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INTEGRATED PERSPECTIVES ON WATER MANAGEMENT IN SOUTH ASIA

'Water' has been on top of the development and well-being agenda both nationally and internationally. However, it has traditionally been considered a subject of interest only for engineers. Primarily, engineers have been involved with the design of water infrastructure. In South Asia, many people still lack access to adequate drinking water and sanitation. The local governance structures are unable to supply the required quantity of water due to insufficient availability of water and inadequate infrastructure. Adding to these are other socio-economic constraints that further limit access.

Rapid urbanisation coupled with the impacts of climate change has resulted in irreversible damage to water resources; in South Asia, this further aggravates the inequities in access to water. The poor have to succumb to the local elite. This manifests in various forms such as the existence of a real-estate mafia, prevalence of rampant sand mining and overexploitation of groundwater. Such a situation calls for awareness among all sections of people for protecting their water resources from further degradation. Our decision-making processes do not allow enough space for incorporating people's opinion in the policy-making process. Nevertheless, the rise of civil society as an important actor in governance has brought important issues into the public domain; in particular, the need for educating and bringing awareness about protection and conservation of natural resources. Since 'water' is an interdisciplinary subject, it is very important for policy makers to integrate this interdisciplinary understanding into the policy agenda for better governance and management of the resource.

In this series of SAWAS, we discuss the importance of incorporating interdisciplinarity in water research and education. Priya Sangameswaran, Vishal Narain and K.J. Joy sensitize on the need to appreciate the value of interdisciplinarity in water management through research, education and advocacy in the paper "Interdisciplinarity in Water Research, Education and Activism in south Asia: Some Reflections and the Way Forward". The paper draws on ideas from the "International Conference on Interdisciplinarity in Water Education: Challenges, Perspective and Policy Implications" held in Kathmandu, Nepal in October 2010.

The paper by Edwin Rap, Anjal Prakash and Margreet Zwarteveen - "Organizing Water Education Regionally: The Innovations, Experiences and Challenges of Three Southern Water Networks" brings to light experiences and challenges of WaterNet (Southern and Eastern Asia), Crossing Boundaries (South Asia) and Concertación (Andes, Latin

America), focussing on the networks' approaches to interdisciplinarity & gender and capacity building, research & policy advocacy. Mainstreaming gender concerns with water governance and management is yet to achieve the target milestone. Seema Kulkarni presents her insights on the “Situational Analysis of Women Water Professionals in South Asia”. This paper draws upon research conducted as part of the crossing boundaries project. Fauzia Mannan further explores the subject through her paper “The Times of Hope and Despair: Gender at the Crossroads of Water and Sanitation in Bangladesh”.

Finally, this issue carries two book reviews. Joe Hill recommends “Land Reform in Developing Countries: Property Rights and Property Wrongs” for all those who are interested in water and land issues. Medhavi Sharma suggests that “Knowledge to Policy: Making most of Development Research Reference” is an ideal book for all engaged in research, hoping to create an impact on policy recommendations.

SAWAS has always been open to new ideas and innovative research in the field of IWRM. It continues to remain a platform for all those who wish to share their research work with a larger audience and see it translated into policy.

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AID, TECHNOLOGY AND PROJECT DEPENDENCE: A Case of Institutional Weakening of Water Sector from Sri Lanka

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Abstract

The deteriorating financial health of public sector water service providers attract large amounts of foreign funds (mostly as loans) to developing countries and could lead to dependence, deterioration of governance and weakening of institutions. The case study is primarily a whistle-blower to the proposed large-scale Water Supply and Sanitation project to be implemented in Kandy municipality in Sri Lanka funded by the Japan International Cooperation Agency (JICA). The bloated expenditure and high tariff rates to recover the operation and maintenance costs of treating wastewater, could be a huge burden particularly to lower and middle income households that raises questions on the larger acceptance of the proposed project. The technological appropriateness, economic viability, social acceptance, political feasibility and thus the sustainability of the project are questioned. The study also explores the related governance questions in the background of the water sector reforms currently underway in most of the countries including Sri Lanka.

Keywords: Water, sanitation, aid dependence, technology, institutional weakening, Sri Lanka.

1. INTRODUCTION

Water Supply and Sanitation (WSS) is of growing importance in the current discussions on MGDs which in turn attracts foreign aid as loans and grants to developing countries with international financial institutions perceiving huge potentials to increase their lending business. In the recent decades, WSS policies and programs of most developing countries have been influenced by donor assistance reflecting strategies of the donor countries and organizations rather than indigenous strategies of the recipients (Pradhan, 1996). An oft-repeated criticism is that such fund transfers create dependence with respect to both finances and technology and might turn up to be inappropriate to the existing institutional structure. Since the debate about the efficacy and implications of aid are not yet resolved, context specific studies are needed to ascertain the different dimensions of this complex issue. This study focuses on the wastewater disposal issues in Kandy, a place of world heritage in Sri Lanka because of its cultural, historical and aesthetic values attached to it. The city has a population of around 160 thousand with a water consumption of about 25 thousand cubic meters per day. Since there is no proper system of waste water disposal, about 80% of this gets released to Kandy Lake and to Mahaweli River. Over the years, Mahaweli river, the main source of water in the region is threatened with increasing pollutant loads due to contamination from agricultural and domestic wastes, sewage and industrial effluents. Many institutions in different sectors with own mandates are collectively responsible for this situation.

The National Water Supply and Drainage Board (hereafter NWSDB) is the principal institution providing safe drinking water and facilitating the provision of sanitation in Sri Lanka, which began as a sub department under the Public Works Department until it became a division under Ministry of Local Government in 1965.

INTERDISCIPLINARITY IN WATER RESEARCH, EDUCATION AND ACTIVISM IN SOUTH ASIA: SOME REFLECTIONS AND THE WAY FORWARD

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INTERDISCIPLINARITY IN WATER RESEARCH, EDUCATION AND ACTIVISM IN SOUTH ASIA: SOME REFLECTIONS AND THE WAY FORWARD

Abstract

This paper analyzes the state of interdisciplinary research, education, and activism in the realm of water management in South Asia, along with the links between them. Using as a starting point the attempt to introduce interdisciplinarity in the Crossing Boundaries Project of SasiWATERS, the paper starts by raising some larger questions about what is involved in the way interdisciplinarity is currently being pursued and taught, as well as about the politics of research and the hierarchies between knowledges. The second section of the paper offers constructive ideas on how to bring about a more meaningful interdisciplinarity in the everyday interactions between students and teachers. The third section focuses on existing and possible linkages between interdisciplinary research and activism and highlights certain issues that are critical to making any engagement between academics and activists more productive and meaningful.

Keywords: water, interdisciplinary, research, education, activism.

INTRODUCTION

The Crossing Boundaries (CB) project of the South Asian Consortium for Interdisciplinary Water Resources Studies (SasiWATERS) aims to bring in an interdisciplinary and gender-sensitive perspective, within the broad paradigm of Integrated Water Resources Management, on water resources research, education, and outreach. The project includes a number of components such as the introduction of social science courses in the curriculum of CB partner institutes and of interdisciplinary research in the realm of water resources management, and

"With the submission of this paper I/we (or: the author(s)) declare that this paper has not been submitted to/is not under review of any other journal, and will not be submitted to another journal till the SAWAS review process is completed."

contributing to a more balanced gender composition among water professionals.¹ The case for both interdisciplinarity and gender sensitivity in the context of water resource management has now been well-made. Yet, it would be a mistake to assume that these are concepts whose meanings are uncontested or whose implementation can follow an easy, uniform blueprint for action. This paper brings out some of the complexities inherent in furthering the agenda of interdisciplinarity, by drawing on presentations and deliberations in SaciWATERS's 'International Conference on Interdisciplinarity in Water Education: Challenges, Perspective and Policy Implications' held in Nepal in October 2010 (SaciWATERS conference henceforth) and also on a general understanding of the kind of water research, education, and activism that exists in the South Asian context. In doing so, it raises a number of larger questions on interdisciplinarity and the nature of research, and also offers some practical suggestions on taking a more nuanced agenda of interdisciplinarity forward in research and education, as well as linking this up with people's movements.

The structure of the paper is as follows. There are three sections – the first on interdisciplinary research, the second on interdisciplinary education, and the third on the links between research and activism; these are contributed by the first, second, and third authors respectively. The three sections are, in a sense, stand-alone ones, although they do speak to each other; further, they vary in the degree of scepticism/optimism about the potential of interdisciplinarity.

GAPS IN WATER RESEARCH IN SOUTH ASIA: QUESTIONS ABOUT INTERDISCIPLINARITY

As part of the CB project, interdisciplinary research was carried out by the South Asia Water Fellows on various issues related to Water Resource Management in the course of their degree programmes (Masters and PhD). Some of this research was presented in the SaciWATERS conference. Apart from the more conventional engineering issues, a wide range of issues usually associated with the social sciences were also taken up such as forms of urbanization, food and livelihood security, valuation of water, institutional aspects, governance, and so on. This is a far cry from the engineering-dominated discourses that one usually associates with water, and is therefore an important step. However, it is also important to not get too carried away at this juncture and reflect more critically on the implications of some of the ways in which interdisciplinarity between the social and natural sciences is being interpreted in the context of water research in South Asia. This is the broad theme of this section. Three sets of points are made – on the kinds of knowledge and hierarchies between them, interdisciplinarity, and the politics of research and knowledge – which reflect gaps in a lot of existing water research. We start, however, by dwelling on two terms that occur in the title of the theme itself – 'research' and 'water research'.

Some preliminary remarks

An interesting phenomenon that has occurred in recent times is the large number of sites in which 'research' is being undertaken (conventional academics, NGOs, government, communities). Whether and to what extent this represents a democratization of research is a difficult question which we do not attempt to answer in this paper. What we would like to highlight, however, is that the goal of research may also vary (bringing about better understanding, action, or policy change), although these goals are not necessarily mutually exclusive and there is no one-to-one correspondence between a particular research site and a particular goal. Hence instead of talking about research as if everyone knows what is meant by it, we need to be more specific about what kind of research we are talking about and what goal it has in any given context. For instance, in the case of research being done at the Masters level, it is rather unusual for these dissertations to be expected to come up with policy implications that would bring about change; as some of the presenters in the SaciWATERS conference were seeking to do.²

Further, irrespective of the kind of research, one could think of certain 'basic requirements' of any research:

¹ For some of the outputs of this project, see papers in Sections 2 and 3 of this special issue of the South Asian Water Studies journal.

- A well-defined research question that is situated within literatures (whether academic or the so-called grey literature) on relevant subjects as well as a concrete socio-political-cultural-economic-ecological context.
- Greater reflexivity about methodology in terms of both methods or techniques used for data collection and analysis as well as the philosophical assumptions made about the nature of knowledge and reality.
- Findings should be derived from the data and analysis with consistency, rigour and integrity; there are, of course, different understandings of these terms and the particular meaning used in a given research project would need to be clearly spelt out.

There are gaps with respect to the above in some of the research presented in the conference as well as the research that exists on water in South Asia. Greater attention to these issues would result in a better understanding of the phenomenon being studied as well as more careful action/policy recommendations; specific examples follow later in this section.

The other question that we want to flag, albeit briefly, is whether water research is only that which explicitly focuses on water. The problem with such a position is that it would exclude a lot of social science work which focuses on particular concepts and theories and uses water 'only' as a case study (e.g. anthropological work on the water bureaucracy),³ even though this literature can offer many interesting insights with respect to the various dimensions of water. This is, in turn, at least partly related to the recent trend of focusing not on disciplines or areas, but on particular sectors. One possible way to deal with this gap is to focus on a conceptual theme or a normative goal rather than a sector; if the sectoral focus cannot be given up, there should at least be a conscious effort to include these other kinds of work.

With these preliminary remarks, we move on to the three main points of this section.

Different kinds of knowledges and hierarchies between them

One of the points that emerges from the SaciWATERs conference is that greater attention is needed to different kinds of knowledge and hierarchies between them. For instance, terms such as 'scientific' knowledge are used as if its meaning is uncontroversial. However, there is now a long tradition of critique of both the hypothetico-deductive method of reasoning (which is the basis of a lot of 'scientific' research) as well as the privileging of 'hard' data over anecdotal evidence.⁴ Similarly, terms like 'unscientific urbanization' or 'more scientific transfer of water' were used without unpacking what precisely the terms mean and what they exclude.

To give another example, although the social, political, cultural, and economic dimensions of water are often added to technical knowledge, the construction of the 'technical' itself is not questioned (e.g. in discourses of sanitation and irrigation). Further, in the process of undoing the hierarchies that are already in place, care is needed to ensure that new hierarchies are not created. E.g. traditional knowledge is often posited as an alternative to modern or scientific knowledge. But apart from the fact that there are hierarchies within traditional knowledge also, such knowledge is often part of a 'lived experience' and any attempt to upscale it might itself result in it losing the characteristics that make it different from 'scientific' knowledge.

² Intervention by Sumi Krishna in the SaciWATERs conference. Other examples of different kinds of research are also given in the fourth section of this paper.

³ This is a gap that was reflected in the SaciWATERs conference also.

⁴ For a brief account of some of these debates, see, for instance, Corbetta (2003).

Unpacking interdisciplinarity further

The term 'interdisciplinarity' has a range of meanings, and is often used interchangeably with 'multidisciplinarity' and 'transdisciplinarity', even though these are distinct concepts. Yet there is a prior question to be asked viz. what is a discipline? This is an important question because the word 'discipline' often seems to be used as an equivalent to a sector or an issue, so that interdisciplinarity is used to just mean that a variety of different social and political issues are considered. This is sometimes the sense in which Integrated Water Resource Management seems to be considered interdisciplinary. Even when the term 'discipline' is used in the more conventional sense of disciplines such as economics, physics etc., interdisciplinarity does not neatly translate into an inclusion of all relevant disciplines. Certain kinds of economics, political science, and sociology are privileged, and disciplines like history, anthropology and critical geography are neglected. This, in turn, is related to the point that the hierarchies and divisions between different social sciences are often greater than those between the natural sciences and social sciences, with deep-seated differences both in their understanding of knowledge and reality as well as in the methods used (see, for instance, Bardhan, 1989).

There is also the question of whether and how one can 'transfer' concepts and knowledges from one discipline to another and the dangers inherent in this. For instance, one often found uncritical reference to the 'population problem', 'merits of the green revolution' or 'participatory research' in the SasiWATERS conference, even though these are subjects that have been the subject of much debate within the social sciences. One does not want to take away the importance of bringing in social concerns to engineers. Yet doing this without consciousness about the political implications of too easy an interdisciplinarity could be dangerous. To put it in a different way, a good engineer who is aware that there are social/political/cultural consequences and who is willing to talk/listen to someone who has studied these (and vice versa) is probably better than an interdisciplinary engineer who claims to know a bit of the social and political, but then talks about population or desalinization or green revolution or migrants in an uncritical fashion. Taking social sciences to engineering colleges without having a reverse flow also feeds into the assumption that the knowledge of social sciences (be it on gender or governance) is more 'amenable' to such transfer and can be neatly packaged in a modular fashion, whereas it would be more difficult to do this with the more 'technical' engineering knowledge.

It may therefore be useful to start with a more modest aim of just being able to converse with other disciplines even as one is grounded well in one discipline, and to think about greater integration between disciplines much later.

Consciousness about Politics of Research/Knowledge

One of the interesting features of the deliberations in the conference has been the relative absence/neglect of terms such as capitalism, neoliberalism, commodification, privatization etc., even though there are many strands of water research which are seriously concerned with them. This is partly a result of the problems with the kind of interdisciplinarity that is usually put in place (a point that was discussed in the previous sub-section). But given that there is no such thing as an apolitical position, it is important that the politics of one's position (whether about climate change, migrants, or desalinization) is at least explicitly articulated if not actively debated. There is also a need for greater attention to the politics of the research/knowledge creation process itself. Exclusions of certain aspects from a particular research project could be just a matter of what is deemed to be important by a particular researcher, but is also more often than not related to her/his social and political position.

Having struck a cautionary note about interdisciplinary research, the paper now moves onto the question of interdisciplinary education and how to take it further, even while keeping some of the concerns in mind which are raised in this section.

MOVING TOWARDS INTERDISCIPLINARY WATER RESOURCES EDUCATION: IDEAS FOR FURTHER CHANGES

There was a consensus in the SaciWATERS conference on the need for interdisciplinary water resources education. This consensus echoed itself in some of the narratives heard during the conference as well as the discourses surrounding water management that were repeatedly cited by many of the speakers. It is possible to distil three such distinct – though closely related – narratives: a focus on the limitation of traditional, supply augmentation approaches to water resource development, an emphasis on the need for students to learn across disciplines to appreciate the various facets of water management, and questioning of the dominant paradigms in water management. At the same time, prevailing discourses such as those around IWRM lend credibility and justification to the need for interdisciplinarity in water resources education. Changes and processes underway in South Asia such as increasing urbanization and climate change that were widely discussed and debated in the conference also have wide ranging implications for both water availability and access and further necessitate analyses of an interdisciplinary nature.

The CB project has made a dent in reorienting the dominant paradigm in water resources education in the region. Gender mainstreaming – an otherwise relatively difficult task in water management – has been relatively more successful in terms of water education, as seen in terms of the fruition of SaciWATERS's efforts in getting female participants in the programmes of the CB institutes. It is interesting to note that the more interdisciplinary we get, the more the gender mix turns in favour of female students. This is not just in the case of the CB partner institutes wherein the CB programme has made a conscious effort to invite and enrol female participants, but is also a trend visible outside the CB partner institutes. A good example is TERI University's interdisciplinary programmes, wherein 80-85% of students are girls, as against the preponderance of boys in conventional, engineering programs.⁵

However, sensitization on the need for a paradigm shift among policy-makers and potential employers – especially in the government – is still required in order to get them to appreciate the value of interdisciplinarity both in terms of the approach to water management as well as in terms of the skill sets needed by water professionals. In the rest of this section, the focus will be on how to take interdisciplinarity in the education system further.

What is the education system? Who or what are we trying to change?

When we talk of changes needed in the education system, it helps to start by thinking about what comprises the education system. Clearly, the education system consists of the faculty, the students as well as the administration that sets the rules and procedures within which they function. Then, of course, there are other actors that play an important role, such as employers and the parents or families of students. Changes can thus be made at two levels; first, in the formal education system, and second, in the daily interaction between students and faculty. Although the former is necessary, it requires lobbying and advocacy and tends to produce results slowly. There is a greater potential to bring about change in a relatively shorter period of time by the second route viz. changes in the classroom and in the field, and it is this that will form the focus of this section of the paper.

Interdisciplinarity as a social construction

In this context, it is worth emphasizing that an interdisciplinary approach is constructed in the modes of interaction and communication between students and faculty. Interdisciplinarity should be seen as a socially constructed phenomenon, shaped by the interactions among them. Therefore an understanding of faculty and

⁵ See, for instance, Narain (2008). However, no easy, neat relationship can be drawn between gender mainstreaming and interdisciplinarity; also what exactly this trend means, particularly in terms of gender stereotypes, would need further study.

student attitudes and relationships is key.

Particularly important is the role of faculty. Having a group of committed faculty members with interdisciplinary interests in any department or group within a university is essential. Further, course design and curriculum often reflect the balance of power among faculty. In moving further, therefore, changes in faculty attitudes are important. Faculty members need to be truly internally convinced about interdisciplinary education so that students see it as more than 'lip-service'. Faculty members remit certain signals to students about what they think is important or worthwhile. This becomes implicit, for instance, in how they talk about certain kinds of research, e.g. 'solid work' or 'soft sciences' (a point that is also linked to the hierarchies between different knowledges discussed in the previous section). There is a strong imperative to come out of our disciplinary ivory towers and lessen attachment to our own disciplines and past training. There is a need to cultivate a greater openness to other disciplines, even when they belong to our academic rivals or competitors.

Bridging the disciplinary divides

The previous section raised some larger concerns about interdisciplinarity, including differences between disciplines. However, one alternative view is that we need to look at points of convergence across approaches and concepts rather than emphasize on paradigmatic differences; in fact, platforms for dialogue need to be built not just between the social and natural sciences (as discussed in the SaciWATERs conference), but also within the social sciences. For this, we need open conversations across disciplines, such as debates on issues of measurement, e.g. on quality of life and poverty.⁶

We should try to build a common ground to foster dialogue across researchers that use interdisciplinary approaches to study the complex relationships across ecology, society, and technology. Further, there is a need to 'de-jargonize', to communicate simply, and to appeal to a wider audience and not just to peers in our own discipline.

Getting and keeping students interested

This brings us then to the important challenge of generating and maintaining interest among students. Here, a few points are crucial. First, it helps to break away from the rhetoric of a 'holistic approach' – a term often used to build a case for interdisciplinarity - and focus instead on concrete discussion of relationships between technology and institutions, ecology and society, technology and policy, or agro-ecology and governance.⁷ The value of interdisciplinarity is well demonstrated when we understand how different types of irrigation systems make different demands on governance, how ecology shapes institutions, and how technologies not in fit with institutions will fail to make a dent. Many examples illustrate what happens when there is a misfit between technology and institutions. For instance, the case of improved chulhas, that failed to make a dent because they did not reflect the cooking habits, perceptions, and priorities of women who used them; likewise, the automation of office systems that fails in the absence of supportive human capacity, skills, and training is a good example of the (mis) fit between technology and institutions. It helps further to relate simple examples from familiar settings. For instance, explaining the social construction of technology to an engineer can be made easy when we talk about the difference between a round table in a canteen and a rectangular or oval one in the board room – both are artefacts catering to different social settings and domains of social interaction.

Secondly, there is a need to demystify the social sciences. Students trained in engineering and the positivist sciences tend to shy away from complex social science jargon and can get confused on issues of rigour and

⁶ See, for instance, Bardhan (1989).

⁷ For a review of these approaches, see Narain (2004).

methodology employed across these fields of study. There is therefore a need to move incrementally, by first explaining the difference between positivist and interpretive sciences and their methodological ramifications. Sharing our own interdisciplinary research with students as examples and cases gets them motivated more quickly.

Thirdly, since students in interdisciplinary programmes travel a road relatively less taken, they tend to compare their worth and career prospects with those of established, conventional, engineering programmes. Therefore, faculty members have an important role in demonstrating the value of interdisciplinary approaches and building students' self-esteem. Promoting interaction of students with inter-disciplinary alumni and seniors with similar career paths has immense value. Faculty members also need to network and lobby with potential employers and demonstrate the value of interdisciplinary approaches to them.

