

WOMEN AND COMMUNITY WATER SUPPLY PROGRAMMES: AN ANALYSIS FROM A SOCIO-CULTURAL PERSPECTIVE⁶

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Abstract

Community water supply programmes are seen as instrumental for achieving the goal of 'safe' water for all. Women, a principal target group of these programmes, are to be benefited with greater convenience, enhanced socio-cultural opportunities and better health for themselves and their families, provided through improved water facilities. Water supply programmes largely consist of three essential components, namely: technology, people and institutions. Although such programmes are intended to benefit women members of local communities, scant attention is paid to the impacts of the socio-cultural context of the community on these programmes. This article explores the influence of social and cultural intricacies on the implementation of community water supply programmes, and assesses their effectiveness. The article offers important lessons for the design and implementation of this type of programmes. It concludes that the local socio-cultural context sets the stage for programme implementation, being a dynamic factor that determines actual access to water sources, more so than mere physical availability, which is often used as a criterion for programme performance. The article stresses the urgent need to integrate socio-cultural factors as a fourth dimension in designing community water supply programmes, and suggests practical measures for enhancing the effectiveness of such programmes.

Keywords: Community water supply programmes; Women; Water; Socio-cultural context; Gender; Caste; Social dynamics; Programme implementation.

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1. Introduction

1.1 Background

Community water supply programmes are perceived to be instrumental in extending access to improved water supply for all. Women have been identified as a major group of beneficiaries, being primary users of domestic water, the objective being to bring greater convenience and enhanced socio-economic opportunities to women, and thus ensure better health for women users and their families. The concern with women's water needs arises from the global recognition of the centrality of women's role as water providers and managers, which began at the 1977 United Nations Water Conference in Mar del Plata, Argentina (UNESCO, 2003), recognized and reiterated thereafter at several global forums.¹⁰

At the global level, it is recognized that women's basic need is having access to an improved, convenient, reliable and safe source of water close to their home. With a focus on this aspect, community water supply programmes (CWSP) have been initiated throughout the developing world, aiming at providing women with improved water supply technologies. Action under this concern was intensified during the International Drinking Water Supply and Sanitation Decade 1981-1990 (IDWSSD) (Elmendorf and Isely, 1983; Deshingkar, 1995; Kalbermatten, 1991). In India, too, the IDWSSD and even the era preceding it, have seen tremendous emphasis on installing improved water supply technologies all over the country. Community water supply programmes were designed and implemented by different agencies -- State, non-governmental or private -- either independently or in partnership. In India, the State has largely shouldered the responsibility for rural water supply, attempting to reach out to every rural pocket across the length and breadth of the country through nationwide programmes. Over the last decade, the *panchayat raj* -- local government -- has been made a partner in this endeavour. In comparison, NGO-based initiatives have been sporadic as well as limited in coverage.¹¹ More recently, private sector participation has also been sought in a new initiative to implement water supply projects, though mainly in urban areas.

Irrespective of the agency responsible for design and implementation, these programmes are essentially built upon three basic components:

- Technology
- Institutional framework, and
- The community.

Among these, the first two are regarded as the 'hardware' and 'software' respectively, the right matching of which is believed to result in successful programmes. This match-up should also be such that the community recognizes the benefits of the improved

¹⁰ Such a concern is reflected in the New Delhi Statement (UNDP, 1990); Dublin Statement (1992) and Ministerial Declaration and Bonn Recommendations for Action (2001) (Appleton and Smout, 2003), to name a few.

¹¹ Well-known initiatives in this sector include those of SEWA in Gujarat (Maharaj, 1999) and Water Aid in the states of Maharashtra, Karnataka, Andhra Pradesh and Tamil Nadu (Water Aid, 2003).

supply, can afford at least the cost of operating and maintaining it, and has the skills, materials and tools available to sustain it (UNDP and World Bank, 1987).

1.2 Problems

In the initial phase, technology was thought to be at the root of the problems experienced with community water supply programmes using handpumps. Consequently, this aspect has been continuously upgraded, while the concept of village level operation and maintenance (VLOM) sought to overcome inadequacies in maintenance in order to secure long-term reliability and sustainability (UNDP and World Bank, 1987).

Some may argue that the performance, reliability and sustainability of the technology enable us to judge the efficiency of a programme. However, technological concerns alone do not provide a sound enough basis for evaluating the programme in terms of equitable access by the targeted group – in this case women. Nevertheless, equitable access to water supply by women is necessary for the ultimate goals of the programme to be achieved, namely: greater comfort, better health and increased socio-economic opportunities. Unfortunately, the effectiveness of the programmes from this perspective has seldom been evaluated. Perhaps it is assumed that once the water supply is installed and sustained, all targeted women will equitably access it, as communities are essentially homogenous.

