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A Masculine Water World: The Politics of Gender and Identity in Irrigation Expert Thinking

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Introduction

Many people who are concerned with gender injustices in water management have noted that there is a huge gap between 'paper' recognition of gender issues in water management, policies and projects, and real on-the-ground efforts to address such inequities effectively. At the same time, they point to the lack of meaningful integration of gender questions in mainstream water analyses and discussions. Gender remains very much a side issue or an after-thought and is not seen as belonging to the core of what water management is about. This chapter looks at one possible reason for the resistance of the water profession to considering gender insights: the incompatibilities between water experts and gender experts in how they conceptualize and act upon water realities.

It is arguable that in irrigation engineering, rather than an unwillingness or a persistent bias of individual water professionals, the problem is that traditional ways of thinking about water are deeply inhospitable to the analysis of social relations and gender. An important conclusion is that *thinking* (and acting on) gender in water management requires active efforts to change mainstream ways of 'knowing in water'.

This chapter critically discusses the terms of discursive existence for gender in mainstream water thinking.[1] The exercise assumes that water knowledge, like most knowledge that is systematically produced, possesses regularities and exhibits systems of rules. These rules are, however, seldom formulated by the participants in the knowledge-generating process. They constitute what

Foucault called the 'positive unconscious of knowledge' (cited in Davidson, 1986, p222). The rules are relatively autonomous and anonymous, and they make it possible to assert claims that count as important, relevant or true within the boundaries of a science or discipline. Much of these unspoken rules in irrigation result from the isolation of scientific knowledge and thinking about irrigation from the social environment in which irrigation takes place, and with the positioning of the knower *vis-à-vis* that which is (to be) known.

The language, discursive practices and textual resources that form the heart of water knowledge are part of a body of cultural resources through which water professionals represent and identify themselves, and that contributes to legitimizing professional activities and choices. Thus, knowledge about water realities reflects prevailing professional water cultures and identities (with their configurations of power, status, authority and funds) as much as it reflects realities in the field. This realization undermines claims of objectivity and neutrality of water knowledge and opens the door to reflecting critically on how knowledge was constructed and by whom, and how the identity and social positions of knowledge producers impact upon the type of truth claims they make. The reverse is equally true: the recognition that water expertise and authority have an identity – a colour, gender and ethnicity – opens the door to questioning critically the symbolism and assumptions that are taken for granted in water, and to welcoming other voices and sources of knowledge.

Misrepresenting women and gender in irrigation

The difficulty of understanding the role and position of women and gender relationships in irrigation is most often attributed to the symbolic, discursive and ideological construction of farmers, irrigators and engineers as masculine and to the fact that being recognized as inhabitants of, and actors in, irrigation worlds requires rights, abilities and character traits that are seen as belonging more to men than to women. This chapter suggests that there are a number of less easily recognized but perhaps equally fundamental conceptual problems in irrigation thinking that lead to misrepresenting women, that prevent the questioning and challenging of gender relations and that misrepresent irrigation realities as genderless or gender neutral. Identifying these problems may help to explain why 'gender mainstreaming' in water remains a difficult and slow process and it may contribute to finding new avenues and entry-points for making the water world into a better place for women.

My conceptualization of gender frames the search for ways to 'think' gender in water management. Most important is the realization that gender is a social construction, and that its meaning is contested and negotiated. Thinking gender, therefore, implies not treating it as something that simply exists and can be known and mapped in a positivist sense. What it means to be a man or a woman is not a given and cannot be determined in any ahistorical or transcendental way. As a shifting, dynamic and contextual phenomenon, gender does

not denote a substantive trait of character or personality, but is a relative point of convergence among culturally and historically specific sets of relations. Gender roles, identities and relations are not tangible and static, but are matters of continuous reinterpretation both in terms of practices and in terms of ideas, sometimes leading to controversy and debate.

Such a contextualized and constructivist understanding of gender is hard to reconcile with a feminist wish to establish women as a political category. It is also incompatible with the habit of mainstream irrigation and water experts to strip away context and meaning to uncover universal human values in efforts to generate generic lessons about the performance of water systems. Understanding gender therefore generates some important challenges to more conventional ways of thinking about water. These challenges fall into three categories.

The first category relates to some general features of irrigation thinking, and in particular how it cherishes its lack of a critical interpretative tradition as a virtue of modern science. These features are related to the positivist epistemological beliefs that guide much irrigation thinking.

The second category concerns the way in which irrigation systems and realities are ontologically defined and the ways in which conceptual boundaries are drawn between 'what matters' for knowing irrigation and that which can be ignored. This is illustrated by the choice of metaphors used for representing irrigation realities that structure the world in oppositional dichotomies with clear gender contents and implications. It also shows in the ontological separation of the technical and the social, or between 'the system' and its context.

The third category relates to how human beings and human behaviour are conceptualized in irrigation thinking, and the overall bracketing of power and politics in this analysis. This shows in the use of deductive methods and ideal-typical models and in the direct association of much irrigation research with those who 'rule' irrigation systems. It also shows in the methodological individualism that characterizes much irrigation thinking, and in its narrow and rather functionalistic and instrumentalist concept of human agency.

These three categories of conceptual problems are interrelated, and they intrinsically relate to water politics and identity.

Power, perspective and knowledge

Although different in focus and scope, and although drawing on different disciplinary theories, the mainstreams of professional water thinking share a number of characteristics. First, and importantly, their traditional subject matter is 'non-social'. Water knowledge is, or used to be, primarily concerned with 'the resource': water. The physical, biological and chemical characteristics of water together with the engineering knowledge needed to convey water constitute the heart of much water knowledge. Although efforts are increasingly made to include social questions in the analysis of water problems, preferred scientific languages and methods continue to be derived from the

natural and engineering sciences. These are not always best suited for understanding the behaviour of human beings and their interactions.