Reorienting the curriculum

In developing curriculum for interdisciplinary programmes, it is important to begin by recognizing that it is better to see 'interdisciplinary' as an orientation, rather than a fixed body of knowledge, tools, and concepts. Therefore, the thrust has to be on inculcating an orientation in students to walk out of the confines of their respective disciplines and incorporate tools, concepts, and ideas from disciplines that may not necessarily be the ones in which they are originally trained; further, inter-disciplinarity is incremental and requires internal drive.

In the CB project, the interdisciplinary orientation has come in through introducing social science courses in curricula dominated by natural science or engineering courses. In further reorienting the curriculum perhaps therefore the next step is to move from 'social science' and 'natural science' courses to new courses that demonstrate the relationships across them. In devising the curriculum and developing the course material, it is important that there be less 'material' but more time and space for students to engage with it and internalize the wide range of subjects that they are exposed to. Needless to say, there also needs to be sufficient exposure to field settings to study the working of the complex relationships between technology, ecology, and society.

Links between interdisciplinary research and education: scaling up interdisciplinarity

In terms of scaling up interdisciplinary education, tapping links between interdisciplinary research and education is crucial. Having more inter-disciplinary PhD programs results in a cascading effect. They snowball the interdisciplinarity – a candidate trained in an interdisciplinary programme goes on to train further another group of candidates and so on. Another useful strategy is to have large interdisciplinary projects of long duration, with a potential to employ/engage many researchers and students. Such projects have the possibility of engaging a large number of researchers, scholars, and students and provide resources needed to get an interdisciplinary grounding for a team of professionals interested in a particular subject.

RELATIONSHIP BETWEEN ACADEMIC RESEARCH AND PEOPLE'S STRUGGLES IN THE WATER SECTOR

The previous two sections discuss some issues with respect to the interdisciplinarity of research and education. This section seeks to explore what interdisciplinarity, and in particular interdisciplinary research, has to contribute to social movements in water.

But first, a caveat. Talking about the relationship between academic research (interdisciplinary or otherwise) and social movements or between the academic and the activist, is a binary and mutually exclusive characterization. Though by and large this is true, we should also acknowledge the overlapping space between the two; further, as Ujwal Pradhan indicated in his intervention in the SaciWATERS conference, there is also the category called "scholar-activist" or "activist-researcher". A binary characterization also assumes that there is a "tension"

between the academic and the activist and that there is a need to resolve it. The discussion in this section is premised on the assumption that a positive relationship between the two can be beneficial especially to re-shape the water sector discourse along more sustainable, equitable, and democratic lines.

This is done keeping in mind that both the nature of people's struggles and academic research has been changing over time. For instance, people's movements have gone beyond the typical class issues and engage with issues like environment, caste, ethnicity, patriarchy and so on; they are also using innovative forms of organization including bringing scientists, technologists, and activists together to develop and ground an alternative approach.⁸ The nature of academic research has been changing over the last couple of decades. Many academics work as consultants of donor agencies and very often consultancy reports are passed on as academic outputs. Also, with the decline of state funding, donor agency funded and led research is on the increase and very often this comes with its own "agendas".

The rest of this section is divided into two broad parts: the first part tries to capture the main insights from the deliberations in the SaciWATERS conference about the academic-activist engagement, and in the second part, the effort would be to step out of the deliberations of the conference and flag a few issues that are important to make the engagement between the academic and the activist more productive and meaningful.

Engagement between academic research and people's struggles: Insights from the SaciWATERS conference

With the above background, let us look at the deliberations of the conference to see what insights it brought on to the table about the relationship between academic research and people's struggles. The assessment is based on three sessions: consolidation of the research programmes in four CB partner universities; cross-regional comparisons in innovations around water resources studies (which included one network each from CB Project [South Asia], WATER Net [Africa] and Concentracion [Latin America]); and the panel discussion on the topic 'Social movements for democratising water resources: Relevance of academic research'.

Perhaps one of the most interesting points that emerged is that in the CB project and WATER NET, there does not seem to be any engagement with people's struggles or social movements; the closest they get to this is by way of stakeholders' consultations in the course of the research. However, in the case of Concentracion, there is a very explicit and conscious engagement with people's struggles. Research in this case is clearly seen as an instrument to articulate demands and political advocacy; in turn, there is a broader normative framework guiding research and its interventions.

In line with the experience of Concentracion, the panel discussion was not a polarized debate and both the speakers – Quratulain Bakhteari and Kuntala Lahiri-Dutt– talked about the overlapping spaces of research and activism, albeit in different ways.

Quratulain talked about her efforts in de-mystifying research through her "University without Walls" linking it up with social action and movements. Not only was there an emphasis on local knowledge, but the research findings were used in education and action and helped people in their daily struggles. This was brought out by a number of examples: rehabilitation of Mirami dam oustees, about 10,000 families returning to land, and involvement of youth in community development.

Kuntala in her presentation – King Canute Riding the Wave: Socially Engaged Academic Research for Democratising Water Resources – pointed out that according to her, the academic and the activist are not always

⁸ Mukti Sangharsh Movement in South Maharashtra is a good example of such a movement that tried to bring together pro-people scientists and activists in its anti-drought movement.

at loggerheads with each other. The difference is that the academic researcher claims to be evidence based and the activist works more from a particular stand point. Further, interdisciplinarity can arise out of two types of collaboration – one, amongst the practitioners of different disciplines, and two, amongst the academics and activists. For her, it is important that the identity and location of the academic be made more explicit; there is also a need for the academic to get out of comfort zones and ask new questions. To ask the right questions or to decide what type of questions to ask, the academic needs to work more closely with the activist.

Redefining the engagement

Stepping out of the deliberations of the conference, one can flag a few issues which would redefine or strengthen the engagement of the academic and the activist. In his Theses of Feuerbach (1845), Karl Marx famously said in his eleventh thesis that “the philosophers have only interpreted the world, in various ways; the point, however, is to change it”. This sentence could provide some sort of a benchmark for the engagement between the activist and the academic. In fact, maybe we need to go beyond this polarization between philosophers (read academics) and the professional revolutionaries (activists), and ask the question as to whether what we do merely critiques the world around us or whether it contributes to changing it.

The first issue is whether academics and movements together have contributed to going beyond the polarized discourse around water. There has been a fairly close relationship between academics and activists in the case of feminist movements and dalit movements. Similarly, a few decades ago, in the movement against the Silent Valley project in Kerala led by the Kerala Shastra Sahitya Parishad (KSSP), intellectuals played a crucial role in forcing the government to scrap the project. But in the area of water, apart from certain isolated cases, we do not find this type of a close collaboration. In fact, there are also cases when a research intervention is made in the context of an existing social movement, but does not work out in the manner expected at least partly because of the lack of an interdisciplinary understanding of water (that combines the bio-physical and socio-cultural dimensions of water) on the part of at least some of the actors involved in the movement.⁹

The second set of issues relates to the nature of research. Here one can think of a number of different ways in which a more positive interaction between research and activism can take place. The first point is that it is important for researchers to make their normative framework/concerns more explicit, so that some of the suspicions/scepticism that movements have about academia can be reduced. For instance, there is often worry among activists that a neoliberal framework seems to be underpinning a lot of research and influencing the issues taken up, the way the research questions are framed, the methods of enquiry, and the solutions proposed. The second point is about theory-building and how academics can contribute to this. In general, there seems to be (what one might call) a postmodern disdain for grand theories of any kind, along with a move towards quick-fix solutions. However, now more than ever, we need new conceptualizations as earlier ones do not seem to be sufficient to explain the new realities unfolding around us (for instance, the changing nature of capitalism). Though there are articulations and practices around certain elements of an alternative, there is also a need to bring them together into an integrated theory and practice, and this is an area where academics and activists have to work together.

The third point is about the way we do research and the kind of honesty and integrity we bring to the process. Although all knowledge production is to some extent conditioned by the character of the state, we should realize that it also has certain relative autonomy. The issue is how we have been able to use this relative autonomy and not merely reproduce what the state (and also the donor agencies) want. The way environment impact assessments (EIAs) are done in India, mostly by mainstream academic institutions, is a case in point. There does

⁹ One such example is alternative proposal (in Paranajpe and Joy, 1995) that aimed to go beyond the polarized debate around large dams and open up a different pathway to utilize large sources without the destructive content often associated with large dams.

not seem to be a single case where the EIA report has gone against a particular project. As against this, in the case of Three Gorges dam in China, when the case was referred to the Chinese Academy of Sciences, apparently it did give an objective report pointing out the multi-faced destruction such a project can cause. If the Chinese Academy of Sciences which functions under much more state and party control could give such a report, why is it that the same does not take place in India? The answer lies in the fact that some of the researchers who work in our research institutions consider themselves more as “government servants” and not as academics. This mindset needs to change.

Finally we also need to re-think the way in which we do movements, especially in the present context of imperialist capitalism and “accumulation through dispossession” as the main means of capital accumulation and exploitation. New issues have come up and there are wide sweeping changes taking place in the water sector. To engage with these developments, movements need new skills and new articulations and innovative forms of organisations and struggles. There is a need to evolve new people's alternatives and organise struggles around these alternatives. Here interdisciplinarity can bring in new insights. Interdisciplinarity is not only for the academics, it is very much needed for the activists as well. This would help to understand the bio-physical and socio-cultural peculiarities of water and would help movements to rise above polarized, sectarian discourses, interests, and programmes.

CONCLUSION

This paper has sought to assess the state of interdisciplinary water research and education in South Asia, along with how these contribute to social movements in water, using as a starting point the efforts made in the CB project of SaciWATERS. Attempts to do away with boundaries of any kind are laudable. However, this paper has called for a healthy dose of scepticism about too easy a dissolving of boundaries because this might involve simplifications that could have serious political consequences. At the same time, there is also a case made for a more nuanced interdisciplinarity in research, education and outreach.

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¹⁰ A term used by David Harvey to characterize the release of assets at low cost in present day capitalism, which is then put to profitable use by surpluses of capital; see, for instance, Harvey (2003).

¹¹ One must, of course, keep in mind some of the scepticisms expressed in the first part of the paper.



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ORGANIZING WATER EDUCATION REGIONALLY: THE INNOVATIONS, EXPERIENCES AND CHALLENGES OF THREE SOUTHERN WATER NETWORKS

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Abstract

The paper presents and contrasts the experiences and challenges of three Regional Water Education Networks in Integrated Water Resources Management (IWRM) - WaterNet (Southern and Eastern Africa), Crossing Boundaries (South Asia) and Concertación (Andes, Latin America). These continental water networks emerged in the new millennium primarily out of dissatisfaction with traditional North-South development and scientific cooperation. Rather than concentrating on centres of excellence that provide universal one-size-fits-all-models, these regional networks of knowledge centres set out to develop a contextual knowledge base on water resources management and build capacity in accordance with regional training needs. These collaborative partnerships have now gained experience in training a new generation of water professionals, who have learnt to appreciate the regional diversity in water problems and design relevant solutions for their regions, often in cooperation with local stakeholders. In this paper, we document and discuss the experiences of these regional networks, focusing especially on the networks' different approaches to 1) interdisciplinary and gender approaches, 2) the connection between capacity development, research and policy advocacy.

1. Introduction

In the wake of a growing demand for regionally relevant knowledge and expertise on Integrated Water Resources Management (IWRM), three Southern-based water education networks emerged in the last decade: **WaterNet (Southern and Eastern Africa)**, **Crossing Boundaries (South Asia)** and **Concertación (Andes, Latin America)**. The three regional knowledge partnerships offer an interesting range of experiences.

The **Crossing Boundaries** initiative is built on regional cooperation between researchers and educators from four different countries with common professional interests on the issue of integrated water

resources management and gender. The programme has established a masters programme in IWRM in all four countries in core water resources education establishments (universities and engineering colleges). To ensure that the supporting research activities are relevant, they are explicitly linked to, and co-funded by on-going development projects. The experience shows that with limited funds are not deterrents for achieving large impacts and that critical water issues can be addressed through planned capacity building programmes in the South Asian context.

The **Concertación** experience has developed a methodology that starts from the selection of knowledge themes. Special knowledge teams are formed around these themes and they formulate knowledge projects. A knowledge project consists of three steps: action research, capacity building and advocacy. Action research is carried out by promising scholars who receive fellowships for a period of five months. Knowledge projects can be academic, policy-related and practical, targeting different audiences.

WaterNet's major achievement is that it has managed to create a new research culture among the academic staff of its member institutes. This has resulted in more local knowledge being produced, published and disseminated, being debated, commented, absorbed and built on and finally being fed back into the university curricula. This is also a major prerequisite for developing policies that support sustainable development. A comparison of the three networks is compiled below:

A provisional comparison of three regional capacity building networks in IWRM

Collaborative partnerships in IWRM	Features of partnerships	Relative strengths
Crossing Boundaries (South Asia)	<ul style="list-style-type: none"> regional network of universities and NGOs since 2005 working at different levels: national and regional MScs and PhDs 	<ul style="list-style-type: none"> capacity building in gender and water in the context of IWRM with a special focus on creating cadre of women water professionals knowledge developed in the concrete context of water problems social learning focused research embedded in society research programme linked to existing regional projects
Concertación (Andes, South America)	<ul style="list-style-type: none"> network of universities, NGOs, water professional platforms since 2006 interdisciplinary and problem-oriented research focus on water and livelihood security of marginal groups 	<ul style="list-style-type: none"> connecting capacity building, action research, networking and policy advocacy through knowledge teams studying regional responses to global policies affecting water security different target populations for knowledge products
WaterNet (Southern and Eastern Africa)	<ul style="list-style-type: none"> regional network of universities since 2000 exposing students to regional perspectives and experiences combination of MSc training and thesis research 	<ul style="list-style-type: none"> learning society that frames its own societal problems focussed on smaller research groups that combine comparative strengths established links with regional water networks (GWP), regional funding agencies and governmental communities (SADC)

Together, these capacity building networks intend to create a paradigm shift in water resources management policy and practice towards IWRM. Although IWRM may mean different things to different people, all the three networks agreed upon the following with the perspectives of capacity building and education:

1. **Regional Integration:** Strengthening regional (and inter-regional) water education in the South.
2. **Interdisciplinary orientation:** Integrating natural-technical and social sciences in teaching and research that is grounded in concrete water problems.
3. **Gendered Approach:** The incorporation of gender and empowerment issues in current curricula for new water professionals.
4. **Linking capacity building** with ongoing research programmes, relevant societal developments and policy advocacy. A significant theme for all three continents in this respect is that of the understanding of water rights within contexts of local water management, unequal power structures and formalisation policies.
5. **Demand-responsive research** requires a conscious effort and carefully designed project modalities in which the researcher engages with the researched population around concrete and real-life problems. This type of research generates a co-learning impact.

After some years of existence, the three networks have now gained quite some experience in training a new generation of water professionals, who in turn have learnt to appreciate the regional diversity in water problems and design relevant solutions for their regions, often in cooperation with local stakeholders. To take stock of these achievements, we organised a creative dialogue among them through a series of inter-continental encounters. Through this dialogue, members of the networks shared valuable experiences and key lessons, both in terms of how to educate water professionals who will be able to deal with effective ways to understand and confront such water problems.

This paper presents and discusses some of the outcomes of this dialogue, on the basis of the interactions and the papers that were developed as part of it. Discussions started with the 'Knowledge on the Move' Conference held in February, 2008 (Van der Zaag et al., 2009) and continued at the Fifth World Water Forum in Istanbul, Theme 6: 'Education, Knowledge and Capacity Development' in March, 2009 (Prakash et al., 2009). The networks interacted and discussed the issues addressed here; most extensively at the international WaterNet conference of November, 2009 in Entebbe, Africa. The paper revolves around the central question - What can we learn from the experiences, achievements, mistakes and ambitions of three regional water networks with regard to the sharing of knowledge, building of capacity, construction of networks and influencing of national, regional and international water resources management policy?

The paper consists of five sections. Section one presents the programmes and activities of the three networks to understand the way they have operated. Section two looks into the issue of interdisciplinarity, while section three dwells on gender concerns. Section four looks into the issue of capacity building and policy advocacy from the perspective of three networks and suggests a way forward. In section 5, we present the conclusions of the paper.

2. Sharing knowledge: regional water education networks

2.1 WaterNet: capacity building in IWRM in Southern Africa

WaterNet in Southern Africa was established with the aim to be a more inclusive regional network as compared to those resulting from the 'centres of excellence' approach. This approach consists of identifying leading research centres, investing heavily in them, and connecting them to similar centres elsewhere. Although this approach is favoured by the Inter Academy Council (IAC, 2004: 5), there is a potential pitfall: as it singles out the strongest research groups, it may foster exclusivity and marginalize small research groups which on their own would not be able to achieve a critical mass, but if connected could make meaningful contributions.

WaterNet was established in 2000, with the precise aim to strengthen smaller research centers and universities through fostering synergies and collaboration. WaterNet now links some 50 universities and institutions in 14 countries in Southern and Eastern Africa that have a common interest and expertise in water-related issues. Individually they were unable to cover the broad field of water resources management, but by pooling their resources they now cover all aspects, from hydrology to water and sanitation technologies, from environmental engineering to economics and law. WaterNet is therefore in a position to offer a unique regional Masters programme in IWRM, in which the staff of six universities are directly involved, as well as guest lecturers from other WaterNet member institutions (see figure 2). The programme involves 12 months course work and 6 months of thesis research. By 2007 more than 170 students from 15 countries, one third (55) of them women, would be graduated.

Connecting institutions within a region makes sense because water has a transboundary dimension. Connecting universities regionally means that knowledge capacities can be spread and shared, which will contribute to greater equity and will be more cost effective than doing so at national level (Opschoor, 2006). Further, students from different countries sit in the same class and learn the same concepts, enhancing mutual respect and understanding. Moving these students around the region further exposes them to a regional perspective. All this is hoped to encourage future cooperation on water, and thus represents an investment in future peace.

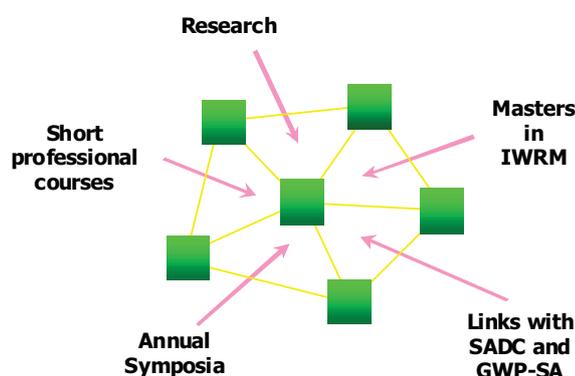


Figure 2. WaterNet and its mutually reinforcing activities

The success of WaterNet lies in the combination of self-reinforcing activities. The modular Masters programme in IWRM allows for a comprehensive set of short professional courses; the research

activities provide thesis research subjects for the students, generates new insights that are fed back into the curriculum, and produces research papers that are presented at annual symposia co-organized by the Water Research Fund of Southern Africa (WARFSA) and the Global Water Partnership – Southern Africa (GWP–SA). These symposia provide a platform where researchers, professionals and policy makers can meet and exchange ideas. For this platform to be effective, it is important that WaterNet is formally recognized by the Southern African Development Community (SADC), and thus by all governments of the member states, and this again strengthens the reputation of WaterNet as a legitimate regional network that offers a credible postgraduate programme.

There are synergies between WaterNet and the WARFSA fund (box 1). WaterNet is also implementing two major research projects in which several institutions and international knowledge partners collaborate: the IWRM for Improved Rural Livelihoods in the Limpopo River basin project of the Challenge Programme on Water for Food (Love et al., 2006), and the Smallholder System Innovations in Integrated Watershed Management project in the Pangani (Tanzania) and Tukhela (South Africa) (Bhatt et al., 2006).

Box 1: WaterNet and the WARFSA fund

Because the WaterNet Masters programme in IWRM includes a six-month research project, there are some interesting synergies with the WARFSA fund. WARFSA supports several projects in which WaterNet member institutions and their staff are involved, and provide a good environment for MSc thesis research. This combination of tertiary education and research has proven powerful. Many WaterNet graduates have contributed insights to various aspects of water engineering and management, some of which have been presented at annual WaterNet/WARFSA/GWP–SA symposia and published in special issues of the journal “Physics and Chemistry of the Earth”. This is a growing body of scientific output; by the end of 2007, six special issues of the journal had been published, containing more than 260 papers. This is significant: one out of six papers containing 'water resources' and 'Africa' in their titles, abstracts or keywords published in the period 2002–2007 originated from the WaterNet/WARFSA symposia (Van der Zaag, 2007).

WaterNet represents a first step towards a knowledge community characterized by a strong connectivity between its parts, sharing of resources and distributed access. These elements are the ingredients for a learning society that is able to frame its own societal problems and find new ways of resolving them. The sharing of knowledge among members is clearly a key factor in the success of the network, as is the eagerness of academics to present papers at the symposia. At first many lecturers were reluctant to write papers because there were more urgent issues (i.e. to augment their meagre university salaries with consultancy work), but this has changed rapidly and each year the symposium receives over 200 abstracts. Although university salaries may not have improved much, having an abstract in the conference proceedings, and a paper in an international peer-reviewed journal, is now perceived to be of great value.

2.2 Crossing Boundaries: regional capacity building in South Asia

The Crossing Boundaries project is working to build the capacity of water professionals in IWRM through higher education, innovation and social learning focused research which leads to direct impact

on the water sector. The project is being implemented by six partner institutions in Bangladesh, India, Nepal and Sri Lanka and is coordinated by the South Asian Consortium for Interdisciplinary Water Resources Studies (SaciWATERS), based in Hyderabad, India and the Irrigation and Water Engineering group at Wageningen University (Gunawardena et al., 2008).

While new research and innovation in the various water disciplines are important, the notion of 'integration' remains elusive, particularly between natural/technical and social scientific perspectives. Innovative research is therefore needed to enhance the IWRM knowledge base. Such knowledge is best developed in the context of real water resources management problems and efforts at intervention, transformation or reformation towards IWRM. The Crossing Boundaries project is supporting such an innovative programme by providing resources to enrol four research coordinators, 15 PhD and 160 MSc students, as well as for staff and student exchanges, and funds for research and stakeholder meetings. For such a huge research effort, the research agenda was to be carefully designed. During visits to partner organizations, staff of member institutions discussed strategies to link the research programme to existing projects and participated in many meetings with stakeholders. During the research formulation stage four attributes were emphasized: [1] the research should address a current problem in water resources management, [2] employ an interdisciplinary approach, [3] encourage the participation of stakeholders and lead to an impact. The research proposals were all linked to ongoing projects, thus ensuring that the research effort would address real problems.

