

Research Paper

Women, technology, and water: creating new waterscapes and contesting cultural norms

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ABSTRACT

With the analysis of primary data, the paper looks at how the adoption of new modes of water technologies and subsequent water commercialization has created new waterscapes. Water commercialization is changing cultural norms associated with water collection in the drought-prone villages of western Rajasthan. The newly introduced water tankers have selectively benefited the upper caste rich households who now buy water from the tankers at doorsteps. The majority of the poor and low caste households remain dependent on common water sources that are drying up due to neglect with the advent of water commercialization. Women from low caste poor households have to walk for long distances to fetch water in addition to doing physical labor to support family income. Though domestic water use remains a domain of woman's working space, men from high caste rich households have started fetching and storing water as it entails cash transactions.

Key words: gendered roles, private tanker, technology, water, waterscapes, women

HIGHLIGHTS

- The tanker technology in the remote arid villages of western Rajasthan has selectively benefited the upper caste rich households who now buy water at doorsteps.
- Lower caste poor women are now doubly deprived as they have to bear the burden of fetching water from long distances since water commercialization has led to gradual decline of traditional local water sources and also work as laborers to support family income.
- Men have started fetching and storing water as it entails cash transactions.

INTRODUCTION

The purpose of technology development is to improve the quality of life by creating opportunities to improve living and livelihood conditions. Accessing water for daily needs has been culturally and socially considered as 'domestic work', being bound by 'gendered roles' (Sarkar 2020). Water technology that can be used to facilitate water collection can act as a 'tool of liberation for women' from this daily, mundane yet most challenging task (Singh 2010). Moreover, fetching water can be far more tedious and time consuming in rural areas in developing countries where water is either scarce and/or contaminated. Evidence from different parts of the world establishes that women spend most of their time and energy collecting water (Krishnaraj 2011; Sarkar 2020) contributing to a major source of time poverty and income loss in water insecure areas (UNDP 2006; Kher *et al.* 2015).

Technology is never culturally neutral (Feenberg 1991), and they do not exist independent of social context (Pretty 1995; Arisalea 2001). In the process of use and adoption of water technology to access water, socio-spatial subjectivities are produced and determined by the notions of people and society in which technology is adopted and the context of a particular social, cultural, historical, and political system in which it is used. As a result, it is important not only to pay attention to the different gender roles attached to activities that come to reinscribe gender in water, but also to the way women struggle to access water technologies that reconstitute and reinforce different subjectivities.

Technology is neither value neutral nor gender-neutral (Singh 2010). Feminist scholars have argued that places and spaces are gendered (Bondi & Joyce 2003; Longhurst 2003; Sultana 2009). Since forms of technology are themselves socio-political

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and cultural institutions, reflecting the power structures which establish them and the resistances they encounter (Arisalea 2001), access and use of water technology may redefine cultural norms and create new gendered spaces. Smith (1984) observed that waterscapes are created by 'active work' and through 'social relationships'. In this paper, I add another dimension 'water technology' that is altering the very nature of this 'active work' and 'social relationships' to create new waterscapes. I take the example of water tankers as the new technology that is providing water at doorsteps in the arid villages of western Rajasthan. The 'active work' that required a rural woman to walk long distances to fetch water for domestic uses has now been replaced by 'cash' that is usually earned by men. These new forms of water transactions have added a new dimension to 'social relationships' altering community traditions and cultures. Needless to say, these new 'techno-waterscapes' are creating a new association between women, water, and technology in the background of water scarcity and water commercialization.

The present study is contextualized in the background of challenges of water scarce regions, especially in the context of accessing affordable safe drinking water in the arid regions of western Rajasthan where commercialization of drinking water has emerged with the use of private tankers carrying water to the interior villages providing door to door service of water delivery. This study aims to see how different dimensions of social identity like gender, wealth, patronage, and dependency relationships shape peoples' ability to access modern technologies of water. It tried to answer questions like: how has technology addressed the issue of drought and water scarcity? Does modern technology help in mitigating water stress? Have all people in the community equally benefited from modern innovations? How has technology adoption affected the gendered roles and cultures surrounding water?

