

A study by the CGIAR Research Program “Water, Land and Ecosystem” (WLE)
theme of Gender, Youth and Social Inclusion

Gender norms and relations in an agricultural watershed project in the Parasai-Sindh Watershed, Jhansi/India

A qualitative gender study on the ICRISAT-CAFRI project
“Enhancing Groundwater Recharge and Water Use Efficiency in SAT Region through Watershed
Interventions – Parasai-Sindh Watershed, Jhansi”
(funded by the Coca-Cola India Foundation for Rural Water Infrastructure)



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1. Introduction

Agricultural watershed projects require intertwined technical and social interventions, and accompanying research should aim at blending technical and social sciences (Douthwaite et al. 2001). CGIAR research programs have been designed by centers and partners with such an approach since their first phase from 2010 to 2016; and also in their second phase, 2017 to 2022, this interdisciplinary approach represents their conditions of existence. As many studies have demonstrated, the success of agricultural intervention projects depends on the degree of participatory approach and gender-sensitivity in each project stage: planning, design, implementation and monitoring (Leder et al. 2017; Quisumbing et al. 2014). Hence, any intervention project should develop mechanisms trying to avoid the reproduction of gender relations and the exclusion of diverse local knowledge at the community level. Instead, a holistic approach to empower communities with its diverse members should be developed and adjusted continuously. While “participatory” has become a buzzword, it is necessary to demystify respective project stakeholders’ assumptions. As Cleaver (1998: 293) argues, “sectorial bias, instrumental approaches to participation, and an inadequate understanding of social context (...) detract from a truly gendered understanding of water resource management”. Hence it is the role of any intervening organization to understand diverse water needs, and to identify who accesses water and who controls water access. Women are traditionally associated with the domestic use of water, while men are linked to the productive uses of water, whereas several studies have found this division inadequate and far more complex, particularly in the context of primarily male out-migration and the so-called feminization of agriculture. In their study on agrobiodiversity management in Nepals Himalaya, Bhattarai et al. (2015: 129) found that women’s lack of power can be “reinforced by the development organizations’ acceptance of established gender roles that privileges men with new products associated with cash”.

Against this background, this study will examine gender norms and relations in an agricultural watershed project in the Bundelkhand region in Central India. The study takes a gender and social inclusion perspective with the aim to identify the status quo of water-related agricultural challenges due to gender norms and gender roles in three villages, and to examine in how far the watershed project interventions could address these towards both improved agricultural productivity and women’s empowerment. Although “gender” was not a particular focus of the project, this study will highlight the challenges, opportunities and entry points for more inclusive watershed intervention programs.

The CGIAR center ICRISAT, the International Crops Research Institute for the Semi-Arid Tropics, along with national partners Central Agroforestry Research Institute (CAFRI) in India, the district administration, the Government of Uttar Pradesh and three local communities implemented a water recharge project funded by the Coca-Cola Foundation for Rural Water Infrastructure¹ from 2011 to 2015. In the micro-watershed Parasai-Sindh in the Babina block of Jhansi district, three villages were selected as pilot sites for implementing various interventions with the aim of improving groundwater recharge and agricultural water use efficiency by strengthening ecosystem services. Watershed interventions such as rehabilitating a traditional haweli (water harvest structure) and check dams were

¹ Coca-Cola has been widely accused of causing groundwater depletion and environmental degradation in villages around their plants, e.g. in Mehndiganj, Uttar Pradesh, and Kala Dera, Rajasthan. In one case, the plant was closed down due to successful civil society campaigns, see the case study “The popular struggle against Coca-Cola in Palchimada, Kerala” by Berglund and Helander (2015).

implemented along with agroforestry and crop productivity enhancement interventions as well as skill development initiatives.

In June 2017, this gender and social inclusion study was conducted by the CGIAR research program “Water, Land and Ecosystems” (WLE), to which the project is mapped to. The fieldwork was conducted in the three target communities with the aim of identifying how gender norms and relations are approached, reproduced or challenged in the watershed project.

This report is theoretically framed around gender relations and participation in watershed projects (chapter 2). Chapter 3 introduces the three villages of the watershed project and the experienced water scarcity. Chapter 4 introduces the objectives of the watershed projects and characterizes the designed interventions into technologies, institutions, beneficiaries and capacity development. Chapter 5 introduces the methods applied, and chapter 6 evaluates the applied WLE survey tools to measure “Gender in Irrigation”. Chapter 7 reflects on the labor division and invisibility of women’s contributions. Chapter 8 analyzes the watershed project’s design and evaluation. Chapter 9 analyses in how far the marginalized were targeted and participation was promoted through the example of several project interventions – the watershed committee, demonstration farms, SHGs and environmental clubs, agroforestry approaches and paper bowl making (dona-making). Chapter 10 reflects on the perceptions of the project staff in regard to the project interventions. In the final chapter 11, the results are discussed and recommendations are formulated.

2. Gender relations and participation in watershed projects

Following the developmental discourse on the need for “gender equality” and closing “the gender gap” in agriculture (FAO 2012; Quisumbing et al. 2014), access to and control over water and land resources are different for women and men, and gender roles and work load in agriculture and associated decision-making power differ fundamentally according to gender and other social divides such as class, caste, and age. Gender differences extend further to the degree of access to technologies and agricultural extension services, as well as markets and institutions, such as the active participation in water user association. As many contributions in the edited volume “Gender Issues in Water and Sanitation programmes – Lessons from India” by Cronin et al. (2015) pointed out, project designs are primarily technologically driven, gender-blind and sectorial detached from ground realities (cf. Leder 2017). Important bottlenecks are the role of water professionals and practitioners, the need for more women in these positions, and water education and training approaches. There is also a great lack of sex-disaggregated data, as well as limited gender analyses on women and men’s differential needs and roles in the water projects. The editors argue that there is a contradiction of women being responsible for water-related activities without being involved in the decision-making. In the chapter “Gender issues in watershed management” by Wani et al. (2015), the authors argue in their study on three watersheds in Andhra Pradesh that the sustainability of watershed programs depends on collective action and community participation dependent on capable female leaders and collaboration. Upadhyay (2003) note in their study on “Water, poverty and gender: review of evidences from Nepal, India and South Africa”:

“In patriarchal societies, women’s voices are rarely heard at the community or policy levels. Social norms and customs (...) determine the roles that women and men have to play in the family and the community. They shape individual preferences and power relations between sexes. In South Asia, male domination is common at the local level, where inequalities of caste and gender often go unchallenged as they are closely tied with religion. The subordination of women within the community is typically premised on the belief that a woman’s relationship to the world must be mediated through a male family member, such as a father or husband, or in the absence of these, a brother, son or uncle. This is shown in the practice of prohibiting women from owning property outright or authorizing a male family member to control a woman’s property. In South Asia, patriarchal domination practices extend not only to legal and political authority over women, but also to physical control through practices of purdah and female seclusion. Purdah refers to the female practice of wearing a veil. Widespread seclusion practices in the region tend to confine women to private places and limit their freedom of movement” (Upadhyay 2003: 508)

In her study on women’s limited involvement in irrigated agriculture, Upadhyay (2003) reveals that the incorporation of gender-sensitive policies and programs in irrigation schemes could have significant positive impacts both on women’s status, gender equality and poverty alleviation.

Hence, a participatory and community- based approach for watershed programs requires a gender-sensitive approach to identify the main constraints faced by diverse women and men in a particular context, as well as a project design which addresses and monitors these challenges. As Agarwal (2001) has demonstrated in the case of community forest groups, so-called participatory approaches in development contexts can vary to a great extent from nominal and passive to active and empowering, interactive participation. Empowerment is a multidimensional and contextualized “process by which those who have been denied the ability to make strategic life choices acquire such an ability” (Kabeer 1999: 346). This refers not only to developing access to material resources and technologies, but also increasing the capacity of self-reliance and inner strength to influence decision-making towards own and family interests. This describes highly complex bottom-up processes.

So-called gender-blind and technical approaches in agricultural development increasingly tend to be replaced with simplistic slogans in development narratives that “entail popularization and the deployment of iconic images of women” (Cornwall et al. 2007). Therefore, gender in agriculture research aims at demystifying certain assumptions on women and men, and argues for a contextualized, relational, intersectional and multidimensional approach for framing women’s empowerment, in particular in water security projects (Leder et al. 2017). International organisations such as the CGIAR research centers and the FAO have published numerous guides arguing for a sex-disaggregated project intervention design and pre- and post intervention data collection, for example in the “Passport to Mainstreaming Gender in Water Programmes. Key questions for interventions in the agricultural sector” (FAO 2013). This indicates an awareness on the role of gender research and gender-sensitive project planning in agriculture, whereas the question remains in how far meaningful participation and policy and project design avoid the “reproduction of existing practices of exclusion” (Joshi 2005). In this regard, an essentialist perspective on individual women vs. men should be replaced by more relational and culturally sensitive perspectives, taking into account women’s respective roles and social relations at the

household and community level. The mediating role of social networks in the process of technology uptake, for example, has been demonstrated in the study by Ravula and Bantilan (2007). An intersectional perspective rejects the perspective of women as a homogeneous group, but highlights diverse socio-economic differentiations. As the study by Singh et al. (2005) has proven in the case of local water governance in Madhya Pradesh, India, women's representation by the reservation of 33% in decision-making bodies does not necessarily ensure that all women's interests are ensured. In their case study, upper caste women representatives in the local government units Panchayati Raj Institutions (PRIs) decided the location of hand pumps only for the benefit of their castes, which reinforced caste hierarchies and thus, non-Hindu castes did not benefit from improved water availability. This is one example that socio-cultural analysis can help determine trade-offs and opportunities of project design approaches which aim at reaching a maximum number of beneficiaries. In their study entitled "Gender and property rights in the commons: Examples of water rights in South Asia" by Zwarteveen and Meinzen-Dick (2001), the authors conclude:

„Whether women are empowered or further marginalized by policies that strengthen local management of natural resources will at least partly depend on the conceptual understanding of facilitating agencies (governments and NGOs) about the dynamics of hierarchical gender relations within communities, and on whether such agencies have an explicit commitment to altering the existing balance of power in favor of women. Steps in the right direction might include the following:

- the recognition (documentation and legitimation) of customary uses of the commons by women, as well as men, of different occupational and wealth categories;*
- the effective inclusion of both women and men in decision-making bodies; and*
- the search for opportunities to recognize women's rights to resources in their own right, rather than only through male heads of households.“*

(Zwarteveen and Meinzen-Dick 2001: 22)

A detailed look at diverse project and government stakeholders involved in designing and implementing intervention studies can help reflect to which degree gender and social inclusion goals can be achieved in implementation projects. In an-depth study in Nepal, Udas and Zwarteveen (2010: 87) report that "the dominant professional culture of irrigation engineers is strongly masculine, linking professional performance to masculinity. The prevailing incentives and culture of the irrigation bureaucracy stand in the way of achieving any real progress in terms of gender goals". Therefore, patriarchal norms *within* organisations are as relevant to study and target as the status of gender norms within communities in which intervention programs are implemented.

3. Water scarcity in three villages in the Central Indian region of Bundelkhand

The semi-arid Bundelkhand region in Central India is a drought-prone region covering Southern Uttar Pradesh and Northern Madhya Pradesh (cf. Figure 1). The region experienced severe droughts from

2004 to 2007 and 2014 to 2016 in which more than 80% of open wells dried up soon after the monsoon (Singh et al. 2016). Water for agriculture as well as domestic water uses are adversely affected. In times of water scarcity, urban and rural communities largely depend on outside water source and private suppliers such as tankers for domestic use. Drinking water scarcity and limited livelihood opportunities increase the emigration from this region. Cattle are abandoned due to shortage of water and less fodder availability (Singh et al. 2016).

The pilot sites of the watershed project are located 20 km from Jhansi and cover 1250 ha. They comprise three villages named Parasai, Chhatpur and Bachauni which were founded in 1837, when migrants from Mathura district in Uttar Pradesh (300km north of Jhansi) settled there (based on oral communication with former Pradhan of Parasai). There are 417 households and a total population of 1,918 (see Table 1). The sex ratio is as low as 79.58 women on 100 men, which is far below India's national sex ratio of 93.47 (Government of India 2011a). This is a first indicator reflecting great gender inequalities; the state Madhya Pradesh is known for its high incidences of female feticides (Times of India 2014). The literacy rate is only 12.4% for female and 41.5% for male which is far below the national average literacy rate of 65.46% for female and 80% for male (Government of India 2011b). The low rate of literacy among women in the villages equals the national average literacy of both sexes after British rule in 1947. However, the literacy among children, both for male and female children, is more than 60%.

Farmers with landholdings greater than 2 ha generate 80% income from agriculture and 20% from milk production; small and marginal farmers with less than 2 ha earn from agriculture and milk almost in equal proportion (Singh et al. 2016). Daily wage daily wage labor is also a source for income for small and marginal farmers.

Water is accessed through open wells for agricultural purposes as well as handpumps for domestic purposes and cattle. Handpumps are only available in Parasai and Chhatpur, while in the third lower reach village Bechhaune, most people rely on open wells for drinking water purposes as there are only three handpumps in total. Access to wells depends on landownership, while handpumps are mostly located in Yadav households which are located in the center of the villages. Ahirwars (SC) need to have their own handpumps since they are culturally not allowed to touch the handpump of upper caste Hindus. Since the Pradhan is from SC (due to caste reservations for political representatives), his first action after taking the position a year ago was to install water pumps in his own area which had been neglected by the prior Yadav Pradhan before.

Table 1: Household and gender of village populations (source: ICRISAT Project Progress Report 2015)

Village	No of households	Adult Male	Adult Female	Adult total	Child Male	Child Female	Child total
Bachauni	61	214	200	414	187	110	297
Chhatpur	86 (120 according to Pradhan)	217	187	404	167	108	275
Parasai	63	157	131	288	126	114	240
Grand Total	210 (417)	588	518	1106	480	332	812

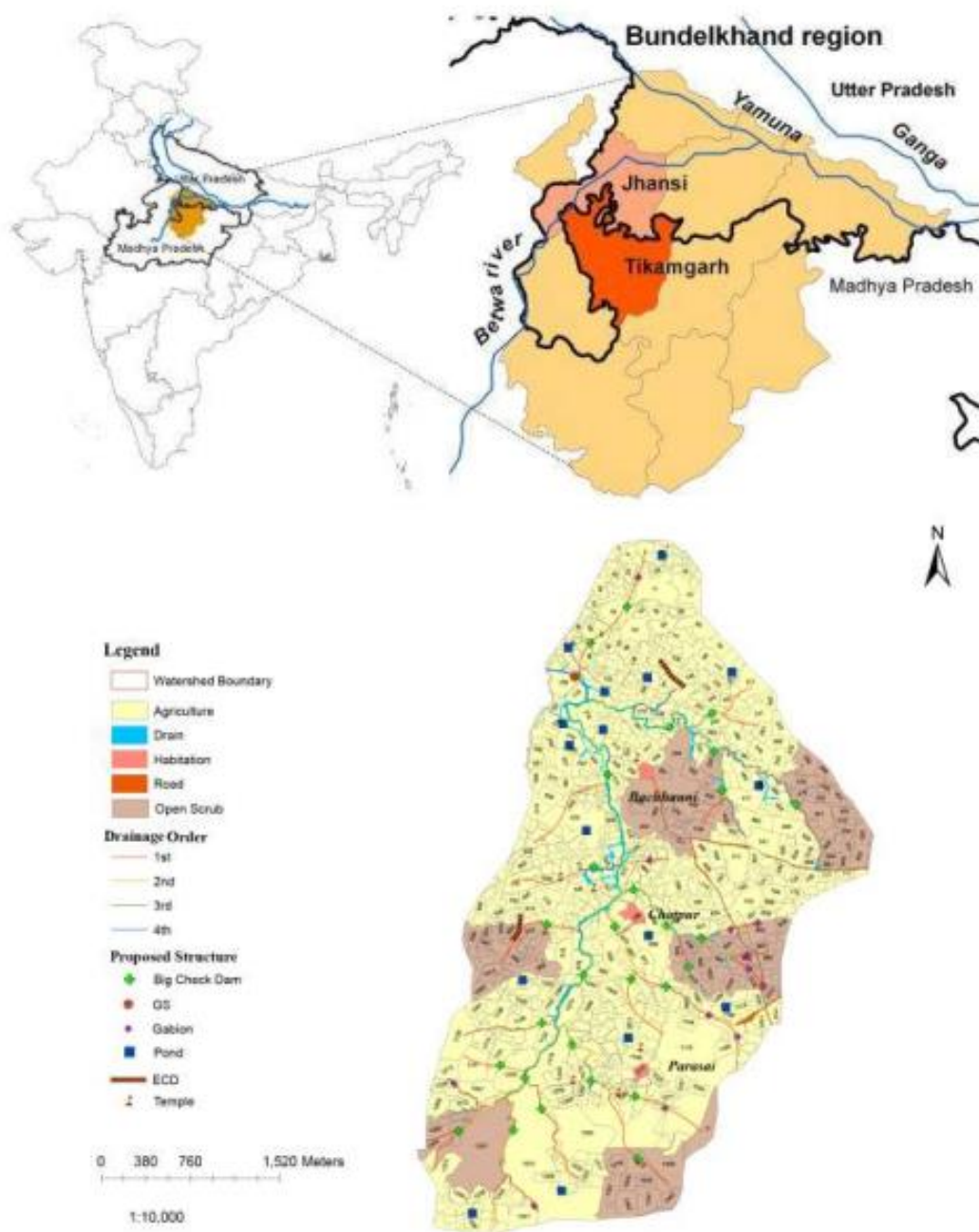


Figure 1: Location of Parasi-Singh watershed, Jhansi district (source: ICRISAT Project Progress Report 2015)



Photo 1: A women and her daughter fetch water for household needs from one of only three handpumps in the village Becchaune, a lower reach village

4. Watershed and agroforestry project Interventions

The main objectives of the ICRISAT-CAFRI community watershed project are to increase drought resilience through groundwater recharge and agroforestry interventions. The aim is to improve water security as well as livelihoods. The interventions can be categorized in both technical as well as social interventions. The technical interventions covered water harvesting structures as well crop diversification and agroforestry interventions, while the accompanying social interventions included the formation of two watershed committees, an environmental club, three women-run self-help groups as well as capacity development initiatives targeting agricultural trainings and nutrition and health components.