The interesting aspect of this initiative lies in the fact that it is built on regional cooperation between researchers from four countries, and links the research activities to ongoing development projects. The project focuses on education, research/innovation, knowledge base development and networking, in a combined effort to contribute to a paradigm shift in water resources management in South Asia. This focus on longer duration education input, as opposed to short term training, derives from the fact that shaping attitudes and perceptions and teaching the skills of interdisciplinary and more comprehensive analysis and intervention requires time. The project is implemented by a group of institutions with a proven interest and track record regarding integrated, interdisciplinary and gender-sensitive approaches to water resources management.

2.3 Concertación: interdisciplinary research in the Andean countries

The current distribution of water, expertise and decision-making power over water management in the Andean region can be described as unjust, undemocratic and unsustainable. Concertación is an interdisciplinary research and capacity building project aims to improve the water and livelihood security of peasant and indigenous communities in the Andean region. A collaborative project involving institutions in Bolivia, Ecuador, Peru, and the Netherlands, Concertación will develop and support more democratic, equitable and sustainable water management policies and practices (Rap, 2008).

The urgency of the water security problem in the Andes is well recognized. New policies are needed to respond to the water management challenges, but proposed solutions are usually hotly debated because of the diverging visions, objectives and strategies of different water use sectors and user groups. One issue is the effect of new policies on water access security of Andean communities, especially for farmers, indigenous peoples and other groups that depend on water for their livelihoods. For example, neo-liberal agricultural policies, land & water rights registration and modern water use technologies promote individualizing tendencies that threaten the collective and customary water

rights of these marginalized groups. These tendencies, their impacts and solutions for the water security of these groups for the water security of these groups, however, prove to be very different in the coastal, mountainous and Amazonian regions of the Andean countries. Another theme is that governments are committed to secure the investments of extractive industries in minerals, oil and gas. Yet, it is unknown what the impact of these industries will be on the water and food security of local communities, and to what extent these communities can negotiate.

The Concertación project intends to contribute to the debate over water policies through research, exchange, capacity building, and policy advocacy. This will lead to the development of new responses and proposals by local, regional and national actors, who will participate in the public debate to develop water management strategies and policies that are effective, equitable, democratic and adapted to local contexts. The project strategy is to establish a network of water professionals who will be able to design innovative research and encourage social learning. The project will also create a platform for exchanging knowledge about sustainable and equitable water resource management. The themes of the project are:

- Legal pluralism, water management and recognition policies: the existence and recognition of different normative repertoires in water management;
- Local water management and the strengthening of authorities and organizations: decentralisation requires new capacities for local and regional organizations;
- Integrated water resources management at the watershed level, involving for example inter-sector water allocations, institutional reforms and stakeholder participation;
- Regional and international policies for integrated water management: current water laws and policies on IWRM often stem from the international level and are similar for the Andean region.

Within each of these themes, the research, capacity building and policy advocacy activities focuses on collective water rights, local irrigation systems and the feminization of water management. Around each theme, a knowledge team of water specialists is created, which designs a comparative 'knowledge project' and may call in international expertise. For the field research, fellowships are awarded to researchers and professionals who may have problems obtaining funding or require job training. The action research begins with a baseline study by a regional or international expert, who also ensures the quality of the final products.

Each knowledge project entails three steps. First, the status of the water management problem is assessed through action research. The findings are then translated into capacity building efforts and subsequently into advocacy and networking activities aimed at improving water policy. In this manner, together with national discussion and training platforms, the results of the action research-based studies can be translated into proposals, methodologies and actions to improve water legislation. The knowledge products generated include publications targeted at academics, professionals, policy makers and lay audiences, including practical guides for water users, their leaders and activists. Although basic research is not the project's primary objective, the network partners, the local and national case studies and the policy processes in which they are embedded offer a wealth of data for analysis of water policy and intervention processes.

3. Interdisciplinarity

All three networks, albeit in varying degrees, share the ambition to transform the prevailing technocratic approaches in learning, understanding and managing water. They all aim to educate 'a new generation of water professionals' who recognize that most water problems are multi-dimensional and that solving them requires more than just engineering expertise. This ambition is captured with the word 'interdisciplinarity' – which is a term that means many different things to different people. The network's experiences with attempts to broadening the scope of the curriculum of water education, can be seen as attempts to grapple with the question: “How to incorporate social science perspectives into technical engineering courses, research and policies”?

The experiences showed that the ambition to change engineering education has a lot of barriers. The Concertación network has many social scientists, most of whom regularly experience how engineering is viewed as a better and higher form of knowledge than social science. It is, as a consequence, difficult for them, as social scientists, to be taken seriously by natural scientists and engineers and even more difficult for them to contribute to setting the agenda. In general, natural scientists and engineers tend to believe that what they do is more difficult and challenging, and also more 'scientific'. In South Asia, proposed curriculum changes were sometimes resisted and perceived as political moves to provide differential and ideologically inspired learnings rather than the supposedly objective and classic engineering courses. For many, interdisciplinarity means a dilution of the core engineering subjects, which is not acceptable. Another problem was the capacity of the faculty members to teach interdisciplinary subjects when their own training had been disciplinarily oriented. Many are of the opinion that it is easier for engineers to learn and practice social science than the other way round. The experience of the engineers and natural scientists is that social scientists often lack their scientific rigor and exactness. In their view, social science remains a question of speculation or of reasoned opinion. This shows that not just the higher value is often attached to exact or natural sciences, but also that social scientists and engineers maintain different epistemological norms.

During the dialogue in Entebbe, different groups were invited to creatively depict or represent their vision of the future water professionals of 2030. What does the water professional of tomorrow look like? The responses were fascinating and diverse, with different groups making use of interesting metaphors to visualize the future water expert: a two-headed animal-person with each head moving in a different direction; a many-armed and headed Hindu God, an adaptor plug that can be used with different sockets; and a strong tree with many branches, etc. Each of these metaphors in different ways illustrates some of the main questions that an interdisciplinary approach evokes:

1. Is 'real' expertise still needed in the future, or do experts need to become communicators and facilitators whose main task is to help organizing democratic processes of water decision making and making sure that water conflicts are resolved in a fair and transparent manner?
2. How much knowledge does one person need to have? Is it a question of all experts knowing everything or of different experts learning to talk to and understand each other?
3. Do all experts have to become interdisciplinary? Or do we just need some interdisciplinary experts who can help in bridging different forms of knowledge and expertise – and can the rest of us remain disciplinary experts?

Some participants were of the opinion that all experts need to remain strongly rooted in one discipline,

but that they need to become literate in other disciplines as well. Others felt that the real issue was the question of how to communicate science to (and with) a broader audience, not just scientists but also politicians, policymakers and communities of water users. The debate about the boundaries of disciplines and how to cross them also led to a deeper questioning about the boundaries between science and other types of knowledge, leading into a discussion about how to democratize knowledge.

4. Gendered approaches

All three networks recognize that there is a huge gender-gap in water: whereas many of those who use and manage water at the level of individuals and households are women, the people who decide and know about water are predominantly men. This gender-gap in water has two dimensions that are interrelated – although not in direct causal ways: (1) the WHO question: who are trained and educated as water professionals? Who are (recognized as) water experts and who manage and decide about water? (2) the WHAT question: What should be done to incorporate questions of gender (and of power, equity etc) in engineering education?

This session started with a lively debate about the WHO question. Interestingly, each network differently deals with the question of gender balance, with the CB network applying a very strict quota system (87% of all students have to be women) and WaterNet and Concertación adopting a 50% rule, but not always fulfilling it. WaterNet reaches percentages of about 40% of women for their MSc courses. In Concertación, percentages of female participation in the courses were much lower (around 20% max.), but when a quota system was adopted, this has improved. Experience from the Concertación network also showed that there are more women participants when course fees are lower. Both in Concertación as in Crossing Boundaries, one impediment to further increasing the number of female participants in water courses is that most courses only accept students with an engineering background.

Opinions about the pros and cons of a quota system however could not be categorized according to network or region; opinions varied widely irrespective of gender, age, disciplinary background or country of origin. Although all participants agreed that there is a need for improving the gender balance in education, there was quite some disagreements about how to best achieve this. Yet, everyone was impressed with the large numbers of female students within the CB network, which in itself seemed to suggest that some positive discrimination – at least in the initial years – may help to create a gender transformation. At the same time and as some members of the CB network noted, gender is not the only implicit selection criterion. In India and the rest of South Asia, caste and class-based discrimination is also rampant – with the large majority of water experts and managers being members of higher caste groups. Having to say no to very good male candidates was also something some members of the CB network regretted.

About the WHAT question, the three networks exchanged their experiences and ideas. Most of the education and training provided through the networks includes some specific modules about gender, and also some larger social science and communication modules. Some also make explicit attempts to scrutinize and reformulate the other modules in terms of gender and other social biases. The relevance of gender is easiest to demonstrate: (1) at the level of users, which is why gender analysis skills need to be taught alongside other methods and theories that help students understand and communicate with users, such as field visits; (2) as one dimension of larger equity and justice questions crop up in water. Addressing and understanding gender therefore requires a framework that helps identifying and analyzing questions of equity in water. An additional interesting finding was that the introduction of

gender-related themes in education comes more easily as part of a wider transformation towards more interdisciplinarity.

In general, many participants felt that the quality of gender and water expertise that they can draw upon in courses is low. Mostly, gender and water work is very qualitative, dealing with specific cases studies. It lacks the rigor and systematic approach that characterizes good scientific work. Also, gender experts who are invited to teach gender and water courses often know about gender, but not about water. Courses risk therefore becoming very ideological and are not well linked to the overall curriculum.

5. Connecting capacity development, research and policy advocacy

The initiative in the three regions is built on regional cooperation among researchers from different countries with common professional interests on the issue of IWRM. To ensure that research activities are relevant, they are explicitly linked to, and co-funded by, on-going development projects. The experience shows that the issue of interdisciplinarity can be addressed through planned capacity building programmes. While new research and innovation in the various water disciplines are important, the notion of 'integration' remains elusive in many new research projects in all the three regions. This is particularly between natural/technical and social scientific perspectives. Innovative research is therefore needed to enhance the IWRM knowledge base. Such knowledge is best developed in the context of real water resources management problems, efforts at intervention, transformation or reforms towards IWRM. In this section, we look at the initiatives in three regions closely to answer the questions - In which way can we link capacity building with ongoing research and policy advocacy in order to increase its relevance and sustainability?

5.1 The approaches

WaterNet focussed on participatory planning and research activities. The case represents in having action research results adopted as policy, protocol and practice. Different practitioners worked together on different topics in same area. Research was impact-oriented and feedback of results went into teaching. The case shows iterative teaching and learning process, interdisciplinary approach to supervision and learning, as well as farmer training. Research was practical, with direct implications on practice and implementation. There was an influence on researchers who were also lecturers. The research was largely multi-disciplinary and it helped in bringing researchers that were harvested into teaching, through involvement of an alumni association. However, the WaterNet case, generates some questions relating to capacity building and advocacy such as the case of gender balance in education. It is believed that gender balance requires a direct policy and a firm stance, as well as active recruitment, as opposed to giving members freedom to recruit, especially from within their own staff.

Concertación's initiative focussed on the lessons learned within the capacity-building system of the CAMAREN Consortium and the National Water Forum (Foro Nacional de los Recursos Hídricos in Spanish). Both experiences are being developed in the South American country of Ecuador. An emphasis is put on identifying the key aspects of these two experiences, which have allowed, on one hand, the development of an inter-institutional network of knowledge and training, and on the other hand, the fostering of a space for the formulation of proposals and political influence aimed at improving the management of water resources. The case shows action research that was undertaken with involvement of beneficiaries and input from policy makers. The Forum defined the research

agenda, enabled a demand-driven approach and the involvement of academia, institutions, indigenous organizations. There was a legitimisation of policy arguments based upon case study results wherein communities were part of the learning process and problems were jointly owned by researchers and the community in a co-learning framework. Academic institutions have become more practical as part of this process and results of the research lead to policy implications that supported advocacy efforts.

The **Crossing Boundaries project** worked to build the capacity of water professionals in IWRM through higher education, innovation and social learning focused research. The project is being implemented by six partner institutions in Bangladesh, India, Nepal and Sri Lanka, and is coordinated by SaciWATERS. The project focuses on education, research/innovation, knowledge base development and networking, in a combined effort to contribute to a paradigm shift in water resources management in South Asia. This focus on longer duration education input, as opposed to short term training, deriving from the fact that shaping attitudes and perceptions, and teaching the skills of interdisciplinary research and more comprehensive analysis and intervention requires time. The project is implemented by a group of institutions with a proven interest and track record of integrated, interdisciplinary and gender-sensitive approaches to water resources management.

5.2 Major Lesson Learned

The value of interdisciplinary teaching and capacity building has developed a sense of appreciation among the faculty and students that most issues relating to water are cross-cutting in nature, involving technical, social, economic, ecological, legal and gender perspectives, and hence needs an integrated approach. This involves knowledge perspectives from different disciplines in the analysis of problems and solutions relating to water resources development and management. This appreciation has encouraged the students and the faculty in conceptualizing research problems and formulating methodology and analytical frameworks to address the problem in an interdisciplinary framework. In doing so, the guiding premise has been that the research results must add value, directly or indirectly, to the community and to the agencies engaged in the development of water resources.

Interdisciplinary teaching and capacity building shaping impact oriented research

The interdisciplinary teaching and capacity building has enabled students to pose research questions in an inter-disciplinary manner which has a societal relevance. Apart from receiving interdisciplinary courses in the classroom, students were provided with additional impetus through various training programmes. Previously, the research questions were more multi-disciplinary than inter-disciplinary in nature. The first set of activities employed during the initial implementation period of the project was to reshape the technically oriented water resources management curriculum of the partner institutions into an interdisciplinary programme through introduction of three new courses, namely Field Research Methodology, IWRM and Gender and Water. The implementation process to incorporate three new courses commenced with the holding of staff trainings to train academic staff and formulate the course capsules. Most of the academic staff has never been exposed to disciplinary areas covered in the staff trainings. These training activities have sensitized them to think beyond technical solutions in addressing water resources management issues. The academic staff, especially the younger group, have very little exposure to societal issues since they have been conducting research in the same disciplinary areas. Continuous exposure to training programmes on societal issues and events which addresses water resources management problems in an interdisciplinary manner has to a certain extent reoriented these technically qualified academic staff to modify the teaching materials of the traditional

engineering courses that they teach.

How differently the problem conceptualised?

All the three programmes have developed research programmes and methodology with the partner institutions that are impact-oriented, societally driven and participatory in approach. Thus, all the partner institutions through their PhD and Masters students have conducted research on themes that address current problems in water resource management in their own selected study areas. The research process is conducted in a participatory manner involving stakeholders as much as possible. The trainings on the various subjects as well as the training on field research methodologies are also geared towards building the capacity of the faculties and students towards successfully conducting such research. As a result the problems were conceptualised differently and as a process that reflected the ground realities of a water management problem.

Implications of interdisciplinary education

The outcomes of the research & capacity building and the results produced are expected to be useful in refining the academic curricula in order to make the curricula more applied and reflecting on the outstanding and emerging problems relating to water resources. The newer knowledge generated through faculty and students' research initiatives will further help in streamlining the teaching agenda in different courses which will enhance the quality of delivery of the courses and understanding by the students. The most important implications with regard to policy advocacy is expected to be an appreciation of importance of alternative perspectives, alongside of technical, economic and financial perspectives, in water resources development and management. The graduates upon completion of the course are expected to pursue these perspectives in the institutions where they will be engaged to work. Apart from providing a wider understanding of water management related problems to the students, the teaching staff is fully involved with the research supervision of students and the findings are incorporated back in the teaching. The students are conducting research with relevant stakeholders and regular meetings are being held with them. The findings from the studies are being used during the training programme of government officials. Since staff and students are working with the relevant government institutions and civil society organizations, most of the findings could find its way to influence policies.

Taking the road - less travelled

The students have been supported by the CB Project to acquire the necessary knowledge and skills required to conduct research through newly introduced courses. In addition, they were given theoretical understanding in water and equity issues and field training in participatory research for a period of two weeks. This also gave them the opportunity to interact with their colleagues from other partner institutions in different countries in the region and learn from one another.

The problem-based interdisciplinary research conducted through stakeholder participation was new to many partner institutions. The traditional practice is to guide the students through their respective supervisors for a specific research project with clear objectives. In this case, academic staff along with the students addresses a common theme from different angles to address a major water management problem identified by the universities. However, apart from the key learning, introducing an interdisciplinary education is not easy in an otherwise rigid university education in all the three regions. In the process, faculty found it difficult to work for an interdisciplinary problematisation of research

when their own training was not interdisciplinary. The content of interdisciplinary teaching has to be grounded in the reality of the sector. Through an initial course in field work, the students get to know the ground reality not only at the intellectual level, but even at the experiential level. The students are encouraged to approach the theory in the light of the real-life situations and problems. This makes students willing and looking for impact-oriented research. If given proper support in terms of specially designed, taught and self-study courses, there is greater chance that the quality of research is higher, not only in academic terms but also in terms of its relevance and utility to the outside stakeholders. At the same time, because of the same factors, the students are less inclined and less capable due to lack of knowledge of literature, lack of awareness of unusual methods and tools for research to non-interdisciplinary research.

To sum up, the issue of interdisciplinary teaching and capacity building in shaping impact oriented research is a road less travelled. It was found that students research problems were more relevant to society and key stakeholders. The research questions then have direct implications for solving the problem. Therefore, the curricula were more applied and reflected the outstanding and emerging problems relating to water resources. The link between research, capacity building and advocacy is well developed. However, the challenge is to transform an interdisciplinary education to a trans-disciplinary one, which is a longer way ahead.

6. Conclusions

This paper presented, compared and contrasted the experiences and challenges of three Regional Water Education Networks in Integrated Water Resources Management. These regional networks of knowledge centres built capacity in accordance with regional training needs and developed a contextual knowledge base on water resources management. They have gained experience with training a new generation of water professionals, who learn to appreciate the regional diversity in water problems and design relevant solutions for their regions, often in cooperation with local stakeholders. Through a dialogue, these networks shared valuable experiences and key lessons, both in terms of how to educate water professionals that will be able to deal with water problems of the future.

One key lesson that comes out of all three networks is that water binds people regionally. There is a perceptible pride in collectively achieving the education of a new generation of water professionals who are able to analyze and solve conflictive water problems that concern the region with a shared body of conceptual tools. For example, this means water professionals from different South Asian countries with contentious ties who are in daily life: Buddhists, Muslims, Hindus or Christians, to work together and construct a common professional language to discuss the region's water problems. This is all the more remarkable in a geo political context of political, economic and religious tensions between nations. Besides professional relationships, this creates friendships that extend over the years and over borders. These connections that a regional network sustains create spaces for debate about regional water policy, the challenge of climate change and transboundary water problems that do not exist nationally. Similar examples can be given for Africa and Latin America, where regional water networks survive and intermediate between instable and politically opposed regimes. Such experiences contribute to a strong belief that strengthening regional water education in the South contributes to regional cohesion and integration, which in the end favours regionally peaceful relations. The immaterial benefits, positive impacts and long-term dividend of regional water education are however difficult to measure. Networks therefore experience problems to convince governments and donors to

commit for the long term.

A crucial factor in the sustainability and coherence of these regional networks is a shared Masters Program in IWRM, such as that of WaterNet or Crossing Boundaries. More than the network itself in which WaterNet plays a vanguard role, it is the network program that can continue without the help of the network. Member Universities establish their own Masters Program and some Universities attract their own students. Concertación has acknowledged the need for a similar Masters Program as the sustainable core of a regional cooperation that will enhance not only water education, but also regional water research (Water Justice) and policy advocacy (Andean Water Forum).

The professional identity of water professionals is historically and universally dominated by male engineers. This presents significant challenges to regional water networks in terms of integrating gender perspectives and interdisciplinary approaches to IWRM. The three networks discussed here have made a significant headway in this respect. Changing the gender balance of the profession implies changing dominant and long cherished professional cultures and identities, and this is a process that will take time, patience and stamina – and one that will continue to require concerted affirmative actions and attention. Another interesting feature that these networks share is their intent to connect water education with water research and policy advocacy by involving local stakeholders. The following aspect is worthy of mentioning yet in practice experiences some shortcomings that merit reflection.

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SITUATIONAL ANALYSIS OF WOMEN WATER PROFESSIONALS IN SOUTH ASIA

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Introduction

Since the last decade or so, interest in the issue of gender and water seems to be increasing. It is partly because women's movements and struggles have made a mark and equally because many funders have come to insist on their inclusion. This has compelled the state to address some of the inequities and disadvantages that women face. However, there is little attention given to the theoretical treatment of this issue in the water sector and hence, most of the efforts at making the water sector inclusive become a mere lip service or remain partial. This is evident from the knee-jerk introduction of programmes in the sector, which seek women's participation in community-based domestic water programmes. However, most of these programmes focus on poor rural women and their collectives to regenerate and effectively manage the resource. Little research has been done related to the professionals who are in key decision-making positions or implementing organisations, the bureaucracy and elsewhere and on how their actions or inactions set the agenda for policy and programmes in the water sector. Further, little thought has been given to the women who work as water professionals in the different subsectors of water and their constraints and positive influences on the sector as a whole. By women water professionals (WWPs), we simply mean women who are employed in the water sector in different capacities.

Are these institutions/organisations democratic at the macro level? Is the environment in these organisations congenial for women to participate effectively? These are some of the questions that largely remain out of the debates on gender and water. The literature on gender and water points to a clear sectoral divide – the domestic and the other productive uses of water. Women's participation in the water sector is, therefore, seen as synonymous to their participation in the domestic arena, which in fact, is an extension of their domestic roles. This reflects the strongly embedded male culture of the sector. It is then important to understand how this culture shapes the water sector as a whole. This reveals why action at the community level alone is inadequate and builds a case for engendering the water sector as a whole.