Second, much water knowledge is visibly rooted in a modernization project – a project that associates positivist science (mathematics, in particular) and modern technology with progress and civilization. Although most contemporary irrigation and water professionals no longer have the strong faith in technology as a motor of progress that their colonial predecessors had, many continue to believe in the superiority and universal applicability of scientifically developed irrigation technologies or institutional and economic models (see also Boelens, 2008). In this sense, mainstream water thinking can be seen as firmly anchored in the Enlightenment tradition, a modernist and Western way of thinking. In this tradition, the 'god trick' is pervasive: the assumption that one can see everything from nowhere and that disembodied reason can produce accurate and 'objective' accounts of the world (Haraway, 1991). Enlightenment is marked by a faith in the neutrality of reasoned judgement, in scientific objectivity, in the progressive logic of reason and in science itself. Through the omnipotence of reason, transcendence is possible, allowing the knower to escape the limits of body, time and space (Hartsock, 1998, p206).

Third, normal water thinking is also pervaded with a belief that given the proper technologies, institutions or incentive structures, human beings will display the same water behaviour everywhere. This belief is rooted in the epistemological claim of human universality and homogeneity, a claim that is also associated with an Enlightenment tradition of thinking. This claim posits that, in essence, all human beings are equal and share a common capacity to reason. Differences among people are fundamentally epiphenomenal, making it possible to make generic statements about human nature, truth and other imperial universalities. In such a humanist or liberal understanding of human beings, gender can only be thought of as an attribute of a person who is characterized essentially as a pre-gendered substance or 'core' (called the person). This is useful for some purposes, but not for the purpose of a critical enquiry into the meaning of gender. Such enquiry requires a relational or contextual conceptualization of gender, suggesting that what the person 'is' – and, indeed, what gender 'is' – is always relative to the constructed relations in which it is determined (Scott, 1986; Butler, 1999). As feminist political theorists have pointed out, the referent for conceptualizing humanity and the human 'core' in much theory has been primarily masculine. Indeed, the term man as used in liberal thought – even by those who are willing to concede that he/him means 'all' – is not simply a linguistic device or a generic label but a symbol for a concept reflecting both masculine values and virtues and patriarchal practices (Dietz, 1992).

A fourth and related characteristic of much mainstream irrigation thought is its denial of the importance of power to knowledge. This denial of the connections between power and knowledge, and between the construction of subjectivity and power, is directly linked to the fact that much mainstream irrigation knowledge is written from the perspective of those who are in

control: planners, administrators and managers. Produced knowledge is aimed at helping *them* realize *their* objectives, and enables them to speak more authoritatively through the disembodied, transcendent voice of reason. Much early engineering thinking did, in fact, reflect an implicit juridical conception of power: the locus of control was situated with the head engineer, at the head gates. He was the sovereign, and the irrigators were his subjects. While there used to be discussion about the most effective control strategy, the very possibility of controlling and manipulating behaviour of people and of flows of water and money was seldom questioned in irrigation knowledge. It is telling that contemporary theoretical models for irrigation system performance, such as those embodied in technical designs or as proposed by neo-institutionalism, are tested primarily through the deductive method rather that empirically. Outcomes or outputs are measured against the expectations of the formal models; but the operational and behavioural assumptions of the models are seldom validated. Moreover, designers are hardly ever confronted with operational realities at the field level just as knowledge about designs is rarely tested against field-level realities. Consequently, the beliefs in the model and in the effectiveness of planners' control mechanisms are not challenged, nor are the legitimacy of water professionals and their knowledge questioned. Indeed, the persistence of certain basic assumptions in irrigation thinking can be explained as much by success in generating funds and power – and bolstering the egos of irrigation practitioners – as by success in generating valid theses about the determinants of irrigation system performance.

Much water knowledge sees knowledge producers, such as the head engineers or managers, as transcendent rational subjects who exist outside time, space and context. Through irrigation knowledge, those in control of water are provided with agency and subjectivity, a discursive construction that is conditioned upon the simultaneous denial or severe limitation of agency to users, irrigators or farmers. The latter group is created as the 'others', who are restricted in their capacity to act and speak, the ones who need to be controlled and whose behaviour needs to be adjusted to what is deemed appropriate by the 'knowers'. In the Andean context, water expertise thus constructed indigenous peasants as backward, uncivilized and irrational. Indigenous peasants were marked and named by irrigation experts, who themselves remained unseen and whose own identity (gender and ethnicity) did not matter in terms of their authority and knowledge (see Boelens and Zwarteveen, 2005).

This is not to deny that contemporary water knowledge takes farmers and officers much more seriously than in earlier days. The call for more participation by farmers in design and management processes, and the associated increased appreciation of the value of farmers' knowledge, have resulted in questions about the legitimacy of scientific water knowledge. The hegemonic superiority of engineers' knowledge and their exclusive claims to the ability to design irrigation systems have also been challenged. Shah (2003, p22) convincingly argues: 'while inclusion of farmers' knowledge and farmers' choices in the process of "design" is envisaged by the dominant model, the validity of

conventional disciplinary – scientific and engineering – knowledge and the context in which this knowledge is generated, is not very frequently questioned'. Issues of power and identity, of location and time, continue to be shielded from scrutiny through appeals to 'the technical', 'the rational' and 'the scientific'. Irrigation knowledge continues to be, as Harding (1986, p76) calls it, 'part of the labour of ruling'.

