Farmer collectives and shifting gender relations in the Eastern Gangetic Plains

Stephanie Leder, Manita Raut, Panchali Saikia, Fraser Sugden

International Water Management Institute (IWMI)

Abstract

This paper examines to which extent a collective farming approach can address gender inequality in water management and the rigid land tenure structures in the Eastern Gangetic Plains. We investigate how intra-household power relationships, gendered norms and intersectionalities shape rules and practices of 16 farmer collectives, and reciprocally, how farmer collectives shape shifting social relations in regard to access to and control over land and water resources as well as agricultural inputs.

Our results in Saptari/ Eastern Terai in Nepal, Madhubani/Bihar, and Cooch Behar/West Bengal in India demonstrate that a collective farming approach can strengthen marginalized interests and voices through collective action at the grassroots level. We observe how marginalized groups can enhance their participation and control over agricultural production, while at the same time, the promotion of improved and just water and land resource access is highly politicized amongst project stakeholders, landlords as well diverse marginal and tenant farmers.

1. Introduction

Environmental, structural and institutional constraints to sustainable resource use in a patriarchal and caste-based society marked by migration pose a threat for sustainably managing water and land resources for more productive opportunities. Land fragmentation, limited incentives for investing in irrigation and mechanization, as well as limited access to and sharing of agro-ecological knowledge and techniques has led to land left fallow and in general, perspectives moving away from agriculture and physical labor. Increased emigration over the past decades led to demographic shifts in terms of gender and age, as well as labor shortages. The distribution of agricultural labor is changing, while there has been limited institutional and technical innovations and gendered authorities and power relations in water and land management are reproduced.

In the context of rural to urban emigration of predominantly men, and as a consequence thereof the feminization of agriculture, deeply entrenched social inequalities and the rigid land tenure structure need to be examined from a gender perspective. We recognize intersecting gender and class inequalities as central drivers of the intergenerational reproduction of poverty in the region. Against this background, this paper investigates how a collective approach to farming can address gender inequality in water resource and land tenure structures in Bihar and West Bengal in India as well as the Eastern Terai in Nepal. Benefits and trade-offs of joint lease, sharing of labour, irrigation costs, and profits are examined with a particular interest in how gendered norms shape rules and practices established by farmer collectives. This paper examines how intra-household power relationships, gender dynamics and intersectionalities affect farmer collectives,

and, reciprocally, how farmer collectives shape shifting social relations in regard to access to and control over land and water resources as well as agricultural inputs.

Employing a social and environmental justice perspective originated in feminist political ecology (Elmhirst 2011), this paper examines how marginalized interests in the rural watersphere are voiced and silenced, and how marginalized groups can enhance their participation and control through collective action. Water resource access is politicized by diverse landlord, marginal and tenant farmers' interests and their multidimensional forms of power (Lukes 1974), intersecting with gender, age, class, caste and other socio-cultural divides. To approach hidden voices within the rural watersphere, it is assumed that exclusion from decision-making processes is not only closely linked to social relations of power, but experiences and particularly gendered subjectivities (Sultana 2011). This perspective on power, experiences and practices is embedded within wider complex and interlinked processes of social and environmental transformations linked to male out-migration, land use and environmental change.

Our findings are drawn from the ACIAR-funded project "Improving water use for dry season agriculture by marginal and tenant farmers in the Eastern Gangetic Plains", which aims at addressing these regional challenges of small-scale agriculture through piloting, monitoring and evaluating original social, technical and institutional approaches. The University of Southern Queensland (USQ) leads the project with a consortium of NGOs, governments and research institutes, including the International Water Management Institute (IWMI). Drawing on six case study villages, this paper describes and analyses innovative solutions for tenant farmers through collective leasing arrangements, identifying both the opportunities as well as the remaining

challenges to overcome. Our guiding research question is: To what extent can a collective farming approach empower marginal, tenant and women farmers by addressing gender inequality in local water governance and rigid land tenure structures in the Eastern Gangetic plains?

Based on qualitative research methods, this paper presents and discuss preliminary results of the benefits and trade-offs of joint lease, as well as the sharing of labour, irrigation and input costs, and profits. We describe the formation of the farmer collectives and the motivations of diverse farmers and landlords to agree on new contracts, as well as the fluctuations which took place in groups. In particular, we assess bargaining processes both within groups in terms of trust, cooperation and conflicts on labor and capital division, as well as bargaining processes with external stakeholders such as project staff, government officials and landlords. We asses in how far collective leasing has the potential to revolutionize tenant farming, allowing producers to overcome tenure related investment barriers, increase their bargaining power with landowners, while building resilience to external pressures such as climate change.

