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Shifting the Focus From Women to Gender Relations: Assessing the Impacts of Water Supply Interventions in the Morni–Shiwalik Hills of Northwest India

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The present article argues for better assessing how drinking water supply interventions affect gender relations. This requires going beyond conventional "water burden" indicators such as time spent collecting water or distances walked to a water source. Based on research in the Shivalik hills of northwest India, the article shows how men's expectations of water uses changed when interventions brought piped water supplies to the area. Though the interventions reduced the distance women walked to reach water sources and the drudgery of negotiating steep mountain slopes, there was an increase in the volume of water women were expected to carry. Following the interventions, men began performing many water-use functions in the privacy of their homes rather than at public water sources, and women were forced to carry more water home for these purposes. The decline of common property resource institutions also resulted in greater dependence on piped water supplies, further increasing the volume of water women must carry. Employing a qualitative research design relying on semistructured interviews, direct observation, and participatory rural appraisal tools, the study described here makes a case for more qualitative assessments of water supply interventions' impacts on mountain women's quality of life. This would yield a better understanding of women's water burdens.

Keywords: *Water burdens; gender relations; water collection; Shivalik; India.*

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Gender and water: assessing women's work burdens in domestic water collection

Gender defines the socially constructed identities, roles, and responsibilities of women and men and the relationship between them (Ahmed 2008). It refers to the socially constructed ideas and practices that determine what is considered female or male (Baden and Reeves 2000; Zwarteveen 2008). These ideas and practices are sanctioned and reinforced by a host of cultural, political, and economic institutions—the norms, rules, and codes of conduct that structure human interaction (North 1990)—including legal and governance structures, markets, religion, and the household. These institutions shape women's and men's access to and control of resources. Gender intersects with other relations of power to "form and re-form our water world" (Zwarteveen et al 2012: 3). In the literature on gender and water, there is growing recognition of the role of the intersection of caste, class, and gender in shaping water insecurity at the household level (Mehretu and Mutambirwa 1992; Cleaver and Elson 1995; Crow and Sultana 2002; van Koppen 2002; Sultana 2009; Zwarteveen et al 2012; Joshi 2013; Kulkarni 2014).

The questions of who carries water home and how they do so are central to gender–water relations, though they are often overlooked in policies and discourses on water and equity (O'Reilly et al 2009). The time spent by women in collecting water is known to have significant implications for their quality of life; the opportunity costs of time and energy spent collecting water have important implications for household food production and welfare (Kulkarni et al 2008). Kulkarni (2014) notes that the time saved collecting water because of drinking water supply programs is often used for other household activities and does not necessarily translate into leisure time for women.

Thus, observers have argued that governments should critically debate and launch projects and educational campaigns that seek to reduce domestic water burdens on rural women and, more broadly, trigger better and more equitable distribution of domestic responsibilities between women and men. Gender equality and the participation of women and men are seen as ways of achieving more effective water policy and program outcomes and are considered key goals of integrated water resource management approaches (Kulkarni 2014).

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Joshi (2013), however, points to a misrepresentation and depoliticization of gender in development. Though some progress has been made—conceptually, methodologically, and theoretically—in better calculating women's work and including domestic work in national estimates, scholars argue that more needs to be done at the practical level (Beneria 1992). In particular, a case is made for more appropriate conceptual and methodological tools to bridge the gap between intent and action in policies for gender mainstreaming (van Koppen 2002).

Development policy regarding women's role in water collection has often emphasized reducing time spent collecting water. Resulting interventions typically focus on specific steps meant to relieve the drudgery of water collection. In hilly areas, for example, this frequently involves relocating water sources closer to homes so that women no longer have to negotiate steep terrain to collect water from traditional mountain sources such as springs. Whether explicit or implicit, reducing the distance women must walk to water sources is a common aim of drinking water supply interventions.

While acknowledging the need for greater gender sensitivity in access to water, the present paper makes a case for carefully assessing the impacts of drinking water supply interventions by comprehensively examining gender relations and how they are transformed by such interventions. This requires going beyond conventional indicators of women's water burden—such as time spent collecting water or distance walked to a water source—and focusing on aspects such as how water-use practices change when new sources of drinking water are introduced, how men and women perceive the "newly discovered water" differently, and the implications of their perceptions for the gender-based division of labor related to water collection.

Research in the Morni hills and the foothills of the Shivaliks in northwest India shows the value of shifting the focus from assessing how these interventions affect women—the conventional focus of policy-makers and planners—to how they affect gender relations more broadly. Drinking water supply interventions give rise to new water uses. Men in particular alter their water uses, thereby creating new water-collection tasks for women. But different groups of women are affected differently, depending on factors such as connections and household access. Indeed, "women" are not a homogenous group and may be subject to variations according to lines of caste and class. Such disaggregation is necessary to accurately assess women's water burdens.