And although the more recent irrigation management literature is much more positive about farmers' knowledge and abilities, their practical influence remains limited. The usual concept of human agency is that of the utility optimizer and rational decision-maker who weighs the costs and benefits of alternative choices. This leaves little conceptual scope for considering the actions and choices of the various players in irrigation from their own perspectives and in their own frames of reference. Nor are culture, tradition and apparently less rational explanations for behaviour considered. In the Andes, the farmers' own systems of distributing water and of defining and allocating water rights, for instance, tend to be considered as 'anomalous' in mainstream water management literature (see Boelens and Zwarteveen, 2005).

The philosopher Spivak once asked: 'Can men theorize feminism, can whites theorize racism, can the bourgeois theorize revolution'? She maintained that when the former groups theorize, it is crucial that the members of these groups be vigilant about their subject positions (Spivak, 1988, p253). Spivak argued there should be critical reflection on the identities and positions of knowers and how they impact upon the knowledge that they produce. Her question entails a much needed acknowledgement in water that knowledge production and designs of water systems are deeply social processes in which different stakeholders interact. The nature of these processes and the different perceptions, interests and powers of the stakeholders involved shape the knowledge produced, as well as the ultimate design choices and technical characteristics. The importance of this insight is that it enables the questioning of irrigation designs, designers and knowers. As a result, the design or the technology (the 'irrigation machine'), as well as institutional models, stop being the norm, dictating the behaviour of users, operators and managers. And technical engineering or other expert knowledge is no longer granted highest status in conceptualizing irrigation realities (compare Shah, 2003).

As a central part of their project, feminist scholars have challenged the norms of objectivity that have long guided science. In the strong formulation of Catharine MacKinnon: 'Objectivity is the epistemological stance of which objectification is the social process, of which male dominance is the politics, the acted out social practice' (MacKinnon, 1987, p50, cited in Langton, 2000, p135). For Haraway (1991), 'seeing well' is not just a matter of having good eyesight: it is a located activity, cognizant of its particularity and of the accountability requirements that are specific to its location. 'Seeing well' implies the refusal of any subject/object split in the production of knowledge, insisting on 'the critical and interpretative core of all knowledge' (Haraway, 1991, p191). In situated knowledge-making projects, embodied knowers

engage with active objects of knowledge, whose agency and unpredictability unsettle any hopes for perfect knowledge and control. Indeed, there are connections and linkages between subjects and objects, and the two can be said to stand in a 'dialogic' relationship with each other (compare Sayer, 1992, pp22–42).

This renders impossible the wish to provide truth claims in the strict positivist tradition. It makes politically dangerous any effort to describe the irrigation world in one consistent all-encompassing discourse. This is because a single description has totalizing and exclusionary effects, and is academically suspect, because it hides the knowers and their identity and power in cloaks of objectivity. In the words of Nicholson (1995, p5): 'Any discursive move which attempts to place itself beyond question automatically invokes suspicion.' Indeed, only from the falsely universalizing perspective of those who are, or think they are, in control and command can 'reality' have 'a' structure. That is, only to the extent that one person or group can dominate the whole can 'reality' appear to be governed by one set of rules or be constituted by one privileged set of social relationships (compare Flax, 1986, cited in Harding, 1986, p193).

Gendered metaphors and dichotomies

The ways in which boundaries are drawn in much mainstream water thinking are informed by a powerful spatial imagery with rather strong gender connotations. For one, irrigation systems and what goes on within them are often seen as 'the work place', a domain or area that is spatially and socially distinct from 'the home'. It is the place where production for the market occurs and where incomes are earned, separate from the place where consumption and production for personal or domestic use happen. Second, the irrigation system is also the place that is labelled as 'public', in implicit contrast to the 'private' location of home and family. For a long time, the public world of work and production tended to be seen, and used to be ideologically constructed, as the world of men. Such construction rested on normative ideas that men should be the breadwinners and principal income earners, whereas women should be caretakers, cleaners and mothers. A widespread and strong ideological connotation of the word 'farmer' and, by analogy, the words 'irrigator' and 'engineer' as symbolizing male identity worked to reinforce this notion. While most irrigation thinkers today would no longer explicitly adhere to such gender ideologies, the conceptual language and methodological tools used continue to be pervaded by the dichotomies of work and home, production and consumption, public and private. What matters to irrigation professionalism is what happens in the former – in the world of work, production and public politics. This world is seen as relatively disconnected from and unrelated to the private world of care, consumption and intimacy. The irrigation world similarly is seen as the domain of reason and logic in implicit contrast to the domains of emotion and affection that characterize the non-irrigation world.

A number of influential images are associated with the use of these dichotomized metaphors. An important one is that of irrigators as industrial workers whose working places are socially distinct and separate from their homes. Depending on the degree of autonomy granted to irrigators, they are either seen as factory workers or as private entrepreneurs. Irrigating and irrigated farming are, as a consequence, seen as the business of one individual whose irrigation behaviour is primarily informed by imperatives related to the irrigation system. Other family members sometimes assist this individual, but he (most often the individual is seen as a man) is the one in charge and makes all the decisions. This view is problematic since smallholder irrigated farming often is not the sole affair of one individual but a family undertaking. It is also problematic because it is implicitly based on a nuclear family household model. Supposedly, the allocation of family labour time between competing uses is determined rationally by the principle of comparative advantage so that each household member specializes in those activities which give the family the highest relative return (compare Kabeer, 1991).