Communities are dominated by heterogeneity based on socio-cultural status (Schouten & Moriarty 2003). 'All women' in the community may not benefit from water technology in the same way due to the socio-economic heterogeneity and hierarchy in the society in which it is accessed. 'Women' typically do not include 'all women' since 'women' are divided by class, caste, ethnicity, nationality, religion, age, and many other factors. Thus, it cannot be assumed that the introduction and adoption of technology will affect all sections of women in similar ways. Any broad generalizations are sure to be wrong because they ignore these complexities of real world (Sim & Hensman 1994).

Some women may have access to water technology while others may be excluded. Exclusion can be due to lack of economic means or due to socio-cultural taboos and restrictions. Studies have reported incidences where women from minority groups and lower castes and underprivileged groups have been denied access to communal water facilities like community taps and hand pumps (Singh 1988; Sarkar 2021). In other cases, due to cultures imposing seclusion on women, women do not approach and use water facilities in public locations (Sultana 2009). Several studies pointed out the relevance of caste inequalities and taboos against the use of community water sources on grounds of untouchability which not only determined households' access to water but affected women who have to fetch water (Planning Commission 1980; Joshi 2005; Sarkar 2021). It has also been reported that powerful people in a community influence the location of public hand pumps (van Wijk-Sijbesma 1985; Singh 1988). Since women do not constitute a homogeneous group, there is a need to correctly identify potential beneficiaries of technology, particularly women belonging to marginalized social segments, and typically not all rural women (Singh 2006).

The paper contributes to the literature on 'water-women and technology' in two ways. Firstly, it studies the nature and consequences of commercialization of water by small-scale water vendors in rural Rajasthan. Secondly, it gives a nuanced understanding as to how this new form of water technology and the new forms of water transactions are changing the cultural and social waterscapes of rural Rajasthan.

RESEARCH DATA AND METHODOLOGY

The findings of this article result from preliminary observations in rural pockets of western Rajasthan,¹ as well as in-depth field research with a mixed-methods approach. First-hand data were collected through ethnographic fieldwork in seven villages in the districts of Jodhpur, Barmer, and Jaisalmer. The villages were selected on the basis of criteria such as multi-caste composition of the community, availability of traditional water supply sources, as well as the use of water tankers. While the structured questionnaires form the basis of some quantitative evaluation, in-depth ethnographic research draws a more

¹ Western Rajasthan consists of 12 districts, i.e., Sriganganagar, Hanumangarh, Churu, Sikar, Jhunjhunu, Nagaur, Bikaner, Jodhpur, Barmer, Jalore, Pali, and Jaisalmer.

nuanced understanding of how accessibility of water is determined by the interplay of factors like gender, caste, and adoption of new water technologies. Fieldwork techniques, such as participant observation, unstructured and structured interviews with key informants using open-ended questions and focus group discussions, were used.

Study area

Rajasthan is the largest state of India supporting 6.57% of the country's population (Census of India 2011) but has only 1.15% of the country's water resources (Government of Rajasthan 2014). Western Rajasthan is the driest part of the state facing recurrent droughts and is prone to water shortages. Only 33% of the villages in Rajasthan are fully covered by rural drinking water schemes and only 26.9% of rural households in the state have safe drinking water² (Census of India 2011). Around 85% of these rural drinking water schemes are dependent on groundwater and mostly hand pumps. Piped water supply schemes only cover around 5% of the villages and villages get water supply only once or twice a week.