Actually, the problem arises from the fact that, despite assertions about its active role in operation and maintenance, the community has been conceptualized as a rather passive actor.¹² What has been entirely overlooked is that communities are not mere 'empty vessels' to be endowed with capacities for handling technology (van Wijk-Sijbesma, 1985). Target communities provide the socio-cultural context within which the process of programme implementation unfolds and within which the intended beneficiaries, in this case primarily women, live as members.

In view of the importance of the socio-cultural context of the community, this article raises some fundamental questions regarding the achievements of the community water supply programmes over recent decades. How effective are these programmes, particularly with regard to the immediate goal of providing women with access to improved, convenient, reliable and safe domestic water close to their home? How do the socio-cultural intricacies of local communities influence the real-life implementation of these programmes? What lessons can be learnt to improve performance?

This article seeks to answer these questions through a micro-level analysis of the outputs of a State-run rural community water supply programme in India, and attempts to understand how socio-cultural factors interact in the process, and may thwart the performance with respect to women's needs. The findings imply that the community's

¹² The need for and benefits of enhanced community participation – especially the women - in community water supply programmes has been increasingly highlighted in recent years and strategies have been defined for an effective approach to this issue (Fong *et al.*, 1996; van Wijk-Sijbesma, 1995; Lidonde and Derbyshire, 2003; Maharaj, 2003; Appleton and Smout, 2003).

socio-cultural context plays an important role in the implementation of these programmes; practical means for enhancing the effectiveness of these programmes are suggested.

1.3 The socio-cultural factors in community water supply programmes

Community water supply programmes in India are implemented in local communities, and the intended beneficiaries, in this case primarily the women, are members of the same communities. Social interaction among community members, and their rights, powers and opportunities are patterned according to the social organizational principles of the community in question. These social principles may also considerably influence issues such as access to and control over water sources, their distribution and utilization, decision-making regarding allocation, etc.

Project donors often assume that everyone in a community equally benefits from the arrival of an improved water supply system, that everyone agrees, and that everyone participates in managing it, and, most importantly, that no one is excluded from its use. However, such social cohesion is a myth. In reality, communities are dominated by heterogeneity based on socio-cultural status (Schouten and Moriarty, 2003). Thus, everyone may not benefit from the water supply in the same degree: some may be favoured while others are excluded. For instance, women from minority groups have been observed to be denied access to communal water facilities; and in cultures imposing seclusion on women, it may not be possible for women to approach and use water facilities in public locations. It has also been reported that powerful people in a community influence the location of public handpumps (van Wijk-Sijbesma, 1985).

As the data underpinning this article derive from a study of community water supply programmes in India, a discussion of the social organizational principles of local communities is relevant. Of paramount importance among these principles are caste and gender, coupled with other aspects of social heterogeneity, such as religion.

Castes in the Indian social system are ranked, endogamous (in-marrying) groups, in which membership is determined by birth. Each caste is part of a local system of interdependent groups, linked through economic, ritual and social relationships (Beteille, 1996). The Indian caste system may be seen as resting upon the basic principles of hierarchy and difference, and defined in terms of the opposition of the pure versus the impure (Dumont, 1988). The notions of purity and impurity are central to the principle of caste, and determine the respective civil and religious privileges or disabilities of the different groups (Ghurye, 1969). Social dynamics among the castes within a community are governed by the principle of dominance, i.e. a dominant caste is one that preponderates numerically over the other castes, and may also wield greater economic and political power. Higher position in the local caste hierarchy, access to western education and external occupations are also factors that enhance social dominance (Srinivas, 1959). A dominant caste will exercise control over the use and management of space and resources in its village and influence decisions affecting the lives of all community members. It has been observed that dominant castes in Indian villages

generally belong to the upper and sometimes middle categories of castes (Singh, 1988).

The principle of caste is sometimes expanded to include other forms of social differentiation found in Indian villages, primarily ethnicity. Thus, groups such as tribals, or religious groups such as Muslims and Christians are perceived as distinct social entities. Patterns of social interaction based on the principle of dominance have an important bearing on inter-ethnic relations in mixed villages regarding access to and management of spaces and resources in the village. Even within a single ethnic group, perceptions of social hierarchy may cause differential behaviour based upon social status, economic position, etc.¹³