The specific project objectives were (Singh et al. 2016):

- 1) To enhance **water availability** in target villages through rainwater harvesting and recharging of the wells
- 2) To enhance **water use efficiency and agricultural productivity** through improved management of land and water resources
- 3) To establish a **learning site** how to transform an entire village from a degraded to a productive state within five years of project inception showing the example of a science led consortium approach

The groundwater recharge measures covered water harvesting interventions through the repair of the traditional 300-year-old haweli (about 7 acres dam area) and the building of nine check dams. Since the haweli and the check dams were in Parasai, the top reach village, the intensity of project interventions decreased towards the middle reach village Chhatpur, where there are also check dams, whereas in

Bachauni, the lower reach village, no water harvesting interventions were constructed. This was due to insufficient funding (project stakeholder interview).



Photo 2: The Haweli, the traditional water harvesting structure is located next to a Hindu temple – therefore Ahirwar (SC) could not attend watershed committee meetings

To support the project implementation, the formation of a watershed committee with community members was facilitated by the project staff at the initial stage. The objective of improving agricultural productivity was aimed at through crop diversification and agroforestry interventions through the provision of seedlings, crop demonstrations and trainings. These two main aims of the project were accompanied through targeted approaches for landless scheduled tribes (dona-making= paper bowl making). For children and women, the formation of environmental clubs and self-help groups were attempted as social and institutional interventions.

The watershed and agroforestry project interventions can be classified according to four essential components technology, institution and beneficiaries and capacity development (cf. Table 2). Particularly “capacity development” is considered crucial, as the means and approaches to awareness rising and skill development in the context of improving water management for agricultural productivity are important for technology adoption and institutionalization.

Table 2: Watershed and agroforestry project interventions (own compilation)

Objective	Technology	Institution	Beneficiaries	Capacity Development
Groundwater	1 Haveli, 9 Checkdams,	Formation of	Beneficiaries:	Individual on the

recharge through water harvesting structures and recharging of wells	3 Nala Plugs, 1 Community Pond, 1 Farm Pond with storage capacity of 115,000 m ³	Watershed Committee in Parasai and Chhatpur to plan and execute intervention under the guidance of project consortium team	Chhatpur (13 male members, 1 female) Parasai (7 male OBC members, of which 3 male SC, no women)	spot training
Increase water use efficiency and agricultural productivity for livelihood opportunities	Crop diversification and productivity (wheat, chickpea, lentil, mustard, groundnut, fodder cultivation etc.) and agroforestry interventions (plantation of teak, bamboo and fruit trees such as guava and lemon), fertilizer, vermicomposting	watershed committee and further farmers	Diverse farmers	Participatory crop demonstrations, awareness week, exposure visits
Non-farm livelihood	Dona-making (Paper bowls), temporary employment through project implementation	Self-help groups (SHG)	Scheduled Tribe	Training
Environmental, nutrition and health awareness	--	Eco-Clubs/ Environmental Club	Children and women	Health Camp, discussions on drinking water quality and causes for water pollution

For monitoring and evaluation purposes, technical data was collected. The water level was monthly monitored in 300 open wells and crop yields and irrigation inputs were documented in selected fields. A weather station measured daily rainfall and temperature in three locations which were used for water balance and impact analysis. Automatic runoff monitoring system was set up at different checkdams for continuous monitoring of surface runoff and for analyzing the impact of various agricultural water management interventions on the watershed hydrology,

According to the project progress report (Singh et al. 2016), project interventions resulted in an additional water storage capacity of 125,000 m³ of surface runoff which facilitates groundwater recharge. In the year 2013, the groundwater table increased 2.5 m, varying from 2-4 m as compared to non-interventions (control watershed stage). Reportedly, the additional water availability in wells reduced the drudgery among women and men farmers as irrigation within 1-2 days is possible. 100

acres of barren land were cultivated leading to an extra income of nearly 20,000 INR/ acre. In the year 2014, the cropping intensity increased by 30-50% especially during the monsoonal season. The wheat productivity doubled from 1500-1800 kg/ha to 3500-400 kg/ha. Several farmers shifted from chickpea to wheat in Rabi and vegetables and used improved varieties of seeds of chickpea and wheat as well as improved groundnut varieties. Furthermore, the project staff observed 30 % increased milk animal population with increased mil yield by 1 liter or more due to drinking water for domestic animals (from 900 to 1200 buffaloes). In selected households, the average family income increased from 50,000 INR (830 USD) to 125,000 INR (2080 USD).

The project attracted attention of local governing bodies and high-level bureaucrats (district magistrate with line department officials) who visited the watershed to understand importance of water harvesting and its impact on water resource availability, cropping intensity and livelihoods. As a side effect, the ICDS center was revived as the project sent a request to authorities. Overall, the government of Uttar Pradesh showed interest to scale up the same technologies in the wider Bundelkhand region.

5. Methodology

To examine in how far gender norms and roles were addressed throughout the project interventions, a variety of qualitative research methods were conducted. A total of 7 sex-disaggregated focus group discussions (5 women and 2 men groups), 5 in-depth interviews with 2 female and 3 male farmers of different caste and age as well as 3 key informant interviews with project staff were conducted. In addition, the “Gender in Irrigation Learning and Improvement Tool” and the “Diagnostic for Gender Equality in Irrigation” was piloted, the former once, the latter twelve times. These two survey tools developed under the CGIAR research program “Water, Land and Ecosystems” (WLE) and IWMI were piloted for broader take up to assess gender equality in irrigation scheme management. Additionally, we conducted village resource mappings and transect walks in each of the three villages.

Table 3: Applied research methods

Method	Parasai (top reach village)	Chhatpur village (mid reach village)	Bachauni village (low reach village)
3 Transect walks	1	1	1
3 Village Resource Mappings	1	1	1
7 Focus Group Discussion (FGD)	1 female Yadav (OBC) 1 female Ahirwar (SC) 1 male mixed caste (watershed committee)	1 female mixed caste 1 male mixed caste (watershed committee)	1 female Adivasi (scheduled tribe/ST, dona-making self-help group) 1 female mixed caste
5 In-depth Interviews	1 male Yadav (OBC) 1 male Ahirwar (SC) 1 female Kushwara	n/a	1 female Ahirwar (SC) 1 female Yadav (OBC)
3 Key Informant Interviews with male project staff	n/a	n/a	n/a
12 WLE Questionnaires “Diagnostic for Gender Equality in Irrigation” and socio-economic data	5 male - 2 Yadav (OBC) - 2 Ahirwar (SC) - 1 Scheduled Caste (SC)	3 male - 1 Prajapati (OBC) - 1 Pal (OBC) - 1 Yadav (OBC)	4 male - 1 Badhai (OBC) - 1 Gurjar (OBC) - 1 Ahirwar (SC) - 1 Banskar (SC)
1 Gender in Irrigation Learning and Improvement tool	1 male Yadav (OBC)	n/a	n/a

6. Evaluation of WLE “Gender in Irrigation” Surveys

“Diagnostic for Gender Equality in Irrigation”

The draft WLE tool “Diagnostic for Gender Equality in Irrigation” was designed under the lead of Ann-Sophie Theis with the objective to (cf. introduction of the tool):

- Identify the key ways in which men and women have differential access to and control over irrigation technology and water resources in a community.
- Highlight both constraints and opportunities for gender equality in irrigation and how these differ by gender and social group.
- Inform the design, implementation, monitoring, and evaluation of irrigation interventions that are more effective and equitable because they take into account social and gender-based differences.

It is meant to be used as

- a qualitative diagnostic in focus group discussions, asking the questions of a male and female focus group in a community
- a training tool to learn about the gender issues that may need to be addressed in an irrigation intervention
- the basis for project M&E indicators
- a checklist for project designers and irrigation planners to make sure gender issues have been addressed

It was influenced by WLE's Gender in Irrigation Learning and Improvement tool (GILIT) and serves to operationalize aspects of the African Ministers Council on Water (AMCOW) Gender Strategy (2011):

AMCOW Gender Strategy goal	Contribution of this Tool
1. Gender approach to implement project interventions at all levels within the water sector, including economic empowerment through equal access to water for productive purposes developed and adopted	<ul style="list-style-type: none"> • Can be used to conduct a gender analysis for project interventions in the water sector • Primarily focused on economic empowerment through equal access to water for productive purposes
2. Strategic research and collection of operational information on gender undertaken, produced, shared, and used by stakeholders to inform evidence based responses	<ul style="list-style-type: none"> • Provides a framework for recording and sharing information between stakeholders on gender equality in irrigation
3. Monitoring and Evaluation system and indicators to support gender equality interventions in the water sector developed and implemented	<ul style="list-style-type: none"> • Can be used to develop indicators for interventions

After a section covering basic information on the main sources of water and technologies used for irrigation (location, users, timings etc.), it is based on six sections in which statements are given, and the reply of respondents is scored (1-disagree, 2-sometimes true, 3 agree). The higher the scores, the better is the access to and control over irrigation. The sections cover:

	Topic	Maximum Score
Basic Information	Main sources of water & technologies used for irrigation	n/a
Section A	Access to Water	10
Section B	Rules about Collective Water Resources	9

Section C	Household Division of Labor	7
Section D	Enabling Environment for Irrigation	8
Section E	Access to Irrigation Technologies	8
Section F	Control over Income	10
	Maximum Total Score:	49

We accompanied a *short socio-economic survey* of the respondents and their family's information. "e considered this relevant to situate the respondents and become aware of gender relations at the household level and to cover intersectionality aspects. The survey covered the respondents and their respective family members' details such as sex, age, caste, years of school education, participation in agricultural trainings, income sources, land ownership and tenancy, types of crops grown in the raining and the dry season, livestock owned and migration. Especially caste, age, family relations and land ownership are relevant indicators to understand gendered relations in the South Asian context.