RESULTS AND DISCUSSION

Sources of drinking water: scarcity and commercialization

Water tankers are usually attached to tractors and are used to fetch water from long distances to doorsteps filling up the *tankas*³ of individual households in the villages. In many study villages, water tankers procured water from the Indira Gandhi canal, nearby streams, or wells depending on availability and distance. More than 78% of villagers in Jaisalmer and Jodhpur bought water from tankers. It is inevitable, as Jaisalmer and Jodhpur are more arid with lower rainfall and fewer number of drinking water sources scattered over large distances. There was a positive correlation between the scarcity of water due to lack of rainfall and subsequent non availability of potable drinking water and commercialization of water.

On an average, one tanker of water was bought for Rs. 400–500 (\$ 5.9–7.4) and the price ranged between Rs. 250 and 500 (\$ 3.7–7.4) depending on the water quality, availability, and the distance from the source of the water to the villages. Though domestic water consumption varied across the households depending on the number of family members and the water usage behavior of the households, most of the households under the survey reported to be buying tanker water twice to thrice a month spending an average of Rs. 800–1,000 (\$ 11.8–14.7) per month.

Paid water vs. free water

Though the water tankers have eased the process of procuring drinking water, it has also driven the villagers to neglect the traditional community water harvesting structures. Commercialization of water has turned water into 'an economic and a private good' from 'a social and a common good'. Other studies have also noted that commercialization of water by tankers in the villages of Rajasthan has resulted in intervillage scarcity, intragender differential access, exorbitant private water markets, and the abandonment of traditional water bodies (Sarkar & Singdha 2020). From the focus group discussions, I could gather that adoption of water technology by a large number of families in the villages and eminent commercialization of water has broken the community solidarity in maintaining the traditional water harvesting structures. Villagers cite reasons like lack of community spirit, perceived abuse, and free-rider behavior that are replacing traditional community water structures with new modes of water transfers. This has negative repercussions on society in the long run as it affects community resilience to droughts, especially in the context of climate adaptations. Still, more work is needed to understand the exact nature of the change that this water technology will have on climate adaptation, and it is beyond the scope of this paper.

Who benefits from the new water technology?

The technology development process is generally driven by economic considerations and favors only those who have the advantage of the ability to purchase, possess and use innovations (Singh 2010). Most of the households that bought the tanker water in my survey villages belonged to the high caste Hindu households who had the money, power, and means to access the new technology (Table 1). In India and particularly in Rajasthan, villages still follow social behavior based on the caste system.⁴ Higher position in the local caste hierarchy and historical subjugation of people in the lower castes

² 'Safe water' is defined as treated water from individual connections and shared public standpipes, protected dug wells (covered wells), rainwater collection, boreholes, and protected springs.

³ Underground water tanks are locally known as *tankas* in western Rajasthan. Traditionally, these water storage containers were used to store rainwater.

⁴ Though legally and constitutionally void, caste continues to be socially valid and extensively practiced in local communities in India (Singh, 2006).

Table 1 | Percentage of households buying water according to their caste

Caste	Jaisalmer	Barmer	Jodhpur
General	66.67%	84.85%	81.58%
SC	26.09%	9.09%	10.53%
ST	7.25%	6.06%	7.89%

Source: Field work.

also has given a greater advantage to the people belonging to higher castes. Moreover, access to western education and external occupations has enhanced their social dominance and has also uplifted their economic status.

In the villages of western Rajasthan, *Dalits* have historically lived in hamlets distanced from the main village and the primary sources of water because Hindu society has historically positioned *Dalits* as eternally polluted, feared to pollute sacred water sources (Joshi & Fawcett 2006). For the same reason, water sharing was not practiced among the high castes and the *Dalits*. In my study village, most of the tankers that carried water did not serve the *Dalit* households. The owners of the tankers belonged to high caste Hindus who were reluctant to sell water to the *Dalits* in fear of losing the other clients who majorly belonged to the upper castes. Even the tankers had castes written on them and such water was only sold exclusively to the households belonging to the same caste. Consequently, *Dalit* households who even had the means to buy water from the tankers were not able to access the tanker technology. Thus, the introduction of the new water technology did not make access to water inclusive in a society divided along caste lines even when water was sold and purchased on commercial terms. Caste and kinship relationships played a dominant role in these modern water transactions.