2. Farmer collectives in the context of the feminization of agriculture

Due to male labour migration from the rural Eastern Gangetic Plains, women are increasingly managing farming processes. As the literature on the so-called *feminization of agriculture* has pointed out (Adhikari and Hobley 2011, Maharajan, Bauer, and Knerr 2012, McEvoy 2008, Paris et al. 2005, Bieri 2014, Sugden et al. 2015, Sugden et al. 2014), this can be associated with both new vulnerabilities and women's empowerment, its extent often depends on women's socio-

economic family background. Opportunities can develop as gender norms are changing due to women's increased mobility, time used and their need to speak up to provide for their families. Vulnerabilities are created through gendered access to and control over resources such as water and land, and are strongly connected with class and caste divisions. Particularly female-headed households face new patterns of vulnerability with an increase in the labor burden and limited access to and control over water resources which are essential for climate resilience and food security. Gendered norms and behavior constrain opportunities to engage in public and economic activities, which adversely impact opportunities for women to access knowledge, acquire skills and strengthen bargaining power to access resources. This can influence women's agency that is the ability to define one's goals and act upon them (Kabeer 1999).

The trend of rural to urban migration of predominantly men for better employment opportunities in rural South Asia affects both gender relations and food security. While mostly men who migrate to South Asian cities or to the Gulf States and Malaysia to find work which can feed their families, women, the elderly, children and youth are "left behind" in the rural areas. Despite receiving remittances, many "left behind" continue working in or even take over agriculture. While women primarily take care of reproductive tasks such as child and elderly care, household chores and livestock rearing, they increasingly enter a new space which previously was men's: farm management and income generating labor. This has far-reaching effects on their mobility and time used, and gendered access to resources takes the center stage.

In the agro-ecological and socio-cultural context of the Eastern Gangetic Plains, farmer collectives formed by marginal, tenant and women farmers evolved as a bottom-up community

engagement approach in our project to pool labor and resources for improved agricultural production. To address prevailing gender inequality and the rigid land tenure structures in the region, collective farming presents a radical approach to redistribute resources. Collective leasing of land, join ownership and management of irrigation equipment (such as borewell, pump sets and drip irrigation kits), as well as pooled labor and shared capital inputs and profits are innovative as they extent beyond traditional family-run farm management. By operating a contiguous plot and sharing costs, investments in pumping are expected to become feasible. Labour pooling helps farmers overcome labour shortages which have escalated due to migration, and allows a division of responsibilities which saves all group members' time. We expect that women's empowerment and capacity to bargain with landlords and service providers can grow considerably.

As the literature on gender in natural resource management groups has pointed out, the participation of women is crucial for effective water and land management. Based on a study of 46 groups in 20 countries of Latin America, Africa and Asia, Westermann, Ashby, and Pretty (2005) found that collaboration, solidarity, and conflict resolution increase in groups in which women are present. Interestingly, the capacity for self-sustaining collective action increased with women's presence and was significantly higher in women's groups. Zwarteveen and Meinzen-Dick (2001) criticize the rhetoric on women's participation in the irrigation sector in South Asia, as women are often excluded through formal or informal membership rules and practices. Due to this, women obtain irrigation services informally and in less secure manners. The authors argue that women's compliance with rules and maintenance contributions is necessary to strengthen the effectiveness of local organizations, while cautioning to consider women as homogeneous group

or category. Meinzen-Dick and Zwarteveen (1998) argue that a more formal participation of women can strengthen women's bargaining position as resource users within households and communities. Agarwal (2001) develops a typology of participation in community forest groups in India and Nepal in six levels (nominal, passive, consultative, activity-specific, active and interactive (empowering) participation), and demonstrates efficiency implications of gender-based exclusions. In a different paper, she highlights the distinctness of women's social networks, values and motivations because of prior experience of successful cooperation, their higher dependence on these networks and greater group homogeneity relative to men (Agarwal 2000).