This also would entail the existence of clear-cut boundaries between the sphere of work and that of home. Positing such boundaries places households outside of supposed irrigation realities, and outside of what needs to be explained by irrigation knowledge. Since the household is seen as the domain of women, further thinking about women and gender also becomes unnecessary. In the Andean situation, with many men migrating to cities and with household livelihood strategies consisting of a combination of activities, this public–private metaphor is particularly ill suited to understand water realities. Research in the Andes suggests that what a household is, and who belongs to it, is itself often an intrinsic part of local negotiations about definitions. The boundaries between a household and its environment are not a given, but require 'social and cultural work to affirm its existence' (Mayer, 2002, p8), and such definitions are particularly important in local water management and maintenance activities since they establish which members of households are allowed or obliged to contribute.

The use of gendered dichotomies is also problematic because the 'masculine' pole of these dichotomies tends to be valued much more positively and tends to be attributed more powers and status than the 'feminine' pole. Some feminists and some streams of eco-feminism have therefore argued for a reversal of this hierarchy, and for a revaluation of the feminine. Others, in contrast, have argued in favour of strategies that would facilitate and encourage women's entry into the masculine worlds of production, politics and reason. Both positions, however, tend to neglect the importance of critically questioning the ways in which the poles are defined. The boundaries that separate nature from culture, private from public, work from home, and so on, are not fixed and ahistorical, but are contingent and socially constructed. It is important to question taken-for-granted gender hierarchies and dichotomies. In addition, the positing of these boundaries invites the treatment of each of the respective poles of the dichotomies as analytically separate, whereas they exist because of and through each other.

From the perspective of irrigators and farmers, home and work are often closely interconnected, both in the fact that the first objective of work often is family survival, but also because family circumstances and considerations greatly influence work decisions and behaviour. Indeed, the boundaries between public and private, as well as those between production and subsistence, blur upon closer examination. Moreover, work and gender are not easy to categorize into two distinct domains, nor are these domains necessarily in harmony – or in conflict, as some feminist scholars would argue. Most smallholder farm households display a high degree of interdependence between production and subsistence activities as well as between the household's farm functions and its family functions. Domestic or reproductive labour is characteristic of all household members' activities across agricultural as well as subsistence production, and is not restricted to women's work. Irrigating and farming are not just about production and are not only associated with the activities of men. Irrigation needs, interests and activities are seldom directly gendered or a function of a person's gender. The ways in which gender mediates irrigation realities depends on time and location and is also affected by class, ethnicity and other cultural and socio-economic structures and identities.

Placing the irrigation system in the productive and public sphere, and conceptually separating it from the domestic and subsistence sphere, is not just analytically problematic. It has important political and distributional consequences in guiding plot and water allocation, and through designating specific users and uses of water as legitimate, and qualifying others as less important or even illegal. This question is also important, for instance, when considering the artificiality of the divide between water for productive and for domestic use when both are taken from the same irrigation system (compare Bakker et al, 1999).

The dichotomous metaphors also 'infect' irrigation thinking in a more diffuse way by associating masculinity with all that matters to irrigation, while implicitly linking femininity with all that is less relevant. Hence, water for productive uses tends to be considered as more important than water for domestic uses, crops grown for the market are more important than subsistence crops, and public decisions are more important than intra-household decisions. Economic incentives for behaviour are also considered more 'real' than, and normatively superior to, those based on emotions, solidarity and affection. Work such as cooking and the provision of meals for agricultural labourers is not normally considered part of irrigation work. And the irrigation conflicts and struggles that are most easily observed and named tend to be of the spectacular and violent type, involving stealing, fighting and bribery. The more hidden everyday forms of resistance (compare Scott, 1985), the silences and strategic invisibilities (compare Jackson, 1998) tend to receive less attention. Hence, while often not directly gendered, the conceptual delimitation of what counts and matters in irrigation, of what belongs to the irrigation domain, and the definitions of what is 'good' irrigation behaviour are deeply coloured by gendered images and connotations. Using such delimitations and

definitions may have the effect of reinforcing and further legitimizing such gendered divides, rather than questioning them.

A clear Andean example of this comes from an irrigation project in Cuzco in Peru. Here, the self-esteem and confidence of male landholders were boosted through their participation in training and interactions with irrigation project engineers and other technical staff. Project staff also appointed men as the community spokespersons and decision-makers. The systematic prioritization of men as the main stakeholders, experts and decision-makers worked to reproduce or perhaps even to generate a gendered hierarchy in how water tasks, powers and authority were defined and divided. Men increasingly became responsible for dealing with 'the outside world' and women became increasingly responsible for the physical labour of farming and irrigating, in addition to their domestic tasks (Vera Delgado, 2005). The former gradually came to be defined and seen as irrigation, while the latter were considered as 'non-irrigation'.

What all this means is that a proper understanding of gender within irrigation systems depends on thoroughly rethinking the metaphorical and spatial, and sometimes ideological and normative, images used. One must overcome, or at least question critically, the dualistic conceptual framework founded upon an opposition between the economic, rational irrigation world of production and politics, on the one hand, and the affectionate and emotional world of the home and the family, on the other. This can, for instance, be done by recognizing the subsistence and livelihood functions of farms. It can also be done by recognizing that men are not just irrigators and farmers, but also husbands and fathers, or by acknowledging that women's identities are not confined to those of mother and housewife, but also often include those of farmers and decision-makers. It includes allowing for the possibility that important irrigation negotiations occur in the domestic domain. And it requires a critical revisiting of what is recognized and defined as irrigation behaviour and of who are recognized as irrigators because what is included in these definitions may be gendered. Rather than assuming *a priori* the meaning and boundaries of irrigation systems, households and farmers, and the criteria for inclusion in the irrigation world, the following questions should be addressed: how do different water users, managers, politicians and others define 'inside' and 'outside' of the system? Who is seen as 'belonging' to the system, and who are ideologically, politically or physically excluded, and in what ways? Are these terms negotiable, and are definitions and conceptual categories themselves a way of defining and reconfirming ideas about gender, and of distinguishing masculine from feminine identities?