It is in this context that a study on WWPs becomes critical. While reiterating the need for a much deeper theoretical treatment of the question, we feel there is a need to look at women at various levels in the water sector. As a first step, this means opening up and analysing the sector and developing a typology of women as users and planners.

This study is an effort to do just that. It was part of a larger project, called 'Crossing Boundaries' (CB), initiated by SaciWATERS which focuses on education, research/innovation, knowledge-based development and networking, in a combined effort to contribute to a paradigm shift in water resources management in South Asia.

The study located in Bangladesh, India Nepal and Sri Lanka was primarily of exploratory nature to understand the profiles, numbers and constraints of WWPs in the South Asian region. Although the focus was mainly on women professionals in the water bureaucracy, we have spoken to a few WWPs from NGOs and academic groups as gender water advocates. We also bring in a few insights from the Sindh province in Pakistan where secondary data was collected and a few discussions were conducted with WWPs in the Sindh Irrigation and Drainage Authority (SIDA).

The South Asian Water Scenario

Both droughts and floods characterise the South Asian water scenario. The question of water scarcity and better governance looms large across the region. In the last decade, all of these countries have introduced various reforms and policies in the water sector. Many of these policies mark a paradigm shift from a techno-centric supply driven model to a demand driven and participatory model. With this shift in thinking, questions of participation, accountability and inequity have come to the fore and inadvertently the 'politics of water' has gained currency.

Interestingly, while many of these policies and reforms have provided spaces for resource-poor groups to participate in decision making and planning around water resources at the micro level, the picture seems just the opposite at the macro level with large numbers of poor being displaced from their habitats or dispossessed of their resources, including water. Goals of decentralised planning and management and that of privatisation are being pursued simultaneously in this region with varying impacts.

Integrated water resources management (IWRM) as a concept has gained currency in the last decade or so and this model is being strongly advocated in the region, but hardly creating the desired impact on the water bureaucracy. The 'best outcomes' of this advocacy have been in the form of renaming sectoral departments as water resource departments in some countries. However, the water bureaucracy largely continues to function, as it did in the past, with its various sub-sectors barely seeing eye to eye with one another.

Admittedly new reforms and policies have at least mentioned gender concerns at the micro level. However, they have not gone into the detailing of how that would be feasible. Despite these policy spaces for gender mainstreaming in the sector, the answers for why this is so have to be sought at different levels. In all these countries, water is clearly a male dominated sector and the manifestation of this is in the low numbers of women found in the water sector as a whole, both in the bureaucracy and elsewhere.

Policy analysis with a gender lens shows us that gender justice receives little attention at macro-meso-micro levels. Unpacking how gender justice can be brought about in the sector would increasingly reveal just how much of work is needed at the level of those who design and implement water programmes or respond or act as civil society groups.

In this study, we try and look at the less studied sector of WWPs in the water bureaucracy. What are their numbers and why are they so few?; What are their concerns and do their presence make any difference to the gender mainstreaming agenda?; Does reform in policy bring any more visibility to their concerns?;

Does it provide them any more space than it did in the past and does this space lead to fruitful outcomes in terms of gender equity? These and other related questions define the scope of our study.

Objectives and Scope of the Study

The study was done in two phases. In the first phase, independent studies for Nepal and Sri Lanka were done in 2008. In the second phase, a co-ordinated study was initiated for Bangladesh and India between January and July 2009. The objectives and scope of the studies done in both the phases were the same, but the methodology differed to an extent and this is evident in the data. Although a full fledged study was not done for Pakistan, we share a few insights from one of the provinces of Pakistan where the irrigation reform process was introduced.

The study aimed to

1. Develop a broad typology of WWPs working in the region.
2. Assess the numbers of these women in the area studied to give an indicative trend of the numbers in the region.
3. Understand some of the key constraints of WWPs across the diverse cultures of South Asia.
4. Bring visibility to this group and their concerns.
5. Make recommendations for policy and action for WWPs.

The study covers a few water departments in the four countries of Bangladesh, India, Nepal and Sri Lanka.

In Bangladesh, the overall management of water resources related to irrigation, flood control and drainage comes under the Ministry of Water Resources. Under this Ministry, there are different institutions/organisations, which are responsible for water resources management. We have considered seven of them, i.e. Bangladesh Water Development Board (BWDB), Water Resources Planning Organisation (WARPO), Institute of Water Modeling (IWM), Centre for Environmental and Geographic Information Services (CEGIS), Department of Public Health Engineering (DPHE), Local Government Engineering Department (LGED) and Bangladesh Centre for Advance Studies (BCAS). The BWDB is responsible for the overall planning and implementing of the Water Resource Development (WRD) projects in Bangladesh. There are seven zones, each divided into Circles and further into Divisions and Sub-divisions.

The WARPO is a macro-level planning organisation for WRD. Its main task is to provide a master plan for environmental-friendly WRD, and also formulate the National Water Policy and plan for scientific use and preservation for water resources. This is located in the national capital, Dhaka.

The IWM is a specialised institute for water modeling, computational hydraulics and scientific research, development and capacity building. The CEGIS is a public trust in the water sector. The CEGIS provides support for environmental and social impact assessment of different water resources related projects. Both these institutes operate from the centre - Dhaka.

The DPHE comes under the Ministry of Local Government and Rural Development. It is responsible for

water supply and sanitation. Other than Irrigation Water Management, the DPHE is responsible for drinking water supply to the urban and rural community. It has a headquarter office and district level offices. The LGED also comes under the Ministry of Local Government and Rural Development. It is responsible for irrigation of 1000ha of land or less in local level water management. It has its headquarters in Dhaka and district level and sub-district level implementing authorities.

In India, we have conducted the study in two states, Maharashtra in western India and Andhra Pradesh in southern India. Both are large states and in some sense recognised as the leaders in water management. Both states also have a strong history of women's movements.

In Maharashtra, we have considered two departments for the study: the Water Resources Department (WRD), which is the irrigation department and the Water Supply and Sanitation Department (WSSD), which is concerned with drinking water and sanitation. Both the departments have their head offices in Mumbai, the state capital. Following new legislation in 2005, the entire state has been divided into five river basin corporations. These are governed by the WRD. Under each river basin corporation there are different region-wise irrigation circles, project-wise irrigation circles and the Command Area Development Authorities (CADA). Including all these, there would be around 35 irrigation offices in Maharashtra. Further, there are different divisions and subdivisions under each circle.

There are three main components of the WSSD, i.e. Maharashtra Jeevan Pradhikaran (MJP), Groundwater and Survey Development Agency (GSDA) and Reform Sector Project Management Unit (RSPMU). For the present study, we have considered the MJP and the RSPMU. The MJP is responsible for design and construction of water supply (costing more than Indian Rs 7.5 million) in rural areas and sewerage schemes in urban areas and mobilisation of resources on behalf of the State Government and local bodies. Recently, due to various reasons, it has been criticised as being a white elephant of the government and there are active efforts for restructuring the MJP. The MJP has its Head Office in Mumbai. There are five regions across the state, further divided into different circles, divisions and subdivisions under each regional office.

The RSPMU deals with the execution of the Jalswarajya (water freedom) scheme in the state. Jalswarajya is a drinking water scheme, introduced under the Sector Reform funded by the World Bank. This process introduces the change in the water sector and hence, is important to the study. The RSPMU has their central office at Mumbai. They have district level teams in all the districts where the Jalswarajya scheme is being executed. These teams include members of technical, social, administrative and financial side.

For the state of Andhra Pradesh (AP), we have considered four departments, i.e. the Irrigation and Command Area Development Department (Irrigation and CAD), the Andhra Pradesh State Irrigation Development Corporation (APSIDC), the Ground Water Department (GWD) and the Hyderabad Metropolitan Water Supply and Sewerage Board (HMWSSB). The Department of Irrigation provides irrigation facilities with the funds from Government under various programmes. There are different circles under the main office. The APSIDC is a state government undertaking, formed for the development and implementation of irrigation projects. This department comes under the administrative control of the Irrigation and CAD Department. The main office is located in Hyderabad, which is the state capital, and there are twelve divisions and two project offices for implementing of the

various schemes..

Like the APSIDC, the GWD also comes under the administrative control of the Irrigation and CAD Department. The Ground Water Department was established to help the scientific development, systematic management and optimal monitoring of groundwater resources for sustainability. It is a multi-disciplinary organisation. The Ground Water Department consists of a Directorate, 22 district offices and two special command area offices. The HMWSSB comes under the Municipal Administration and Urban Development Department. The Board is responsible for planning, designing, constructing, maintaining, operating & managing sewerage treatment works and potable water supply in the Hyderabad Metropolitan Area.

In Nepal, the study focuses on women water managers at the field level; interviews with water professionals, both male and female working in academia; implementing agencies i.e. irrigation department and drinking water department; the society of engineers and donor agencies in the water sector.

In Pakistan, like the rest of South Asia, the water sector is male dominated. The Sindh Irrigation and Drainage Authority (SIDA) is an organisation working for water reforms in the Sindh Province, and was established in 1998 under the SIDA Act. Later, the SIDA Act was replaced by the Sindh Water Management Ordinance, promulgated in 2002, which sets the stage for a complete rollout of the reform programme financed by the World Bank. The key elements in the proposed reform are the transformation of the Irrigation and Power Department (IPD) into autonomous organisations and irrigation management transfer to users. The reformed framework envisions farmers' participation to increase accountability, transparency and equity. Women's employment was introduced in 2004, under the water reform programme. Currently women are working for different departments of SIDA, mainly in the secretariat including field offices. All employees (male and female) working for the reform programme are contractual employees, but the organisation itself plays the role of prime change agent for water reforms in the province and has a multi disciplinary team rather than only engineers.

In Sri Lanka, the study focuses on two departments: The Department of Irrigation and the National Water Supply and Drainage Board. The former, a government department, has an island-wide presence and possibly employs the largest number of women on and off the field. The latter is a statutory board established by the government, also with an island-wide presence, but without the same rigid structures of administration as a department.

Methodology and Tools

Definitions, Analytical Framework,

Broadly, as already mentioned, we define WWPs as all women working in the water sector at the meso and macro levels across different sub-sectors of water in different capacities in government as well as non-government organisations, as academicians and in the private sector. For the purpose of this study, however, we have focused on women working as employees in the government set-up, both in technical and non-technical capacities at different positions.

A combination of factors, all commonly linked to patriarchy, determines women's presence or the lack of it in the water sector. These could broadly fall in two terrains - patriarchy within organisations and the masculine character of the sector itself, which can be described both by its content and by the mode of its operation. The present study being an exploratory one hopes to provide insights into these two broad areas. For this study we, therefore, rely heavily on the foundational work in the area of feminism and science. We also draw on work around gender and organisations, and the studies on masculinities, particularly work done by Margreet Zwartveen (2008) in the area of water and masculinities.

The low numbers of women in the water sector or for that matter, any of the 'hard' sciences, often remains an area wanting in research. The most general explanation given for this is patriarchy, without going into the nature of these sciences themselves. Most often, the question is either treated as a myth not requiring an enquiry or self-evident or nonsensical i.e. falling outside the domain of the formal knowledge systems and hence needing no attention.

According to Keller (1978), this unexamined association between gender and science has been internalised as a belief system, into peoples' thinking and value systems. These values and the belief system then gets further perpetuated through the various socio-cultural practices to an extent that we stop questioning the content and the form of the 'hard' sciences themselves and find reasons for women's absence outside of it.

Feminism and Science

The natural sciences have assumed unparalleled authority in the 20th century. Feminist critiques of modern western science and technology as gendered processes have come from a wide range of disciplines. What kind of knowledge do these sciences provide and what is the basis of their cognitive authority? Feminists have questioned the idea of objectivity and subjectivity and the separation of the knower from the knowable. These challenges have become prominent in the post 1960s when Kuhn (1962) and others questioned the idea of objectivity in science. They showed that science was a part of the social and cultural context in which it is developed and practised. Sandra Harding (1986) and others showed that all knowledge is produced under specific social and historical conditions and must be understood to give us insights into more truthful accounts. She uses the three useful concepts of symbolism, structure and identities in the context of gender and science. She talks of the symbols or metaphors that are used to describe gender dichotomies and separate the public from the private domain. For example, the dichotomy between production and reproduction - these are used to organise a set of gendered activities. By this logic, women would do all the activities that revolve around reproduction and men would move into the production sphere. This can thus be referred to as the structure, and finally individual identities are constructed around these activities and these are essentially gendered. These identities are internalised as part of our belief systems and determine our

¹Thomas Kuhn (1962) in his *The Structure of Scientific Revolution* argued that science does not progress via a linear accumulation of new knowledge, but undergoes periodic revolutions, also called 'paradigm shifts' in which the nature of scientific inquiry within a particular field is abruptly transformed. Both he and later Karl Popper believed that scientists' subjective experiences made science a relativistic discipline and that science gets developed and practiced in a social context.

practices and ideas. Anything that falls in the realm of the public, for example, gets defined as male. Objectivity, rationality or technical competences thus get to be seen as male traits and its lack as a female one.

Another path-breaking work, which informs this study, is that of Evelyn Fox Keller (1978) who draws on psycho-analytical theories expounded by Freud, Piaget and others. Through her work she has tried to trace the origins of the gendered nature of science. Keller's main enquiry revolves around the low numbers of women in science, particularly engineering and physics. However, her concern throughout this exploration is less on the relative absence of women in science but more on the structure of science, which she argues, is in fact the cause for this absence. She therefore strongly argues for a discussion on 'beliefs' over a 'reality' (absence of women as scientists). This belief manifests itself through direct references, which until very recently were not uncommon to hear. Women, it was said, are among the most unfit species to understand science. Clarity of mind, rational thinking and rigour were all identified as male characteristics that were most suited for pursuing a scientific endeavour, and are manifested through language and metaphor to describe science itself. Often objective sciences are referred to as 'hard' sciences and the subjective ones as 'soft'. Similarly, facts are always most objective and rigorous when they are 'hard' and feelings are always 'soft'. In each of these instances 'hard' obviously has a male connotation and 'soft' has a female one. What Keller effectively demonstrates is how such language, imagery and metaphor slowly but surely shapes realities.

The continuing exclusion of women scientists in the disciplines such as engineering and physics is argued by many scientists of reflecting not only gender bias but also institutionalisation of male bonding which render such disciplines particularly inhospitable for women scientists. In fact, some feminist historians go as far as to say that the very definition of scientific genius remains an essentially masculine trait while some others challenge these positions by saying that these are further inhibiting the process of change by perpetuating gender stereotypes. Within the feminist critiques of science one sees a debate between those who are perceived as anti-science as it is seen as anti-feminist and those who see a positive role of science and conceptualise subjectivity and objectivity as different from the mainstream Baconian and Cartesian views of science.

Another useful concept developed in the 1980s is that of 'hegemonic masculinity' and it helps us move beyond a singular understanding of masculinity or femininity. The idea of hegemonic masculinity gained currency in the 1980s when challenges came up to the idea of masculinity which no longer could be understood as a singular concept. The argument that there are multiple masculinities and that they manifest themselves in different ways was acknowledged. Hegemony, a concept so powerfully introduced by Gramsci, was then used to explain certain kinds of masculinities which were linked to power derived from social locations of caste, class, race, age religion etc. Hegemonic masculinity thus looks at masculinity from a broader understanding of the various layers that affect and intersect gender relations. This concept helps us understand why certain social groups alone and within them only men have been able to dominate knowledge production and its practice. It helps us look at patriarchy in a much more nuanced way, with the way it intersects with other social groups and creates what can be referred to as hegemonic masculinity.

Gender and Organisations

The other terrain of patriarchy and organisations that we hope to examine here is largely informed by the work in the area of gender and organisations. Of particular importance, here is the work of Joan Acker (1990) which showed that organisations cannot be seen as gender neutral and need to be seen as sites in which the gender identities are presumed and reproduced. She defines a gendered organisation where 'advantage, disadvantage, emotion and action, control and exploitation, meaning and identity are patterned through and in terms of distinction between male and female, masculine and feminine'. Her work brought out that hierarchical organisations are important locations of male dominance and countered the view that organisations are gender neutral. Assumptions about gender underlie the documents and contracts used to construct organisations and to provide the common sense ground for theorizing about them (Acker, 1990).

Kathy Fergusson's (1984) work on bureaucratic organisations is also worth noting in this regard where she argues that ideal typical bureaucratic form is inherently gendered in that both the structure and mode of operation lead to a gendered effect. She then calls for a restructuring of the bureaucratic organisations to make them more gender sensitive and equal.

Sources of Data and Tools

Different sets of tools and methods were used to investigate this question. Here again we would like to reiterate that the studies in Nepal and Sri Lanka were done at a different time and by independent researchers, so the choice of methods did differ from the studies that were done in India and Bangladesh, where the study was co-ordinated by SOPPECOM.²

In Bangladesh and India, the study was conducted at the same time, through an intensive consultative process. In both these countries, our focus was largely on looking at the WWPs in the government set-up. We have drawn information from both secondary and primary sources. As discussed earlier, in India the study was done in the two states - Andhra Pradesh and Maharashtra. Between these two states a total of 52 women were interviewed and about eight focus group discussions (FGDs) were conducted with different groups. Secondary information in India was collected through the Right to Information channels, from the websites of different departments as well as through visits to the offices as well as written correspondence with them. The details of the primary data collected are included in the interviews below.

In Bangladesh, 32 women and 18 men from across the different departments were interviewed in depth and about four FGDs were conducted with different groups of water professionals.

In both the countries, men and women belonged to the Government departments and came from mixed social and educational backgrounds. They were also selected carefully to represent the various positions in the hierarchy. For both these countries, a large amount of secondary data (which is only

²Society for Promoting Participative Eco-system Management (SOPPECOM), Pune, India is an organisation working in the area of rural livelihoods and natural resources. Its prime focus is on water in which it does policy advocacy, research and capacity building.

partially presented here) was collected to give us a picture of the number of women in the water sector and where they stand in the hierarchy.

In Nepal, the study was conducted between April and May 2008. The study includes both case studies from women water managers at the field level, interviews with water professionals both male and female working in academia, implementing agencies i.e. the irrigation department and drinking water department, society of engineers and donor agencies in the water sector. Very specifically, the women interviewed for the study were as follows:

- a) Graduates who have studied water resources at the Bachelors, Diploma and higher levels in formal education that open an opportunity to work in the water sector;
- b) Those who do not have an academic background in water resources as such, but were/are involved in water activities in the later phase of their career;
- c) Those involved during water policy formulation and implementation;
- d) Researchers in the water sector and;
- e) Educators teaching water resources at universities and colleges.

Most of this information collected was part of the PhD work of the researcher in Nepal.³ Data collection tools, such as open-ended interviews, e-surveys, FGDs and tracing the careers of WWPs from college to their present work, were used. Both qualitative and quantitative data were collected.

In Pakistan, we did not do a detailed study, but conducted one FGD with the SIDA. In Sri Lanka too, an independent researcher conducted the study, based on published and unpublished information, interviews with key stakeholders and FGDs. Information was obtained from public sector organisations, private companies and local and international NGOs in the water sector employing women professionals.

Twenty five in-depth interviews were conducted with water professionals in universities, public sector institutions, an international agency and a private sector company. Both women and men involved in the work in water sector were interviewed.

Four FGDs were conducted in Colombo (Western Province), Anuradhapura (North Central Province), Peradeniya (Central Province), and Ratnapura (Sabaragamuwa Province). The participants included engineers and technical officers working in the field, supervisors, academics, sociologists, economists, and NGO and CBO activists. Both men and women participated. There were 38 participants at the FGDs. The selection of the participants gave particular attention to capturing a diversity of viewpoints.

The findings and analysis that follows is based on these diverse sources of data.

³The study was done by Pranita Bhushan Udas who is currently completing her PhD work under the guidance of Margreet Zwarteveen in Wageningen University, Netherlands.

Typologies

One of the main aims of the study was to develop a typology of WWPs. Categorised very broadly, they include the technical as well as the non-technical professionals. In each country studied, we can see some uniformity and some differences. A typical exercise in typology would involve a detailed classification of WWPs working in different organisations such as NGOs, INGOs, the government, the academics and even the private sector. That would be an important and interesting exercise where we could map the extent of WWPs, the nature of their work and the problems they face across these sectors. While doing this mapping it would also be important to see the caste, class and other social differentials that determine exclusion alongside of patriarchy. In an NGO set-up or an academic set-up for example, we would find women professionals largely outside the technical domain and more as social experts (gender, community participation, etc) or researchers/teachers.

For the present study, we have not been able to do a detailed mapping of this kind across the different sectors and have focussed on the water bureaucracy alone. Our classification, therefore, would be applicable to this category only.

In the government set-up, we would typically find the technical and administrative classification as an explanatory one for preparing a typology. However, with the introduction of reforms in the water sector, we see a changing scenario in which a few non-technical and non-administrative professionals, such as sociologists, biologists or chemists are coming into the sector in active roles. In most countries, they are still outside of the state apparatus.

While compiling the secondary data, we found the following categories of women water professionals, with some variations in each of the countries.

1. Technical: Engineers (both, those working on site and those who do desk work like designing, scrutinising, sanctioning, etc.), hydrologists, geo-hydrologists.
2. Technical Type 2: Professionals who are not qualified as engineers but do support their technical work -like draftsmen, assistant draftsmen, tracers and lab assistants.
3. Non-technical Experts/Permanent or Contractual: With the introduction of the sector reform process, an effort to bring in a multi-disciplinary team is seen. Therefore, there are non-technical social and natural scientists. In each of the countries, their position in the state government differs. In India, for example, all the social sciences employees fall in the contractual category and are not part of the mainstream government set-up. This is also true of Pakistan. In Nepal, Sri Lanka and Bangladesh, they are part of the mainstream government set-up.
4. Administrative: Those who do administrative work (desk work) like accounts officer, clerk, steno, typist, store superintendent, etc.
5. Service staff: Employees who are not doing administrative work but provide different services (most of these would be low ranking, those classified in India as Class 4 employees) like sweepers, drivers, cleaners, watchmen, labourers, electricians, gardeners, linemen, pump operators, wiremen etc.

There are further classifications possible for each of these categories and in every country that has been

different. These depend on the sub-sectors in the water sector, the departments within the sub-sectors, hierarchy of position, educational qualifications and whether they are permanent or temporary/contractual employees of the government.

