listened to others. Poorer and less educated men said that they did not feel that they had anything meaningful to contribute and that their opinions did not count as much, and they often went to find out what was going on rather than give opinions. One man said that those who are eloquent and give good ideas are allowed to talk, and others just listen: 'The rich people decide what to do, that is fine with me as long as I can benefit from getting arsenic-free water.' However, another man related, with some measure of frustration, 'We are poor, no one listens to us anyway.' There is also the issue of respect and deference shown to elders, making it harder for younger people to speak up in their presence. Thus, it is seen that even within predominantly male groups, there are differences by class, age and education. Invocations of differences through gender, class, location, literacy and religion are common in community projects, which influences how people understand 'participatory exclusions' (cf. Agarwal 2001), as reflected in one man's comment: 'What can we *murkho*, *oshikkhito* [illiterate, uneducated] people do, the ones who know, the ones who are educated, and know other people, they are the ones that can do more.' However, if arsenic had come to affect a household particularly badly (i.e. prolonged exposure to high concentrations had led to illness or death in the family), then members of that household are often given more voice and say in communal water management decisions, irrespective of social power relations (although how such voice is exercised varies across cases).

Gendered participation and decisionmaking activities for women were generally curtailed by age, marital status, education and socio-economic class position across households with similar exposure and experience with arsenic contamination. Which women are allowed to participate or are appreciated when they do participate also varies. Men often will listen to more senior and wealthy women if they have some history of influence or power in the village. Younger women find it more challenging. But if they are very educated and able to communicate with men, they are given space to speak. But this is often looked down upon as well, as such women are out of the ordinary and seen to destabilise social norms if they speak up too much or against any older man. In general, older educated women who have played some leadership roles (e.g. school teacher) are more respected and participate more in decisionmaking fora. Similarly, as Cleaver (2001) notes, hired female labour may fetch water for the wealthier households, but it is the households' more powerful women who are in a position to participate at decisionmaking fora; similarly, younger women (especially daughters-in-law) who actually procure drinking water are largely left out of water management institutions and decisionmaking processes as older women from the household may be involved, if at all. Thus, different women in different social locations can have very different experiences concerning water and opinions about water management.

The majority of the women interviewed in this study did not know about the workings of the community projects, their rights and roles, or even membership in such institutions. Often their names existed only on paper, they attended no meetings, or were not informed of meetings nor asked for their opinions. In most cases, the water user committee consisted of only men, or mostly men with a few token women; only 4 of the 132 women interviewed claimed to have ever attended a water management meeting. Even if women were asked to attend meetings, they mostly listened in and rarely gave their opinions in public, and they were not given sufficient assistance or encouragement to attend such meetings. There is a general sense that the women's role is limited to deciding where to fetch the water from, and less so in terms of how to alleviate the access, control and managerial aspects of most water options (Box 3).

Opinions on the ways and to what extent greater participation was possible varied. Some men

'Men go to meetings to decide what to do about the arsenic problem. We would go if we were asked, but we're never asked to go'. (Woman in interview, December 2004)

'There is no scope for women to participate at the meetings, they are generally not informed or asked to attend'. (Man in interview, January 2005)

'She is a woman, what does she know? She doesn't have anything to say, she just fetches the water'. (Man in interview, January 2005)

'My husband would never let me go to a meeting'. (Woman in focus group discussion, January 2005)

'Women should participate but they do not come to the meetings'. (Man in interview, December 2004)

'The committee is on paper only, not in reality. My name is put down as the treasurer, but I don't know what is going on'. (Woman in interview, November 2004)

(Author's fieldwork notes)

Box 3 Gender and participation in water projects

thought that women should only give their opinions to male members of their family to pass on, while others thought that women should actively and equally participate at public meetings. While most women felt that they should have more decisionmaking powers, and expressed interest in voicing their opinions and having more decision-making capacities, the majority were not willing to challenge the norms and authorities of their husbands, fathers, brothers or elders in order to do so. Such constraints need to be viewed within the broader context of women's lives, as well as local geological contexts, as women in households without arsenic problems were less willing to engage in gender equality in water projects compared with those facing greater challenges in accessing safe water. Women can resist, accept and create different meanings out of notions of participation; this can be done directly and indirectly, actively and passively. Women are more likely to share their concerns with those in similar subject-positions than with women in general or with men (although this varies depending on the conjugal relationship and household structure). Women are also likely to make strategic alliances with men in their households in order to push forth their agendas for safe

water in public fora; thus, there is control, domination, negotiation and cooperation that can be brought to bear on how households and members in the household participate in water projects. As a result, irrespective of whether women participated or not, they remained overwhelmingly circumscribed by their gendered positions of subordination and were not able to challenge or change power relations through water management projects.¹⁸