Technical and management systems and boundaries

In much of today's irrigation thinking, the colonial view of farmers as backward and in need of civilization is no longer popular. Yet, much thinking is still pervaded with an implicit normativity regarding what is 'good' and what

is 'bad' irrigation behaviour. In fact, much irrigation knowledge is more concerned with creating the conditions and teaching people the skills for functioning as desired than with understanding what is actually going on. Perhaps as a result of this, people tend to 'matter', and thus discursively exist, in irrigation thinking only to the extent that they relate functionally to the irrigation system as conceived in technical designs and management models. In their conceptualization of irrigation performance, Small and Svendsen (1992, p4) explicitly posit that 'farmers are considered in their roles as irrigators, but their parallel roles in other aspects of crop husbandry are excluded'. This distinction, as the authors explain, 'is necessary to establish a clear analytic separation between the irrigation system and the broader agricultural system of which irrigation is a part' (Small and Svendsen, 1992, p4). They do not deny that all individuals in irrigation play many roles simultaneously (Small and Svendsen, 1990, p286); but this rests on the Weberian assumption that individuals can, and do, consciously separate their irrigation roles and behaviour from their other roles. Who farmers are thus only matters as far as their irrigation identities are concerned. Their identities are achieved because of their rational involvement in the system. Therefore, unless irrigation roles are directly gendered (i.e. if being a woman or a man in itself is seen as an irrigation role), gender also ceases to matter.

Such conceptual insulation of the irrigation system from its environment mirrors the attempts of many irrigation engineers to immunize the irrigation system from outside interferences. It can, in fact, be seen as an attempt to achieve what technology scholars call a process of 'closure' (Latour, 1987; Bijker, 1993). Closure is achieved when the possible meaning and use of the technology is no longer contested and its origins are ascribed to the laws of nature. One of its effects is that the authority to make truth claims about irrigation lies with experts. It is also another illustration of how the irrigation system is metaphorically compared to a factory or workplace. The very concept of 'role' as used by Small and Svendsen (1992) portrays irrigation realities as factory-like settings with strongly pronounced normative definitions of expected modes of conduct. The nature of roles is taken as a given, and it is derived from an ideal-typical model of how the irrigation system should function. As Giddens (1984, p84) remarks about the role concept: 'the script is written, the stage set, and actors do the best they can with the parts prepared for them'. Again, who plays these irrigation roles and in what social context does not matter. What people do in the irrigation factory is conceptualized as a function of the factory, and is unrelated to who they are or to their status, position or power outside of the factory. Their gender, as a result, is also inconsequential for the understanding of the functioning of the irrigation system and therefore does not require further investigation or questioning.

There are an increasing number of studies showing that in day-to-day irrigation realities, the boundaries between the system and its environment are not so easy to draw. In actual irrigation life, people cannot easily set aside their non-irrigation-related identities and interests for the sake of the good perfor-

mance of the irrigation system. People's irrigation decisions also stem from considerations that are not internal to the system. More often, irrigating farmers know each other and relate to each other in many more ways than just through sharing a joint irrigation facility. Irrigation decisions are tied to and influenced by wider choices related to farming, livelihoods and social networks. Some studies about Andean irrigation systems show how intra-household disputes over farming and irrigation may be caused by wider conflicts between family members. One study documents how a woman sold her water rights to prevent her ex-husband from using the plot that she considered hers (Vera Delgado and Zwarteveen, 2007).

Like 'the hardware' of irrigation systems, 'the software' – or water user associations – is often seen as relatively insulated from the social context. Not much thought is usually given to who are or should be the participants of user organizations. Instead, in most writings on participatory irrigation management, the group of farmers or irrigators is referred to as a group that is already existing and easily identifiable: those people who are served by a common irrigation facility. 'Participation' is about participation of this group in the project or system of the engineers or state irrigation bureaucracy. The ultimate concern is to unravel the determinants of 'well-performing irrigation management institutions', while what good performance means is already decided – based on universal laws of human behaviour and nature – and mostly expressed in rather narrow technical, productionist and economic terms. In other words, existing situations are thus described and judged on the basis of whether or to what extent they follow, or can be made to follow, the ideal model. The existing social relations of power and the existing culture and norms are loosely treated as the raw material from which institutions can be 'crafted', 'the institutional resource bank from which arrangements can be drawn which reduce the social overhead costs of cooperation in resource management' (Cleaver, 2000, p365).