Each of the country reports gives a detailed typology of women as water professionals, but here we use two broad categories i.e. technical and administrative. Technical includes all experts from the natural sciences including engineers, hydrologists, geologists, agricultural scientists (1, 2, 3 combined) and administrative includes all clerical jobs and other support staff (combining 4 and 5 categories). The main reason for clubbing this data is the non-availability of segregated data in Nepal and for some departments in Bangladesh and India as well.

Table 1: Department-wise Typology of Women Water Professionals for India, Bangladesh and Nepal

Country	Department	Technical Employees			Administrative Employees			Total Employees		
		Total employees	Female employees	% of female employees	Total employees	Female employees	% of female employees	Total employees	Female employees	% of female employees
India (Maharashtra)	MUP (entire state)	1429	74	5.18	5122	502	9.80	6551	576	8.79
	Irrigation (5 circle offices out of 35)	933	18	1.93	1390	157	11.29	2323	175	7.53
India (Andhra Pradesh)	APSIDC (entire state)	267	11	4.12	300	36	12.00	567	47	8.29
	GWD (entire state)	81	10	12.35	979	72	7.35	1060	82	7.74
	HWSSB (Hyderabad city)	323	13	4.02	53	7	13.21	376	20	5.32
Bangladesh	BWDB (entire country)	1400	46	3.29	6060	399	6.58	7460	445	5.97
	WARPO (entire country)	37	2	5.41	17	2	11.76	54	4	7.41
	CEGIS (entire country)	108	17	15.74	22	1	4.55	130	18	13.85
	IWM (entire country)	72	12	16.67	15	0	0.00	87	12	13.79
	LGED-SSWRDP (entire country)	1696	30	1.77	0	0	0.00	1696	30	1.77
Nepal	Department of Drinking Water and Sanitation (central office only)	35	0	0.00	82	9	10.98	117	9	7.69
	Department of Irrigation (central office only)	66	1	1.52	80	10	12.50	146	11	7.53

Source: CB Project, SasiWATERS

Low Numbers

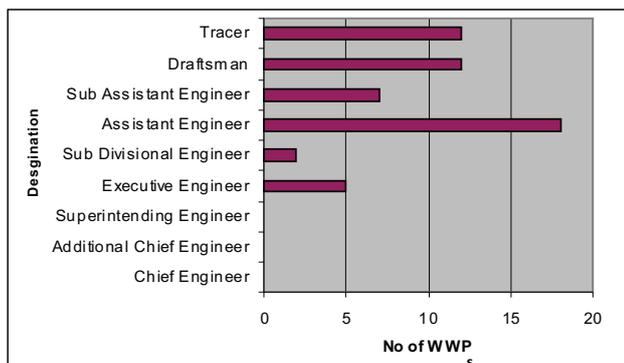
All of the countries show that a very small number of women are working as WWPs in South Asia. Table 1 shows that except for three departments in India and Bangladesh, the women in technical posts are not more than 5% and in some departments like the irrigation department in Maharashtra and Nepal, it is as low as 1.9 and 1.5% respectively. While it might be interesting to pursue this difference across sectors separately, what we see here is the consolidated picture of the water sector in South Asia. The percentages are just slightly better for women in the administrative sections in the water sector. The Bangladesh data for the BWDB includes, among its technical staff, sociologists and other non-technical experts as well. Interestingly these are included as part of the mainstream government staff. However, in Maharashtra and Andhra Pradesh in India, we see a complete absence of sociologists or any other social sciences experts in the mainstream government departments. In a later section, we discuss the changing nature of the sector and the introduction of social scientists in contractual capacities, which also marks the entry of more women in the sector. This is also true of Pakistan as is evident from the data on SIDA, which is discussed later.

In Sri Lanka, although we do not have a complete data base for the entire country for any of the departments, at the time of the study, in the irrigation department the Director General was a male, two of the eight Directors, and seven Deputy Directors were women. Out of 231 irrigation engineers, 41 or 17.4% of engineers were women. The majority of engineering assistants were women. The Department is primarily staffed by engineers and other technical personnel and has no multidisciplinary team even though among its functions are community interface and interaction. Like in most government departments, there is no gender policy although statutory entitlements are available to women workers.

The Glass Ceiling

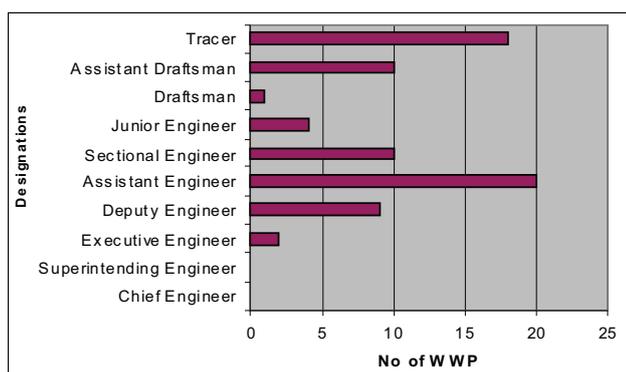
Charts 1–3 show the posts at which women are currently employed. These are representative charts of one department each in India and Bangladesh showing women in the technical hierarchy in the MJP (Water Supply and Sanitation Department, Maharashtra, India), the Bangladesh Water Development Board in Bangladesh and the Irrigation and Command Area Development in AP, India. In all these departments we see that women are not present at the topmost level. In no country do we see women at the Chief Engineer level. Except in AP, India, we do not see women even at the Superintending Engineer's posts. In Maharashtra, we see two women in the Executive Engineer's position of which one was promoted just as she was about to retire and the other is a very dynamic young professional in charge of a division. In Bangladesh too, we do not see women in these two posts but five of them are executive engineers, which is certainly a positive change.

Chart 1: WWP in BWDB Technical Hierarchy, Bangladesh (Entire Country Data)



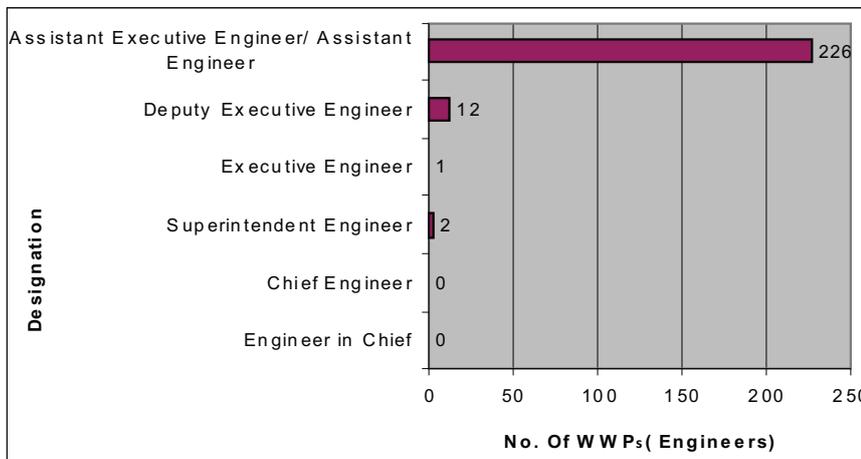
Source: CB Project, SaciWATERS

Chart 2: WWP in MJP Technical Hierarchy, Maharashtra, India (Entire State-level Data)



Source: CB Project, SaciWATERS

Chart 3: WWP's in APSIDC Technical Hierarchy, Andhra Pradesh, India (Entire State-level Data)



Source: CB Project, SasiWATERS

It is interesting to see the differences across the three different locations. Andhra Pradesh in India has a large number of women as assistant engineers in the irrigation department and it is the only place which has women in the senior post of Superintending Engineer. However, this is still only 5% of the total employees in the Irrigation and CAD department. Maharashtra is also one of the progressive states in India and has recently introduced a progressive policy of 30% reservations for women in government employment, but the numbers do not reflect that in practice. The main reason cited for this is that there were no recruitments in these departments since the policy was introduced in 1997.

Hesitant but Changing Profile of the Water Bureaucracy

Our typologies for the water bureaucracy fit into the categories of technical and administration and hardly have any space for non-technical experts from the social sciences. This is a comment on the nature of the sector, which despite the recent promises of integration and multidisciplinary is characterised by technocentrism. Changes are being introduced in small and cautious ways and the examples of this are seen in the SIDA, Pakistan as well as the Jalswarajya programme of Maharashtra, India. This is also seen in Nepal, Sri Lanka and Bangladesh where some sociologists and other social scientists are being employed in the water sector now. In some ways it does open up spaces for women to be employed in the sector though in the current scenario, they are more likely to be social scientists than civil or water engineers.

The data in Tables 2, 3 (both Pakistan) and 4 (Maharashtra, India) below are indicative of the changing scenario in the sector.

Table 2: No. of Employees, SIDA, Secretariat, Sindh Pakistan,

Table 2: No. of Employees, SIDA, Secretariat, Sindh Pakistan,

Type	No. of female employees	No. of male employees	Total no. of employees	Comments
Technical and managerial	01	28	29	Includes, MD, GM, Engineers, social scientist specialists, advisors, analysts etc
Administrative and service staff	05 (all Social Organizers)	83	88	Assistants, directors, operators, field social mobilizers, office managers, surveyors
Service Staff	01	23	24	
Total	07	134	141	Women are 5.2% of total employees, based in the secretariat

Source: SIDA office

Table 3: No. of Employees, SIDA, Field Teams Sindh Pakistan

Type	No. of female employees	No. of male employees	Total no. of employees	Work background of professionals
Group leader	00	01	01	Irrigation engineer
Social mobilizers	05	32	37	Social and community mobilisation
Administrative and Service Staff	00	18	18	
Total	05	51	56	

Source: SIDA office

The above tables for Pakistan show a very small number of women in the Irrigation department.

In Maharashtra, India, however, we see a hesitant change in this regard. A whole new set-up is in place, where social scientists are brought in, but all of them are on contractual or temporary posts. The

technical persons are mainly deputed from the different water departments. The change indicated in the profile of the water department (Table 4) is only a temporary as after a seven-year experience, the state government is thinking of dismantling the entire structure of Jalswarajya, retaining only the technical and administrative staff.

Table 4: Women's Employment in the Sector Reform Process in Drinking Water in Maharashtra, India,

Status of Employment	Details	Technical and Non-Technical Experts	Administration and Accounts Professionals
Permanent employees	No. of total posts	208	208
	No. of female employees	7	21
	Percentage of female employees	3.37	10.10
Contractual employees	No. of total posts	182	26
	No. of female employees	22	3
	Percentage of female employees	12.09	11.54

Source: CB Project, SaciWATERS
(Data for 26 districts of the state where the programme is currently implemented)

The Women With Whom We Spoke

From across South Asia, about a hundred WWP's working in different set-ups were interviewed in detail (Tables 5, 6, 7 and 8 provide some details). These women were selected on the basis of their position in the hierarchy, nature of work and in the Indian context, on the basis of their caste. These diversities are enumerated in greater detail in the country reports (Reference).

Table 5: Typology of WWP's Interviewed, South Asia

Country	Technical	Adminis- trative	Non- technical experts	Academicians	Total
India (Maharashtra)	18	10	7	0	35
India (Andhra Pradesh)	13	8	2	0	23
Bangladesh	11	14	4	3	32
Nepal	NA	NA	NA	NA	7
Sri Lanka	NA	NA	NA	NA	25
Total					122

Source: CB Project, SaciWATERS

Table 6: Department-wise Number of WWPs Interviewed, South Asia

Country	Department	No. of WWP
India (Maharashtra)	MJP	11
	Irrigation	15
	Jalswarajya	9
India (Andhra Pradesh)	Irrigation and CAD Department	10
	CDO	2
	APILIP	1
	APSIDC	2
	GWD	4
	HMWSSB	4
	Bangladesh	BWDB
	IWM	6
	CEGIS	3
	WARPO	3
	LGED	3
	DPHE	3
	BCAS	1
	Others (Academician, Research org.)	3
Nepal	Government, NGO, academic	7
Sri Lanka	Government departments, academicians, private sector and NGOs	25
Total		122

Source: CB Project, SaciWATERS

Age and Education Profiles

Table 7: Age Profiles of WWPs Interviewed, India and Bangladesh,

Age	India (Maharashtra)	India (Andhra Pradesh)	Bangladesh	Total
20- 25	0	3	0	3
26- 35	16	6	21	43
36- 45	9	5	9	23
46 and above	10	9	2	21
Total	35	23	32	90

Source: CB Project, SaciWATERS

Table 8: Education Profiles of WWPs Interviewed, India and Bangladesh

Education	India (Maharashtra)	India (Andhra Pradesh)	Bangladesh	Total
SSC	0	0	2	2
HSC	0	2	0	2
Engineering diploma	4	0	0	4
Engineering/ technical graduation	13	9	13	35
Engineering/technical post-graduation	2	2	0	4
Pure science diploma	0	1	0	1
Pure science graduation	0	0	0	0
Pure science post graduation	1	1	11	13
Social science graduation	7	6	1	14
Social science post-graduation	8	2	3	13
PhD	0	0	2	2
Total	35	23	32	90

Source: CB Project, SasiWATERS

After speaking with more than one hundred WWPs in the region and conducting several group discussions with a diverse set of people, we feel that the study does point to two major constraints that determine women's low presence in the water sector as professionals: a) Constraints that come from the type of work women do and are expected to do. b) Constraints connected with the related but distinct category of content and structure of engineering science itself.

The two constraints are intertwined and cannot be separated and each of these categories also have the interplay of other factors of class, caste, religion, education, age and hierarchy of position etc. determining the presence or absence of women. Here for clarity we deal separately with our findings on the socio-cultural issues that determine women's presence or absence in the bureaucratic organisations and our findings on women's absence as a result of the nature of the sector itself.

Culture of the Water Sector

The culture of a sector can be defined in several ways that relate to the form the organisation takes, the content of work and mode of governance, work relations and task allocations, to name a few. Here we present findings that can be sifted out from the general organisational issues, although, as discussed earlier, there is only a fine separation between these.

Making Educational/Career Choices

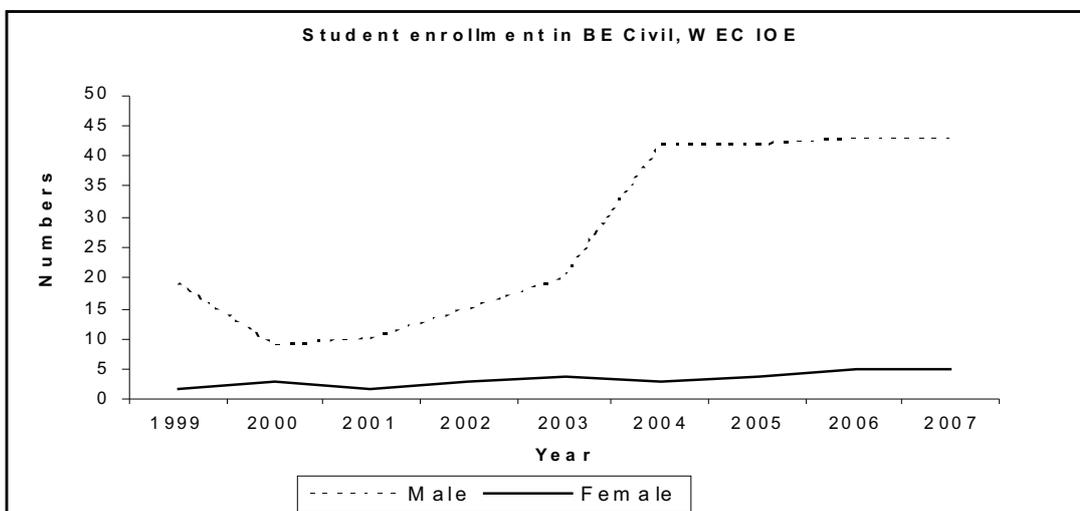
Looking at both our secondary and primary data, we see that there are very few women in the sector and fewer still in the higher positions. One of the major reasons cited by women for the low numbers in the sector is that very few women opt for a career in civil or water engineering and secondly, the water sector does not look beyond recruitment of engineers. A deputy engineer puts this very succinctly, 'teaching, health and education are considered as the most suitable options for women. Teaching because you are teaching values - children are moulded and that work is seen as women's work. There is no male interference there'.

Another woman who finally opted for an MSc in hydrology says, 'I aspired to do Civil engineering, but was told that Civil engineering is a course suitable for boys and would require site works which a girl can't do'. An assistant engineer from BWDB Bangladesh says, 'Nurse, teacher are respected as women's profession, but water is something traditionally different; it is technocratic and discourages women'. Other views show a determination: 'I opted for the job in Engineering because I felt proud that I was an Engineer', Sectional Engineer, WRD, Maharashtra. 'I accepted Irrigation because it is in the public sector and it creates national assets. I knew I was going to work in a good department'. However, most of them said that they opted for civil engineering as a last choice. Most of them also considered settling down in either teaching jobs or some part time arrangements, which would not involve too much mobility.

Secondary data for Nepal (December, 2003), shows that there are 4524 registered engineers in Nepal Engineering Council, out of which women engineers are 195 (4.56%).

Enrolment of female students in Civil engineering courses is very low as compared to male students in Nepal (Chart 4, Table 9). There is a strong preference for architecture as a course. Interviews with students indicate that among the engineering courses, architecture is considered the most feminine. It has more desk work than fieldwork which suits women's 'biological responsibility to be a mother and take care of children'.

Chart 4: Students Enrolment in BE Civil, Western Engineering College, Nepal



Source: CB Project, SaciWATERS

Table 9: Students Enrolment in Bangladesh University of Engineering and Technology (BUET) from 1991 to 2001

Undergraduate			
Session	Male	Female	Total
1991-92	524	83	607
1992-93	528	77	605
1993-94	546	59	605
1994-95	559	60	619
1995-96	608	68	676
1996-97	610	121	731
1997-98	650	112	762
1998-99	637	111	748
1999-00	614	120	734
2000-01	637	168	805
2001-02	657	162	819
2002-03	678	136	814
Post-graduate			
Session	Male	Female	Total
1993-95	502	64	566
2001-02	593	54	647

Source: CB Project, SasiWATERS

Table 10: Admissions for Engineering Course by Universities, Sri Lanka

	Peradeniya			Moratuwa			Ruhuna			Total		
	Total No	Female No.	Female %	Total No	Female No.	Female %	Total No	Female No.	Female %	Total No	Female No.	Female %
2001/2002	320	52	16.25	562	105	18.68	107	23	21.49	989	180	18.20
2002/2003	315	67	21.26	548	69	16.24	104	15	14.42	967	151	15.61
2002/2003A	329	59	17.93	535	102	18.37	116	23	19.82	1000	184	18.40
2003/2004	320	58	16.56	554	82	14.88	96	23	23.95	975	163	16.72
2004/2005	348	53	15.20	647	127	19.60	94	21	22.30	1089	201	18.45
2005/2006	364	71	19.50	801	177	22.10	205	32	15.60	1370	280	20.4

Source: Statistical Abstract 2006, Dept. of Census and Statistics

A similar pattern can be seen for both Sri Lanka and Bangladesh in the educational institutions. Bangladesh University of Engineering Technology shows only a marginal increase over the years in girls' enrolment for the undergraduate engineering courses. For the post-graduate course, it shows a downward trend. In Sri Lanka too a similar picture is seen in all the prime universities.

Nature of Women's Work in the Water Sector

Of the hundred odd women interviewed across South Asia, a majority, especially those from the engineering field, are involved in varied deskwork. They find this very unchallenging but agree that it is a choice that they have made for several reasons beyond their control. Our data shows that most of the technical women are either working as sectional engineers or assistant engineers in different departments. Almost all of them felt that their skills were highly under-utilised due to the unchallenging nature of their jobs. Most of them are stuck in administrative work and feel that their knowledge and understanding is not put to use here. The important question is why are women into these types of tasks?

Site Work and Financial Transactions Not Your Cup of Tea?

In making choices of the kind/type of work they do once in the department, women cited domestic responsibilities as the major reason for not opting for site work. But this was not always true and some women, early in their careers were seeking site-related experience, but were deliberately kept away from it. This convenient labelling of women never wanting site work was used to keep women away from a rich learning experience and also away from the corrupt politics of the organisation/sector. A Bangladeshi professional says 'mostly women are working in less important places, like drafting letter, and other communications, dealing with administrative problems, etc. My case is different, as I have already proved my capabilities, so no one bothers me now. I had to fight the culture of the organisation which only made women work at the office, but tell me what design work is complete without implementation at site?'

One of the deputy engineers of the MJP, Maharashtra says, 'Women were shifted to a project office because there was little work there. I demanded a transfer to a sub-division office, as I was interested in doing some actual engineering work, but our boss was of the opinion that we should be transferred to less challenging project (tap drinking water supply) office as he would not be able to take the risks associated with sending women to the remote villages'. She regrets today that she did not fight her way through and at the age of almost 50, she continues to be a Deputy Engineer, and works as Personal Assistant (PA) to an Executive Engineer.

Several of the young professionals spoke of their struggle to get jobs of their liking and shared how they were continuously under pressure to prove their mettle without falling prey to various tactics. A Deputy Executive Engineer at the CADA, AP, says, 'There are more women who joined as Executive Engineers but they don't have any work in the department right now. Therefore, they are assigned tasks like drafting letters, correspondence that has no relation with their education, so most of the new employees are very disappointed with the job'.

In Bangladesh, male bosses thought it a liability to recruit women for field work, but women have fought

nonetheless. A gender specialist in the BWDB challenged the decision of the senior who decided not to send her to the field.

Apart from site work, which is said to require hard technical knowledge and competency and physical strength, women were also kept away from any financial dealings. Women narrated how different strategies were sought to keep them away from sanctioning finances to projects. Men used their informal channels and collectives to decide on the share of the money. Senior Administrator, Maharashtra WRD says, 'It is difficult for a person who does not take bribe to survive in the system as he/she is continuously pressurised by others and as a result, work suffers. Women are recruited on Establishment department's desks because they are aware that they are usually not corrupt in nature. They look at this as one person less from the chain of corruption. Task allocations are thus based on these criteria, not on the work they do or are capable of doing. This work culture has to change'.

Renegotiating and Redefining Work or Fighting the System

Most of the professionals are caught in these situations and do not know if they should fight the system or come to terms through a redefinition of their work and find meaning in it. Says an MJP engineer: 'Financial tasks are not given to women but neither are we interested in them'. Or, 'we are also happy with desk work'. She continues, 'I have learned to find meaning in things beyond the water sector like teaching poor children which is more philanthropic than sitting at the desk'.