Caste and ethnic groups residing in local communities are essentially 'gendered', meaning that men and women assume different behaviour, attitudes, roles and responsibilities (Seymour-Smith, 1986). Men and women may also differ in their social, cultural, economic and political attributes and opportunities (Woroniuk et al., 1997). Within anthropological theory on gender, these differences are thought to reflect a natural division between the domestic and public domains. However these domains are not exclusively linked to male or female but both women and men have culturally appropriate parts to play in both domains (Lamphere, 1974; Strathern, 1980; Pina-Cabral, 1986; Harris, 1980). It is also argued that while women appear to be denied formal power and authority in the public sphere, they are not without individual power in the domestic sphere, which may even determine male activity in the public sphere (Friedl, 1987; Lamphere, 1974). Within this theory, gender is seen as a symbolic system, not fixed in a simple dichotomy but representing symbolic metaphors for types of action that may be ascribed varying social values and relate to other socio-cultural symbols and forms of experience. Gender is further seen as part of a complex system of thought that may relate to aspects such as age, generation, social status, etc. (MacCormack and Strathern, 1980; Harris, 1980; Pina-Cabral, 1986; Llewelyn Davies, 1981). In the Indian context, gender can be intricately related to the principle of social differentiation, leading to several complexities within the socio-cultural context of the communities where water supply programmes are implemented.

1.4 Methodology

The findings of this article result from preliminary observations in rural pockets of India, as well as in-depth field research. First-hand data was collected through ethnographic fieldwork in 15 villages in the states of Bihar, Jharkhand and Madhya Pradesh. The villages were selected on the basis of criteria such as multi-caste composition of the community; availability of traditional water supply sources; installation of new technology (handpumps) under State initiative. Fieldwork techniques,

¹³ For instance, a clear instance of social hierarchy was observed in the *Munda* tribe between the followers of the indigenous Sarna religion and the Christian converts. The former regard themselves as superior and tend to exercise control over village resources (Singh, 2000). Elsewhere it has been noted that conversion of ex-untouchables (the scheduled castes) to another faith has not made much difference to inter-group relations or to the social structure of the village (Jodhka, 2002); it has also been observed that caste exists among non-Hindus as well (Singh, 1977).

such as: participant observation; unstructured and structured interviews with key informants using open-ended questions; focus group discussions; and case studies were used.

The sample of informants selected within the villages numbered 265 men and 230 women, and were drawn from the different caste groups in the villages. A total of 11 focus group discussions were held in the selected villages, of which five specifically for women. Case study data was also collected from three villages to obtain evidence of the interplay between caste and gender in the implementation process of any programme.

The article is divided into five sections. The second section presents an overview of community water supply programmes implemented in India. The third section makes a micro-level assessment of the outputs of this programme while the fourth section presents a socio-cultural analysis of the problems that challenge achievement of programme objectives. The final section presents a conclusion to the discussion, highlights implications of the present study, and outlines suggestions for a more realistic approach to designing community water supply programmes.

2. Community water supply programmes in India: An overview

State-initiated community water supply programmes in India have been implemented within national and international policy frameworks. The National Water Policy (1987 and 2002) recognizes the provision of adequate and safe drinking water facilities in rural regions as one of the priority areas for action. Similarly, the National Policy on Empowerment of Women (DWCD, 2001) emphasizes special attention to the needs of women in the provision of safe drinking water within easy reach of household, especially in rural areas.

While rural water supply has been provided through the launch of a number of national level programmes, the oldest and most widespread has been the Accelerated Rural Water Supply Programme (ARWSP), initiated, in its present form, in 1972-1973. The programme aims to assist states in implementing schemes for supplying safe drinking water to villages, as rural water supply constitutionally is a state responsibility. Handpumps and piped water schemes were widely installed under the programme. This programme is still ongoing with the basic objective of ensuring coverage of all rural habitations, and especially to reach the 'unreached' with access to safe drinking water (Ministry of Rural Development, 2002). Women have been identified as the principal beneficiaries of ARWSP, based on the assumption that the availability of safe water sources close to their home will unburden women of the task of fetching water from faraway sources, thereby having a positive impact on health as well as offering a variety of socio-economic opportunities.

The programme guidelines define 'access' in the following terms: provision of 40 liters per capita per day (lpcd) of drinking water for human beings; with one handpump

or stand post for every 250 persons; and the availability of a water source (either private or public) in the habitation or within 1.6 km in the plains and within 100 m elevation in hilly areas. For areas inhabited exclusively by scheduled castes or scheduled tribes¹⁴ or having a larger scheduled caste/scheduled tribe, a population smaller than 100 persons per water source is permissible.

Potable water for humans is meant for meeting the following daily requirements: drinking, cooking, bathing, washing and ablution.

A habitation that does not fulfil the above criteria is recognized as 'not covered' while one where capacity of the water supply system ranges between 10 lpcd to 40 lpcd is categorized as 'partially covered'. Habitations that have a water source but are affected with quality problems are considered 'no safe source' habitations, at least for purposes of drinking and cooking. Areas classified as 'not covered' or having 'no safe source' are both prioritized for the provision of safe water, and if inhabited exclusively by scheduled castes and scheduled tribes, or having a larger scheduled caste/scheduled tribe population are also prioritized, even if the population covered by a single water source is less than 100. In order to address water quality problems, assistance is provided to states within the ARWS programme for purposes such as: installation of treatment plants for defluoridation; removal of arsenic and iron contamination; establishment of water testing laboratories; organization of awareness, etc. Habitations classified as 'not covered' and 'partially covered' habitations that are also affected by quality problems are prioritised.