It is interesting to note that people belonging to lower castes did not see commercialization of water as a process of further marginalization. They felt it was part of the social norms of maintaining purity from pollution validating their perceived norms about proper behavior, respect, and 'rightful' hierarchies of status.

Though most households belonging to the lower caste groups did not get the advantage of tanker technology, very few households belonging to lower castes were also buying water. My conversations with such Dalit heads of the households revealed that despite the day-to-day failures of the caste system, they have claimed their space in society with better incomes mostly by acquiring higher education and sometimes even migrating to cities for work and sending remittances back home. Income and education have opened up a new, personal horizon of hope. Social mobility in the Indian context results in the weakening of some features of the caste system but does not do away with the system itself. What it does is to increase understanding and thereby change the way in which a low caste individual perceives his or her own self and history. This identity certainly does not have the old meaning. But whether it can acquire a new meaning de-linked from the old is a question that is beyond the scope of this study. However, the probing question is, 'can redefinition happen within the confines of the old system, or can new definitions be born with modernization and commercialization of resource access'. It is evident from the field experience that low caste households were negotiating their space into the newly emerging informal water market in rural Rajasthan challenging, negotiating, and manipulating such norms and social systems.

Has tanker technology helped 'women'?

The tanker technology has definitely helped women with easy access to water for domestic needs at their doorsteps. It has indeed reduced the drudgery of carrying water over long distances and freeing up time that they used to spend in walking and lugging water. In some cases when water is accessed easily, women used this time and energy to engage themselves in activities that provided an income (Sarkar 2020) if such opportunities exist and if women are able and willing to use them. However, in my study, I found that none of the women who now had water at their doorsteps engaged in activities outside their homes that provided them with any income. In this context, it is also important to note that easier access to water is desirable not just for economic reasons but for overall quality of life, regardless of how the extra time is spent (McKenzie & Ray 2005).

The tanker technology has improved the quality of life of women accessing it. However, it is interesting to note that women desired better-quality water and its self-management, but they did not envisage a waterline to the house that would eliminate the practice of carrying water completely. This notion of having individual piped connections at home is still 'unimaginable'

to them either due to their consciousness of lack of physical availability of water in a desert or simply their wish to access ‘that technology’ which ‘others’ were already using in their village.

Has technology helped ‘all women’?

It is important to differentiate between outcomes of water commercialization and the advent of new technology of water for various groups of women because differently placed people within the same group may have varying experiences. In the earlier section, I discussed that due to socio-cultural and economic reasons only the rich high caste Hindus adopted tanker technology. Therefore, it is the high caste Hindu women who have benefited from this technology and not the *Dalit* women.

For households belonging to low castes, the common property water sources were the only means of domestic water within a reasonable distance. After the advent of the tankers, common water sources are not being used by the village heads who now buy water. These water sources are gradually drying up due to lack of proper maintenance. *Dalit* women in my study villages walked 1–9 km daily to just fetch water. Thus, the tanker technology has selectively freed up time for high caste Hindu women and not for ‘all women’. Women of the *Dalit* households also worked outside their homes to earn and support their families. They mostly worked as agricultural laborers and in the MGNREGA programmes⁵ that were providing local employment in villages. *Dalit* women spoke of burdens outside and within the house as unequal division of labor and wage on the farms is often reinforced by unequal division of labor inside their household. Above all, they were aware that water could be made available at doorsteps now. From the gender perspective, women belonging to low castes are doubly deprived; for being a ‘woman’ and for being a ‘low caste’. Thus, the tanker technology has indirectly led to an increase in *Dalit* women’s drudgery of fetching water.

New water technology and changing cultural norms

Expanding on the applications of Sultana (2009) argument of social and spatial fluidity and O’Reilly’s (2006) mutual construction of meanings of women and water, I try to associate the process and consequences of the adoption of tanker technology to the construction of ‘gender class and water’. I look at the ways in which water technology changes cultural norms in the context of gendered roles in domestic spaces associated with water because ‘Good women’ are those who performed the ‘domestic water-related tasks’ (Joshi 2011).