Our approach builds on these insights and learnings on gender norms, gender roles and power relations in farmers' collective groups. Agarwal (2010) highlights collectivities as new institutional and human-rights-based approach for poverty reduction, agricultural revival and social empowerment. She contrasts this participatory, small-scale bottom-up approach to historically failed socialist collectivization, which was top-down, large-scale, and mostly coercive and non-participatory. As guidance for the introduction of farmer collectives, and the monitoring and evaluation of their functioning, we will orient our analysis on the six principles for bottom-up collectives by Agarwal (2010):

1. Voluntariness
2. Small size
3. Socio-economic homogeneity, or marked social affinities among members
4. Participatory decision-making in production, management, and distribution
5. Checks and penalties for containing free riding and ensuring accountability
6. Group control over the returns and a fair and transparent distribution of benefits

Set within the ACIAR-funded project "Improving water use for dry season agriculture by marginal and tenant farmers", 16 farmer groups are currently piloted in Bihar, the Nepal Tarai and West Bengal through a consortium of government and NGO partners. The strategy includes mobilising groups of landless women to take a joint lease for a plot, and then sharing labour, irrigation costs and profits. Groups have been supported to use water and energy efficient technology such as solar pumps and micro-irrigation systems. In addition, agricultural trainings as well as social engagement and gender-sensitive trainings have been conducted. In our six project villages, four different types of models were introduced:

Model 1: Pure collective on leased land

Model 2: Pure collective on voluntary consolidated land

Model 3: Joint leasing of land by tenants but responsible for individual plots

Model 4: Sharing of irrigation and labor, responsibility for individual owned plots

3. Methodology

To analyze the formation and functioning of the farmer collectives from a gender perspective, this qualitative study is based on extensive field work and a variety of qualitative methods useful for studying collective action in rural development (cf. Meinzen-Dick, DiGregorio, and McCarthy 2004). These range from interviews, focus group discussions (FGDs), field observations, and diverse participatory rural appraisal methods (PRAs) as well as action research. Before the

establishment of the groups, we conducted 65 in-depth interviews with female and male farmers of different caste, class, ethnicity, age and socio-economic backgrounds to identify changing gender norms, gender roles and power relations in agriculture in the context of male emigration in the region. With the onset of the collectives, a series of timed field visits at different points in the cropping cycle were carried out throughout winter and summer planting from 2015 to 2017 (cf. Table 1). We conducted repetitive focus group discussions with each of the 16 farmer groups to understand farmer's perceptions on opportunities and challenges in their groups and beyond in their families and with diverse stakeholders. This was accompanied by both formal interviews and informal discussion with key project staff who is engaged with and supporting the farmers regularly in the field. Observations in the field were documented with photographs and in detailed field notes. Furthermore, we use household survey data covering all households in each village to link our findings with the individual group members' household information such as the type of male emigration, the household composition, income, land ownership, cropping patterns and irrigation use.

On a methodological note, the comparability of the collective models across sites is limited due to different approaches through different NGOs and diverse trainings and agricultural inputs such as seeds, crops, and water technologies in each of the three region. The adoption of a collective model also depends on different socio-cultural background of each intervention site. We could not visit the sites in Saptari, Eastern Terai for a year due to the 2015 earthquake aftermaths as well as the Indian border blockage. Hence, the project started with a delayed onset. Because of the great diversity among the different regions and groups, productivity for each group and site

cannot be compared, but trajectories of group formation, motivation and incentives are qualitatively investigated. This has implications for up-scaling these models in the future.

Table 1: Interviews and FGDs conducted in the field sites

Field Sites	Days in Field	FGDs	Interviews
Madhubani, Bihar	**24**	**26**	**42**
Cooch Behar, West Bengal	**20**	**24**	**44**
Saptari, Eastern Terai	**8**	**9**	**14**
Total	**52**	**59**	**100**

4. Field sites

The 16 farmer groups are based in six villages (cf.

Figure 1). In Nepal, the villages are Koiladi and Kanakpatti in Saptari district in the Eastern Terai. In India, two villages are Bhagwatipur and Mahuyahi in Madhubani district, Bihar, and two other villages are Dholaguri and Uttar Chakoakheti in Cooch Behar, West Bengal.