3. Programme outputs: A micro-level assessment

While the rural water supply programme in India exhibits a general focus on women as beneficiaries, there is particular concern for women from the 'weaker' sections of the population, namely the scheduled castes and scheduled tribes, who are identified as the most needy in terms of lack of access to safe drinking water. This section seeks to assess the achievements of the ARWS programme.

3.1 Distribution of benefits of ARSWP

Government of India statistics show that, out of a total number of 1,422,664 rural habitations in the country, 1,256,956 (88.4%) are fully covered with drinking water facilities, while 147,791 (10.4%) are partially covered (Ministry of Rural Development, 2002). It is estimated that more than 3.5 million public handpumps and over 100,000 piped water schemes have been installed in these habitations under the government programme (Planning Commission, 2002; Chakraborty, 2003). In the light of these vital and rather positive statistics, the critical question that arises is: has the coverage of rural habitations with handpumps ensured effective access to targeted users - the women of the

¹⁴ The terms scheduled castes (SC) and scheduled tribes (ST) refer to categories mentioned in the Indian Constitution. These categories are considered to be weaker sections of society whose interests need to be safeguarded and promoted. Socially, these groups are seen as occupying the lower rungs of local hierarchies.

community? Effective access here means that the targeted women are actually using the water source for the intended domestic purposes.

In most cases, the public handpumps are installed at public locations - such as along main roads, near schools, health centers, community halls, etc. – on lands owned by the State or the local government. Ease of access for technical teams is often cited as one of the reasons determining the location (van Wijk-Sijbesma, 1985). A certain functional relevance can also be attributed to the pattern of siting, since a water source installed at a public location – compared to one on private land -- is expected to be more available for public access and use, thus being more suitable for achieving the objectives of the programme.

The reality of user availability as observed in the field is, however, to the contrary. An early study of the effectiveness of the ARWS programme conducted by the Planning Commission of India showed that, in a sample of 99 villages across the country, while 80% of the water points were installed in public locations, only 16% were actually in poor areas, although such areas made up one third of the total village area (Planning Commission, 1980).

The present study confirms the continued existence of this imbalance in the study area. Out of 44 public handpumps installed in the villages studied, only 9 were found to be in the neighbourhoods of the scheduled castes or scheduled tribes or in other poorer sections. Three case studies illustrate the extent of manipulation of the programme criteria, with negative impacts on the achievement of the objectives.

3.1.1 Case study of Lamkana Village

In Lamkana Village, Shivpuri District, Madhya Pradesh, the only handpump was intended to benefit women of the scheduled castes. The pump was installed along the village main road next to the Brahmin neighbourhood. Although this is a public location, due to the social pressures imposed by the caste system, the location of the pump has implications for its effective availability to the intended beneficiaries. The Brahmins are an upper caste, and are also dominant in this village. Due to the expected social norm for the scheduled castes to keep out of the Brahmin neighbourhood, their women are excluded from accessing the pump. In addition, most of the Brahmin households are well off and own private wells, and the public handpump represents only an additional water source to them. For the scheduled caste women, on the contrary, the public handpump represents the only source of clean, safe water within a reasonable distance. Thus, despite the ARWS installing a working handpump, in reality, the scheduled caste women, who were the originally intended beneficiaries, continue to draw water from their traditional source – a distant well. Depending on this well as a sole water source poses additional hardships during the summer months, when it generally dries up.

3.1.2 Case study of Saprar Village

In another village, Saprar, in the same district, the handpump meant for the Jatav, a peripherally located scheduled caste group, was installed in a public location towards the middle of the settlement, between the Brahmin and Yadav areas. These two castes belong to the upper and middle level orders respectively within the local caste hierarchy and are together socially dominant in the village, owning a number of private handpumps that are shared with their same caste neighbours. The *Jatav*, however, lack access to any source of safe water of their own. Again, due to social norms with regard to the separation of castes, they are denied access to the public handpump installed by the ARWSP, and continue to depend on a distant well for their domestic water needs.

3.1.3 Case study of Masarh Village

In Masarh Village, Bhojpur District, in the state of Bihar, a public handpump that was supposed to be located along the main village road near the areas occupied by the *Kumhar* and *Koiri*. However, the pump was in actuality installed in front of a Rajput household. This group has virtually monopolized its use and maintenance, although they share the pump with neighbouring Rajput households. The intended beneficiaries, meanwhile, as they are placed lower in the caste hierarchy, and also enjoy limited economic resources, continue to depend upon their old well.