What is evident is that differences and inequalities are sharpened through the community projects, both from the rules of membership and distribution of costs and benefits from involvement, as well as from the level of contamination of water sources in a locality. Nature and society thereby come to interact in dialectical and complicated ways to influence how people benefit from development interventions. Furthermore, social power relations often result in the marginalisation of men and women based not only on class and gender, but also on whether they are within the 'natural'/geological spaces of safe water (i.e. if they have access to safe water that would perhaps reduce their social marginalisation, or if their sufferings are further compounded by lack of access to safe water). Everyday village politics can come to influence water politics, where the political processes of water allocation, access and use are often overlooked in the belief that community and participatory water projects benefit everyone. Since these projects involve access to and control over a life-giving, non-substitutable resource such as water, they are inherently political. Such social realities are further complicated by the heterogeneity of arsenic and safe groundwater sources, as discussed earlier.

Conclusion

This article has posited that there is a benefit in bringing together the different literatures on community and participation in development geography with nature-society geography to problematise and flesh out nature-in-development, in order to enrich and nuance both the discursive thrusts in development thinking as well as to elucidate why certain development endeavours fail or succeed. I analysed the role that nature plays in development processes in unexpected ways, shaping and challenging practices of community and participation in water management, as well as the ways that nature and gender relations intersect to complicate

development debates. Attention to social heterogeneity (gender, class) as well as natural heterogeneity (arsenic deposits, safe aquifers) helps to clear space in better understanding nature–society relations in the context of development. Such a focus assists in better articulating the role of nature in development, which is often neglected in community/participation literatures that focus predominantly on social issues in debating why and how community and participation operate. Nature's 'lively materiality' (cf. Goodman 2001) and ontology (cf. Mitchell 2002; Castree 2005) needs greater attention from development scholars. Similarly, it could be argued that nature–society geographers should more fully heed the complexities involved in gender/class/social power relations and institutions involved in nature–society relations as well as the ways that development discourses operate in everyday resource management contexts.

Despite the problems of discourses of community and participation as discussed above, such notions continue to have enormous staying power in development projects, as policymakers, project officials and local elites buy into the various understandings of what community and participation mean, and how different benefits can be reaped from mobilisation of such polyvalent terms. Community-based water management can simultaneously further stratify communities, as well as create and congeal communities for specific projects, where the spatiality and heterogeneity of nature plays a critical role in the ways that institutions are crafted and operationalised. People are more aware of what community means, or is supposed to mean, and can work through the processes of such development interventions vis-à-vis their own relationship with un/safe water. Thus, a community reflects its internal stratification at such formalising moments of interventions, where differences in needs, abilities, power and influence become evident, as do the locational differences and relations people have to a spatially heterogeneous nature (one which is both benign in providing safe water, as well as harmful in providing poisonous water, depending on where and at what depth one draws water from). Differences are thus reinforced through arsenic mitigation and water management institutions, in that relations of domination and control tend to further marginalise those who do not have access to safe water, meaningful participation in water management institutions, and information about arsenic and mitigation (including arsenic's distribution, safe

water options, impacts on health and health management). As such, the creations of differences that are gendered, classed and geographical (in relation to access to safe water sources as well as in relation to where contaminated aquifers are) are reinforced by the very notions that are expected to reduce such differences and promote egalitarian and democratic water institutions.

This article has argued for expanded and inclusive notions of participation and community that heed both social and natural heterogeneity and uncertainty, with the hope that this will allow for more dynamic, adaptive and reflexive governance of development processes (Leach 2008). In this way, understanding nature's complexity becomes critically important in both policy and practices of community and participation in development, elucidating why certain projects operate the way they do, and appreciating notions of community and participation not just by social parameters but vis-à-vis nature's role in context.

Acknowledgements

I gratefully acknowledge the following for research support: the MacArthur Program and various grants from the University of Minnesota, the International Water Management Institute (IWMI), and the Department for International Development (DFID). I would like to thank several anonymous referees for constructive criticism and comments, Alex Loftus for thoughtful feedback on drafts, and participants at the 2007 AAG session where a version of the article was presented. Thanks also to Adam Tickell and Alison Blunt for their editorial support in completing the article. All shortcomings, of course, remain mine.