The basic information section of the "Diagnostic for Gender Equality in Irrigation" proofed to be suited for an introductory village comparison of water and irrigation technologies if the tool is conducted with respondents of diverse caste and land ownership backgrounds. We also found the tool useful as a guideline for semi-structured individual interviews, as the responses varied to a great extent, in particular dependent on the caste and landownership status of the respondents. Therefore, the division in one focus group with women and one with men proofed not sufficient as the respondents of women and men of the same caste would be more likely to be the same, whereas the answers of different castes differ. In the presence of upper caste women, other women might not speak up, and hence it is important to disaggregate Focus Group Discussions also according to caste and class. For example, in one of our study cases, the Parasai village, the Yadav (upper caste) settlement area is concentrated in the village center, whereas the Schedules Castes (SC) are in a different area with different water access in terms of timing and technology. Not visiting this area and conducting research there would exclude the perspectives of the most marginalized of the village. Similarly, landownership played a key role in answering the survey questions as the ownership of electric pumps and irrigation technologies were the privilege of a few bigger landowners. In terms of gender, we noted that women tended to be not aware of the collective water sources in the village. Similarly, male SC representatives were not aware of the location of the one in the central area of the village. This demonstrates that a further *subdivision into diverse groups* is strongly recommended, and that both actual infrastructure location as well as awareness of those can be measured.

Section-wise review of the tool

Interestingly, the answers to the statements for each section varied even within the same group of respondents (considering gender, caste, landownership). For example, the answers to the first statement, whether the availability of water is an obstacle to irrigated agriculture, covered all scores as farmers of the same group related it to different times – covering only one year's time or several years. However, belonging to the Scheduled Caste is a strong indicator for disagreement to this statement. Therefore, the *follow up question* on who in the community does not have reliable access to water is very important; the statement could specify already different groups within a village which have different water access. Similarly, the timing of collecting water varies to a great degree by caste and

household location. Consequently, the satisfaction varied a lot accordingly and covered all score ranges that it was not possible to agree on a score for the group interviewed. Therefore, we decided to conduct the survey on an individual basis and used it as guideline for interviews.

While most male respondents stated that they do not depend on other community members for their water supply (Section B, Question 1 and 2), one stated the need to wait 30 minutes, whereas the question did not clearly state whether it refers to irrigation or domestic water use; and the boundary of other communities was also not clear. Women would refer this question to the handpumps where they have to line at for domestic use as well as for their livestock. However, as water uses are not clearly diversified, diverse answers are given. More relevant is the follow-up question on water disputes, which needs to be probed and followed up, therefore it depends on the interviewee's qualitative social sciences skills to identify these in the village. Therefore it is recommended to use a *social scientist* rather than an enumerator for this questionnaire.

As there are no formal rules or water user groups established in the villages where we conducted the survey, a range of questions in the "Rules about Collective Water Resources" (Section B) was not applicable. As there is no functional watershed committee, the GILIT was also not applicable. However, as there is a range of *informal rules* concerning the access of water, in-depth qualitative studies are necessary to explore this further in-depth.

Section C on the "Household Division of Labor" included some statements, which were not clear to the enumerator (e.g. "I practice irrigation on the plots of land over which I am the primary decision maker" is confusing as the primary decision-maker was not yet identified. Everyone stated to receive help from their spouses for irrigation, and men stated to help with collecting water for domestic purposes. However, as observations in the village have shown, these statements are too generalizing and men would not admit or be aware of the unequal work load in regard to fetching water which we observed and which has been stated in the literature. Therefore, section C seems to focus too much on *social desirability* and can be better investigated with a detailed study on daily time spent on fetching water and irrigating, or with in-depth interviews and observations.

Section D "Enabling Environment for Irrigation" covers a wide range of issues in each question (e.g. access to markets, inputs, memberships, knowledge of mechanized irrigation technologies, credit availability and the approval of the spouse). Particularly the perception on whether markets or inputs are accessible varied independent of social markers of the respondents. This demonstrates the relativity of the answers depending on their household position, their experience and expectations, and more detailed questions about the ways to access these should be asked. As for each aspect a separate survey or FGD could be conducted, the follow up question on the challenges related to each item is very important to bring out in-depth case studies. However, we recommend to ask these questions to some key informant and then collect case studies of different farmers which reflect the diversity of access issues according to different groups within the community, as gender plays a secondary role in these aspects. This part of the survey could be developed as a tool to compare different villages and to design targeted approaches.

The Section E on "Access to Irrigation Technologies" was also answered quite diverse independent of their background, for example, some felt comfortable using irrigation technologies, others did not, as they were using different technologies. Hence the particular technologies need to be first identified and by whom these are used, and then it needs to be probed whether the specified are useful. Similarly,

satisfaction with irrigation technology varied to a great degree. The question on “reputation” was rejected by the responses, as the concept was not clear and we suggest that this requires further in-depth interviews.

The last section on “Control over Income” (Section F) highlighted that male respondents decide with their son how to spend income earned from irrigated agriculture (question 9) and that women are excluded from this. While other questions were answered again in diverse ranges with no pattern emerging, such as the decision-making on selling, except one man, all other decided how to spend income earned from irrigated agriculture.

Recommendations

It is striking how diverse the answers on most questions were. This indicates that they should be formulated more specified, and that Focus Group Discussions with particular subdivisions of each gender according to class and caste or even single interviews can bring out the range of issues covered in the questionnaires.

To tailor targeted approaches in the South Asian context, it is highly important to reflect the diversity of water access not only by gender, but also by caste and class divisions within one community. For this purpose, it is recommended to:

- use the questionnaire as an orientation to develop a more contextualized questionnaire
- conduct interviews with representatives of diverse socio-economic groups in a village, divided by gender, caste and landownership (e.g. male upper caste, female upper caste, landless male Scheduled Caste, landless female Scheduled Caste) – if you conduct Focus Group Discussions, make sure to subdivide women and men further according to their caste and class background
- specify the questions, e.g. which irrigation technologies, where is the next market located, who has access to which input providers etc.
- use a social scientist rather than an enumerator for this questionnaire to identify diverse water access challenges and disputes

“Gender in Irrigation Learning and Improvement tool”(GILIT)

The GILIT assesses meaningful participation of men and women in collective irrigation schemes to advise on the implementation of gender-equitable policies and practices. It was developed by Deborah Rubin, Nicole Lefore (IWMI) and Elizabeth Weight (IWMI). It covers men and women’s:

- i) access to scheme resources (including information, such as in the design phase; land, water, and other inputs);
- ii) participation in scheme membership, leadership, and decision-making; and
- iii) access to scheme benefits, including access to market information, packaging, and payments from product sales or processing, depending on the location and crop (cf. GILIT).

As there is no functional watershed committee in the three villages of our case study, the GILIT was not applicable for this study. However, we felt this is a useful tool for a comparative analysis of different established irrigation schemes which function in some way or the other under formal rules. In particular,

the guiding questions on the broader national and sub-national context of an irrigation scheme is useful to explore how the policy context promotes gender equitable outcomes.

The statements were probed with some watershed committee members which was established for the project time (2011-2015) in retrospect. In the highly patriarchal environment of central India, we noted the tendency of project staff to confirm women's participation, whereas there was no awareness of women on the watershed committee despite their name being on the member list of the project, and also male farmers stated that women were not involved. Hence there is a danger that the participation of women is tokenistic, and an in-depth survey of a gender researcher is necessary to identify the status of women within the respective irrigation scheme. We further noted yes/no – questions in the tool, which might be answered according to the social desirability.

7. Labor division and the invisibility of women's contributions

The labor division of agricultural practices in the villages is linked to sustain gender norms, and hence, women's labor is associated with the domestic and less visible sphere. Women mostly engage in time-intensive tasks which can be done from home, while men engage in labor-intensive, technology- and market related tasks which require to leave the domestic space and engage with wider social networks (cf. Table 4). Particularly upper caste women's status is linked to purity and hence, only widows or women with mentally or physically challenged husbands can or have to do the jobs of their husbands if a son or male neighbor is absent. These purity restrictions are different for socially marginalized groups as women of the Scheduled Caste have greater mobility, for example to purchase inputs, or apply fertilizer. Particularly upper caste women fear using an irrigation pump as in the village Becchaune, two accidents have happened, one woman died and a 15-year-old girl broke her arm (FGD).

Table 4: Agricultural labor division according to gender based on Yadav and SC FGDs in Parasai village, Jhansi

Activity	Women	Men
Land preparations by hand/hoeing	√ (women bring cattle to farm)	√
Land preparation/ploughing		√
Purchasing inputs (seeds, fertilizers)	(√) SC women sometimes	√
Sowing	√	√
Weeding	√	
Thresher	√	√
Operating machines for irrigating crops/applying irrigation water	(√) women start electric motor	√
Clearing/cleaning irrigation canals	√	
Hiring agro-machineries (tractors, pumpsets, tubewells etc.)		√
Maintaining agro-machinery		√
Spraying crops with pesticide		√
Applying fertilizer	(√) SC women do	√
Harvesting crops	√	√
Cleaning and drying of crops, separating jute fibre, fibre and stick etc.	√	

Storing/Processing crops	√	√
Storing/Processing seeds for next season		√
Selling produces in the market	√	(√) SC do not sell
Negotiating with input provider	√	√
Negotiation with landowners		√
Negotiation with local partners		√

Table 5: Primary decision-maker according to gender based on Yadav and SC FGDs in Parasai village, Jhansi

Decision-making on	Women	Men
Types and amounts of seeds and fertilizers	√	√
How much irrigation water is to be applied and for how many hours for each crop	√	√
When and for what activities to hire labours, how much to pay labourers	√	√
How much produce to sell and how much to store	√	√
Where to market the produces and at what price		√
Sharing of Inputs		√
Sharing of outputs (profits etc.)		√
Negotiation with input provider		√
Negotiation with landowners		√
Negotiating with local partners		√
Decision over division of labour		√
Financial decisions		√

Although the labor division is not overtly challenged, women shared that they have discussions with their husbands on their workload. In a mixed caste FGD with women in the village Bechaune, a woman shared that “discussions do not help. In anger, men say, ‘if you want me to go, you can marry someone else’ or ‘Go back to your parents house’. I did this but returned after two to four days as I have small children” (FGD Bechaune). This demonstrates that men have better bargaining power as they feel the security that their wives will not leave due to cultural norms which go against breaking up the traditional family set up. One woman stated how her husband yells at her if she does not wake up early to finish all chores such as cooking and cleaning on time. Another woman stated that she fights with her husband as he sells wheat for alcohol.