One important conceptual issue here concerns the distinction between policy "outputs" and policy "outcomes" (Hogwood and Gunn 1984; Campbell 2001; Bratton and Ray 2002; Koontz and Thomas 2006). Policy outputs are essentially the physical results of a delivery process. Policy outcomes are the broader, long-term impacts of the policy in question. For instance, in a scheme for improving access to safe water, the hand pumps installed are the policy outputs. However, the impacts of installing these devices on disease incidence or quality of life are considered policy outcomes. Policy-makers and planners typically evaluate policies based on their outputs, such as number of hand pumps installed, new water connections constructed, or new tube wells dug. This emphasis on outputs rather than outcomes can be attributed to various factors, including the time it takes for policy outcomes to emerge and the high visibility of policy outputs and therefore their attractiveness to policy-makers, planners, and politicians. However, as shown in the following, it is vital to look beyond outputs to assess the impacts and outcomes of water supply interventions. For example, household interviews and qualitative indices may be used to gain a better understanding of how drinking water supply interventions influence gender relations and different categories of women.

Research design and methodology

The present study was carried out in 2 villages of northwest India—Dhamala and Mandhana—located in the Panchkula district of Haryana. Mandhana lies in the Morni hills of the Shivaliks, while Dhamala is located at the foothills of the Shivaliks. These villages were selected following an initial exploratory phase designed to identify the most relevant sites for studying the impacts of development interventions on water resource availability and human–environment interactions. The research methodology composed of a mix of participatory rural appraisal (PRA) tools, semistructured household interviews, time budget exercises for women, meetings with key informants, and direct observation.

Case study method

The case study method of research was used (Yin 1984). A case study is used for purposes of analytic generalization. In this case, the researchers sought to identify generalizable findings of relevance to other mountain contexts.

PRA tools: A range of PRA tools were employed. Village maps were used to build initial rapport with the villagers. Water source maps were used to identify sources of water and changes therein. Timelines were used to capture changes in water availability from a historical perspective. Trend lines were used to understand changes in water availability and water extraction mechanisms.

Key informant technique: Members of the joint forest management (JFM) team, the school headmaster, and the wife of a former village headman served as important informants in this study. Key informants were interviewed

as a means of triangulation, as well as to learn of other potential interviewees.

Semistructured household interviews: Semistructured household interviews were used to investigate aspects of water use and consumption; to learn about changes in water-use practices, household occupations, and agriculture practices; and to cross-check certain findings and note variations in comparison with village-level discussions. Semistructured interviews with women provided detailed insights into the daily tasks of domestic water collection, how these changed when traditional water sources were eliminated, and how new water sources generated new expectations and water uses. Over approximately 6 months, about 30 women and 30 men were interviewed in each village, cutting across castes. A mix of convenience and snowball sampling was used.

Direct observation: Much time was spent observing water-collection activity at village water standposts. Combined with the insights obtained from time budget exercises, observation helped establish reliable estimates of the time spent by women in water collection. Direct observation also made it possible to study the role of caste and class dynamics in shaping access to water.

Thick description and quotations: A thick description refers to a detailed, minute-by-minute, vivid account of a given activity as recorded by a researcher (Fetterman 1989). In this study, researchers' recorded their observations of water-collection activity at Mandhana at specific times of the day when water was available, making inferences based on these. Furthermore, researchers periodically examined interviewees' documented responses to better understand their perceptions. This revealed various perspectives and provided direct insights into women's experiences of water collection.

Village study sites and assessments

Mandhana

Mandhana village lies in the Morni hills of Panchkula district in Haryana. It is located 25 km from the district headquarters at Panchkula. The terrain is hilly and scenic. The population of the village is about 1800, comprising mainly Chowdharys, Brahmans, and Harijans. The Chowdharys practice agriculture. The Brahmans have traditionally been priests but also practice agriculture. The Harijans typically engage in manual labor.

The primary occupation is agriculture; there is also some wage labor involving loading stones in the Ghaggar River that passes through the village. The main sources of water in the village are *tutis* (public taps), *bawdis* (springs), and *johads* (village ponds). Each of the 7 *baas* (settlement areas) in the village has 1 *bawdi* and 1 *johad*.

TABLE 1 Prioritizing of problems in Mandhana village.

Ranking	Problem mentioned
1	Water
2	Fodder
3	Employment

Source: PRA exercise.

Water remains a priority need in the village (Table 1). There is no steady source of irrigation. Some low-lying land along the Ghaggar River receives irrigation during the rainy months. There is also a dam under the JFM project. However, the delivery pipe is not aligned correctly to the fields. This fails to bring water to the fields (personal communication, JFM team; cross-checked in village discussions). Only some land around Bharal, a small settlement in the village where the dam is located, is irrigated by the dam. The rest of the farmland is rainfed. There is little marketable surplus; agricultural production is mainly for subsistence.