Notes

- 1 While development debates on 'sustainable development' and 'sustainability' do engage with nature, the goals are often to configure how to better protect/conservate/preserve/organise nature, or better use nature as raw material or pollution sink. My goal is to heed micro-scales of nature, and the ways that attention to nature helps us understand processes and outcomes of development interventions better, as well as understand complex social realities in everyday nature–society struggles. This is not resorting to some form of environmental determinism, but to recognise the contradictory roles that the natural environment plays in socio-economic processes of development.

- 2 For more information on the arsenic situation in Bangladesh, see Smith *et al.* (2000), Ahmed and Ahmed (2002), Hanchett (2004), Ahmed *et al.* (2005), Sultana (2006 2007a 2007b 2009).
- 3 Arsenic consumption leads to arsenicosis (arsenic poisoning), which can cause various health complications, cancer, and ultimately death. Arsenic is often called the 'king of poisons' because of its high toxicity, and displays carcinogenic effects from prolonged exposure to small doses found in drinking water.
- 4 Arsenic mitigation projects generally involve some form of water technology (often called water option) that is either household-based or community-based (e.g. more expensive, deeper tubewells accessing the arsenic-free aquifers, rainwater harvester technologies, pond sand filters, arsenic removal technologies attached to contaminated tubewells, modified dugwells and some trial small-scale piped water schemes). The goal is to produce and distribute arsenic-free water to people who are involved in the project.
- 5 This section engages with political dimensions of community and participation largely at the local scale, recognising that this is entangled with global discourses. However, the section does not go into the literature on multi-level political aspects of water resources management or the debates on national-level participatory planning of water (e.g. participatory budgeting).
- 6 Working in a different vein, Panelli and Welch (2005) look at the heterogeneity in communities as a tension that is maintained between distinctions of 'being community' and 'community-in-being', highlighting the ways that a differentiated unity can exist where people forming communities are simultaneously divided and united.
- 7 However, there is no guarantee that democratic institutions will lead to ecological sustainability, and the linkages between democracy, sustainability and empowerment are tenuous at best. See Agrawal and Gibson (2001) and Ribot (2004) for more details.
- 8 Agarwal (2001) further identifies that people can participate in a variety of ways, articulating a typology of participation that progresses from nominal/token (e.g. physical presence) to empowered participation (ability to meaningfully participate and make decisions).
- 9 For many feminist scholars, the politics of representation relate to the concerns of who can represent who, and the power relations involved in any one person speaking on behalf of others. Certain essentialist notions are present when any woman is expected to speak on behalf of all women, especially in political spheres or development projects, where richer and influential women may have more public presence. Such politics of ideas (as opposed to politics of presence, cf. Phillips 1995) signifies that women are able to convey the concerns/issues across the multiple axes of differences that may exist. However, class differences can make it hard for such women to represent poorer women, although it is possible to speak across divides and have coalition building; however, this would necessitate that the representative women are aware of their positionality and the politics of representation that are involved, and know the concerns of other minority women in any context. See Mohanty *et al.* (1991) for a fuller overview of feminist debates on the politics of representation.
- 10 Castree defines materiality to be 'both the real, ontological existence and causal efficacy and agency within history, of those entities and processes we call "natural"' (1995, 20).
- 11 While much of the new literature on 'uncooperative commodities' (e.g. Bakker 2004) works within the capitalist commodity framework, I am focusing on an uncooperative natural resource rather than a commodity.
- 12 Generally, some sort of cost-sharing is deemed to be needed in order to ensure access to water technologies, and financial involvement as well as consent to have projects operate are seen as participation; in other words, incorporation into projects through information-sharing or brief consultations are common. The user committees were usually articulated to be non-political and for the benefit of people needing water, thereby depoliticising the project when it was very embedded in local politics. '*Shobai mile-mishe pani niben*' ('Everyone cooperate to share water') is a common statement made by project personnel in forming a water user committee. Naturally the present parties would agree. Participation can be seen as means or ends, and this distinction is important, as often in participatory development it is seen as the ends, rather than a means to broader ends. In most water management projects, participation is incorporation in the project (at various stages of the project cycle), rather than a transformative experience.
- 13 Not all tubewells in the country have been screened, although local NGOs often undertake water testing and paint tubewells red/green accordingly when they start any new water project in an area. There are many new tubewells being installed (by people desperate in the hope that a new tubewell might produce safe water, or those with money to purchase a deeper tubewell that can access the deep aquifer that is largely arsenic-free), and these new tubewells are often not tested or painted. A greater discussion on the politics of development involved in arsenic mitigation at the national level is beyond the scope of this article and will be the focus of a forthcoming article.
- 14 £1 is approximately 130 Taka.
- 15 While Ahmed *et al.* (2005) did not find any reports of rich or influential people denying poor people access to community-based mitigation options, it should be recognised that conflicts and frictions may not be overtly reported and that such issues are gendered, where negotiating access and rights to any water

source may result in gendered hardships that may always not be obvious or conveyed. Many official studies thus claim that there is little conflict or problem in community arsenic mitigation projects.