When being asked what changes have occurred for women in the last ten years, women stated that their children are now attending schools which gives them less work during day time. Handpumps were also a rather recent change which made their life much more convenient, while there are still no toilets in the village and they practice open defecation, but the awareness of the need for better sanitation was there as they know that toilets are under construction in many places. They also noted that families tend to move from joint to nuclear set ups, and they increased their mobility due to moving around for work. One women said that they used to wear their scarves much lower, far below the chin, but that it

moves more up now towards covering only the nose (cf. Fig. 1). They like wearing a veil as it is a sign of respect, and since it is a habit, they do not have a problem with it. They used to take off their slippers in front of their elders due to respect, but this also changed as daughter-in-laws are more educated now.



Fig. 1: A woman demonstrates how the depth wearing a scarf in front of an elder person has changed within the last ten years

8. Analysis of the watershed project design and evaluation

The project was set up in a way that ICRISAT facilitated the project and maintained financial control while CAFRI led the implementation work in three villages with the support of a watershed committee formed by community members (cf. Fig. 2).

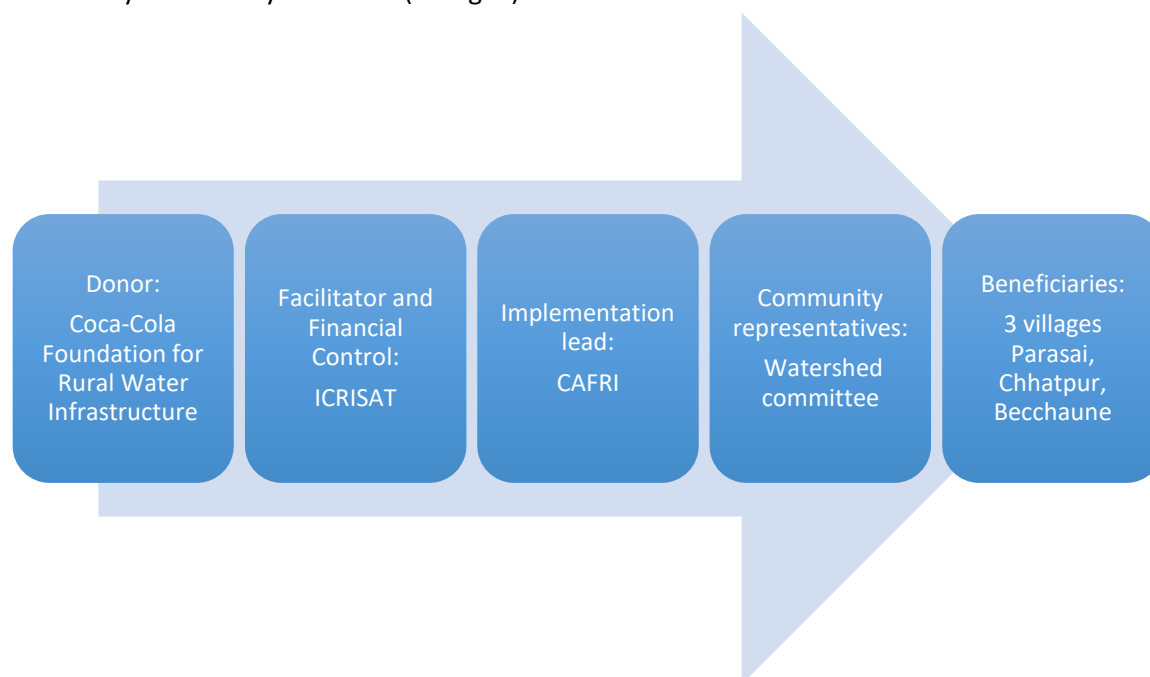


Fig. 2: Stakeholders involved in the Watershed Project

Prioritizing in a community approach

The implementation intensity decreased from the key entry village where the Haweli structure was rejuvenated which stresses the focus on the village Parasai. Less interventions took place in Chhatpur, and least in the most distant village Bachaune. High-intensity demonstration farms for particular crops were only found in Parasai. Due to the complex socio-cultural and economic diversity within each village, only few farmers who were intensively targeted benefited from the interventions. While the gender researcher of this study aimed at spending equal time in all three villages, project staff tried to focus her attention on the successful demonstration farmers in the first village. Reasons not to enter the other villages were alcoholism, on-going festivals as well as troubling tribals being there. When entering the third village, a staff pointed to a wall where villagers wrote their oath to stay away from alcohol. While conducting focus group discussions in the third village, a lady stated: “out of all neighboring villages, ours is the most backward. There is no work or education” (FGD Bachaune). This demonstrates that villagers themselves have internalized their “backwardness” in comparison to other villages. The project interventions hardly reached this village as well as it was the “lower reach village” where water would not be supplied to; the reasons to focus the project on Parasai mentioned by the project team were due to the geographical advantages as there is a slope in Parasai with better soil types. Another observation showed the focus of interactions of project staff with the watershed committee president and the demonstration farmers.

Technically driven project design and social interventions

The approach of the watershed project design, monitoring and evaluation was technically driven with the primary objective of improving ground water recharge. Project staff justified the technical design as this was the mandate of the funding Coca-Cola Foundation. Nevertheless, in the implementation phase, several social activities and trainings were conducted to reach out to women, children and the marginalized caste of Adivasis, officially known as the Scheduled Tribes (ST). Engagement with women was mostly led by a female, non-scientific staff based in Delhi who visited the field sites twice a year. She was the only female staff in the team. A social scientist or even a team designing meaningful and systematic institutional approaches to social activities was not included in the project design. As the project staff noted, no systematic social or institutional approach was integrated in the project design, whereas a great number of community activities were introduced. Because of a rather fragmented social engagement approach, the overall project interventions had limited outreach and sustainability, and policy recommendation for systematic upscaling could not be made.

Quantitative Project Evaluation

Before I visited the field, project staff ensured that the “outputs of the project are more than expected as the income increased strongly”. However, the positive evaluation of all project activities is not based on a comprehensive household survey comparing beneficiaries and non-beneficiaries, but the data is collected from a few successful farmers. The monitoring and reporting was done in a descriptive manner, and only few farmers’ plots were monitored for impact assessment, from which generalizations were drawn such as “the average household income doubled”. This proved true for single demonstration farmers, but many of the interviewed households had not increased their income through project interventions (FGD).

The project assessment was done in 2013, a year with sufficient rainfall after the project implementations took place. The following two years 2014, and 2015, the region experienced a tremendous drought in which the water infrastructure could not fulfill its purpose. Therefore, the enthusiasm of the project staff needs to be linked to a temporary state after the infrastructure implementation:

“We picked a few households and compared to others. You will see. If you look at farmers, every household income has doubled, tripled. Even 2 acre farmer had a good jump. The growth engine was water. With good interventions, there is no need to take care of anything. Big landowners of 20 acre could only cultivate 5-6 acre. Now they have good availability of water, so they do at least one crop in post-monsoon, as well as animal husbandry.”

From a number of different farmers, the overall situation has not changed and only few farmers success was measured and communicated as all households having increased their income. The data in the reports is not sex-disaggregated and a gender analysis is missing. Nevertheless, the establishments of social interventions such as an environmental club and self-help groups is stated, whereas these were not maintained and hence non-functional during field work in June 2017. When male project staff was asked which women-targeted trainings or interventions they might find useful they mentioned horticulture, agroforestry, as well as trainings for pickle and jelly-making. Hence, a focus on learnings beyond the initially designed interventions can help develop future project designs.

The project evaluation was guided by quantitatively measurable indicators, such as the number of interventions implemented and trainings given. The output were a descriptive project report and technical publications, while an in-depth qualitative study on the sustainability of these interventions was missing. This might be an explanation for putting less focus on a progressive and systematic social activities with the aim of building institutions around technical interventions to ensure sustainability.

9. Participation and targeting the marginalized: reflecting project implementation from a gender perspective

Despite the great variety of agricultural interventions, only few activities targeted women. The reasons stated are that it was “not possible to reach out to women” (project staff). However, a scientist and the female project staff conducted focus group discussions with women to identify their needs. Reportedly, they stated economic interests and the need for money at hand. As one result, the formation of self-help groups for saving money, and paper-plate making for tribal women were introduced. Other activities specifically addressed to women were related creating environmental awareness. This indicates that gender norms were not challenged but reproduced through project activities. Overall, interviews demonstrated that women who had little awareness about project interventions.