Several developments have improved the availability of water in the village, as inferred from the village timeline. The first tap providing piped water came to the village in 1972. In 1975, the first electricity connection was introduced. From 1975 to 1976, a tube well was installed to pump water from the *nallah* (drain). A second tube well was constructed in 1992, increasing local pumping capacity. The creation of yet another tube well between 1995 and 1996 meant that water could now be pumped to Jakhri, a small settlement at an elevation.

In the past, women collected water from the *bawdis,* or springs, located at a steep elevation in the hills. These were located 3–5 km from the settlement area. Bringing sources of water closer to homes through the public taps *(tutis)* has reduced the drudgery women endure walking long distances over steep terrain to collect water from the *bawdis.* As 1 respondent said, "Earlier the whole day would go simply in getting water.… We are then better off than the previous generation.… Our future generations will be better off still." Moving the water sources closer also reduced physical discomforts related to collecting water: "I [used to] have a shooting pain radiating from my neck down to my hip—now I no longer need to confront that" was a typical comment made by a respondent in field interviews. Nevertheless, even with a source of water located closer to home, women still usually spend the first 2 to 3 hours of their day collecting water from public taps, as revealed by time budget exercises and direct observation of the water-collection activity.

Though the women now walk shorter distances to collect water and must no longer negotiate steep terrain to reach the *bawdis,* the volume of water they carry home has increased. This is because several activities that were previously performed at traditional, public water

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sources—such as *bawdis* and *johads*—are now performed at home, and water must be carried home for these relocated activities. Earlier, men would regularly bathe at the *bawdi*. They would also occasionally bathe at the *johad*. Today, they do so rarely. Now that sources of piped water are available closer to home, bathing activities are increasingly performed at home. As a result, women are expected to carry water home for these purposes. In addition, the timing of water collection coincides with that of other crucial household chores, especially getting children ready for school. This caused frustration among the women interviewed.

Based on the interviews, men did not appear to appreciate the effort involved in water collection, and they frequently sought to legitimize their claims to the new water. Typical responses included: "Now there is no problem getting water.… Earlier they had to walk steep slopes.… Now it is a short walk away, and all this is time to socialize.… Why should we not bathe in our homes now?" In addition, commenting on their daughters-in-law, the older generation of women made observations such as, "We have seen drudgery in water collection.… Their life is easy." Many men echoed this sentiment as well: "Hard times were seen by my mother.… These ladies only sit and gossip."

Some men also refrained from helping their spouses with the tasks of water collection because their parents or elderly male relatives perceived this as compromising their masculinity. However, this appeared to be less pronounced among lower-caste households. In the latter households, the gender-based division of labor related to water collection was more fluid and norms of masculinity and femininity were less rigid. Nevertheless, women's workloads related to water collection increased across all households, regardless of caste.

Another important factor contributing to women's increasing water burdens has been the decline of the institution of the *johad*. A *johad* is a pond that stores rainwater. Because of the deterioration of institutions supporting the use of the *johads,* many functions performed at these water sources are now performed at home, and additional water must be carried home for these purposes. Earlier, when villagers' houses were *kutcha* (made of mud), women would desilt the *johads* and take the mud for their homes. Thus, there was an integrated mechanism for maintaining them. Today, *pucka* (concrete) houses have replaced *kutcha* houses, and the practices of desilting and maintaining *johads* have died out. In the past, urinating in the *johads* was prohibited, and the word of the elderly was sacrosanct on such matters. Strong norms prohibited contamination of the *johads*. With the arrival of piped water supplies, people's interest in maintaining the *johads* waned. Men have also become more conscious about hygiene; because the *johads* are a source of water for livestock, and often contaminated, men now refuse to bathe in them. One of the *johads* observed is now used to collect village wastewater. Taken together, these factors have increased the volume of water women must carry home.

Dhamala

Dhamala is a village in Kalka *tehsil* (District) of Panchkula district in Haryana, at the foothills of the Shivaliks. It is situated 12 km from the district headquarters at Panchkula. It has a population of about 900, comprising mainly Jats, Brahmins, and Harijans. The Jats are agriculturists and dominate the village by sheer number, socially, and in terms of land ownership. The Brahmins have traditionally been the priests, but some also practice agriculture and work in the government.

Drinking water is more easily accessible in the village now compared with a decade ago. Hand pumps have been installed that serve virtually all households. A water connection typically serves 5 or 6 households; some serve even more. However, certain wealthier households (eg Jat) have a private household tap. Female respondents in these households spoke of substantial time savings because of recent water supply interventions. In the past, they typically made five 10-minute trips per day to collect water, so women in these households now spend about 1 hour less per day on water collection. Most female respondents described using the saved time for leisure.