- 16 Such findings concur with that of Ahmed *et al.*, where many community water projects were found to be lacking: 'In planning and implementation of the mitigation options broad-based participation appears to have been largely absent and some respondents interpreted [financial] contribution for the water point as participation. No respondent, except those who had given land to install the facilities were found to be directly involved in decisionmaking on the water points' (2005, 38).
- 17 As community participation involves time, those who are marginalised or poor usually cannot afford that kind of time (compared with the rich who, for instance, are generally less involved in agricultural wage labour and have opportunities to free up time for project work).
- 18 See Sultana (2009) for a discussion on re/production and re/negotiations of gendered subjectivities in relation to water.

References

- Agarwal B** 1997 Environmental action, gender equity and women's participation *Development and Change* 28 1–39
- Agarwal B** 2000 Conceptualizing environmental collective action: why gender matters *Cambridge Journal of Economics* 24 283–310
- Agarwal B** 2001 Participatory exclusions, community forestry, and gender: an analysis for South Asia and a conceptual framework *World Development* 29 1623–48
- Agrawal A and Gibson C** 2001 The role of community in natural resources conservation in **Agrawal A and Gibson C** eds *Communities and the environment: ethnicity, gender, and the state in community-based conservation* Rutgers University Press, New Brunswick 1–31
- Ahluwalia M** 1997 Representing communities: the case of a community-based watershed management project in Rajasthan, India *IDS Bulletin* 28 23–34
- Ahmed M and Ahmed C** 2002 Arsenic mitigation in Bangladesh: an outcome of the international workshop on arsenic mitigation in Bangladesh 14–16 January 2002 Local Government Division, Ministry of LGRD and Cooperatives, Government of Bangladesh
- Ahmed M, Shamsuddin S, Mahmud S, Rashid H, Deere D and Howard G** 2005 *Risk Assessment of Arsenic Mitigation Options (RAAMO)* Report produced by Arsenic Policy Support Unit, Ministry of Local Government, Rural Development and Co-operatives, Government of Bangladesh
- Bakker K** 2004 *An uncooperative commodity: privatizing water in England and Wales* Oxford University Press, Oxford
- Bakker K and Bridge G** 2006 Material worlds? Resource geographies and the 'matter of nature' *Progress in Human Geography* 30 5–27
- Bardhan P** 2001 Water community: an empirical analysis of cooperation on irrigation in South India in **Aoki M and Hayami Y** eds *Communities and markets in economic development* Oxford University Press, Oxford 247–64
- Bickerstaff K and Walker G** 2003 The place(s) of matter: matter out of place – public understandings of air pollution *Progress in Human Geography* 27 45–67
- Blaikie P, Cannon T, Davis I and Wisner B** 1994 *At risk: natural hazards, people's vulnerability and disasters* Routledge, London
- Boyd W, Prudham S and Schurman R** 2001 Industrial dynamics and the problem of nature *Society and Natural Resources* 14 555–70
- Braun B and Castree N** eds 1998 *Remaking reality: nature at the millennium* Routledge, London
- Castree N** 1995 The nature of produced nature: materiality and knowledge construction in Marxism *Antipode* 27 12–48
- Castree N** 2005 *Nature* Routledge, London
- Castree N and Braun B** 2001 *Social nature: theory, practice, and politics* Blackwell, Oxford
- Chambers R** 1997 *Whose reality counts? Putting the first last* The Bath Press, Bath
- Cleaver F** 2000 Analysing gender roles in community natural resource management: negotiation, lifecourses and social inclusion *IDS Bulletin* 31 60–7
- Cleaver F** 2001 Institutions, agency and the limitations of participatory approaches to development in **Cooke B and Kothari U** eds *Participation: the new tyranny?* Zed Books, London 36–55
- Cleaver F** 2003 Bearers, buyers and bureaucrats: the missing social world in gender and water in *Feminist fables and gender myths: repositioning gender in development policy and practice* Workshop, Institute of Development Studies, Sussex 2–4 July 2003
- Cleaver F and Elson D** 1995 Women and water resources: continued marginalisation and new policies *The Gatekeeper Series of International Institute for Environment and Development's Sustainable Agriculture Programme* 49 3–16
- Coles A and Wallace T** 2005 *Gender, water and development* Berg, Oxford
- Cooke B and Kothari U** eds 2001 *Participation: the new tyranny?* Zed Books, London
- Cornwall A** 2000 Making a difference? Gender and participatory development *IDS Discussion Paper* 378
- Cornwall A** 2003 Whose voices? Whose choices? Reflections on gender and participatory development *World Development* 31 1325–42
- Crow B and Sultana F** 2002 Gender, class and access to water: three cases in a poor and crowded delta *Society and Natural Resources* 15 709–24