The case studies discussed above illustrate the fact that dominant castes in Indian villages have succeeded in interfering with the ARWS programme criteria – which are to provide one handpump for a population of 250, preferably located at a public site, and to give priority to women and members of scheduled castes and scheduled tribes. The result is that, although underprivileged community populations merit coverage under the programme, and are intended by the law to be served by these handpumps, members of these groups do not in reality enjoy access to improved water sources. The study also found that other underprivileged groups were similarly barred from public water sources by dominant upper-caste groups, who control access to the pumps. The socio-cultural reasons for such situations are analyzed in Section 4.

3.2 Control of fluorosis

The Government's effort to provide access to safe drinking water also merits assessment from the point of view of water quality. Though the programme aims at supplying safe drinking water to all rural habitations, national statistics indicate that groundwater supplied by the handpumps installed under the ARWS programme, in many locations is actually unfit for drinking. The Government status report acknowledges that groundwater in 36,988 habitations is affected by high concentrations of fluoride (Ministry of Rural Development, 2002). As many as 196 districts in 19 states report incidences of fluorosis in their populations, a clinical condition resulting from drinking water contaminated with fluoride (Susheela, 2001).

To combat this problem, the Government has introduced a special project within the ARWSP. This project among other approaches, supports states in providing community treatment plants to reduce fluoride contamination, and also assists with raising public awareness and extending education on health issues related to fluoride in the drinking water. DANIDA and UNICEF have also provided substantial assistance to combat the problem of high fluoride concentrations.

In the state of Madhya Pradesh, fluorosis is known to be endemic in 14 districts, and 24 villages in Shivpuri District have been identified as being at risk. Villagers have been exhibiting the symptoms of fluorosis for more than two decades, with women and children being most affected, especially children, many of whom suffer from not only dental fluorosis but also the crippling skeletal fluorosis. Many of the handpumps installed in the villages under the ARWSP yield contaminated water. In a number of villages, however, alternatives have been installed in the form of water treatment plants – either mini-plants attached to pumps or major plants treating groundwater and channeling the water through pipes which allows fluorosis to be checked. Here again, the benefits are not distributed equitably, as illustrated by the following case studies. Thus, the effectiveness of the government programme to control fluorosis need to be assessed.

3.2.1 Contaminated water in Hathoda Village

In Hathoda Village, the public handpump with its attached mini-plant for fluoride decontamination was intended to provide safe water at least for drinking and cooking needs to a section of the village population, including lower caste community members. To serve this end, the pump was installed at a public location. However, the chosen location is actually situated within an upper caste area to which lower caste women are being denied access. They therefore continue to depend on their traditional well for all domestic purposes -- although the water from this well is contaminated.

3.2.2 Phoolpur piped water scheme

In the neighbouring village of Phoolpur, the main water pump and defluoridation plant with attached pipes is located inside the village on public land. However, the surrounding area is inhabited by upper castes that dominate the village while the lower caste people reside on the outskirts of the village. Due to the existing social norms defining spatial mobility and access to resources, the latter are denied access to the pump and the plant.

The scenario described in the above case studies casts serious doubts on the effectiveness of the ARWS programme in providing any real assistance to its basic focus group, namely women. Clearly, the above data shows that the programme has not reached all women in Indian villages. Reports from the field show that while some (upper caste) women enjoy a privileged position with respect to the accessibility of improved water supply, others (lower caste women) continue to be denied access even in those villages that the programme claims to have 'covered'.

Also, it needs to be explored how much the women privileged with access to State-provided handpumps in their villages actually use them. While ostensibly intended to facilitate and unburden women, public handpumps are commonly seen being used by men rather than women, and the water used for washing, bathing and watering their animals. The sight of young children – both boys and girls – collecting or using water is also comparatively common. The least common is to see married women fetching and using water at public handpumps.

Ironically, it is precisely married women who are believed to be actually responsible for domestic water management, and yet their appearance at public handpumps shows much variation geographically as well as socially. Scheduled caste women in Madhya Pradesh or parts of Bihar, regardless of age and marital status, may be seen at public handpumps collecting and using water. The same holds partially true for the tribal belt of Jharkhand, although young married women may be less frequent visitors. However, married women from the upper castes are actually conspicuous by their absence at handpumps in the area of study. Such a situation is a manifestation of the gender-based conceptions regarding domestic and public spaces and their usage. These are discussed at length in the next section. In this situation, can the claim of the ARSWP be trusted that it has achieved universal outreach to women as primary beneficiaries?

4. Problems in reaching the unreached. A socio-cultural analysis

The micro-level assessment of AWRSP indicates that even after decades of implementation efforts, the unreached continue to remain so. These unreached are essentially women, and they lack real access to safe water sources, either by outright denial of their rights of access or due to prevailing patterns of distribution of roles within families. Almost universally, a substantial number of these women belong to the lower classes or underprivileged segments of society. While the Planning Commission of India envisages that the scheduled caste/scheduled tribe population and other weaker sections should be fully covered on a priority basis (Planning Commission, 2002), yet at the micro-level, the same women form the majority of those who continue to lack access. We now turn to analysing the underlying reasons.