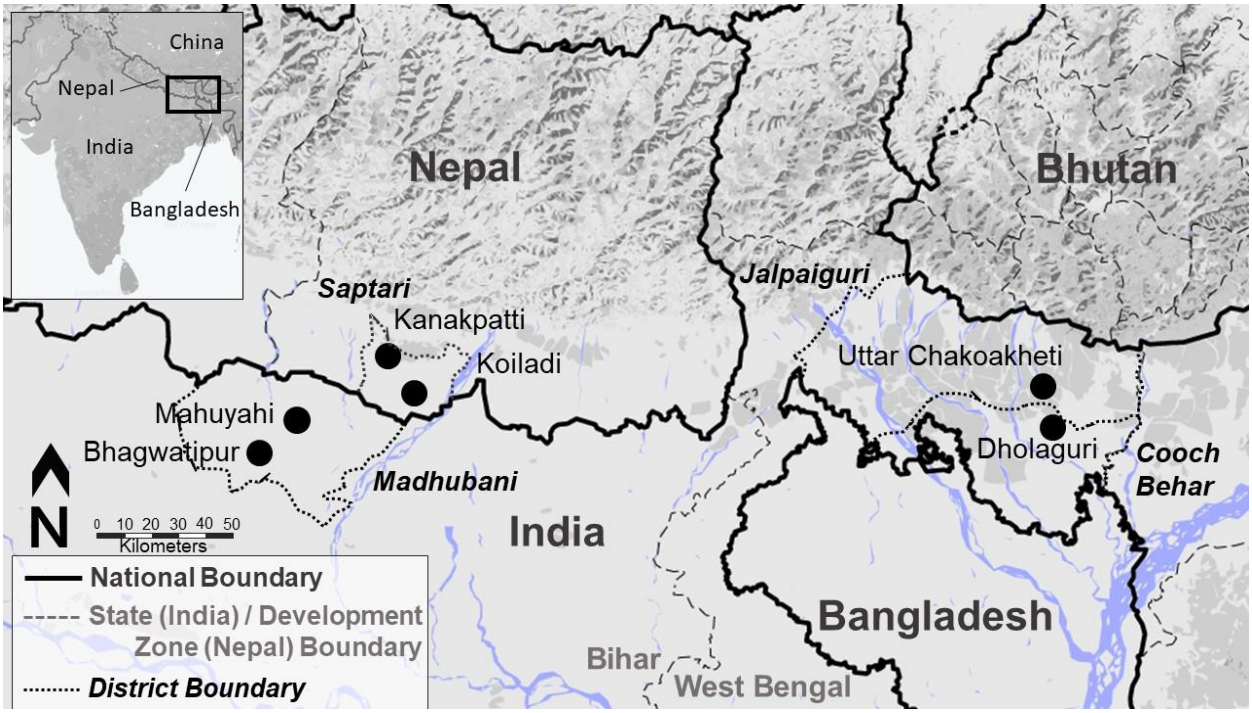

Figure 1: Location of case study villages (Draft: Stephanie Leder, Design: Andrew Reckers, source map: google 2017/snazzymaps.com)

Given the historical context marked by feudalism (cf. Sugden 2013), land inequality is still acute in both the Saptari and Madhubani sites, with a clear division between a marginal and tenant farmer majority and a minority class of large owner cultivators and landlords. The 'mode of production' can be described as broadly semi-feudal in character. Past research has characterized semi-feudalism by concentration of land amongst a minority landed class, appropriation of surplus through rent and usury, and reinvestment of surplus primarily in luxury consumption. 81 % of the population of in Madhubani and Saptari villages is either landless or owns less than 0.5 ha of land (Figure 2). The area of land under tenancy is high in Koiladi, Bhagwatipur and Mahuyahi, where it is 77%, 66% and 62% respectively, while in Kanakpatti where landlords are less powerful, it is

27%. What is most striking when one considers all the data from the four villages, is that the land owners with more than 1 ha represent just 6.9% of the surveyed population, yet own a substantial 56% of the cultivated land. This land fragmentation makes it unfeasible to invest in irrigation and agricultural mechanization. Access to groundwater is closely linked to large landlords as shallow tube wells and water pumps belong to larger landlords, which leaves power over water and land resources with only a few.