The project team developed interventions which were designed to target different social groups in the villages, that is, apart from men, also women and children, and also Scheduled Tribes (ST). The major interventions linked to watershed development were designed and implemented by male scientists, project staff or community members which made it difficult for women to engage. Primarily technical

scientists were engaged, as only one (male) social scientist was part of the project team which made it difficult for the team to attract and engage with women. The team admitted to be lacking a sensitive approach, any specific gender component or collected sex-disaggregated data. This indicates that there is a danger of reproducing gender norms, as well as provide an explanation why interventions were only partly taken up.

Women were seen as the carer for the family and the environment, while they were excluded as stakeholders from the major project interventions on agriculture and groundwater recharge. Agriculture and irrigation is seen as the male domain, while women are associated with caring for health, nutrition and the environment. They “do not come forward” and cover their faces – “purdah” (project staff). On the other hand, a project staff acknowledged: “Women do 70% of the irrigation. Men only start the diesel pump” (project staff).

Despite the neglect of women in the watershed interventions, diverse approach to reach out to groups of different caste, gender and age were trialed. In the following, diverse implementation activities will be reflected from a gender and social inclusion perspective to provide recommendations for future up- and out-scaling of similar watershed projects.

Decision-making on water: the watershed committee – exclusion of SC and women

For the purpose of implementing water harvesting structures, two watershed committees were formed in the Parasai and Chhatpur villages: “Without community involvement we cannot do construction. They might object, why do you construct in this place?” (project staff). The role of the committee was to identify the location site and owners, to supervise the structure building, and only with their approval and signature, the new infrastructure could be build. The costs for the water infrastructures was covered through the project while the costs for labor and agricultural inputs was covered through farmers.

The president of the watershed committee is the biggest landlord in Parasai and the former Gram Panchayat head with social and political networks as well as respect and authority within his own upper Hindu caste community and beyond. SC/ST were involved “to follow the Central Government watershed guidelines” (project staff). In the project report, the watershed committee members in Parasai are all male, with three SC and seven OBC representatives, while in Chhatpur, out of 14 members, one widow is there, and no SC members. Hence, each committee had one to three representatives of different caste or gender, but during field work enquiry, they did not know about their membership. When being asked whether the caste representation is proportional as there are a majority of upper caste Yadav members, the project staff noted: “there is more Yadav in the community, and many times there is conflict if there is more SC/ST”. When questioned whether women participated, the project staff stated:

“Women are not allowed to speak, cover their face, so it is men-dominated. We cannot upset community, then we cannot come in the village. (A female staff) comes just ones in 6 months, so she could not do much.” (project staff)

On the one hand, this confirms the importance of government guidelines on caste reservation to fulfill these on the ground. On the other hand, a few women and diverse caste representatives are committee members on paper, whereas they did not know about their membership. This suggests that alternate

local knowledge was excluded in decision-making processes of the committee. The new Ahirwar (SC) Pradhan noted that the meetings took place next to the Hindu temple which is where the watershed was build, which he is not allowed to attend for cultural reasons of purity: “they always sat in one area at the temple where only Yadavs can go, so we did not discuss this area here”.

This shows that technical knowledge was dominating over diverse local knowledge as practically the meetings took place where the Haweli was constructed, while this is a space restricted for the Yadav caste. This could have been accessed through rigorous social science methods such as in-depth interviews and participatory rural appraisals (PRA) with diverse community members. Diverse local knowledge was excluded as the watershed committee meetings conducted next to the Hindu temple, where Ahirwars are not allowed to enter. Therefore, Ahirwaya were not included in the project activities and hence, power relations were reproduced throughout the project implementation in that a few male Yadav landowners were communicating with the project staff and influencing the decision-making process.

In an interview with the president of the watershed committee as well as project staff, it was noted that the committee does not exist anymore as it merely served the purpose of constructing water harvesting structures, without institutionalizing a system to repair and maintain both the infrastructure in case of damage, or the water distribution. Whereas siltation is mentioned as a possible upcoming issue by technical staff which would need to be addressed through farmers, it is expected that the president and “those whose fields are covered under the Haweli catchment area will take care of this” (Key informant interview). Hence there is a great dependence on the former president of the watershed committee (who was also Gram Panchayat head) and bigger landlords. This indicates an instrumental notion of participation which serves the project needs, whereas a long-term perspective on institutionalization of a water committee for management was not seen necessary as the “infrastructure will last 50 years” (key informant interview). This reflects a technical perspective of water infrastructures excluding the need of robust local water governance.

Demonstration farms of cooperative couples – wives’ perspectives

To assess both kharif and rabi crops productivity, demonstration farms were set up for blackgram, greengram, and groundnut (Kharif) and chickpea, mustard and wheat (Rabi). Farmers contributed 50% of the cost of varieties. Some high-intensity farms were set up which also planted forage to provide nutritious fodder to livestock. In addition, through agroforestry interventions fruit tree seedlings were planted on farmers’ fields and courtyards. Several agroforestry interventions were introduced, of which some have been successful, for example in one village, 84 bear plants with improved quality were provided, which led to a profit as every plant could be sold for 250 INR. This is linked to a successful state government scheme. In contrast, Lac-cultivation was given up as there was no market to sell these and hence people lost their enthusiasm despite successful production.

I visited four of the most successful demonstration farms and noted that both husband and wife put tremendous effort of work and time in the farms. During interviews with these women to understand why their farms had been more successful than others, they stated that they are both willing to have a higher workload and take inconveniences into account such as staying at the farm over night to protect it from wild animals. They understood the economic benefits and stated to enjoy “seeing greenery” (female Yadav farmer in Parasai). She noted that she feels that both she and her husband work very

hard, and that their children sometimes skip school to support if needed. Interestingly, she was one of the few women who knew the location of the water “the water is coming from the temple” (even though not knowing the Haweli structure), and that the water level increased because of water being stored, because her husband explained this to her. She also stated that they have a mutual understanding, for example, if she is tired, her husband helps her with the work, while she would also use electric irrigation if he is not there without being scared. Despite being in the background during the presence of a male researcher, she was willing to openly share her experience with the project interventions when only a female researcher was around. Her statements demonstrates the centrality of cooperation between husband and wife for successful farming, but also the importance to approach women through women.



Photo 3: Discussing fodder production at a demonstration farm with male scientists and a female farmer hiding in the background



Photo 4: A girl demonstrates that she uses electrical pumps for irrigation



Photo 5: A successful demonstration farm with agroforestry interventions

Sidelining women – Environmental club and SHGs

The major project interventions were led by male staff which resulted in women being dependent on their husbands for receiving information. (Male) project staff mostly communicated through the watershed committee president and a few other farmers to mobilize other farmers to join demonstration trials and skill development trainings. Apart from this, three women-centered approaches were introduced. All three of these approaches were independent of the water harvesting interventions and agricultural trials. They were meant to promote women's role as carer for the environment, and grouped together with children's activities, rather than seen as relevant stakeholders in the project. There was a clear distinction to the technical interventions with economic benefit (water harvesting structure, crop trials, agroforestry interventions). This reproduces gender relations as women's involvement in agricultural labor remains the same without empowering them with knowledge and the ability to participate in decision-making. Instead, women are kept in dependence and a subordinate position to their male counterparts who could extend their social networks, build their knowledge and skills through the project, which were only accessible to women through their husbands.

For the purpose of rising environmental awareness on conservation of resources, an environmental club was formed to reach out to children and women through activities such as drawings, distributing books and playing games. This was guided by the only female (non-scientific) project staff from ICRISAT who visited the sites every six months from Delhi for social engagement, which made a continuous effort and a robust institution building difficult. While several SHGs were initiated, these were equally not sustainable. As project staff reported, women were not interested: "we pursued them to initiate, but nothing happened" (project staff CAFRI). The approach to women focused on SHGs and environmental clubs to raise awareness without integrating it in productive agricultural labor which the project promoted.

At the same time, a systematic approach linked to meaningful activities for women and integrated in the wider objectives of the project was missing. The fragmented approach to engage women demonstrates the overall weakness of a social and institutional approach, as there were plenty of activities, but missing links and progression to ensure sustainability or even upscaling or policy advice. This entails the projects' assumption that women will benefit through the interventions and men's involvement. However, through an approach focusing on the engagement of men, women's subordinate position is maintained.

Land to boys, Bund to girls

Even if interventions are targeted to support women according to their stated needs of economic support, those can lead to reproducing gender relations of dependence despite being well intended. Focusing solely on economic empowerment excludes the need for social change through which women can become more self-reliant. The following example demonstrates that dowry as a social practice is used to sustain women's subordinate position to men through monetary exchange, while it is expected that a greater dowry provides upward social mobility through a better suited husband based on economic or cultural standards (Chandramukhee and Leder 2013).

When asked whether there was a gender-specific approach within the project, one project staff replied that he conducted a focus group discussion with women with the support of the female project staff in which they asked how to improve their economic situation. As women stated that they need money for marriage and education, the project staff developed the idea to hand out 100 teak tree seedlings to

mothers of 0-5 year old daughters with the purpose to plant the trees on bunds (boundaries of the land). In 20 years, when the girl is at a marriageable age, these trees can be cut and sold, with the money to be used for dowry: “the trees are meant for assured revenue to girl child, as now in the constitution (of India) girl equal boys (...) knowing mother’s attachment, we felt an emotional motivation would encourage mothers of girls to come forward.” (key informant interview). Hence the trees were planned to be handed over to more than 80 farmers, in particular one demonstration farmer, with the following slogan:

“Ladhko ko khet, ladhkiyo ko medh, har modh par, sau sagaun ka pedh”

(English translation: “Land to boys, bund to girls, on every bund, 100 teak trees”)

Although this practice was not systematically introduced as the trees were handed over to men and interviewed women did not recall this idea, the idea represents an example of the reproduction of gender relations. As the slogan indicates, land ownership is meant to be for men, while women are seen as commodity who is sold to be sold off to another family. Instead of investing in her education or improving their self-reliance through an empowering approach, capacity development and meaningful institution-building, a girl can be invested in through a higher dowry which promises a husband of higher value and possibly upward social and economic mobility. These deeply entrenched patriarchal norms are hence sustained through the project approach, while the subordinate position of girls is instrumentalized to serve the project purpose of agroforestry adoption.