In rural India, particularly in Hindu villages, the principles of caste and social dominance define the rules of access to public resources. Socially acceptable access thus stands in contrast to physical access as envisaged in the AWRS programme framework. While its theory postulates that the siting of handpumps in public spaces would ensure access for all in the community, socio-cultural principles stipulate that public spaces in the village are accessible to and usable by only those castes that reside in the immediate vicinity; decision-making regarding such access and use rests with the dominant caste. These notions of privilege derive from the historical context that the currently dominant caste is generally the social group that founded the village, and subsequently invited other castes and ethnic groups to settle. Thus, de facto social ownership of the entire village and its resources is conferred on the descendents of the original founders. Consequently, while theoretically speaking, public spaces in the village and the resources located there should be accessible to all, in practice, it is in most cases only the dominant caste and other upper

castes that are actually socially privileged to enjoy them. Access of lower castes to public spaces and facilities is generally restricted to those within their own areas, as the traditional social mapping in Indian villages is based largely on the principle of single-caste neighbourhoods. The principle of caste-based spatial segregation, discussed above, is extended to generating rules about sharing of water and water sources. Parallels of the above arrangement can be observed in tribal villages in Jharkhand (Singh, 2000a).

These social realities have interfered with the process of implementation of ARWSP, and created a problem of denial of access to water to the needy. When a new handpump is to be allocated in a village, the question of its siting is generally settled by the locally dominant caste. Project staff generally consult community leaders, usually belonging to the same dominant caste. Even where members of the local government (panchayat) are consulted, these too either belong to the dominant group -- the real decision-makers in the village -- or convey its preferences. Since the programme guidelines are not explicit as to precise social considerations regarding the actual installation site, villagers with political clout are able to influence project staff to select a pump location that suits their interests. Even so-called public facilities, such as schools, health centres, community halls, etc. may be locally identified as belonging to and controlled by the dominant group residing around them. Since lower castes and other underprivileged groups, are possibly already excluded from access to such a spot, their interests come to be entirely overlooked, despite the fact that they are generally the real intended beneficiaries of the programme. This happens because project staff are often unaware of the social intricacies of each locality, and fail to consult all resident groups separately. It may also be true that even when consulted, lower caste villagers feel socially obligated to follow the wishes of the dominant group. As a result, most handpumps get installed at sites where universal access is a myth, as borne out by the above case studies. Consequently, the neediest remain deprived of safe drinking water.

Similar social processes have been at work in the case of the programme to control fluorosis and stymied efforts to provide universal access to fluoride-free water under the ARWSP (see sections 3.2.1 and 3.2.2 above). Second, this study reveals that within the same caste, the notion of gender influences the patterns of actual access to and use of domestic -- and what can be called 'extra-domestic' -- spaces with respect to water sources intended to be publicly available. The focus on women in the ARWS programme paints a picture of women as universally responsible for fetching water for their families as well as for themselves -- hence the concern with easing their burden. In rural India, however, the correlation is not that simple. The gender-based behavioural norms that govern the task of water collection and use are founded on the association of women with the domestic sphere of work, but have become extended to associate women with the domestic space as such. In the broadest sense, the notion of domestic space implies the working area of women. Beyond the confines of the home, women's involvement ends and that of men begins, the latter's working area being identified with the extra-domestic space.

These concepts of male versus female working spaces are further correlated with notions related to caste, where substantial variations are found between different castes. The higher the position in the social hierarchy, the more closely are women associated

with their domestic space. Within upper/dominant castes, women are identified with the domestic space to the extent that they avoid moving around in extra-domestic areas. Violation of this norm is perceived to disturb the gender-based social harmony and balance, and therefore invites public criticism. As one moves down the social hierarchy, the rigidity of these norms decreases and women may show greater mobility. However, in the case of lower castes, women may sometimes tend to restrict their movements to their domestic space in what has been called the process of 'sanskritisation' that may be adopted by a particular group for upward mobility in the local caste hierarchy (see Srinivas, 2002).

The dichotomy that exists between domestic and extra-domestic spaces is paralleled in the notion of 'private' vs. 'public' spaces. In this sense, as can sometimes be observed within the upper castes, women actually enjoy mobility outside and between households; but while they cross domestic boundaries, such movements are governed by the concept of private space. A private space is considered part of the extra-domestic space, but is available to women for mobility. Examples are side doors and side passages to the main house and main entrance. Otherwise, all extra-domestic spaces are classified as public in nature. However, even within the domestic space, certain spaces are further secluded as private, and are segregated from men of the household and from other women visiting from other households, even if they are of the same caste. The confrontation of married women with men from the household or outside belonging to a senior generation or relatives, and even with women of any age or generation, including relatives belonging to other households, is not desirable. Men of the household and outside women are also expected to reciprocate the behaviour by avoiding the possibility of such confrontations. These norms also extend to public spaces where face-to-face encounters are avoided through segregation of resources, or through the observance of time cycles.