Adoption of water technology creates new social norms

Social norms based on class and gender relations are intricately intertwined in rural India, and one cannot be interpreted without looking at the other. In a hierarchical family structure, different members are positioned differently within the household class relations (Gibson-Graham 1996) and thereby command differential access to cash, food, decision-making powers, and other resources (Sultana 2009). Since women in high caste households were not engaged in any gainful economic occupation, they had limited or no access to family’s income and cash. So, when the tankers came to sell water, men were responsible to fetch water (Tables 2 and 3) as it required both cash transactions as well as interaction with male members who were mostly ‘outsiders’ signifying other social implications which I will discuss in the later section.

Though women belonging to high caste households had weaker class status within their own families, they had other advantages as compared to other women across other socio-economic classes. While such women in wealthier high caste households may be powerless within their own families, they have access to the family’s inhouse water *tankas* filled with water (and thus easier access to water), which places them at an enormous advantage compared to poorer *Dalit* women of other households who do not have water source at homes. Thus, class positions are important in the ways that gender relations come to play out in society and especially with respect to water.

Whatever may be the reasons behind the majority of the men collecting and storing water for their households, commercialization of domestic water has indeed led to ‘gendered role reversal’ establishing ‘gender is made through water’. In other words, with commercialization of water, the mode of water transaction has changed, changing the gendered roles associated with water collection for domestic uses. Feminist geographers have argued that spatial and social processes are co-produced. Social processes occur in specific spaces and places, which in turn influence the formation of social practices and spatial

⁵ The MGNREGA is a government funded programme in India that was initiated with the objective of enhancing livelihood security in rural areas by providing at least 100 days of guaranteed wage employment in a financial year, to every household whose adult members volunteer to do unskilled manual work.

Table 2 | Percentage of households according to the gender of the person fetching water for them

Persons	Jaisalmer	Barmer	Jodhpur	Total
Women	34%	44%	44%	41%
Men and Women both	34%	23%	44%	33%
Men	9%	0%	3%	6%
No need to fetch	23%	33%	8%	20%

Source: Field work.

Table 3 | Percentage of households and the gender of the persons buying water for them

Districts	Men and Women	Men
Jaisalmer	33%	67%
Barmer	42%	58%
Jodhpur	37%	63%

Source: Field work.

structures (Massey 1994; McDowell 1999; Besio 2006). The question is, has the gendered norms really changed or it is a patriarchal way of controlling 'women'? The next section throws further light on that.

Gendered roles and the notion of male vs. female working spaces

Due to gender-based behavioral norms, 'domestic spaces' are implied as the working area of women and the task of water collection and use is considered as 'women's domestic sphere of work'. Singh (1988) identifies men's working areas as 'extra-domestic space' which are beyond the confines of the home, where women's involvement ends and that of men begins. This dichotomy between domestic and extra-domestic spaces is paralleled in the notion of 'private' vs. 'public' spaces. Public spaces have been historically construed as masculine spaces and private/domestic spaces as feminine. Female bodies that are seen to be 'out of place' outside of the private realm are often thought to be in need of greater control (Domosh & Joni 2001).

For upper caste households, there are even restrictions on mobility within the domestic space. Certain spaces are further secluded as private and are segregated from use by men. The verbal exchanges of married women with men from the same household or outside belonging to a senior generation or relatives, including relatives belonging to other households, is limited as it is neither desirable nor socially accepted. Men of the household and outside are also expected to reciprocate the behavior by avoiding the possibility of such exchanges. Thus, women of the upper/dominant caste households are not allowed or expected to communicate with the men who come to sell water in the tankers. Even when the task and place of fetching water fall in the sphere of 'domestic space', interacting with a male outsider are considered as outside the domestic spaces that in effect converts a 'private space' into a 'public space'. Hence, men of the household must step out to fetch and store water.