For some households, however, the drinking water situation has worsened despite the introduction of drinking water sources (hand pumps) closer to home. Their water supply only lasts about 1 hour every day, forcing them to forgo certain water needs. Furthermore, as in Mandhana, the men in Dhamala no longer bathe at a common water source and now expect water to be brought home for bathing.

Several women in Dhamala felt that their earlier situation was better. They spoke of frequent clashes and fights in the present context. In times of water scarcity or when supplies break down, lower-caste women must typically accept unmet water needs. Across households, women were found to compromise their own water needs related to hygiene and sanitation while making sure that scarce water could be used by men and the elderly.

One important observation that emerged in this village was that women belonging to the upper castes were the main beneficiaries of the water interventions. Such women had private taps installed in their households. For other women who had to use shared water standposts, the results were increased conflicts because of erratic, insufficient water supplies. Even though these women no longer had to walk long distances to collect water, they now confronted conflicts over shared standposts. According to 1 respondent: "Earlier there was a spirit of cohesion when we walked together to fetch water from the springs, now there is competition in taking water from the standposts."

Lower-caste women also faced other forms of discrimination when accessing water; they were often

expected to give priority to upper-caste women, especially in times of scarcity or when water supplies broke down. In the event of irregularities or breakdowns in water supplies, women commonly used their social capital—social relationships and networks—to meet their needs (Putnam 1993; McKenzie and Harpham 2006; McKenzie 2008). For example, when the supply of water at a public tap was erratic, some women were able to fetch water at a private tube well based on their social relations. However, in times of extreme water scarcity, they were often denied access to such private wells.

Women in different life stages also experienced the impacts differently. Newly married women, for instance, perceived more intrinsic value in water-collection activities. For them, the act of collectively going to the standposts to fetch water provided an opportunity to socialize and escape the confines of the household.

Another important insight that emerged from direct observation of water collection was that much of women's time was spent waiting in a queue at the standpost. Thus, one way of reducing time spent would be to increase the number of outlets. Another portion of the time was taken up by socializing en route. Hence, it is valuable to deconstruct the components of time spent collecting water.

To summarize, though women walked longer distances and negotiated steep slopes to carry water before the water supply interventions, following the interventions they were expected to collect and carry larger volumes of water. This was because several functions performed at common property water sources were moved to the home and because common property water sources deteriorated. Men perceived themselves as having a legitimate right to the newly supplied water but viewed sharing in water-collection tasks as compromising their masculinity. Negative effects were more pronounced among lower-caste women who had to share water from standposts, while upper-caste women often had exclusive private taps.

Shifting the focus from women to gender relations

The analysis of the cases presented earlier suggests that conventional indicators such as distance walked to the source of water or time spent collecting water are insufficient when assessing the impacts of drinking water supply interventions on women. Instead, it is necessary to examine aspects such as how such interventions influence gender relations more broadly, how they change people's expectations of how water should be used, and how perceptions change about who should collect water and for what purposes. Policy-makers' and planners' focus on women as the collectors of water has often restricted the assessment of water interventions to conventional indicators. Shifting the focus from women to gender relations enables a better assessment of the impacts of such interventions. A gender-relations perspective is capable of capturing water interventions' implications for gender-based divisions of labor, as well as gender-segregated aspects of domestic water use.

Mountain contexts are characterized by several changes affecting women's water-collection workloads. These include the effects of climate change, globalization, migration, and feminization of agriculture (Kelkar 2010; Mehta 2010). The present research suggests that the effects of these changes on women's water-collection tasks may further be aggravated by how drinking water supply interventions themselves create water-collection tasks for women. Furthermore, the decline of common property water resource institutions (eg village ponds) may further increase dependence on water sources that increase women's workloads related to water collection.

Women are not a homogeneous group; the impacts of such interventions vary, for example, according to caste and class. Going beyond conventional indicators, such as time spent collecting water or distance to water source, to include more comprehensive, process-based, and qualitative indicators would yield a better understanding of women's water burdens in mountain contexts. At the same time, it could make the transformation of gender relations an explicit goal of water supply interventions, rather than focusing solely on reducing how much time women spend fetching water or how far they must walk.

This has methodological implications for how we measure the impacts of drinking water supply interventions. In assessing these impacts, it appears worthwhile to focus on the new water uses that arise from new supplies and the way in which they reshape the gender-based division of labor related to water collection. Such an approach would need to qualitatively assess these changes according to different categories of women and capture the broader impact of these interventions on other village water sources, such as common property water sources. Finally, direct observation of water-collection activities can enable a better understanding of the caste and class dynamics that shape water access. In combination with time budget exercises, direct observation helps distinguish the various components of time spent collecting water, providing a fuller picture of women's experience.

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