Conceiving of the irrigation management domain to include all that irrigation experts consider to belong to the irrigation system, and nothing more, is not conducive to making women and gender visible. To 'see' the social and gender factors in water management requires understanding that what happens 'within' the formal water management domain is shaped and influenced by what happens 'outside' it. It also requires a realization that events and decisions that have to do with water do not just take place within the formally defined water management domain. Insulation of the formal water management domain from its environment is based on the idealized views of experts rather than on-the-ground realities reflected in women's experiences as participants in user organizations. Women do not stop being seen as women and become genderless rational deliberators once they enter the formal public domain. One clear illustration of this is provided by an irrigation system in Peru, where about half of the members were women, and where both women and men attended meetings. Observations during these meetings showed that although male members, on average, talked for approximately 28 minutes,

female members only talked for 3.5 minutes. Although 'speaking time' cannot be used as a straightforward measure of influence, women did explain that they felt diffident about articulating their concerns in meetings, and that they were afraid of making mistakes and being ridiculed (Krol, 1994). In an irrigation system in Mexico, only 15 per cent of the female farmers thought that their opinions mattered in meetings, against 73 per cent of the male farmers. Female farmers also displayed little interest in playing more active roles in the organization since they felt that by doing so they would call into question their moral integrity and status as women (Ahlers, 2000). A study in Bolivia likewise documents how women felt ill at ease in meetings, which is why many preferred sending their sons or husbands instead of going themselves.

Although not cited here, there are many more examples that suggest that gender colours deliberation and decision-making, even in the absence of formal entrance barriers. Public interaction and styles of deliberation almost everywhere are gendered in that there are distinct social norms and rules that define what sorts of interaction are permissible for women and which for men, in what contexts, and using which modes of conduct. Fraser (1997) even goes further to suggest that discursive interactions within the public domain are governed by protocols and styles of decorum that are themselves correlates and markers of gender inequality. In the above cited examples, to be outspoken and opinionated can be positive characteristics for men, markers of masculine distinction in Bourdieu's sense – a way of defining and reconfirming masculinity and male superiority.

At the same time, belying the formalistic and functionalist expert view, water management is not actually confined to formal water management institutions. One of the more telling illustrations of this is the story many Andean irrigation professionals tell when reflecting on gender: men participating in water management meetings always require a second meeting (the following day or week) to be able to make a decision. As the story goes, they want and need to consult with their wives at home. There are other anecdotal examples of women who are playing important but non-formalized, and therefore non-recognized, roles in organizations or in carrying out collective action. Juana Vera Delgado, for instance, notes how women play prominent water management roles 'behind the screens' in the traditional *reginas* in the irrigation system of Coporaque in the Colca Valley in Peru. Usually men assume the traditional water leader position (although some women also do); but it is normal practice and implicitly understood that their wives will assist them (Vera Delgado and Zwarteveen, 2007). Krol (1994) notes how one woman almost singlehandedly adapted the irrigation schedule in response to requests from neighbours and friends who did not understand it or who experienced difficulties irrigating at the times designated to them (Krol, 1994).

Indeed, water management can occur in a number of coexisting and partly overlapping 'domains of interaction' (Villarreal, 1994), which are not limited to the ones recognized and designated for water management by policy-makers and managers. The very fact that formal water decision-making is defined as

something belonging to the sphere of men may in itself prompt the emergence of alternative ways and networks for managing and dealing with water questions. Because formal water users' organizations have come to be defined as masculine domains and because water expertise and authority have come to be associated with masculinity, becoming accepted as members and leaders is not easy for women. In Coporaque, Peru, for instance, one woman who stood up for herself by attending meetings and speaking to authorities was looked at with some suspicion by other women and men. They referred to her as a *machista*, which was not meant as a compliment (Vera Delgado and Zwarteveen, 2007).

Technical and organizational water systems are embedded in wider social and political relations and hierarchies that are not entirely based on or derived from water. Irrigators belong to wider social, cultural and normative systems, and are informed by locally specific ecological conditions. This recognition of embeddedness opens the conceptual door to the recognition of gender: because all social and political environments are gendered, gender shapes and colours all irrigation interactions and irrigation decisions.[2] The work of Giddens and Long assists in recognizing the social positioning of irrigation actors in power relations, including gender relations. Rather than seeing actors solely in relation to the resource or activity of interest to the knower, Long (1992) suggests perceiving them as complex individuals, partly involved in the projects of others and partly involved in their own. Giddens (1984, pxxiv) argues that a person should be recognized as positioned in multiple ways, with social relations conferred by specific social identities. Such recognition could help to explain that Andean women enter formal water-user organizations on different terms than men precisely because they are women, as in the previous example of Ecuador by Krol (1994); they cannot leave their gender identity behind when dealing with water. It would also help to recognize how women and men can manipulate and strategically use their gendered identities, rather than just accept how they are labelled by outsiders.

The implication of embeddedness is that what the system is and how its boundaries are drawn is importantly constituted by the social, political and ecological context in which it functions. This realization leads to a different ontological definition of irrigation or water systems than the one used in mainstream thought, one that allows the physical/technical and the social to be analysed simultaneously as different but internally related dimensions of a single object (Mollinga, 1998). Notions such as 'socio-technical systems' (Mollinga, 1998), 'waterscapes' (Swyngedouw, 1997) and 'nature cultures' or 'cyborgs' (Haraway, 1991) provide ingredients for such an ontology of irrigation systems that does not isolate the water system from its social, cultural and ecological environment. These notions envision human activity and nature as being interactive, shaping landscapes that are dynamic and continuously contested in a process that is constituted by, and simultaneously constitutes, the political economy of access and control over resources (Haraway, 1991; Swyngedouw, 1997). Importantly, the boundaries of the system are not static

but change over time and are the subject of negotiation and struggle. This is why describing and understanding an irrigation system requires what Haraway (2003) refers to as an ontological choreography. It requires explicit inclusion of how different actors define and manipulate the boundaries and constituent elements of the system.