Targeting scheduled tribal women through bowl-making

The project engaged with Scheduled Tribal women, which demonstrates caste-sensitivity of the project design. To reach out to the landless scheduled tribes (Adivasis), a paper-bowl-making machine (dona making) was given to a group of 18 Scheduled Tribe (ST) women who are landless and only work periodically as agricultural laborers in the third village Bachauni. In this lower reach village, the watershed interventions was not successful for several reasons. Most of all, there was no link to the market or a strategy to sell the paper-bowls. Furthermore, the group stated that it is not economic to earn from the bowls considering the material costs of 8 INR, while they sell a bowl set of 35 bowls for 10 INR. Furthermore, the space to keep the machines was limited as they live in joint families which share houses. They reported a misunderstanding, as the machine was agreed upon with men, and women expected a machine which can produce both bowls and plates which would help to sell at weddings. This example demonstrates the messiness of interventions in the field, and rather than a trial and error approach, aspects such as economic and market analysis as well as social analysis could help to identify the robustness and institutionalization of interventions in which a technology is given to beneficiaries.



Photo 6: Paper-bowl making for Scheduled Tribes in Bechaune village

10. Perceptions by project staff: enthusiasm and frustration

The primary objective of the project team was to fulfill the donor mandate of the Coca-Cola Foundation to ensure groundwater recharge. As the year 2013 after the rehabilitation of the water harvesting structures proved successful, there was great enthusiasm about the successful implementation as well as diverse agricultural interventions taken up by several farmers. One scientist described the project as the most successful he had worked on in terms of technical implementation as well as successful uptake of agricultural trials in demonstration farms with increased plot productivity and income of respective farmers. However, project staff expressed both frustration and enthusiasm about the project implementation process.

The perception of one ICRISAT staff diverged from the perception of CAFRI staff. ICRISAT staff stressed the technical focus of the project with little social engagement because it is a “difficult environment” of the Bundelkhand region: “making rapport is difficult, we did not have much interaction with women candidates as they are not allowed to come out of their families. So engagement was with men mostly” (technical ICRISAT staff). While they denied that there was an objective of capacity development or institutionalization, the CAFRI staff was in particular proud of their social engagement approach and trials to reach out to scheduled tribes (ST), women and children. At the same time, as they have spent a great amount of their time to reach out to more marginalized farmers, they expressed frustration particular in that successful agroforestry interventions such as bear plants, citrus trees and fodder were

not taken up despite successful demonstrations and low cost and labor investments. Notably, a project staff stated his frustration:

“To our surprise, only few farmers approached us to ask to be involved... farmers are not coming forward, they are not picking it up... despite successful demonstration sites...not even fodder production, despite it being simple and cheap, 1 rupee, requiring not much care... No one came, there was no interest and the attitude: you do for us.... (things for) pleasure they do, for example, if they are exposed to trousers, all wear now trousers.” (project staff).

Reasons mentioned were that “families have gone nuclear, and when the wife visits relatives, they cannot ensure to water plants every day”. They also mentioned that roaming cattle eat and destroy the plants particularly in the beginning of the dry season (rabi), while the cattle is not loose in the monsoon season (kharif) from April to October. Stone or bush fencing is too costly, but particular thorny bushes work well. Another reason stated is that the boundaries of landholdings are not clear due to frequent fragmentation of the families. In one case in Parasai village, an Ahirwar family even brought a case to court as a Yadav family occupied their land.

When being questioned about the existence of any institutions when observing a dead cow inside the catchment area of a checkdam, a project staff replied: “there is no one to control people....Social institutions are not effective anymore because of Western influence, in the name of democracy” (project staff).

Being questioned on female or social science staff, there was only one social scientist and one non-scientific female ICRISAT staff from Delhi who visited twice a year “to interact with women and the environmental club, the gender work you do” (technical ICRISAT staff). This demonstrates that there is a need for a rigorous social science approach within the project, which is to be differentiated from capacity development, which nonetheless should be planned and implemented systematically through scientific staff. Gender and social science research should be considered as integral part of project planning, design, monitoring and evaluation, instead of sidelining it, independent of the technical and agricultural project interventions.

As there are discussions to upscale the interventions with the Government of Uttar Pradesh in seven districts, the main recommendations to follow are to develop water harvesting structures and try new (pest-resistant) varieties of rabi crops (post-monsoon – wheat), since the kharif crops such as groundnut, sesame, mungbean, blackgram were hardly taken up primarily due to grazing cows. When weing asked about the institutional approach to implement these technologies, one technical staff said: “We tech them and they follow” referring to developing a workplan with the line departments on how to construct water harvesting structures and capacity development. This demonstrates that the transfer of technological knowledge is perceived as the main pathway to upscale the interventions.

11. Discussion and Recommendations

This research report aimed at reflecting on the watershed project from a gender and social inclusion perspective by referring to the beneficiaries' perceptions and the project's sustainability. As a gender-sensitive approach was not included in the project design, women's dependence on men was reinforced in that primarily male farmers were consulted for water and agroforestry project interventions. This contradicts an empowerment approach as women were kept in a subordinate position. When implementing watershed projects in a highly patriarchal context as in the Bundelkhan region where sex-ratios are extreme and women are hiding behind the strong presence of men, there is a need to recognize the relevance of need to sensitize project staff for behavioral change and strengthen systematic and gender-sensitive institution building, social engagement and capacity development. As there is a tendency to sideline gender and caste aspects as something untouchable or separate to deal with than technical interventions in order to conform with social norms in the village, it is necessary to highlight how the reproduction of deeply rooted gender norms exclude women as relevant stakeholders for the sustainable uptake of watershed interventions.

Acknowledging the complexities of gender-sensitive watershed interventions, several entry points for a gender-targeted approach in watershed projects identified. The following criteria should be considered:

- 1) **A socio-economic survey identifying diverse socio-economic groups** according to gender, caste, age, class (landownership), family relations etc.
- 2) **Participatory and gender-disaggregated needs assessment** for targeted project intervention design on access to institutions, technologies
- 3) Intertwining social and technical intervention design which **increase women's awareness, their access to and decision-making over resources (institutions, technologies, natural resources)**
- 4) Linking technological interventions with **institution building to ensure participatory implementation process and continued maintenance of structures** beyond the end of the project
- 5) **Systematic and progressive capacity development and social engagements** to develop contextualized knowledge, upscaling mechanisms and policy advice
- 6) **Monitoring project implementation process and outcome** through gender-disaggregated data on adoption and meaningful participation as well as through case studies to track the impact for diverse social groups
- 7) Balanced female and male **project stakeholders** as well as both, technical and social science researchers
- 8) **A qualitative in-depth gender analysis** to document gendered technology adoption and project implementation process

For the planned quantitative study led by Dr. Padmaja Ravula (ICRISAT), it might be useful to conduct a socio-economic survey covering recommendations 1, 2, 3, 6, 7 post-intervention as well as benefits measured in 2015 as per their continuity in 2017. These cover household income as well as uptake of diverse agroforestry and watershed interventions.

12. Appendix

Table 6: List of water-specific Interventions

Water Intervention	Objective	Beneficiaries	Approach	Impact
Formation of Watershed Committee in Chhatpur and Parasai	Community participation in project intervention planning and execution under guidance of consortium team	Chhatpur (13 male members, 1 female) Parasai (7 male OBC members, of which 3 male SC, no women)	Selection and construction of water harvesting sites and types of structure Procurement of materials, record keeping, verification of bills, payment delivery	
9 Check Dams	Water harvesting to increase agricultural productivity		Project consortium and two Watershed committee	Storage capacity
3 Nala Plugs				
1 Haveli				
1 Community Pond				
1 Farm Pond				

Project Interventions	Objective	Beneficiaries	Approach	Impact
1 SHGs established		women	Young girls helped form SHGs so that they can avail benefits of government schemes. 1 SHG promoted vermicompost and nursery plantation. STEP govt scheme- women showed interest in vegetable farming, asked for provisions of seeds and pesticides	