But there are others who fight it out, like for example a Bangladeshi professional says, 'I do not want to bind myself in designing; rather I want to build myself as an all-rounder. Who knows I may have to manage the entire organisation in future?' Similar feelings are voiced by many professionals in India as well. One of them, presently working as an Executive Engineer is clear that in 10 years' time she will be heading the organisation.

It is indeed difficult to interpret which of the two options can be considered as women's agency?

Images, Symbols and Metaphors

Any description of a good water sector officer started with a 'he'. Most of them thought that technical competence was very important for success in the sector as was the ability to think rationally and take instant decisions. Mostly men were seen to possess these qualities, although women too were confident of their own abilities in some instances.

One of the very capable senior officers in Maharashtra says, 'Women face problem in this sector because we lack somewhere in knowledge and daring attitude compared to men. We should be tough to survive in this'. Another one added, 'But women lack the capacity to take instant practical decisions on site. Because they have not received that kind of exposure and they are always confined to the desk'.

A sectional engineer from irrigation department says, 'an attendant in an adjacent office always thought I was a clerk in the Irrigation office. She was shocked when she got to know that I was an engineer' - a telling comment on how women are perceived as engineers.

Many of the women described their relationships with their male seniors as fatherly, brotherly and one senior engineer says, 'My boss once introduced us in one public gathering as "these are my daughters". This created a sense of attachment towards office and it motivated me to do my best and live upto his expectations', which becomes a very patronising relationship. Another officer said that survival for women in this sector is tough because one has to 'possess both the masculine and feminine qualities'.

In Pakistan, the scenario is different and all of the women described the water sector officer as male, engineer, corrupt, dominant, having support of influential/political people, field-based professional. However, recent changes in the sector undoubtedly have brought out other voices as well. They describe the ideal officer as not one with technical competence alone but also one who has ability to communicate with people and establish a rapport with communities. These are voices largely of social scientists in the sector but also increasingly of sensitive women engineers.

Men's Collectives and Women's Collectives

Usually most crucial decisions are taken after office hours and this was voiced very strongly by the Assistant engineers in AP. They add saying that women find no time to be part of these informal collectives. They are too preoccupied on both the work and home fronts and find it very uncomfortable to interact with men in these informal decision making spaces. One of them says, 'I think my work was not noticed because I am not able to be part of the informal meetings with the boss'.

Women too try to form their collectives, but these are more in the nature of sharing platforms - sharing of injustice done to them in terms of promotion, appreciation of work, etc. They also meet to discuss their personal lives and relieve themselves of the stress. In offices where women are in greater numbers, these collectives get formed otherwise it is most often a solitary struggle.

In some places like in AP, women said that there were efforts to register a formal organisation, but it never really took off. All of them felt that formal spaces would be more useful and that they should be initiated.

Difference in Thinking and Understanding of Water Issues

The gender difference in thinking about water issues was crucial from the point of view of getting insights into what the belief systems of men and women are and how they shape their understanding of issues and subsequent actions. We were not able to talk to men to assess the difference in thinking, so this set of data is largely based on women's self-perceptions about the differences.

The study found that women work with a social understanding. They think about people and have a micro-perspective which men are not conditioned to have. A sectional engineer in the Irrigation department in Maharashtra says, 'Men think more about themselves. They give more importance to proving their capacities. But women think about others - at the household level, women think about relatives, which men don't. At the office, women think about other colleagues. Men don't think like that. If somebody comes late, woman thinks about why it would have happened. But a man normally says - don't give excuses. Superiority of men is also legitimised by the society. If a man is doing something wrong then nobody tells him so. But similarly if a woman does, there are so many people who point it

out. So women are always under pressure, if they do anything wrong'.

A senior administrative officer in CADA AP says, 'Yes, there is difference in the way men and women think. Women are more committed to their work, they are seen on their seats working right from morning to evening and deliver better outputs while men feel insecure when women outperform.'

In the Pakistan FGD, women said, 'There are differences in the way men and women think, because they experience different realities based on different types of attitudes they face in society. Women's interests are usually discounted in their absence in decision making. Apart from this, women bring different set of values and perspectives to work'.

The understanding around water issues was largely dominated by the current departmental understanding. However, women are far more sensitive to micro planning and gender issues than one would otherwise assume. In an FGD in the WRD headquarters in Maharashtra a group of women engineers had the following to say, 'Water scarcity is an important issue and we cannot think about this in fragments. All the concerned departments like watershed, irrigation, etc should have a think tank at the "mantralaya" (state) level'. A Deputy Engineer at the same place says, 'I think government should initiate in building rapport with the people. I think the WUA would be instrumental in doing so. The benefits of WUA should reach people...'

Addressing the concerns of women at the grassroots level was also articulated by the women professionals as an important but missed out area in the water sector.

Making a Difference: Women As Active Agents in the Organisation

In the changing face of the sector we do see some women taking very bold steps and making a difference to the sector and specifically to the cause of women. Women professionals said that some of their qualities have proved to be assets in the water sector as well as within the organisations. In a Nepal FGD, women said that for conflict resolutions women were better. An example from a WUA was cited where a woman sociologist made a difference. There her role as a social scientist and being a woman proved to be an attribute, which she used effectively.

Another observation from Nepal shows that gender mainstreaming becomes more feasible if a women engineer is involved in designing - it helps to change the discourse on women as uneducated and weak. It represents women as an expert and knowledgeable. Moreover, women colleagues can help internalise fellow male colleagues and address the gender issues better with her experiences.

A sectional engineer from Maharashtra says, 'In fact there are double advantages being a woman professional, because being a woman, villagers take extra care and they also respect out of admiration'.

In the Sri Lankan experience, women engineers from the Irrigation Department who worked in the field stated that they had the ability to communicate better with both men and women farmers and they were accepted in the community and at field level. For example, in walk-through surveys, women responded better to women engineers than to men as they could discuss their problems with them. In projects that demand women's participation in large numbers such as the community water projects of

the Water Supply and Drainage Board, the community actually preferred to have women engineers and technical assistants deal with them.

A consultant with the Irrigation and CAD, AP, 'Being a woman, I can influence other women to come in the sector; e.g. a women who was project staff cum teacher in the Musi Project, was the only women from the village in the entire group, I used to take her in programmes like exposure visits or project committees. Since I am there, she feels comfortable to participate. A women officer's presence affects the participation of women in the field'.

Gender and Organisation Related Issues

In this study, we have specifically focused on the bureaucratic organisation, which has its own culture. We discuss a range of organisational issues from physical infrastructure and facilities to rules, hierarchy, work atmosphere and work relations.

Gendered Spaces and Infrastructure

In all of the countries, what comes out clearly is that basic facilities like clean separate toilets are missing. Most of these offices continue to be housed in old buildings, which were constructed at a time when it was not conceived that women could be employed in the water sector. There are of course significant variations across countries and states in India. In some of the newly set up offices in the capital city of AP, India we see that these basic amenities are provided for and maintained as well. However, some older offices in AP too face similar problems and in the words of Deputy Director Hydrology department, 'There are toilets but the maintenance is too bad. There is no water. Most of such issues which are very basic necessities are not talked or raised because of shyness'.

In the Sindh region of Pakistan, at the SIDA office women said that there are no separate toilets for women and mostly they use common toilets which are very unclean and unhygienic. Interestingly the location of the toilets in the office is also a hindrance to use them. In Maharashtra, India, of the 35 women interviewed, only four mentioned a separate toilet facility in their own office. Many others had to work out some arrangements with other offices or with staff who lived in the staff quarters on the campus.

The other major lack of facilities came in the form of transport and accommodation during fieldwork. In Pakistan, all of the women employees mentioned a significant lack of facilities for fieldwork for women like transportation, lodging and boarding facilities. Evidence shows that women themselves have to pay for fuel and transportation. Although this is reimbursed later, it is not a part of ToR and therefore involves a struggle each time women are out on fieldwork. In India and Bangladesh too, the overall availability of transport is not conducive for women's travel. This is strongly stated by an Assistant Executive Engineer in the Irrigation and CAD, AP where she says despite her seniority vehicle facility is not provided and then it becomes tiring and this is one of the reasons that women avoid field visits. Another striking problem that most women face in the field is the lack of security and this was voiced by women from all the countries in SA, but more so in Pakistan and Bangladesh. Evidences from all these countries bring about how space and infrastructure facilities too are gendered and how raising a demand for these facilities too is seen as a 'non issue'.

Maternity Leave and Other Benefits

Women are often seen as a liability and more so when they become pregnant. In different countries, the experience of rules for maternity and childcare varied. None of the contractual employees got maternity benefits, unlike other permanent government employees. In most of the countries, the maternity leave is not more than three months though women are demanding of at least six months of leave. In India the central government rule does grant a six month paid leave, but neither of the two states studied have accepted that rule.

In the SIDA office in Pakistan, women are not entitled for maternity leave with pay and it is a herculean task to get approval for leave. In this office women are not considered professional if they ask leave for maternity/reproductive health problems or deny working late hours.

In Nepal, the leave granted is only 45 days and women think it is very difficult to get back to work so soon. As per the government rules here, women staff can have leave for 45 days on paid basis for two pregnancies. In addition women can have unpaid leave for an extended period. Interestingly, women feel quite pressurised about this extended unpaid leave. Indeed women in Nepal say that they prefer not to go for extended period of unpaid leave when they are in a better location place job-wise such as the ministry and department in Kathmandu, the capital. An agriculture officer, who looks after small irrigation projects of the government, said, 'I was scared to take extended leave, because many officers would have liked to be based in my position which became vacant when I went on leave. If I rejoined later than 45 days then I would have been posted in some remote districts'. So she resumed work after 45 days, leaving her child at home and tried for alternate feeding arrangements besides regular breast-feeding.

Most offices do not have childcare facilities. There is no facilities for infants or breast-feeding them in the office premises. Such a condition not only affects the mother's health but also has an adverse effect on the child. In Bangladesh, of the 32 women interviewed only seven said that their office had a day care. In the Irrigation and CAD, AP, India, almost all women talked about the need for childcare facility in the office. Not only this, some of the women came forward and filed a requisition to the ENC (Engineer-in-Chief), Administration, for providing a space in the office premises for a childcare facility. The request was ignored by saying that there is no vacant room for childcare.

Maternity is not just the act of delivering a baby but involves much more than that. Women would need support in every way during that period. An irrigation engineer in Maharashtra located at the state office says, 'pregnant women are often seen as problems - but the nine months given by the women should be seen as an investment for the future'. Rules and policies within an organisation clearly reflect the gender dichotomies, which separate the productive sphere from the reproductive one. Organisations are seen as gender neutral and hence the "problems of pregnancy and child care" should be handled at the domestic level and not brought out into the organisational or public domain.

Sexual Harassment at Work Place and Related Supports

Most of the women were not too forthcoming about discussing sexual harassment at the work place. However, in Pakistan women were extremely articulate and narrated their experiences regarding men's

behaviour towards them. Majority of women here reported cases of harassment, and some of them left their jobs due to the same reasons: 'Yes we are asked by male bosses to dress in a particular way. In fact many appointments too are done looking at women's faces rather than their work expertise . . .' 'Often men ask us to come to their cabins when some of their male friends come to visit them'. 'We are also asked to perform their personal tasks not related to office jobs. For example writing/preparing assignments of their children or writing personal papers/articles/book chapters for them'.

In Maharashtra a woman employee says, 'During the Gadgebaba Swatchata Abhiyan (Total Sanitation Programme) one woman sanitation expert had made a complaint to us about the Chief Executive Officer (CEO) of a district who would often call her to his cabin after the office hours. She was on contractual employment and so was scared to give a written complaint. . . We sympathised with her, and suggested that she should take a break until this CEO is in-charge, and when he is transferred we will recruit you back. But then, she got same work in different district'. A community development expert in Maharashtra says, 'a lot of harassment is done in subtle ways - like transferring a woman to a difficult field area, allocating her tedious tasks not related to her brief'.

In the HMWSSB, Andhra Pradesh, a retired officer shared a case of sexual harassment in the office premises targeting a woman attendant. The Women's Welfare Association protested and took this issue to the Managing Director. The accused was threatened with suspension from his job. This case was discussed with other employees informally and secretly to spread the message that stern action will be taken if such an act is repeated again. Significantly, very few women shared their personal experience and said that they had heard that there are problems with other women, but they themselves have never actually faced this. A woman from Bangladesh says, 'This has never happened to me. I think it all depends on a woman and how she portrays (behaves) herself'. All of them agree that it is best not to cross the 'limits' either in dressing, having social relations at work or anything not acceptable to the society. If they want to dress the way they want, they fear that men would pass comments on them.

Many of the offices in India do have a grievance redressal cell or an anti-sexual harassment cell, but none of them said that it was active. In fact, no cases get reported there so there, is no activity. None of the other countries reported that such a cell is mandatory.

Normative Woman

Most women, whether engineers or otherwise, enter the so called gender neutral organisations aware of the normative behaviour expected of them. In Pakistan, women said that they couldn't shout or laugh loudly in offices, they should be good looking, smart and well dressed and caring as well. Politeness is valued. 'I was shocked when during the interview one of the members of the interview committee asked me not to apply makeup or dress the way he thinks women should not do so'. In the Irrigation and CAD, and GWD, AP too, most of the WWP accepted that women should wear 'decent and appropriate' clothes: Salwar kurta or saree with half or full sleeved blouses, as wearing sleeveless blouses might warrant unnecessary attention and gossip.

If a woman is dynamic she is seen as very egoistic and stretching herself a bit too far. An Assistant Engineer from BWDB, Bangladesh is rightfully agitated about this and says, 'Women are always thought typical. This is not the fact! This is time to re-think.'

Women as Preferred Subordinates

In most of our FGDs and individual interviews across the region, women spoke of themselves and other women as being very sincere and hard working. They also said repeatedly that they were not corrupt and did not indulge in power politics within the organisations. In Nepal, men said that women brought decency to the office space, that is legitimacy to the otherwise corrupt place.

Many of the male bosses and colleagues we spoke to also reiterated this point of sincerity and hard work. Women do not leave their desks until office hours are over, as against men who continuously need to move around, go for a cup of tea or a smoke, the men said. Male bosses were actually very proud of their female subordinates and seemed to see them as an asset. A DFT team leader, Maharashtra said, 'Women do their tasks with dedication, we specially like to give them tasks that have to be completed in a particular time and need rigorous follow up'. As a woman from Pakistan rightly commented, 'Women's issues are not their priority; they want to see women as sub-ordinate to men'.

Most women recognise these qualities in themselves and also the fact that they get to do the most tedious of the tasks while the men fritter away their time. Women said they neither have the time to engage in organisational politics nor the initiative to involve themselves in corruption. So more than lauding women's values as inherent feminine qualities, one must see them in the context of women's over-burdened life which does not permit them to engage in these activities and the societal expectations of them. But, nonetheless these are qualities that need to be nurtured as part of a progressive value system.

Women as Leaders

Most men find it difficult to accept women in leadership roles. They are always more comfortable in brotherly, fatherly roles to women (of course they do not miss any opportunity to make passes at them as well in these roles too!). Deputy Engineer, Maharashtra MJP: 'Men are not ready to accept women as their boss. Age is another constraint. A junior at work, but senior in age found it difficult to accept me as a boss. Then it becomes difficult to take decision.' Often men oppose women's seniority as that curtails their chances of sharing in the corruption that takes place.

Women had mixed responses to women bosses. Some were sensitive to women's timings and allowed for more flexibility in work hours, but some were very rigid and refused to budge on the rules. In fact, women said that sometimes male bosses were more considerate in this regard.

Gender Neutrality With Seniority

A typical finding across the countries was how seniority and moving up in the hierarchy affects women professionals. Many of these engineers have struggled their way to reach the posts they have but when we spoke to them, they have this to say: Senior Executive Engineer CADA, AP - 'I have a good relation both with my boss and my juniors. One should focus on work and the outputs but not the gender. I do not discriminate based on gender. There should be positive relations between each one of us to deliver good outputs'. A similar experience can be shared from Maharashtra as well where a woman who started out as an Assistant Engineer is now a Deputy Engineer, but feels that gender should not come into

organisations.

A different example was seen of an Executive Engineer leading an entire division in Maharashtra; of how an individual actor can change the culture of the organisation/sector. With her innovative ideas of discipline, she has made a difference to work culture and has made many of the women feel secure. Examples are cited by some of the other women members who worked under her, of her sensitivity to women and their roles and responsibilities. Most men, who were not too happy to see a young woman boss, gave her the most respect and support in her work. Usually women in power tend to become gender neutral and start advising women to become tough, leave their private spheres at home etc., but she seems to be different and it is this difference that is important. There is no struggle for being equal to men or being like men, but just being a woman and yet succeeding by your own definitions.

Changing Gender Relations at Work and Home

As working women and as water professionals, women have had to undergo several changes in their lifestyles. Many of them are overstressed because of many responsibilities on different fronts and lose out on any meaningful relations with both their families and work colleagues. Different women water professionals shared the following:

One of them says, 'After doing all the housework I am not given due status in the house. I am always taken for granted and decisions are always taken excluding me. My role is that of executing the decisions'. 'Women cannot fully dedicate to their work, also because of the patriarchal system. Home becomes their first priority. They look at the work as an employment and not as a social concern'. 'As a woman I had to struggle to prove my mettle. Whereas, my male colleagues were encouraged to take on new responsibilities, they got more exposure, and so their career grew. They easily get sites, but for me I got it late. There is a protective attitude towards women which is not always positive'. 'At office level, I continuously have had to prove myself. The seniors always seek opportunities to find faults. The smallest of mistakes are not spared. 'Woman Engineers are expected to be perfect but the same is not expected of male Engineers, they are allowed to make mistakes'.

At work, women are often ridiculed for getting all the privileges in terms of leave, desk work, etc, but women think differently and say that it builds tremendous pressures on them. They need to prove their mettle and therefore demand exposure to a wide range of activities, but never have that opportunity. So both at home and at work, women are perceived as escaping work.

Caste and Other Forms of Social Discrimination

Patriarchy coexists with the other forms of social discrimination. In the Indian context the interplay between caste, class and patriarchy needs to be examined far more carefully than it is done here. One of the senior administrators says, 'I am not dominant kind of a senior, may be because of my caste (Dalit/Scheduled Caste (SC)). I have always taken a submissive role. So even as senior I am not bossy'. A young Dalit (SC) civil engineer in the head office in Mumbai says, 'I never faced caste related discrimination. Maybe people feel or express their jealousy but it is among themselves, I do not know any. Never experienced it on the face because people are aware that it could be termed as harassment'.

Way Forward and Recommendations for Government Polices

Two sets of issues determine women's presence in the sector. The first relates to the educational choices women make and the second relates to the major constraints that women face after entering the sector where the struggle between the public and the private sphere becomes significant. Challenging the notion that hard sciences are for men and soft disciplines for women therefore becomes an important ideological struggle. At another level, a change in the understanding of women's work too becomes important in changing our existing belief systems that determine women's absence in this sector. Reconceptualising science, here in water sector and in women's work, would definitely go a long way in making it more conducive to gender equity. Moving with this understanding, the study then proposes the following recommendations:

Need for a Gender Policy in the Water Sector

Almost all the women we interviewed said that there is no specific gender policy for the organisation and it would be important to have one. This should outline specific rules regarding organisational facilities, allocation of tasks, etc.

More Numbers can Make a Difference

Changing staff composition may have greater impact as women's interests are discounted in the absence of women at all levels, mostly at the policy and decision making level. Women will also bring in a different set of perspectives than men on many issues. It therefore becomes important to bring in a policy of reservation in government recruitment. Maharashtra has introduced such a policy of 30% reservation on all new recruitments and this will change the composition of the sector in the coming years.

A view from Sri Lanka stressed the need for including non-engineering experts in the water sector. The integration of sociologist, social worker, graduate in environment science and professional from other disciplines is very important to bring in a socio-technical perspective. Those with Masters degrees in environmental science (with 'water resources' as an elective paper) complained that they did not find a job in the water sector. They complained that their credibility to work in the water sector is considered less as compared to engineers.

Basic Amenities and Benefits

Almost all the women in each of the countries asked for improvement in sanitation facilities at the work place. Apart from this, they asked for increase in the duration of maternity leave upto six months and introduction of a childcare centre at the work place. Women engineers in AP narrated an experience of following up on these demands and yet not succeeding.

Women also spoke of some flexibility in work hours especially those with younger children as that becomes a major constraining factor for women to continue performing effectively. Women who have to take a break after marriage and children need some incentives in terms of fellowships to get back into their careers. Some of these benefits have been introduced by some state governments like

Maharashtra in India

Training and Capacity Building

The Sri Lankan study prominently highlights the need for bringing in multi disciplinarity in the water profession. Trainings on bringing in a socio-technical perspective of water management is, thus, seen as important. Apart from that, several women said that they need regular refresher courses on engineering subjects. A lot of their knowledge does not get utilised and hence they feel stagnated. Many of them said that there were no trainings done with them after the induction trainings and exposure. A few of them who had attended trainings on communication skills, building rapport with communities etc. found it very useful and wanted more such trainings. Women in Pakistan underscored the need for gender sensitivity trainings for the male staff and said that no change would be possible without that. In Bangladesh, all the WWPs emphatically stated the need for capacity building as a major requirement, for themselves as well as to sensitise the men in the office.

Networks and Regular Meetings of these Networks

In most countries, women felt the need for regular meetings through networks that can liaise with other women's groups . The interviews clearly showed that women are looking for an articulation of their concerns and want visibility to their concerns.

In conclusion, we see that the challenge is formidable but requiring attention. The challenge for us then is the creation of new forms of organisation, education and practice through which scientific knowledge and technique will become more representative and inclusive.