'Seeing' gender in water management, then, not only requires allowing women to enter into the already defined and ideal-typical domains of irrigation decision-making. It also requires rethinking the boundaries and functions of these domains. And it includes a critical enquiry into how drawing boundaries between identified domains serves to maintain or erode existing modes of gendered power and gendered identities. The current association of water authority and expertise with male identities and the perception of water management as a masculine domain may rest on implicit gendered beliefs and ideologies that serve to preserve and strengthen gendered power hierarchies, as well as on the actual division of water rights and powers. For women, entering a masculine domain, and assuming water identities that are associated with men, involves revaluing and redefining female identity and work, and a rejection of rules and regulations that tie them to specific roles. This typically happens through calling into question their sexual integrity and moral virtues. They are, for instance, accused of being 'public women' and risk physical and verbal abuse (Arroyo and Boelens, 1997, 1998). The account of Inés Chapi about the early days of her water leadership in an irrigation system in Ecuador is illustrative:

> *We [the women who got together and organized themselves] were told that our children were not from our husbands, that they were children from 'gringos', and the priest told me that we were Negroes. To our husbands they said: 'Listen, you are dummies, you have to take off your trousers, your wife does such and such things.' In the mass in church, people were told not to associate with me and Rosa, that we were bad women leading bad lives.* (cited in Arroyo and Boelens, 1998, p400)

Inés's comments show that not just women, but also their husbands and men, in general, risk losing respect and authority when women assume identities of experts and water decision-makers that tend to be reserved for men. Husbands risk being considered as 'weak' or 'effeminate', while the job of water manager loses respect and imparts less status when women can also do it.

Conclusions

This chapter explains how mainstream professionals conceptualize water realities and the implications for 'seeing' and misrepresenting women and for understanding gender. Ways of framing – of talking and thinking about irrigation – are an intimate part of the larger projects of maintaining or challenging

gendered hierarchies and norms. Professional identities in irrigation use languages and ways of producing truths. As such, irrigation knowledge and discourses are part of a larger range of cultural expressions through which professionals represent themselves. This process of identity formation is deeply gendered, both in how it continuously works to reconfirm the masculinity and, thus, the power, strength and authority, of knowledge producers. One example is the labelling of some activities and domains as masculine and others as feminine. In addition, choosing certain metaphors and drawing the boundaries of subject matter in particular ways allows normal irrigation knowledge to reproduce gendered hierarchies and reconstitute gendered identities.

Water science is a peculiar form of science. Read in a Foucaultian frame of analysis, the construction of irrigation knowledge is tied to the development of particular modern forms of practising irrigated agriculture and to 'disciplining' the practitioners. Detailed prescriptions about how to optimize the use of land and water for the production of crops are concretized in technological and managerial designs. As such, irrigation knowledge can be seen as a project to turn farmers and irrigators into 'docile' bodies whose movements can be controlled in time and space (compare Foucault, 1979). This is not to say that the results of irrigation research are misused or misapplied by governments. However, the irrigation activities and policy agendas that address significant irrigation problems are intertwined so that the values driving irrigation policies also determine policies for much irrigation research. Many irrigation texts have been funded by development agencies and a large number of studies have arisen out of, or were commissioned to inform, specific irrigation programmes. Helping to make irrigation systems perform better is a major objective of much research. This has an important effect on the applicable standards of research competence.

For international experts, familiarity with the international irrigation discourse is often of far greater importance than knowledge of a particular country or water use context. Many studies are produced for consumption by the agencies or universities that sponsored them and are circulated only within a privileged circle of policy-makers or academics. Many studies present quite basic information and are predominantly descriptive, providing evidence to substantiate a selection of key themes. Their thrust, in general, is to provide better irrigation designs or management models, rather than producing sharper analysis. Diverse irrigation realities across the world are reduced to 'key performance indicators' (see Perry, 1996; Molden et al, 1998) which can serve as the basis of comparison to compound 'a screening process for selecting systems that perform relatively well and those that do not' (Molden et al, 1998, p19). Such systematic exclusion of context, or of the specifics of the cultural, social and political environment, allows sustaining the façade of a universal and generic 'water expertise', which can be applied the world over with only minor adjustments. It is an expertise that is intrinsically resistant to seeing and understanding gender because gender is necessarily about context. It is also an

expertise that may not be hospitable to critical reflection because that would risk unveiling and threatening the foundations of unequal economic and political relations on which mainstream water knowledge is based and that it helps to sustain.

'Normal' water knowledge often continues to be typically positivist, and much of it continues to be prescriptive: it is concerned with how water realities should be, and possibly with why actual realities are different. It is less concerned with trying to understand the logic and determinants of how such realities actually are. Through prescriptive ways of 'ordering' realities – water systems, organizations, institutions, economies – people themselves are also 'ordered' and 'normalized'. They act on the basis of sets of incentives that are clearly identifiable and known to planners, managers and knowers. The incentives can be manipulated or at least, to some extent, controlled by those in power. Gender, just as other social differences and social relations of power, are 'assumed away'. They do not fit in the rational, logical and scientific organization of the water world either because they are seen as despicable remnants of backward cultures or traditions, or because they are perceived as belonging to the world of the family and the private that supposedly do not matter for understanding what goes on in water.