- de Laet M and Mol A** 2000 The Zimbabwe bush pump: mechanics of a fluid technology *Social Studies of Science* 30 225–63
- Gareau B** 2005 We have never been human: agential nature, ANT, and Marxist political ecology *Capitalism Nature Socialism* 16 127–40
- Goodman D** 2001 Ontology matters: the relational materiality of nature and agro-food studies *Sociologia Ruralis* 41 182–200
- Guijt I and Shah M** 1998 *The myth of community: gender issues in participatory development* Intermediate Technology Publications, London
- Hanchett S** 2004 Social aspects of the arsenic contamination of drinking water: a review of knowledge and practice in Bangladesh and West Bengal Report presented to the Arsenic Policy Support Unit, Ministry of Local Government, Rural Development and Co-operatives, Government of Bangladesh July 2004
- Haraway D** 1991 *Simians, cyborgs and women – the reinvention of nature* Free Association Books, London
- Harvey D** 1996 *Justice, nature and the geography of difference* Blackwell, Oxford
- Hickey S and Mohan G** eds 2004 *Participation: from tyranny to transformation? Exploring new approaches to participation in development* Zed Books, London
- Jackson C** 1999 Social exclusion and gender: does one size fit all? *European Journal of Development Research* 11 125–46
- Kesby M** 2005 Re-theorising empowerment-through-participation as a performance in space: beyond tyranny to transformation *Signs: Journal of Women in Culture and Society* 30 2037–65
- Kesby M** 2007 Spatialising participatory approaches: geography's contribution to a mature debate *Environment and Planning A* 39 2813–31
- Latour B** 1993 *We have never been modern* Harvester Wheatsheaf, London
- Latour B** 2004 *Politics of nature: how to bring the sciences into democracy* Harvard University Press, Cambridge
- Leach M** 2008 Pathways to sustainability in the forest? Misunderstood dynamics and the negotiation of knowledge, power, and policy *Environment and Planning A* 40 1783–95
- Leach M, Mearns R and Scoones I** 1997 Challenges to community-based sustainable development: dynamics, entitlements, institutions *IDS Bulletin* 28 1–14
- Leach M, Mearns R and Scoones I** 1999 Environmental entitlements: dynamics and institutions in community-based natural resource management *World Development* 27 225–47
- Loftus A** 2007 Working the socio-natural relations of the urban waterscape *International Journal of Urban and Regional Research* 31 41–59
- Loftus A and Lumsden F** 2008 Reworking hegemony in the urban waterscape *Transactions of the Institute of British Geographers* 33 109–26
- McCay B** 2001 Community and the commons: romantic and other views in **Agrawal A and Gibson C** eds *Communities and the environment: ethnicity, gender, and the state in community-based conservation* Rutgers University Press, New Brunswick 180–92
- McCully P** 1996 *Silenced rivers: the ecology and politics of large dams* Zed Books, London
- Mehta L** 1997 Social difference and water resources management: insights from Kutch, India *IDS Bulletin* 28 79–88
- Meinzen-Dick R and Zwartveen M** 2001 Gender dimensions of community resource management: the case of Water Users' Associations in South Asia in **Agrawal A and Gibson C** eds *Communities and the environment: ethnicity, gender, and the state in community-based conservation* Rutgers University Press, New Brunswick 63–88
- Mitchell T** 2002 *Rule of experts: Egypt, techno-politics, modernity* University of California Press, Berkeley CA
- Mohanty C, Russo A and Torres L** eds 1991 *Third world women and the politics of feminism* Indiana University Press, Bloomington IN
- Montgomery R** 1998 Disciplining or protecting the poor? Avoiding the social costs of peer pressure in micro-credit schemes *Journal of International Development* 8 289–305
- Mosse D** 1997 The symbolic making of a common property resource: history, ecology and locality in a tank-irrigated landscape in South India *Development and Change* 28 467–504
- Mosse D** 2003 *The rule of water: statecraft, ecology, and collective action in South India* Oxford University Press, Delhi
- Narayan D** 1995 The contribution of people's participation: evidence from 121 rural water supply projects Environmentally Sustainable Development Occasional Paper Series No 1 World Bank, Washington DC
- Nelson N and Wright S** 1995 *Power and participatory development: theory and practice* Intermediate Technology Publications, London
- Page B** 2003 Communities as the agents of commodification: the Kumbo Water Authority in Northwest Cameroon *Geoforum* 34 483–98
- Panelli R and Welch R** 2005 Why community? Reading difference and singularity with community *Environment and Planning A* 37 1589–611
- Peet R and Watts M** 2004 *Liberation ecologies: environment, development, social movements* 2nd edn Routledge, New York
- Peters P** 2000 *Development encounters: sites of participation and knowledge* Harvard University Press, Cambridge MA
- Phillips A** 1995 *The politics of presence* Oxford University Press, Oxford
- Platteau J** 2004 Monitoring elite capture in community-driven development *Development and Change* 35 225–48
- Platteau J and Gaspart F** 2003 The risk of resource misappropriation in community-based development projects *World Development* 31 1687–703
- Resurreccion B** 2006 Gender, identity and agency in Philippine upland development *Development and Change* 37 375–400