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List of Abbreviations

AP	Andhra Pradesh
APSIDC	Andhra Pradesh State Irrigation Development Corporation
BCAS	Bangladesh Centre for Advance Studies
BWDB	Bangladesh Water Development Board
CADA	Command Area Development Authority
CBO	Community-based Organisation
CEGIS	Centre for Environmental and Geographic Information Services
DPHE	Department of Public Health Engineering
FGD	Focused Group Discussion
GSDA	Groundwater and Survey Development Agency
GWD	Ground Water Department
HMWSSB	Hyderabad Metropolitan Water Supply and Sewerage Board
IWM	Institute of Water Modeling
IWRM	Integrated Water Resource Management
LGED	Local Government Engineering Department
MJP	Maharashtra Jeevan Pradhikaran
NGO	Non- Government Organisation
RSPMU	Reform Sector Project Monitoring Unit
SIDA	Sindh Irrigation and Drainage Authority
ToR	Terms of Reference
WARPO	Water Resources Planning Organisation
WRD	Water Resources Department
WSSD	Water Supply and Sanitation Department
WUA	Water Users Association
WWP	Women Water Professional

'THE TIMES OF HOPE AND DESPAIR': GENDER AT THE CROSSROADS OF WATER AND SANITATION IN BANGLADESH

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1. Introduction

Since our childhood, the fairy tales of different cultures such as Cinderella, Sleeping Beauty (English), *Vacilisa* (Russian) and *Rajkonna Kongkaboti* (Bengali) have been enchanting our minds towards the 'romantic' notion that a brave, dynamic, strong prince will come and rescue the princess from worldly distress so that they can live 'happily ever after'. These fairy tales depict a 'dream world' where suffering, pain, vulnerabilities and violence are non-existent. This *Cinderella symptom* has indeed deeply influenced the social attitudes and the behaviour of men and women in any given society. Recently the Oscar winner movie 'Slum Dog Millionaire' depicted the miserable face of poverty as well as the 'heroic' role of a poor boy living in a Mumbai slum. The real stories of the 'prince and princess' are far different from those depicted in fairy tales or in the movies. I quote here the voice of a 10 year old girl living in a slum in Dhaka, the capital of Bangladesh. Poverty has taken away her childhood but not her dreams. Young Farida, tiny and malnourished, carries six pitchers of water every day which often leaves her shaking from exhaustion. Farida shared how painful it was for her to walk each day and collect the water:

“My body aches, my waist and my legs ache so much. I end up getting an ache in my waist whilst walking all the way. This job is painful. My mother also carries water. Some other girls do similar work. They bring the water in the morning and then leave for school and fetch water again after school”. She mentioned that some houses do not fetch water. “If the woman of the Household is ill or elderly then they buy one pitcher of water for five taka.’ Sometimes my mother does this, but I do not let her do it. Her hand is broken so I do not let her collect the water. If she gets hurt and dies then who would take care of us? We bring six pitchers daily. We have to cook in the morning and in the evening, so we need more water. My father pulls a rickshaw. My mother works in the community centre where marriages take place. She comes at night. I carry lunch for my sister at Pallabi (nearly two miles away from the slum) as she works in a garment factory. I bring water from above and it is a hard job. It is very far. After returning, I bathe my younger brother and sister; feed them, put them to bed and then I go out to collect sticks for the fire. Then I take a bath and leave for school. I wish we had a better water and sanitation system. The bathroom is dirty and I cannot go in it. Nobody cleans it. People cannot pay the expense of the cleaner. How would they pay when there is no work? There is a problem with water in the pond. There are many people who go to the pond to bathe and end up urinating in the pond. I hate this. The sewage pipeline from the toilet also ends in the pond. This causes diseases. Many face diarrhoea and as a result lots of money is wasted. We face more problems in the rainy seasons. We live in this wrecked house and when it rains we fall into trouble. In this situation we sit here and cry. What else can we do when we are poor? We live in this slum because of the fact that we are poor. I want to do a decent job. I want to go to a nice school and also want to be a doctor. I just want to take good care of my parents. I am willing to do any job”. (Mannan, 2003).

Rapid urbanisation in Bangladesh has primarily been a function of rural to urban migration. There is a strong link between urban poverty and the feminisation of the poverty of women who have left villages with the hope of a better future. However, the garment industry promoted by the globalisation principles of a free market economy has been instrumental in the in-migration to Dhaka. They are living a miserable life in the cities without basic services and amenities. Although they have been contributing to the national income, where 90% of the workers in garment factories are female, the majority of whom, live in the slums. Squatter settlements and slums do not have legal tenure or occupancy and are thus not officially recognised and served by Government authorities. Insecure legal tenure makes slum dwellers vulnerable to eviction and thus results in both NGOs and poor residents being reluctant to invest in micro-credit schemes, building of schools and establishment of water points and latrines. As such, only a small number of NGOs work in urban areas with the majority of development work and interventions being concentrated on rural areas (Feroz Ahmed, 2004).²

Poverty experiences are more or less the same irrespective of the geographical locations, but are very different in terms of gender. Gender and the environment (encompassing water and sanitation) is one of goals in the Millennium Development Goals (MDGs) for eradicating poverty. The two issues are interconnected as water is essential for the well-being of humans, crucial for economic development and a primary prerequisite for the health of ecosystems. Safe water for domestic purposes is a necessity for human health and survival and along with improved sanitation and hygiene will decrease morbidity and mortality especially among women and children. Water is an entry point for sustainable development, poverty eradication, human rights, reproductive and maternal health, combating HIV and AIDS, energy production, improved education for girls and a reduction in morbidity and mortality. But yet there are still 1.1 billion people without access to safe drinking water and 2.6 billion without access to adequate sanitation (Internet: Gender and Water Alliance, 2010). This situation has an enormously negative impact on women and children worldwide, including those in Bangladesh

With this background, this paper will be focussed more on urban than rural based issues in relation to gender, water and sanitation. Insights will be drawn largely from my long term involvement in research titled 'Livelihood Gender- Sanitation relating to Urban Poor'. The paper will also consider the links between gender related policy approaches in general (WID, GAD) and water and sanitation in particular, to locate the critical concerns and issues in Bangladesh.

1.1 Is gender a development issue?

It has been accepted that without the development of women, who constitute almost half of the world's population, real development cannot be achieved. International recognition of the critical and complex socio-economic and political conditions faced by women are reflected in world conferences of the United Nations held in Mexico in 1975, Copenhagen in 1980, Nairobi in 1985, Beijing in 1995 and Beijing +15 New York in 2009. Many international agencies, including the UN, along with national governments have given gender issues a higher profile when addressing development challenges, particularly in developing countries. Renowned universities all over the world are offering gender courses and organising conferences, seminars and workshops about these issues. Academics, feminist writers and activists are continuously working on gender issues in many parts of the world.

The concept of gender is perhaps the single most important factor in shaping who we become. Feminists argue that culture and religion portray an expectation of the ideal role of a 'good woman' as the dedicated mother, wife, sister and daughter in society. These patriarchal systems shape the minds of society. This social construction of male and female relationships denotes gender stratification, that is it refers to an unequal distribution of socially valued resources and rewards between men and women e.g. women are only seen as docile, wives and mothers involved in cooking, cleaning, washing, caring and nurturing the family within the private sphere, whereas in public sphere, men are strong, virile, the breadwinner, head of the family and the decision maker. Thus, from the time when we are born until we die, gender socialisation is a constant part of our lives.

Gender refers to the social relationships of a given society that are constructed by man or manmade patriarchal systems. Connell has argued, that the concept of hegemonic masculinity reflects the power dimensions of gender relations (Cleaver, 2002; Connell, 1987). This concept introduced some fluidity, in the sense that masculine and feminine characteristics may change over time, and thus the ruling group of men may be replaced by another group of men (Bhasin, 2004; Chowdhury, 2008). However, gender roles are a dynamic concept that is flexible, shifting and constantly changing over time and in terms of context. Gender is thus an analytical tool used to understand the status of men and women in a given society.

The water and sanitation sectors have also been emphasising gender equality and demanding greater participation of women in social, political and decision making process, actions which have resulted in an empowerment process for women. 'Water is also vital for other facets of sustainable development such as environmental protection, food security, empowerment of women, education of girls and reduction in productivity loss due to illnesses. Water is a catalytic entry point for developing countries in the fight against poverty and hunger, and for safeguarding human health, reducing child mortality and promoting gender equality and protection of natural resource' (UN Millennium Task Force on Water and Sanitation, 2005). But we still experienced that despite the various policies and measures adopted by international agencies and national governments, women are the poorest of the poor, particularly in developing countries. The question to be asked is whether women access and participate in the development process? How effective has the water and sanitation sector been in promoting women's advancement and gender equality? What have been the achievements so far?

I have found no simple answers to these questions. As mentioned earlier, gender is a complex issue and it must be dealt with from a holistic perspective. I would now like to discuss some of the current issues and debates in Bangladesh around gender and development in general but in particular relation to water and sanitation. There have been some significant policy level achievements in this sector, but huge frustrations remain in the attempts to translate these policies into practice. I will not critically analyse the water and sanitation sector, but rather I am seeking to look at the nexus between gender approaches in water and sanitation among urban poor, who are identified as a critically vulnerable section in society.

2. Gender and development, water and sanitation: Hopes and despairs

The last few decades have witnessed a great deal of discussion on the development of women and

gender, particularly in developing countries. Mainstreaming Gender³ has been since the 1990s a key concept discussed in literature in the fields of gender and development. The ultimate goal of gender mainstreaming is to achieve gender equality. This concept successfully leads to a gendered perspective in the national systems of developing countries, including Bangladesh.

Correspondingly, mainstreaming gender in water and sanitation would re-address the gender inequalities in this sector that currently hinder development. Increasing international awareness about the importance of gender in sanitation and water to date has had little impact on planning, policy and management (Plowman, 2000; Mannan, 2010). Nonetheless, in recent development processes in Bangladesh and particularly in the sector of water and sanitation, gender is being referred to as a 'cross-cutting' issue that is often lost in the mainstream approaches (Mannan, 2010; Joshi, 2003). For many agencies working in the WATSAN sector, 'Gender still means women (and children)' and the manner in which gender is addressed, translates at best to involving women in the projects (as in the WID approaches from 1970s), with the emphasis still being on making the project successful, i.e. completing within the given time frame and with low costs (Wallace and Wilson, 2005; Cleaver, 1998).

Again, effective analysis suggests that 'gender approaches to water and sanitation have largely concentrated on increasing the numbers of women represented in the organisations. This approach is justified by the argument that involvement in decision making and management will ensure that resource management takes the priorities of women more accurately into account, resulting in the more efficient empowerment of those who take part (Cleave, 1997; Narayan, 1995; UNDP, 1990; UNCED, 1992; SDC, 1994; DANIDA, 1992). In Bangladesh, this sector primarily focuses on the Practical Gender Needs (PGN) as directed by the WID approach and yet lacks the implementation of Strategic Gender Interest (SGI) from the perspective of the GAD approach, which hinders the empowerment process of women which discussed below.

2.1 Lack of conceptual clarification

I have come across different interpretations and understandings of gender among and within organisations (Mannan, 2010). Either they treat it as 'special', as a separate issue or there is a general understanding that it is not a responsibility of all, but the sole responsibility of the gender focal point or if there is one, the gender unit. The perception of gender varies from person to person, between males and females and even within females as identified by a senior female staff member of a national NGO in Bangladesh, "I got the impression that gender as a concept is not understood by the majority and that the entire burden of gender lay on the shoulders of me alone. Even some of my male colleagues complained that 'everywhere women are receiving priority and please stop this as you are raising problems by giving them priority'". This person was the only person responsible for looking after 'gender' concerns or issues within this organisation (Mannan, 2010).

In Bangladesh, while water and sanitation for the poor remains a 'poorly researched issue', gender issues are an even more neglected concept, highlighted only by the occasional passing reference to women's roles as family caretakers or their needs for privacy during defecation. The Bangladesh Poverty Reduction Strategy Paper (PRSP) fails to include an understanding of the local poverty and gender inequities that affect sanitation and water and its uptake. This is ironic in light of the huge volumes of

poverty research in Bangladesh (Joshi, et al., 2005). None of the agencies (NNGO, INGO or even donors) do not have conceptual clarity and well defined policy framework in relation to gender in the water and sanitation sector.

In Bangladesh, the widespread use of the term gender has been largely influenced by donors. Each project in each sector then develops their own gender policy according to the donor's requirements. These have not been consolidated by the respective ministries or departments (or even donors). There is such resistance to follow the gender policy of a project that even committed staff members cannot make progress beyond their own immediate scope. Gender policies themselves tend to only cover the difference between men and women. However, the lives of men and women from each different socio-economic group are very different. As a result, most urban policy documents categorically mention women and/or gender with little differentiation made between the two terms. Subsequently, the process of implementation has been hampered due to the lack of a proper understanding of the issue.

2.2 Policy intervention and gender

The Constitution of Bangladesh ensures equal rights and equal opportunities to all citizens, irrespective of sex (Articles 19 and 20) and the participation of women in all spheres of national life (Article 10). This is further incorporated into the principles of City Corporation 'municipal ordinances - intent' to provide basic services to all. Articles 17, 18 and 19 of the Bangladesh Constitution refer to the provision of educational, nutritional, health and other socio-economic services and opportunities (MOL, JPA, GOB, 2000) and the 1997 Pourashava Ordinance outlines the provision of water supply, sanitation, drainage, refuse disposal as compulsory functions of these local bodies (MOL, JPA, GOB, 1998). The National Housing Policy (1993, 1994, 2004) makes specific recommendations (in Article 5.10.2 of NHP, 2004) to provide 'slums and settlements with hard core poor' populations with water supply, sanitation and other basic facilities. The policy goes as far as recommending (in Article 5.10.5) the extension of water and sanitation services to permanent dwellers and other non-slum poor (GOB, NHP, 2004). It is the only urban development policy in Bangladesh with little influence from international donor and financial institutions because Dhaka Water and Sewerage Authorities (DWASA)⁴ in collaboration with national and international NGOs have been undertaking the activities of providing safe water and sanitation in the slums and to low income communities (Source: an official document of DWASA).

All policies and strategic level planning, including the Millennium Development Goals (MDG) and Poverty Reduction Strategy Paper (PRSP)⁵ also provide strong emphasis on water, sanitation and gender in Bangladesh. Since the 1980s, many initiatives in the sanitation sector have singled out women for special attention. In 2003 an international conference on sanitation 'SACOSAN' was held in Dhaka with a declaration of sanitation for all by the year of 2015 with the support of the Government, NGOs and donor collaboration.

Despite the vast numbers of poverty studies and analyses, policy formulation in Bangladesh remains an elitist exercise. An example of this is Bangladesh's PRSP, finalised in December 2004. There is local criticism that 'the policies proposed in the draft PRSP are pro-poor but do not offer tangible initiatives to bring about real improvements in the lives of people living in poverty' (Ahmed, et al., 2004). The PRSP is claimed by its formulators to be a product of participatory consultations, but provides no evidence of

consultation with urban poor or with women (Joshi, et al., 2005). There is a notable silence in Bangladesh, as well as in international policy statements on the sanitation needs of children, the elderly and the disabled and finally on why and how women remain responsible for water and sanitation tasks at home (Joshi, et al., 2005). There is a National Plan of Action for the Advancement of Women (1998) and the Ministry of Women and Children Affairs is responsible for overseeing its implementation. Instead, it is largely ignored, partly because it is too long, too complicated and too confusing (Joshi, et al., 2005). However, respect for the rights of the poor to demand a space and voice in urban planning is not encouraged by the government and is rarely challenged or supported, even by progressive donors (Joshi, 2005; Mannan, 2010). During a personal meeting with a senior urban development staff-member of a donor, it was stated that the donor's focus was not on urban poverty, as this would oppose the government initiatives to control in-migration (Mannan, 2010).

2.3 Gender blindness within organisations: an effective agent for change?

The first feminist critics of organisational theory developed in the mid-1970s, as a result of organisations not being gender-neutral (Plowman, 2000). From feminist perspectives, it is well understood that women have not equally benefited with men from development, a statement which includes the sanitation and water sector (Zwarteveen, 1994; Goetz, 1997). However in Bangladesh, there is inadequate knowledge and documentation about the understanding of gender, water and sanitation in general and in reference to the role of organisations in particular. In the sanitation sector in Bangladesh, gender is neither adequately visible at the grass root levels nor within organisational culture. Development agencies (NGOs, Donors) have sound gender policies, but it has been observed that the mind-set at a management level is very important. For example, a sector programme coordinator of a donor agency who has been in Bangladesh for eight years admitted that he was not totally familiar with the urban sector in general and gender in particular, but argued that over the past five to six years, that gender had been an integral part of his work! (Mannan, 2010)

The extent to which women in a given organisation can exercise power is dependent on whether the concept of gender analysis has been introduced into the organisation itself. National cultural values are reflected in the ways in which an organisation functions. These values stereotype the appropriate roles and behaviours in a manner that generally limits the access of women to resources and decision-making (Wallace, 1998). A senior level manager (female) in an INGO shared her views about gender, 'I observed that a trend in this office among male colleagues, even at the higher executive level, is to have a friendly attitude and cooperate with female staff members only at lower levels but not with female staff members holding an equal or higher position' (Mannan, 2010).

The effectiveness of the existing 'women's machinery' of the government, which has been in place for a long period of time, has never been properly analysed. The Ministry of Women and Children's Affairs (MOWCA) was established in 1984 and later, WID and sub-WID focal points were introduced to each ministry. However, organisational attitude towards gender relations reflect not only in the external programs of the organisation but also in the internal organisational culture. As Plowman critically argued, "it is always much easier to raise questions of gender differences in an organization's programs 'out there' in the field, than it is to get your own house in order first" (Plowman, 2000, p193). Hence gender is not only lonely on the agenda, but also receiving 'subaltern' attitudes from the policy through

the organisational level in relation to water and sanitation. In the decision making process there are quite a few professionals and academics from the water field working in the sectors where I identified serious gender gaps.

2.4 Gender and governance: a power relation

In a gender sensitive system of governance, the required machinery is created to facilitate the process of gender mainstreaming in all sectors, including water and sanitation, so that both men and women are given the opportunity to participate equitably in the development process. Women's participation is marginalised even further at local government institutions, reflecting the social realities of the subordinate and dependent status of women and the consequent invisibility of them in the public sphere in Bangladesh. In order to secure a minimum representation of women at the various levels of local government bodies, the system of nomination was introduced by ordinances promulgated and/or laws framed by the Parliament. Women's access to the political arena is one of the most significant areas in the empowerment process of women. Women are still in the secondary position and cannot influence the decision-making process in the family, community or at the national level. Women's participation in politics is a precondition for democracy and the state is compelled by the principles of equality to ensure steps are taken to achieve this. In addition, one of the primary reasons why successive plans have failed to be achieved and policies have failed to be implemented in Bangladesh is the partisan attitude of the alternating governments⁶ (Joshi, 2005; Mannan, 2010).

2.5 Urbanisation and gender: limited access to basic services

Over the recent years Bangladesh has experienced rapid and unplanned urbanisation; the capital city of Dhaka has already a population of over eight million. The inadequacy of urban utilities and overcrowding are reflected in the high levels of urban deprivation in Dhaka, characterised by poor levels of public health, education, shelter and provision of infrastructure. In the slums, which are occupied by 22% of urban inhabitants, less than one-third of the people have access to a public water supply and less than one-fifth to proper sanitation. In general, the environmental conditions in the slums are deplorable and deterioration of the urban environmental sanitation situation is foreseeable (Joshi, 2005).

Cash is desperately needed in the slums to pay for water, food, rent and for goods and services. A study conducted by Southampton University (2005) projected that water collection takes a long time in the slums. Women waited in queues and walked for 30 minutes to almost an hour on certain days and nights just to access water. Women are the prime victims of this situation, carrying water from long distances and in order to keep their 'dignity', waiting for less crowded times to go to the latrine either in the early morning or late evening. No privacy for young girls when bathing or particularly on their menstruation days is problematic, when they cannot occupy the latrine for the required time. This wasted time means that they are late for work or miss working days. Shanti for example, a garment worker, missed one working day so that she could wash her dirty dresses and take a proper bath in Begunlita slum. Children get sick because of the dirty water and unhygienic environment and women are then responsible for taking care of them. This also has an impact on their working hours as well as their income. Further, pollution and the lack of access to clean water are proliferating the cycle of poverty, water-borne diseases, and gender inequities (Khosla and Pearl, 2003).

Government authorities do not serve slums and squatter settlements as they do not have legal tenure or occupancy and are thus not officially recognised. The absence of legal entitlements of the slum residents has resulted in the current practice of bringing in illegal connections for water, electricity and other services. Providing services may constitute a 'de facto recognition of their right of their occupancy' (Feroz Ahmed, 2004). In general, committee members/leaders are the main decision-makers on social issues and access to resources in the slums. For the urban poor, the ability to gain access to any service involves manoeuvring and building relations and networks in complex vertical, political economic structures. For instance, research titled 'Mastanocracy, Insecurity and Gender in Dhaka slum' (Mannan, 2011; Mannan, 2007) highlights the importance of social and particularly political-economic networks which in turn determine access to all kinds of resources and basic amenities from land and housing to water, gas, electricity and jobs. Groups of influential leaders/committee members control the monopoly of basic amenities, charging/extorting ordinary residents huge amounts for access to erratic and inadequate supply of water,⁷ electricity and other basic services (Mannan, 2004; Joshi, et al. 2006; World Bank, 2007).

2.6 Gender and violence

These political alliances do impact on the situation of the slums and the vulnerability of the slum residents, particularly the women, as they are the most vulnerable and easy prey to violence. Mastanocracy as a process intensifies the vulnerability of the urban poor, especially the women (Mannan, 2011; World Bank, 2007). In the Dhaka slums, the influential men (leaders/mastans) from outside the slum try to maintain their dominant position by establishing networks with those up in the existing higher vertical, political structures. Nonetheless, many garment workers living in the slums routinely have to pay 10 percent of their wages in 'protection' (World Bank, 2007). In a Dhaka slum, for example, one teenaged (unmarried) girl who works in a garment factory received the threat of rape if she did not deliver Tk. 5000 to the mastan (Mannan, 2011).

2.7 Missing population: Elderly, disability and gender

The lack of access to adequate water and sanitation places an enormous burden on poor women and in particular, on elderly women living alone who take on the entire responsibility of daily cooking and cleaning themselves. A large part of the vulnerability of women is caused by gender norms, expectations and social and economic roles. Elderly women tend to remain disadvantaged because of their age, health, gender and restricted mobility and also the lack of support from family, society and the state. Poor access to water and sanitation greatly increases their vulnerability. In the slums, poor elderly women have to pay to get some water for drinking or washing. They usually pay young children for a pitcher of water or so. Most of these women have no electricity connection as they cannot afford it. They have dug a hole in their own little hut for a toilet. They use the common bathroom for their daily wash whenever they can manage it.