15,983 seedlings planted in watershed				Survival of species varies 66-95% by end of 2014
300 tree plantations			Farmer exposure to Lac demonstration site at NRCAF camp, provision of seed	Survival 65%, farmers willing to adopt
Fertilizer (zinc and baron application on groundnut)	Improve yield productivity through micronutrients	Farmers participatory trial (who?)	Farmers contributed 50% of fertilizer costs	Increased yield 15-20%
Vermicomposting	To improve soil nutrients		3 day training cum exposure visit at village Ganeshgarh, with locally available materials (crop straw, biomass, cow dung)	12 pits were constructed, 40-50 tons produced in 2012
Improved variety of chickpea, lentil and mustard	Improve crop yields	14 farmer participatory trials		
Improved groundnut variety	Improve groundnut yields		Participatory field trials for improved groundnut varieties	Improved 30-50% compared to local variety
Improved wheat crop productivity	Improve wheat productivity	30 wheat fields		10-15%
65 Participatory crop demonstrations				
Weed density and biomass studies				
Parthanium Awareness Week (Weed Management)	Awareness raising to eradicate weed through release of bioagent Mexican beetle <i>Zygogramma b.</i> during monsoon		Lectures, demonstrations, 50 boxes a 400-500 beetles	
Developing Forage Resources	Improve land preparation (bed and furrow), seed sowing, fertilizer		Made available to committees, field demonstration trial	

	application and inter-cultivation operations			
Land form treatment by Tropicultor	Improve land preparation			
Fodder Management and Lac Cultivation	Preservation of green fodder by silage making and promoting lac cultivation		One day training organized by NRCAF	
Environmental Clubs	Creating awareness about water and soil conservation	Women and children	Discussions on drinking water quality and causes for water pollution	
Eco-Clubs	Encouraging children for (conservation) agriculture	children	Exposure visit, fruit plants planted in children's backyards	
Dona (platter) making for landless				
Health Camp			5 doctors examined 400 villagers, distributing 10,000 INR medicine	Children malnourished, women anemic, large number of villagers have worm infections and skin problems
Exposure visits	Awareness raising on soil and water conservation, rainwater harvesting, well recharging, improved crop varieties and cropping systems, crop diversification with high value crops, productivity enhancement			
Field Day	Share soil fertility			

	research findings and inform on nutrient application			
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6 Self-Help Groups

Name	Location	Members	Contact
Shriti Swayan Sahayata Samooh	Parasai		
Jai Khati Baba Swayam Sahayata Samooh	Chhatpur		
Jai Mata Di Swayam Sahayata Samooh	Bachhauni	Tribal	
Jai Pathan Baba Swayam Sahayata Samooh	Bachhauni		
Chri Ganeshay Namah Swayam Sahayata Samooh	Bachhauni	Tribal	
Shri Radhe-Radhe Swayam Sahayata Samooh	Bachauni		

Questions for project key informants

Project-level

- Have there been any female project staff involved? Who, and what was her task?
- What have been the challenges and learnings of the project?
- What are your recommendations for further uptake or outscaling of the project approach?
- Did you collect gender-disaggregated data in any form (socio-economic data, participation in trainings, participation in committees, project staff involved)?

Field Site Information

- Do you have more information on the community population in terms of caste/ethnicity, class, landholding size, household size, female-headed households, migration rates etc.?
- Why was there no water committee formed in Bachhauni, but 4 SHGs there (and in other villages just one)?
- Do you have village maps of the exact location of all water infrastructures installed as well as land holding information?

Water Interventions

- What is the status of the rainwater harvesting infrastructures? Is the project report up to date or has there been some malfunctioning/ leakage etc.?
- Were the costs covered by the project, or did farmers participate?
- Is there a maintaining system set up to keep the water infrastructures (checkdams, haveli etc.) in place? How well does it work?
- The pictures in the report show mostly men – were women at all involved in the water interventions and the agricultural interventions or just in the environmental club? Were women able to take up interventions? Why, or why not?

Watershed Committee Formation:

- Why only in Chhatpur and Parasai, not in Bachauni?
- How was the decision-making on membership?
- What is the role of the watershed committee?
- In the project report it is written that women and SC/ST were involved in the formation of watershed committees, as per common guidelines. Which common guidelines do you refer to?
- Why are there none or only one female member, and none, or only 3 SC members? Does this represent the community population? What was the process/ incentives to encourage women and SC/ST membership?
- How well is the watershed committee functioning?

Further interventions

- Were trainings e.g. on improved crop varieties and fertilizers repeated?
- What was the uptake rate of farmers?
- How was the SHG formation linked to the overall project interventions and objectives?
- Did the SHGs function well? What are the roles and responsibilities? Were SHGs provided with any inputs such as seeds, pesticides etc.?
- What was the role of environmental clubs?
- What was the role of eco-clubs?
- Were the seedlings provided for free?

Results/ impact measured

- Average family income increased from 50,000 INR (830 USD) to 125,000 INR (2080 USD)
 - o How was this measured? Which households were covered? → Can I have the original survey data to follow up
- 30 % increased milch animal population with increased mil yield by 1 liter or more due to drinking water for domestic animals (from 900 to 1200 buffaloes)
 - o How was this measured? Which households were covered? → Can I have the original survey data to follow up
- the data in the report on groundwater monitoring in open wells is only from May 2012 – April 2013 – is there any additional data?

- Crop yields increased by 30-50% especially during monsoonal season in selected fields - is there any original data? Is this still the case as in the project report dated 2014/2015?
- Did you monitor plotwise irrigation inputs in fields? Is there data to share?

Interviews with Gram Panchayat head (Pradhan, also former Pradhan)

1. Could you give me an overview of the village population (number of households, annual population growth rate, sex ratio, % of caste and religion, panchayat representatives)
2. Could you give me an overview on the agriculture in the community (% of landless, marginal and large farmers, water/pump access, crops grown, income, market access issues)?
3. Which agricultural and water constraints and opportunities does the community face? Why, and which are the attempts (schemes) to resolve these?
4. Are there any agricultural trainings, SHG facilitation etc. to support agricultural development?
5. How did agriculture change in the last 5, 10 years?
6. How does migration impact agriculture and the community?
7. What are the specific problems women face in the village? How could these be resolved?
8. Do/can women have land ownership certificates?
9. Do you have any maps, household data etc. which you could give me?

Transect walk and participatory observations

(sex-disaggregated) with villagers and a camera, map, paper, observing, listening, discussing problems and opportunities with farmers, documented in field notes

Guiding questions:

1. Who is when and where visible in the community?
2. How does a typical day look like for a female-headed/ male-headed family (time, space)?
3. Who speaks in the family how much, when and on which concerns?
4. Who speaks in the community how much, when and on which concerns?
5. Who retains ownership titles for land?
6. For female-headed households, do they have access to pumping equipment, agriculture equipment, land ownership? Why (not)?

Village resource mapping:

drawn by local stakeholders, showing the village geography, physical setting and natural assets, observing the process and the discussions:

- 1.1. Location and extent of housing, farmland and other natural and man-made capital
- 1.2. Distances between various resources, especially farmland and irrigation sources
- 1.3. Location of large, medium and small farm plots if there is a significant range of farm size. What is large, medium and small can be defined by the farmers to ensure these terms are locally referenced.

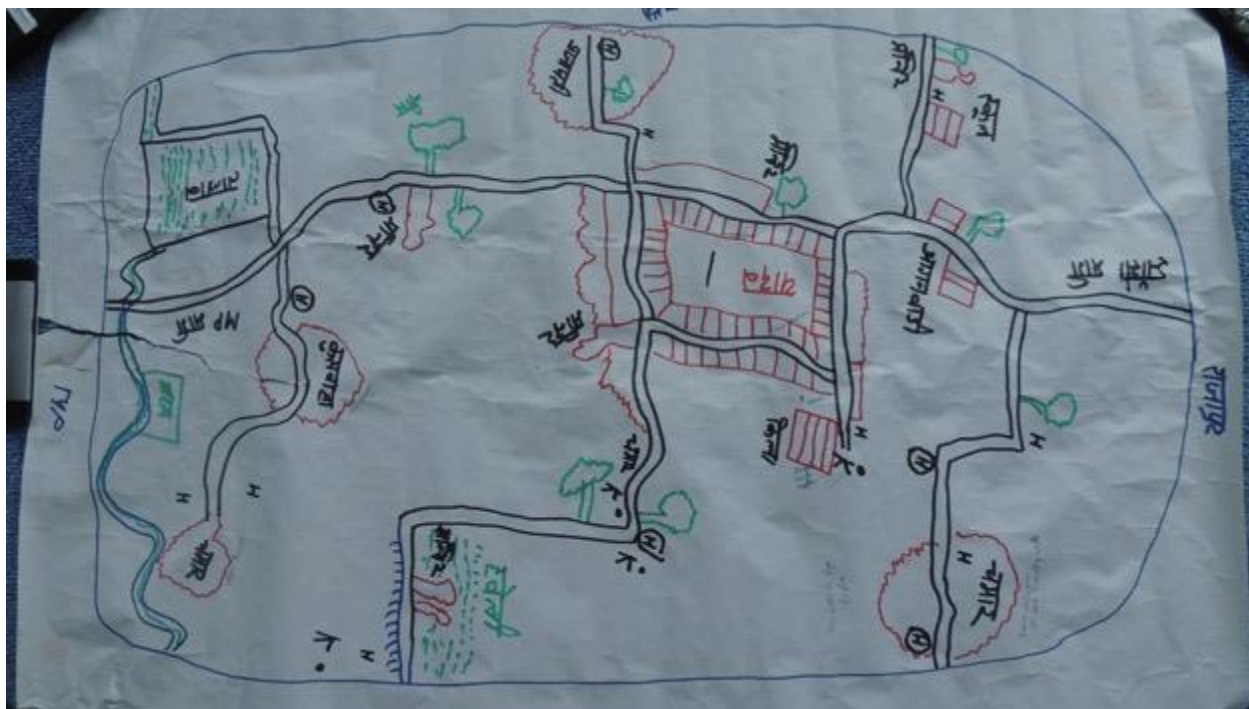


Photo 8: Village resource map of Parasai, the top- reach village



Photo 9: Village resource map of Becchaune, the lower end village

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