- Ribot J** 2000 Decentralization, participation, and representation: administrative apartheid in Sahelian forestry in **Peters P** ed *Development Encounters: Sites of Participation and Knowledge* Harvard University Press, Cambridge MA 29–60
- Ribot J** 2004 *Waiting for democracy: the politics of choice in natural resource decentralization* World Resources Institute, Washington DC
- Rico M N** 1998 Women in water-related processes in Latin America: current situation and research and policy proposals *International Journal of Water Resources Development* 14 461–71
- Sen A** 2000 *Development as freedom* Anchor Books, New York
- Smith A, Lingas E and Rahman M** 2000 Contamination of drinking-water by arsenic in Bangladesh: a public health emergency *Bulletin of the World Health Organization* 78 1093–103
- Sneddon C** 2007 Nature's materiality and the circuitous paths of accumulation: dispossession of freshwater fisheries in Cambodia *Antipode* 39 167–93
- Staeheli L** 2003 Women and the work of community *Environment and Planning A* 35 815–31
- Sultana F** 2006 Gendered waters, poisoned wells: political ecology of the arsenic crisis in Bangladesh in **Lahiri-Dutt K** ed *Fluid bonds: views on gender and water* Stree Publishers, Kolkata 362–86
- Sultana F** 2007a Suffering for water, suffering from water: political ecologies of arsenic, water and development in Bangladesh PhD thesis Department of Geography, University of Minnesota, Minneapolis MN
- Sultana F** 2007b Water, water everywhere but not a drop to drink: *Pani politics* (water politics) in rural Bangladesh *International Feminist Journal of Politics* 9 1–9
- Sultana F** 2007c Reflexivity, positionality and participatory ethics: fieldwork dilemmas in international research *ACME: An International E-Journal for Critical Geographies* 6 374–85
- Sultana F** 2009 Fluid lives: subjectivities, water and gender in rural Bangladesh *Gender, Place, and Culture* 16 in press
- Sultana F** forthcoming Suffering for water, suffering from water: conflict, cooperation and collectivizing in water *Geoforum*
- Swyngedouw E** 1999 Modernity and hybridity: nature, regeneracionismo, and the production of the Spanish waterscape, 1890–1930 *Annals of the Association of American Geographers* 89 443–65
- Swyngedouw E** 2004 *Flows of power – the political ecology of water and urbanisation in Ecuador* Oxford University Press, Oxford
- Wade R** 1988 *Village republics: economic conditions for collective action in South India* Cambridge University Press, Cambridge
- Whatmore S** 2002 *Hybrid geographies: natures, cultures, spaces* Sage, London
- Williams G** 2004 Towards a repoliticisation of participatory development: political capabilities and spaces of empowerment in **Hickey S and Mohan G** eds *Participation: from tyranny to transformation? Exploring new approaches to participation* Zed Books, London 92–109
- Zimmerer K** 2000 Rescaling irrigation in Latin America: the cultural images and political ecology of water resources *Ecumene* 7 150–75