These principles and their associated behavioural norms have significant implications for women's involvement in domestic water management. Higher caste women often have their own private sources -- generally wells -- within their domestic space, and can therefore be fully responsible for domestic water management. However, the quality of the water supplied by such sources may be of concern especially in areas where groundwater is known to be contaminated. In families that depend upon public sources, domestic water management becomes an explicitly cooperative venture between men and women, with men taking up the task of fetching water while women make decisions as to quantity, quality, appropriateness of source, purpose of use, and management in the home. In this case, then, the problem of accessibility and of time and energy investment is actually seen as more of the men's concern. It is only occasionally that young children and older women share the task, particularly in the absence of men. This also explains why many of the public handpumps installed under the ARWSP are being used more by men and children than by women -- for whose primary benefit they were installed. This type of situation is especially common within dominant sections in villages.

Where public handpumps have been installed in the localities of lower castes (including scheduled castes) and in tribal villages where effective access is available to

these groups, the scenario is different with regard to gender-based use-patterns. Here, women make more frequent use of the handpumps in public spaces. Within these groups, the norm of face-to-face avoidance between men and women or between women and women outside the family is less rigid, and to the extent that it is adhered to, it is implemented through alternate mechanisms such as time-based daily routines for the use of a single common source, or gender-based segregation of the sources. In sum, within these neighbourhoods, women can move around and work in public spaces for household or economic purposes.

In fact, the caste-related arguments and analysis presented here can be seen as extending to multi-ethnic situations as well, where Hindus and non-Hindus reside in the same village. Such non-Hindu groups may be from tribal or other religious backgrounds. Spatial segregation of these groups and denial to them of access to water sources used by Hindu castes is commonly observed. With regard to Muslims living in the villages under study, it was similarly observed that they routinely have to fetch water from distant sources in the fields. Here, parallels may be drawn to upper Hindu sections with regard to the role of women and their sphere of activity: Muslim women, especially young married women, take responsibility for water management within their household, while fetching water from public sources is done by the menfolk. Similarly, avoidance of confrontation with men guides the extra-domestic movements of young married women among the *Munda*, which may actually restrict them from fetching water at public sources.

The water fetching behaviour of a household is also influenced by factors other than social differentiation/dominance and segregation/avoidance, such as e.g., the socio-economic condition of the family. Even within the same ethnic or caste group, among those who allow women a certain degree of movement in public spaces, differences can be observed between wealthier and poorer households. Wealthier households may employ a servant to fetch water or have a private water source installed, which will cause the family not to participate in fetching water from public sources. Thus, in upper or dominant castes, even men are relieved of this responsibility.

The two sets of social principles identified in this study, namely, caste/social differentiation and dominance and segregation/avoidance, derive from the social organizational principles in Indian villages. An analysis of the operation of these principles can help define the position of women in the context of their being the intended principal beneficiaries of ARWSP, and throw light on their real-life ability to access and benefit from public water sources. A complex heterogeneity among women beneficiaries needs to be acknowledged. Where a social group as such lacks effective access to public handpumps due to its location in an inaccessible zone, its women are automatically denied the opportunity of fetching water from such pumps. Where the group enjoys the privilege of accessing and using the public source, the women themselves may not be involved in the process of fetching water. An additional dimension is added where water contamination problems exist and women from lower social strata lack access to safe water directly due to social reasons. Even women from higher social strata may not necessarily be ensured access to safe water on at least two grounds. These are, first, lack of information as to the actual source from which drinking water for the family is being

fetches and second, the water from private sources in use by such women may not be of potable quality.

5. Discussion and recommendations

The findings of the article offer important lessons towards improving the design and implementation of community water supply programmes. According to recent estimates, 1.1 billion people worldwide lack access to improved water supply (UNDP, 2003). A challenge currently confronting the water supply sector, and one of the Millennium Development Goals, is to halve the proportion of people without access to safe drinking water by the year 2015 (UN, 2000; Lenton, 2002). In an attempt to address the global challenge of universal access to water, India has set a national target of providing safe drinking water to all rural habitations by the year 2004 (Ministry of Rural Development, 2002). The current study points out the inadequacies inherent in formulations based on physical targets alone.