Interacting with a male (in this case water seller) is also considered as an inappropriate behavior of a highborn woman who is expected to have *lihaz* (etiquette). Moreover, notions of *ghumta* (veiling, seclusion) also operated in defining appropriate feminine behavior which deterred high caste women to come out to buy water. Notions of *izzat* (honor) and *sharam* (shame) are often used to regulate female bodies in public spaces, both limiting their mobility as well as dress code and behavior in the villages (Sultana 2009).

However, women are also seen to use patriarchal sensitivities by reproducing certain notions of femininity and masculinity and thereby invoking the men's fear of dishonor caused by women having to go outside in the public spaces and the men being seen as not sufficiently providing for their family (Kandiyoti 1988). Women in the focus group discussions expressed their influence on their men to get water at home through the tankers. They argued that having to fetch water from farther away meant that they had to go into public spaces, which they could avoid if their husbands would buy water from the tankers and fill up their *tankas* located inside their houses. By invoking what is seen to be appropriate gender behavior (i.e., confining

in the house), women were able to argue that fetching water forced them to deviate from the norm, thereby challenging social status and family honor and that the issue could be resolved by investing in buying water. As such, water scarcity and commercialization become an ally that is conveniently maneuvered to obtain easier access to water and reduce hardship. Women used their conventional gender roles to their advantage by resorting to such strategic essentialisms, even if in limited ways.

Caste, gendered roles, and the notion of male vs. female working spaces

There are substantial variations in accepted social and cultural norms between different castes even within the same gender. As one moves down the social hierarchy, the rigidity of these norms decreases and women may show greater mobility (Singh 1988). Moreover, poverty often pushes women to go beyond the domestic spaces to earn or support for family income; and hence has society's approval. *Dalit* women in the villages went out of their private spaces to both fetch water and work as wage laborers to provide for their families. The other interpretation of such social acceptance or behavior sanctions is not merely cultural or social. Women from upper castes have the economic means and to some extent a choice to remain within the limits of her 'domestic spaces' and are not expected or may not be forced to go into 'extra-domestic spaces' to economically provide for their families.

Similarly, there is flexibility in veiling practices (*ghumta*) in the villages of western Rajasthan which is based on caste. *Ghumta* is not merely a cultural issue, it is indeed a class issue because wealthier and middle-class women adopt such practices of proper attire more readily than poorer women who often have to go out to work (mostly physical labor) in public places. Poor *Dalit* women are less subjected to such social regulation of their attire. Women have been negotiating their attire and identities in different spaces as their 'body' becomes the site of social control. Water comes to play a role in this social control: 'how often and for how long female bodies are "out of place" in fetching safe water'.

Nature of technology use determines the gendered roles

Women accessing water from tankers were no longer fully in charge of domestic water management as men of the households now fetch and store water. In contrary to this, I observed in some low caste families domestic water management became a cooperative venture between men and women, with both women and men taking up the task of fetching water.

In this context, we can say that water technology creates gender and defines gendered roles. When technologies can be used in domestic or private spaces, women could use it to fulfill their gendered roles (in case of a private hand pump). The moment the technology use requires the person using it to leave private and domestic spaces, gendered roles get reversed. When women walked long distances to fetch water, they were not required to handle cash nor necessarily interact with other male members of the society. Though they were required to enter 'public places', they still operated in their 'private or domestic spaces of work'. In other words, workspaces define gendered roles and not vice versa.

Task of water collection: a way to build social network

Carrying water to some women is not about 'lack of technology' as we might imagine. It is an integral daily activity that invigorates their cultural and spiritual significance. Many women expressed their desire to use this daily necessity to fetch safe water from farther places as a way to get out of the confines of their residences and to socialize with others. When I asked in a focus group discussion, 'would you want to have a tap at home?' the general idea was, 'if the water comes at our homes, our men will not let us go out. Where do we see each other then and share about everything in our lives?' I observed this notion was more pronounced among the younger women who saw water collection as a typical domestic duty that assisted them to leverage outside mobility.