For making women visible, and providing them with a legitimate existence in mainstream water discourse, there are two distinct rhetoric strategies that are not mutually exclusive. The first is to show that there are women among irrigators, water users and managers and among the inhabitants of the world of reason and work. This strategy posits women as similar to all other irrigators. Its strategic effectiveness in gaining recognition for, and attention to, gender importantly rests on convincingly showing that women, too, are endowed with the gifts of reason and rationality, that they too can irrigate and farm, etc. In other words, they are humans too. It implicitly questions the ideological and symbolic association of productive work and the public domain with masculinity and domestic work and the private domain with femininity. It is a successful strategy to claim rights to water and land for women. Yet, it is not very effective in questioning gender inequities as they relate to water. Because of the way in which irrigation and water systems are perceived, the discursive transformation of women into irrigators and water managers entails screening off their non-irrigation identities. This is how women cease to exist as women. Mainstreaming gender, therefore, implies its disappearance as a theme that can be discussed. Women, just like men, get to be treated as 'universal' subjects who are implicitly modelled on men, and 'the gender question' is reduced to one of exclusion or lack of integration. Gender becomes irrelevant because rational water behaviour is not influenced by the gender category to which one belongs, but conceptually 'bracketed away' and defined by one's function and location in the water system.

The second strategy to show that women 'matter' is to create them discursively as a distinct functional group in relation to the water system. This

implicitly argues that they are different. For instance, this can be done by showing that women's water needs are distinct from those of men. Or it can be done by showing that female farmers systematically have different assessments of the water system's outputs, impacts and internal operations compared to male farmers. It entails the establishment of another important category of individuals next to the already existing category of water users and farmers, and claiming a degree of acceptance and 'normalcy' for this group. It may also entail a change in the ideas about what the irrigation system 'produces' or should produce, such as by including providing water provision for domestic uses. And it may further entail shifting the system's boundaries – for example, by including women's homestead gardens in the area that is to be served by the system. It implies, then, the expansion of the water reality with a distinct 'women's domain'.

This second way of making women visible clearly does put them on the water map, and allows thinking about their specific water needs and demands. Yet, it is not without problems. Women are made visible as women, as individuals whose identities and needs are derived from the fact that they belong to the female gender. Their link to the water system and, thus, their existence in water discourses also come to be seen as primarily determined by their gender. What is problematic about this is that women's water existence is linked to their gender, while that of men is simply there and unrelated to their social identity. Masculinity is thus assumed and taken as the norm, while femininity is defined as the 'other' which needs mentioning. Such reasoning dangerously limits the definition of the female subject to gender identity to the exclusion of other identities. An illustration of this is provided by van Koppen et al (2001), who describe the different types of members at the lowest organizational level of the West Gandak irrigation system in Nepal. Next to, for instance, a chairman and a vice-chairman, a woman is mentioned as one type of member.

Such reductionism discursively constructs women in implicit opposition to the construction of irrigators, who are assumed to be men. Women's professional identities as farmers and irrigators become difficult to see and understand, while men's identities as irrigators are overemphasized to the neglect of their other identities, including gender. The two categories are defined as mutually exclusionary and dichotomous. Gender – or at least female identity – then becomes itself a determinant of water behaviour, dividing the water world into 'normal' water users or irrigators and women. This dichotomous conceptualization of gender analytically is also problematic because it leads to the universalization and essentialization of gender differences, and thus risks 'freezing' them rather than questioning and challenging them. It is based on the construction of women as an already constituted coherent group with identical irrigation interests and desires, regardless of class, ethnic or racial location, or contradictions. This group of women exists prior to the process of analysis, and prior to their entry into the arena of social relations or the irrigation system (compare Mohanty, 1991).

Questioning gender requires a social relational approach in which men and women are seen as parties to sets of social relations involving rights, resources, responsibilities and meanings. These relations with other men and women are the vehicles through which what it means to be a woman and a man, in that time and social place, is defined and experienced. Gender operates within social categories rather than through pre-existing bounded groups of men and women. Categories of men and women are to be deconstructed, allowing differences within gender divisions, recognizing male gender interests and identities, and separating actually existing women and men from hegemonic femininity and masculinity (Connell, 1995).

In the end, critical knowledge of water is not just concerned with water realities 'out there', but also, and importantly, by how such water realities are interpreted and understood at different levels of governance and by different actors. Gender importantly colours and influences the construction of knowledge, and the identities of who are recognized as water experts. Gender, therefore, is not just a part of water realities in the field, but also fundamentally colours and structures ways of thinking and making sense of those realities and of how identities are constructed. Struggles over meanings and discourses, about how truth claims are made in water, about expert identities and cultures, are and should therefore assume a much more central place in attempts to mainstream gender in water.

Notes

1 By calling a particular way of knowing in water 'mainstream', I do not mean to imply that it is uniform, static or uncontested. Mainstream irrigation wisdoms have always been contested and continue to be challenged by various civil society groups, as well as by water scholars. I use the word 'mainstream' to denote its widespread acceptance and status of 'normalcy'. Indeed, most produced knowledge about water needs refer to it – whether in agreement or in disagreement – to be counted as knowledge, or to have an influence in debates and policies; see Zwarteveen (2006), which is also the basis for the contents of this chapter.

2 The fact that most accounts of embedded realities of water management hardly mention gender may be due to the fact that many of these studies describe and understand irrigation situations in the terms used by irrigation actors themselves, and uncritically accept their gender connotations. Most studies also uncritically adopt the local or conventional methods for identifying relevant actors. Hence, where farmers, irrigators and water leaders in the local understanding are men, researchers accept rather than question this. A focus on visible and audible conflicts, and on a tacit limitation of observations to the 'public' realm of irrigation (fields, canals, meeting rooms and offices) may further hide gender (and women) from the view of irrigation researchers, at least in situations where women's struggles occur in less open and visible ways and where women are not routinely among those present in recognized public irrigation spaces.

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