2.8 Ecological degradation and livelihood strategies

The water pond has played a crucial role in the lives of women. It provided a source of washing, bathing and even drinking water at no extra cost. But now the pond, rivers and other bodies of water are

disappearing. They are either drying up or filled in by illegal occupancies and multi-purpose buildings. Ponds and open lands are important sources of livelihood strategies for the poor. However, with an increasing number of people in the slums, the lack of a natural water body coupled with land being claimed by the housing society and government, pose a great threat to these vulnerable women as they are denied yet another form of institutionalised access.

2.9 Gender and poverty; an old drink in a new bottle!

Despite all the efforts, women and children are the most vulnerable groups amongst the poor in Bangladesh. The magnitude of poverty and vulnerability of women remains shocking. Rounaq Jahan (1995) illustrated this in her book 'The Elusive Agenda: Mainstreaming Women in Development' when she describes the situation of women in the world: "In the last two decades, more women have joined the ranks of the world's poor in both the North and South. The cutbacks in social services as a result of structural adjustment policies, and the increased incidence of crime and violence, have hit poor women the hardest. Women's responsibilities as sole or primary income-earners have increased, their labour force participation rates have grown, but the workplace has not made significant changes to accommodate women's needs, and continues to exploit women as cheap labour. Economic desperation has led to unprecedented female migration and an increased trafficking of women and children worldwide".

Equally, in Bangladesh men and women experience poverty differently. The highest rate of poverty is found amongst poor females in Bangladesh.

2.10 Gender budgeting

According to Amartya Sen: "If our goal is to strengthen economies, alleviate food crises, and eliminate disease and poverty, we must invest in women" (Source: internet). The allocation of the budget for gender related activities is not receiving due attention at the institutional level. However there is flexibility in the gender budget, when required it can be allocated to emerging issues as identified through field level development work. 'Gender is a 'cross cutting' issue that has a 'cross cutting budget' with flexibility to change accordingly' (Joshi, et al., 2005; Wallace, 1998; Plowman, 2000; Zwartveen, 1994; Cleave, 1998).

Dhaka Water Supply and Sanitation Agency (DWASA) and governmental organisations do not have separate budget for gender, and thus they think that "no support was forthcoming on the policy paper in relation to gender. They hope to soon launch a large project with the financial support of the World Bank. Under this project, WASA will improve its 'gender sensitivity' and other pro-poor policies". The Ministry of Women and Children's Affairs (MOWCA) receives funds directly from the government of Bangladesh. Interestingly, within this total budget there is no separate allocation earmarked for gender related issues. Gender remains a cross-cutting issue in the governmental organisation both theoretically and financially. This makes these organisations less accountable and committed to gender in relation to water and sanitation in Bangladesh. The government of Bangladesh recently declared a Gender Responsive Budget (GRB) for 10 ministries for 2010 -2011. This allocation represents 25.96% of the main budget and the government promised to do the same for the other ministries in the near future

(Shomokal, Bengali daily newspaper, 27th August, 2010, p 13).

3. Half of the world, half a chance⁸: Gender at the crossroads

This paper has illustrated some critical issues in relation to gender, water and sanitation in Bangladesh. Nevertheless there are other significant issues beyond gender that also require appropriate attention which are not discussed here. To meet the demands of women's movements and mandates of the United Nations, many special policies and measures have been taken and many international agencies, including the UN, have given gender issues a higher profile when addressing development challenges, particularly in developing countries. According to various data analyses, more girls in Bangladesh are enrolled in school and more women hold political positions in national and local government; but in the crucial areas of women's employment and reproductive health (strongly related to the access of water and sanitation), progress has lagged. Likewise, because of its global relevance, the national government has also identified gender issues as a prime concern in the development planning process.⁹ Progress has been made against the development challenges of the world as set by the MDGs, but much more remains to be done if the world is to achieve gender equality and empowerment of women by 2015. Worse yet, other priorities cannot be measured due to limited or non-existent data. For these areas, we have no idea whether progress is being made and if so, to what extent. To conclude this discussion, some major issues will be highlighted in the context of Bangladesh in relation to gender.

Organisational culture is of critical concern. Deep rooted gender inequalities do exist in the organisations currently being discussed and research points towards three major areas for further consideration: a) organisational culture, b) financial status and c) the power axis within and beyond the organisation. The organisational culture (how values, beliefs and attitudes are played out in practice) is strongly influenced by the given social institutions. Agencies are not alienated from the society; their culture has both external and internal influences that shape roles and culture. Values and culture of a particular society in turn have a great influence on the organisation.

It is not possible to create a gender sensitive organisation until or unless top management is willing to institutionalise gender related issues. Gender is locked in the minds of the agency leaders. The majority of NGOs in Bangladesh suffer from the 'Charismatic Leadership Syndrome' (Mannan, 2002) that is to say that the head of an organisations or the core management team are making the decisions and the voice of women is seldom heard or recognised.

There are no shortcuts to mainstreaming a gender perspective into an organisation's policy and working practice (Levy, 1996). Rather, a dynamic process of questioning "one's own practice and how it promotes the values that are espoused, and then adapting accordingly, is essential" (Wilson and Wallace, 2000). As discussed, gender is always treated as 'special' or a separate issue and thus the general understanding that it is not a responsibility of all but the sole responsibility of the gender. This is one of the major challenges for organisations seeking to mainstream gender.

Gender mainstreaming in development sectors is very much dependent on the role and attitudes of the government and funding agencies. In Bangladesh, the whole concept of gender has been largely shaped and formulated by the donors along with national and international feminist movements. In fact, the

development arena and its many facets, concepts and tools are mostly designed and dominated by outsiders who operate top down and rarely from the bottom up. This situation therefore demands strong commitment and long term sustainable efforts to face the challenges on many fronts and has a long way to go to mainstream gender in sanitation, particularly in institutions. This external influence has caused an enormously debilitating impact on the country's capacity and in terms of the effect it has had of emasculating the intellectual capacity of the country to undertake its own development planning or thinking (Joshi, 2005). Recently in a workshop in Dhaka organised by the BRAC, a leading NGO in Bangladesh, the agriculture minister, Ms Matia Chowdhury (she is an eminent nationalist politician and is renowned for her dedicated work in Bangladesh) asked the NGOs not always to follow the donor prescribed roles for the donor and the implementing agencies, she said, "we [NGOs] don't judge the pros and cons of a project if we get funding without analysing the country's socio-economic and ecological realities and the need of the people" (The Daily Star, 12th August, 2010).

There is a lack of reasoning and power in the institutionalisation of gender. The role of donors and the source of funds have an impact on institutionalising gender. My experience with the Department of Women and Gender Studies (involvement in the project 'Institutionalising the Department of Women's Studies', Dhaka University) drew my attention to the fact that the implementation of gender requires considerable financial backing. Further, government agencies rely heavily on donors for gender sensitisation of the organisation! The founding Chair of the Department expressed her concerns in this light, "it is important to look at the historical growth of women issues through women's studies that could be traced from both experiential and philosophical bases of women's movement and feminist scholarships. As funds required for sustaining women's studies in the western academia became scarce, women's studies courses were wound up or downgraded in terms of significance. This action, coupled with dissipating support from the UN and donor agencies, which had earlier encouraged women's studies in many ways, created crisis for its survival as a discipline of scholarly knowledge" (Chowdhury, 2008). The sanitation sector tends to ignore women even where components focussed on women exist. Greater access to funds and more control over these funds, especially in terms of gender budgeting, would increase the effectiveness of gender mainstreaming in this sector.

Power relation is a critical issue. It is widely discussed that men and women experience power relations differently and unequally (Wallace, 1998; Plowman, 2000). The unequal power relationship between men and women has been identified as a crucial area for change in order to bring about gender equality within organisations (Moser, 1993; Young, 1997). Incorporating gender within an existing plan, programmes or legislation at all levels is not an easy task. More importantly, the person and/or office with a gender focus should have adequate power in the decision making process and not simply be ornamental. Mere policy formulation cannot bring changes to the gender situation in Bangladesh; implementation of the policy requires high political commitment. Political commitment can actually also act as a catalyst in the empowerment of women. Power is a critical issue, for example, there is a 10% female quota in the recruitment policy of the government, although a senior official has confessed that his organisation does not implement this policy as such. The time to explore these links to find new ways of understanding the cycle of power in relation to development work has come (Plowman, 2002; Wallace and Moser, 1993). It is only then that this kind of analysis could help produce appropriate strategies that result in bringing about real changes, changes that benefit both sexes in a positive way.

In Bangladesh 'gender' in the sanitation sector is not sufficiently visible at the grass roots level or in the organisational culture, both of which are still male domination areas. For instance, to ensure the participation of women in the decision making process in a community based slum committee, two female members are included but in practice they are confined to the role of supporting the male members of the committee (Mannan, 2003). In practice, gender with regard to water and sanitation is an isolated agenda in Bangladesh. Mainstreaming gender in sanitation is confined to WID approaches by engaging women in the program priorities only. Nonetheless, the weakness of this approach is that the components focussed on women are often marginal and small compared to the mainstream project and are thus often not very sustainable (Jordans, 1998). The GAD approach, which advocates a long term focus in strengthening the role of women in the decision making process is yet to be reached.

According to Amartya Sen,¹⁰ "Women can be prime movers of constructive social change, locally as well as globally." Wasting half of the human resource and potential cannot bring changes in the development arena. A dream keeps humans alive and living. We are dreaming for a better world where half of the sky will not be dark with violence and the violation of women's rights, that is to say human rights. A global focus that merges the necessary commitment of the international women's movement as a powerful political force with resources and actions will produce results. Similarly, if we dream of a prosperous South Asia, it is also time to utilise our resources and opportunities together to bring about changes in the lives of the deprived section of the population, the majority of whom are still women.

The above discussion reveals a story that is neither new to Bangladesh nor to sectors other than water and sanitation. Achieving gender equity and reducing poverty will require a departure from the current ways of thinking and working within the development process. It can be concluded that there is still a long way to go to reach gender equality in the sanitation sector. Thus, to eliminate gender injustice in general and in terms of sanitation in particular, the patriarchal, organisational culture and mindset need serious rethinking and redefining.

Finally, I think development is a form of politics and thus without political will development cannot be achieved. Gaining political power within a patriarchal system is of critical concern. Without positive political will, change cannot take place in the processes of power relations and decision making. Development can no longer be based on the notion of wellbeing, but must be based on the principles of human rights. This is not only a matter of justice but a matter of rights and good governance. Women, in power and decision making processes are still at the cross roads and must walk a long way to reach their rights to justice, which benefits them and all of mankind.

4. The way forward:

- Each organisation is required a gender focal person with adequate technical expertise.
- This gender specialist should have decision making power both at the policy and advocacy level.
- A regular flow of financial support is essential and gender budgeting is significant.
- Gender training is needed for all levels of staff within the organisation.
- The salary structure should be restructured, especially for front line staff who (90% are female) work as the foundation of the project but are severely underpaid.
- Finally and most importantly, the involvement of women in the decision making process should be encouraged.

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- The heterogeneity of the urban poor', Fouzia Mannan and S. Rashid, December 2004, (unpublished research report);
- Gender and Violence in Dhaka slum', paper presented at the conference on the Future of Asian Feminisms: Confronting Fundamentalisms, Conflict and Neo-liberalism, Kartini Asia Network, Bali, 8-10 November 2008 (in press as a chapter of a book)
- Mainstreaming Gender in Sanitation: An Analytical Study of Selected Organisations in Bangladesh', Working Paper, WGS, no.10, 2010.

Endnotes

¹ Approximately \$1 = Tk. 70.

² A national NGO, DSK has been successfully providing sustainable water and sanitation to slums. A small private enterprise has started delivering water door to door to houses, as the DWASA supply is considered unfit for drinking (Feroz Ahmed, 2004).

³ III World Conference on Women in Nairobi, 1985 brought the slogan 'mainstreaming women and gender'

⁴ DWASA, government agency responsible for water and sanitation services in Dhaka city

⁵ The present Government has by-passed the PRSP as it was a development agenda of the previous government.

⁶ Present Government has by passed the PRSP as it was a development agenda of the previous government

⁷ Slum dwellers pay approximately more than ten times for water access compared to ordinary citizens. This is blamed on billing irregularities, the paying off of linemen and others, and the desperation and willingness of the poor to pay this amount (verbal communication- Fouzia Mannan attending Seminar on Decentralisation on Efficient Urban Management in Bangladesh – December 2004.)

⁸ Mosse, 1993. Oxfam, UK.

⁹ MGDS, PRSP, National Policy for Women in Bangladesh, 1997, Five Year Plan.

¹⁰ Leadership Council chairman, Nobel Laureate Amartya Sen has spoken in The ICRW Leadership Council. 2008

Land Reform in Developing Countries: Property Rights and Property Wrongs

Reference: Lipton, Michael. 2009. 'Land Reform in Developing Countries: Property Rights and Property Wrongs'. *Priorities for Development Economics Series*, pp. 456. Oxon: Routledge

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Land reform has always been a contentious subject. Yet to many of the actors involved in water and irrigation, what does and does not constitute land reform remains unclear. For example, (when) is land consolidation considered to be land reform? Michael Lipton's book 'Land Reform in Developing Countries: Property Rights and Property Wrongs' sets the record straight on land reform, explicitly debating what does and does not count as land reform, and reviewing differing experiences from across the globe spanning the past century. The most important points made in this book, in my opinion, are that smaller, redistributed landholdings are most often more productive than larger, unequally distributed landholdings (a fact that is counter-intuitive to the lay person). Second, that land reform needs to be integrated with water reform, or vice versa (a point rarely mentioned by scholars discussing water reforms). Third, that besides decreasing poverty, and increasing productivity, land reform can improve water use efficiency (a consideration conspicuously absent in recent global assessments of the water resource). Fourthly, in rainfed or agriculturally stagnant areas, land reform may be a pre-condition for green revolution growth, because restructured systems of farm ownership or operation are required for the spread of 'green revolution' technologies (irrigation, inputs, credits).

Lipton's half century of research work on the topic and ten years or so of research for this book have culminated in an accessible, comprehensive and passionate guide on land reform.

The five ways in which average income can be raised through increasing poor people's share of land rights (especially via land reform) have been identified. In the introductory chapter, Lipton directly confronts the issue of poverty. He establishes that though GDP growth has helped to reduce the number of people in the world that were 'dollar-poor', and the green revolution made poverty far less than it was, a large part of the sharp acceleration of poverty reduction has been due to land reform. Lipton refers to the (often) disastrous collectivisation of landholdings in the period 1910-80 followed by de-collectivisation mostly since 1977, as 'land reform by detour'. This, he views has affected over a billion people dependent on agriculture.

In the present day, various types of land reforms are being implemented across the globe, from Bolivia to Zimbabwe. Yet because classic land reform involves state intervention, it currently entertains little interest in many international and inter-governmental policy circles. For example, land reform receives no mention in the United Nation's Millennium Declaration of 2000; whereas in the UN's Declaration (2626) of 1970, there is explicit mention that reform of land tenure systems would be undertaken for the promotion of 'social justice and farm efficiency'. Ziai (2011) shows how this omission by the UN relates to a shift in the perception and representation of 'poverty' by powerful players in the international arena, from a theorisation pre-liberalisation of poverty as a relative phenomenon to its modern-day abstraction.

Lipton argues that appropriate land redistribution usually helps liberalisation to be pro-poor, growth-inducing, and politically sustainable or feasible.

In India for example, though sceptics would have one think otherwise, substantial classical, tenancy and other reforms have had considerable effect. In the 1950s, independent India abolished the zamindari system in North India, with over 20 million tenants being brought into direct relationship with the state. However the second phase of land reform remains incomplete due to widespread evasion and avoidance of ceilings legislation. The Indian Planning Commission was self-critical of progress in 2001 and Lipton correctly analysed the link between

classic land reform (land transfers from big to small farms) and tenancy laws in 2006. The successful acceleration of land reform in India, Lipton argues, will depend on showing that smaller more equal farms are not only equitable but also good for productivity.

Taking solely a poverty reduction angle to land reform, e.g. stressing 'land as a basis of livelihood – for subsistence, survival, social justice and human dignity', will unlikely succeed in attempts to garner the political will necessary for land reform. The fairly extensive Indian example further concludes that land reform is possible, though new efforts, politics or circumstances will be required (pages 284-289).

Early in the book, Lipton states that due to water stress, land reforms must be integrated with water reforms, to entail fair and sustainable access to farm water (page 9); a point that is rarely considered in publications discussing recent reform processes around water. For example, the 2007 Comprehensive Assessment of Water Management in Agriculture 'Water for food, water for life' seldom refers to landholding structures or ownership patterns, leave alone land reform in any of its possible forms. The assessment states that rainfed farming is practised on some 80% of the world's cropland. It devotes considerable space to its argument that upgrading such farming systems promises large social, economic and environmental paybacks, particularly in poverty reduction and economic development. Yet, in discussing restricted access to water and low yields, 'political and social issues' caused by 'ineffective institutions and poor governance' are cited as barriers.

Discussing the green revolution with reference to Asia, Lipton cites authors who argued that the 'new agricultural strategy' had an implicit bias against institutional reforms and land reforms in particular, emphasised large-farmer led agricultural development, and saw the problem of land development (output expansion) in isolation from that of labour absorption (employment absorption). Lipton reasserts his standpoint that land reformers have driven the case of land reform as a source of growth and employment too far down the agenda.

In recent years, climate change predictions have led to a renewed interest in irrigation for rainfed agriculture. Where agriculture is stagnant, Lipton argues, land reform may be a condition for green revolution growth not because 'only' some types or sizes of farm will innovate, but because restructured systems of farm ownership or operation are necessary for the spread of 'green revolution' technologies to rainfed (or backward) areas.

Chapter 2 presents an extensive review of the goals of land reform: output, efficiency and growth. Carefully reviewing the evidence, Lipton concludes that redistributive land reform is good for output and growth in many regions, especially those where land is very unequally distributed at the outset. The argument for land reform remains valid today, and more land reform will be required in the future.

Chapters 3-6 explore the main types of land reform, making explicit the assumption that what constitutes land reform for Lipton are those reforms whose goal is 'farmland-based reduction of gross, unearned inequality and hence of poverty'. Finally, Chapter 7 reviews the cases made for the alleged death of land reform. Lipton concludes that the debate about land reform, and land reform itself, are both alive and well – as they should be.

This book is highly recommended for those interested in water and thus land issues; however, the book seldom refers to water, a shame given the inseparability and intractability of these two fundamental resources. Nonetheless the book does allude to several pressing areas in which research needs to be undertaken.

References:

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Knowledge to Policy: Making the Most of Development Research Reference:

Carden, Fred. 2009. *Knowledge to Policy: Making the Most of Development Research*. New Delhi: Sage, Ottawa: International Development Research Centre.

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Knowledge is power. Based on this premise, social scientists have engaged in researches with the aim to influence policy making. Indeed one of the primary pursuits of social research is to provide the decision makers with first-hand evidences that can be fed into the policy framework. A question which has intrigued many is how and to what extent does this research influence policy? What is the path which leads to social research culminating into policy actions? While the linkages between the two may appear obvious (why would the policy makers ignore the evidences from the ground?), practical experiences especially in the context of developing countries suggest the contrary. Since its onset, the findings of social researches have not been integrated into the decision making process as one would have expected. Many empirical investigations have been conducted to explore how research percolates into policy in different research arenas and the book *Knowledge to Policy: Making the most of Development Research* by Fred Carden is one such attempt to assess the impact of research on policy making in the field of international development. It discusses a range of issues that determine how much effect research studies have on the bureaus, legislatures, and administration of governments in developing countries. The author has undertaken an investigation to examine the consequence of 23 research projects funded by Canada's International Development Research Centre (IDRC) which were identified to have influenced the policy making successfully.

The book is divided into three sections. The foreword by Carol H. Weiss provides a befitting start as he introduces the ideas presented in the book and sets the tone for the discussions. Section I entails discussion on policy matters which commences with the distinctive features of governance in developing countries. Carden opines that political causes deeply embedded in a country can do both – favour or inhibit policy making based on sound research findings. He provides an interesting account of characteristic features of governance in the developing countries. He broadens the meaning of influence to include the effect, “that is lasting, that results in real change, draws from research that expands a country's capacity for sound policymaking, broadens the policy horizon with new choices, and improves the ways in which governments make decisions.” There are three ways in which research can influence policy viz. expanding policy capacities, broadening policy horizons, and by affecting decision regimes. He argues that the influence of a development research on public policy decisively depends on its context of time and place. He has categorised the government and policy communities into five categories of research and policy interaction i.e. when (a) there is a clear demand from the government for research, (b) government is interested in research but the leadership is absent, (c) government is interested in research but there is a capacity shortfall, (d) policy makers are uninterested with a new emerging research issue, and (e) government treats the research with hostility. He then provides illustrations from the IDRC project experience for each of the category.

Section II is a compilation of the projects implemented by the IDRC in various countries in the form of 23 case studies and makes a very interesting reading. They are further divided into sections namely poverty monitoring, trade and finance, resource management, water management, health and education reforms, networks & innovation and information & communication technologies for development. The case studies provide deep insights into the practical aspects of policy making and the challenges which researchers have to face in order to ensure that their research finds its way to policy. It is also interesting to read about the characteristics of the policy making regimes world over. For e.g. the section on water management consists of case of cleaning up of the Dnipro river in Ukraine, wastewater recovery and urban farming in the Middle East, use of brackish water for irrigation in Syria, and managing water scarcity in Tunisia. Each section consists of a range of issues diverse in their



approach and each case is followed by the lessons learnt for policy implication which provide invaluable insights into transforming research to policy actions. Section III on technical notes provides the methodology to IDRC's multiple case approaches in the interest of agencies who would like to follow suit.

The book traverses an understudied but nonetheless crucial aspect of development i.e. whether and how research influences decision making? Rather than throwing a set of ideas at the readers, Carden carefully reconstructs the policy implications of research corroborating them with appropriate case studies. The lessons and experiences presented are extremely useful for researchers, policy makers and donor agencies that look forward for research work with practical policy implications. The author puts forth perspicuous arguments and has refrained from the use of jargon making for a simple yet interesting reading. The book with its simplistic style, well placed examples and varied case studies is a worthy resource material. It is a must read for people engaged in research work hoping to create an impact with its policy implications.