However, several families avoid sending young girls to fetch water now wherever they had the choice and resources to buy water. One woman said 'I do not send my unmarried daughters to get water from faraway places. People talk and it is bad for their prospect of marriage'. While women may exercise their limited agencies in a variety of ways, it appears that majority of them have internalized certain norms of female behavior in their understandings of what it means to be a good mother, daughter, or wife.

Choice of not carrying water

While some women associated fetching and lugging water as a 'wish for the survival and well-being' of her family members, others called it as a 'despair' that she has no choice but to carry out an endless and repetitious duty she resents. This seems like a personal choice. However, a deeper investigation revealed that older women from high caste families mostly considered the task of fetching water as their duty and to the extent they represented themselves as 'a carrier of the way of life of her own

people'. They probably resist the new changes in this gendered behavior. The younger women especially from *Dalit* families expressed their frustration in their inability to transcend to a better way of life. The advent of the tanker technology has given the present generation of women a 'choice to not to carry water'. Her only constraint was her inability to exercise that choice to access 'that technology', and that she was aware of.

DISCUSSION AND CONCLUSION

UN-WATER (2006) defines water scarcity as the 'point at which the aggregate impact of all users impinges on the supply or quality of water under prevailing institutional arrangements to the extent that the demand by all sectors, including the environment, cannot be satisfied fully'. In this context, it is clear that with insufficient rainfall, the drought-prone areas of western Rajasthan face water scarcity. But overtime technological innovations have led to better water access. However, access to technologies is not always uniform, particularly when private investment is required to access it. Moreover, access to water and control of water resources is dependent upon a sense of security and beliefs at the individual level. Access to technology to access water is not only determined by the class position of households but is also governed by the individual's and household's position in the social hierarchy. While water scarcity is a 'real' enough problem with bio-physical manifestations, it can also be 'manufactured' in such a way to serve the interests of powerful actors in the society (Mehta 2001).

Water tanker technology has made water collection much easier and faster enabling 'space-time' compression. However, we must understand that access to water and water sources depends on the identities of 'water users' in a country like India where it is connected to the notion of 'purity and pollution'. The tanker technology may seem like a new innovation for carrying water in the remote arid villages of Rajasthan, but it has given rise to an uneven and a more complex waterscape. It has selectively benefited the richer upper caste Hindu women. Lower caste poor women are now doubly deprived as they have to bear the burden of fetching water from longer distances and provide labor to support family income. The use of tanker technology also shows positive correlation with water scarcity and low rainfall. In other words, a greater number of households used tankers to access water in village of Jaisalmer than in Barmer. Thus, the gradual expansion of this technology may also have long-term implications like intervillage scarcity, intragender differential access, usurious private water markets, the abandonment of traditional water bodies, and water contamination.

The new water technology also seems to be somewhat altering cultural norms. There appears to be an intensification of traditional gender roles simultaneously with gendered role reversal. Men without any 'fuss' are collecting and storing water and are seen participating in such a 'gendered task' typically reserved for women only. This further establishes the fact that 'technology is itself a form of culture'. The same technology can acquire radically different significance in the larger social context where it can produce and alter different cultural forms, norms, practices, and value-systems since cultures are not static; they are always in the state of dynamic transformation.

The tanker technology is also creating gender and altering masculine and feminine workspaces. Gendering is thus a social, spatial, ecological and contested process for men and women, and water commercialization and water technology (in this case tankers) are implicated in this process. This reconceptualization of gender as a socio-spatial-ecological process enables greater clarity in understanding how women-water-technology relations evolve in any given context, thereby enriching debates in feminist political ecology, development, and gender literature.

DATA AVAILABILITY STATEMENT

All relevant data are included in the paper or its Supplementary Information.

CONFLICT OF INTEREST

The authors declare there is no conflict.

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