The case studies presented in this article demonstrate that the ARWS programme has not succeeded in achieving universal coverage. Nor has it succeeded in reaching its priority group of beneficiaries, namely poor and/or low caste women. The present study has also shown that this dual shortcoming has its roots in a failure to recognize the pivotal significance of patterns of social interaction and gender roles within Indian village communities, which impose severe limitations on access to the public handpumps installed by the AWRSP, especially for low caste groups. While state agencies have identified a number of factors thwarting the achievement of full coverage by the ARWS programme (Ministry of Rural Development, 2002), the report, unfortunately, mentions neither caste nor gender issues.

The case studies analysed also suggest that there is a need to define ARWSP targets from a social perspective rather than merely in quantitative terms (such as e.g., that at least one handpump is provided for every 250 people). While the indicators specify 'how many', the objectives are defined by questions such as, 'whom', 'what' and 'where'.

From the present study it also emerges that in order to enhance the effectiveness of community water supply projects, merely identifying women as a priority beneficiary group will not suffice. There is a need to take cognisance of the various socio-cultural dynamics revolving around women, depending on their specific social niche and economic circumstances. Perhaps there is also a need to incorporate details concerning aspects such as which women are intended (e.g. women belonging to which caste or other social group), how they may be approached, what kind of benefits they need and how these can be effectively delivered to them.

With respect to the women who do not engage in fetching water, there has to be a thrust on modifying their decision-making practices informed by effective delivery of new knowledge that can in turn lead to changes in the quality and quantity of water available to the household. This new knowledge may, for instance, seek to bridge gaps

between shortcomings in the water quality standards defined in the cultural context and the emerging water quality problems and their adverse health implications, along with possibilities of avoiding the consequences by adopting the new water sources for the desired purposes. In this exercise, men should not be excluded. Simultaneously, alternative avenues for enhancing socio-economic opportunities for women must be explored, although some may actually have less to do with women's water management roles.

To address the needs of those women who have been barred from utilizing the newly installed water supply due to its being located in an area inaccessible to them, often for caste-related reasons, detailed guidelines need to be set for the identification of acceptable pump sites. Such guidelines must be in tune with the internal social dynamics of the village community in question. For this, an in-depth understanding of the social structure of the specific village is required, along with a knowledge of the spatial layout of the village and its resources. Participatory exercises, such as social mapping, coupled with setting of quantitative criteria that consider the existing distribution of private (safe) water sources in the village, can be incorporated in the programme design. However, considering the realities of resource limitation, coupled with the fact that most rural communities have already been 'covered' under the AWRS programme, there is an overarching need to incorporate a persuasive educational component, aiming at inducing suitable behavioural change with regard to sharing of resources among different social groups within the village community. While general health and social welfarist messages may have some impact, special measures need to be adopted in this situation, as it requires a major reorientation of social attitudes. It is suggested that substantial attitudinal change with respect to notions related to social exchange can be achieved through spiritual education based on universal human values and needs imparted by local spiritual gurus.¹⁵

The implications of this article may be contested on the grounds that the limitations highlighted here might be actually more inevitable in State-run schemes where the emphasis on hardware tends to outweigh the software components. But it must be clarified here that non-recognition of the context of implementation as a critical factor in the programme cycle is an ailment common to community water supply programmes (Smet and van Wijk, 2002). Agencies designing such programmes have applied a so-called blanket approach using the same technology and service level, and the same maintenance, management and financing systems in every community. Implementation has tended to follow the same national design criteria and the same technical, social and management processes everywhere, irrespective of local social conditions.¹⁶ Unfortunately, the significance of the socio-cultural context of the recipient community

¹⁵ Social integration of the outcast *Sansi* (a scheduled caste) was achieved in a number of villages in Madhya Pradesh through spiritual sessions held in the area under guidance of spiritual leaders where the concept of 'common spiritual brotherhood' cutting across different castes was inculcated based on humanitarian values (Singh, 2000b).

¹⁶ An example was found in the activities of an international NGO in India that plans to replicate the CWSP model, earlier executed in the south, to India's northern states. Differences in the socio-cultural contexts of the two parts of the country need no elaboration but ironically these do not appear to form a part of the agency's considerations (information collected through personal communication with programme staff).

has been overlooked in designing water supply programmes, but its role in the implementation process is of paramount importance, and it impacts directly on the achievement of programme objectives. Inequities in access and utilization may continue to thwart the quality and outreach of service delivery even under participatory programmes based on demand-responsive principles, as long as lack of recognition of social heterogeneities within communities continues to mar proper identification of problems and concerns of the truly needy members.

Taken all together, the findings of the article suggest that community water supply programmes need to be reconceptualised beyond the current construct of mere technology, numbers and localities. If real benefits are to be delivered to those in need, it will be necessary to integrate the socio-cultural context into which water supply installations are to be delivered as a fourth aspect of programme design. This could be identified as a dynamic variable, interacting with all other aspects. Integration of this aspect will imply changes in programme contents as well as strategies towards a more pragmatic, acceptable, workable and effective approach.

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