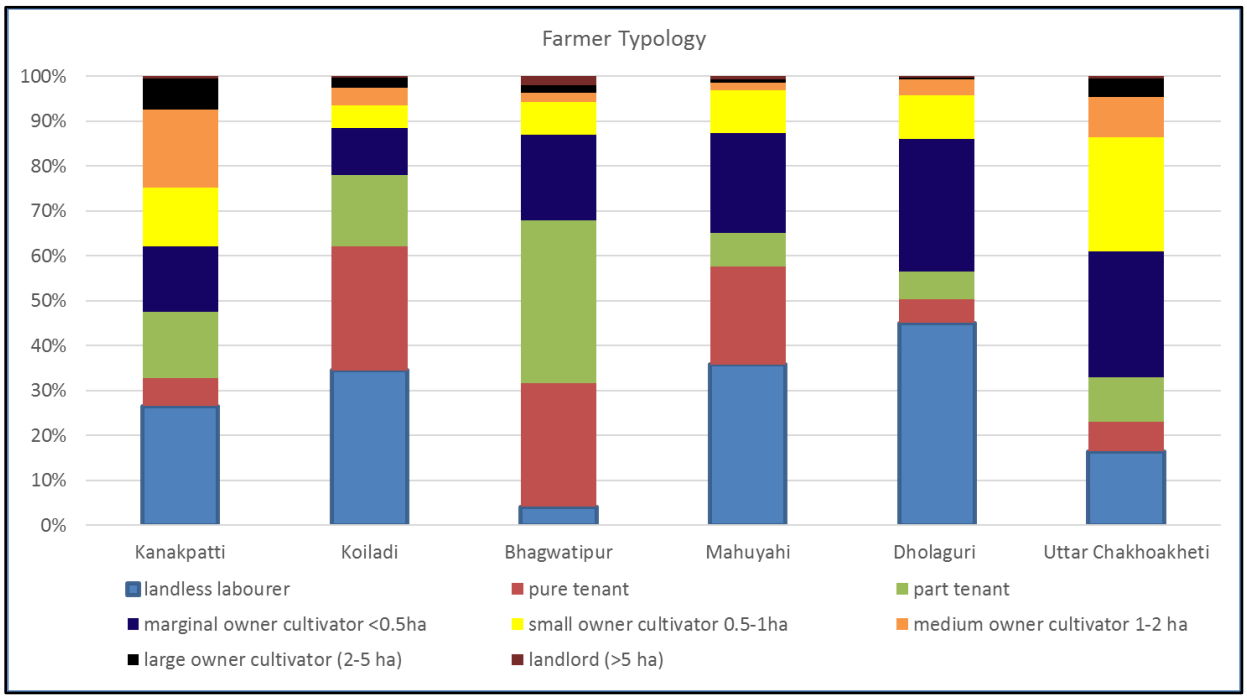

Figure 2: Farmer typologies by landownership in six field sites

5. Intra-household power relationships and gender dynamics affecting farmer collectives

5.1. Formation of the collectives

After initial discussions in the field with project staff and key entry persons, mostly landlords, group meetings were set up by the NGOs to inform the community about the project and to raise awareness on group formation for the purpose of sharing land, capital inputs, labor and profits. Regular visits to individual members and small groups followed as part of the community engagement process. In this case it is important to critically mention that the project, like any other intervention project, is at a continuous danger to reproduce existing power relations in the villages due to the convenience of focusing on easily approachable farmers rather than reaching out to the particularly marginalized.

Offering "free" irrigation technology were the main focus to incentivize farmers economically to join the group, while time-saving through labor sharing and sharing of other agricultural inputs were foremost hypothetical. Several groups received pump sets to share after group formation, but without collectives rules set up, several members were unwilling to become a collective as they already received benefits and did not see the benefit of sharing labor and further inputs. In this context we noticed some pressure exercised by the NGO on farmers to becoming a collective in a top-down manner as it is a project objective, while not sufficiently explaining the benefits and rules. During the discussion with the group members in Bhagwatipur whether they are motivated to move from a part to a pure collective, one of the female members stated that they would prefer to cultivate individually and not under the pure collective model. She further stated,

‘when we are getting all the benefits, inputs from the project, why should we move to pure collective group’ (B2, Nov. 2016).

Efforts were made by project staff of the NGOs to particularly encourage female laborers and landless to join. In some cases, a female farmer was included in the group because of the gender component of the project and the objective of promoting gender equity. This seems to be by force as the female farmer is not active in the group activity due to increasing workload and time constraint. Therefore, mechanisms for meaningful participation and incentives for women are necessary.

Other factors such as age, caste, family background (female-headed household focus), and one member per household were rather implicit and not rigorously followed as group formation was highly context-dependent. While in Bihar and Saptari, land is collectively leased from landlords by former sharecroppers or a new area of prior fallow land was leased, in West Bengal, landlords themselves became group members along with laborers. Input and output are shared among the members, but the landowners gets a greater share compared to the others. The share for the landowner is not fixed and it is based on the yield and based on agreements made by the group which should be based on mutual consent and discussions. However, the disbalance of landownership, and hence, in class background, challenges the distribution of outputs and sustained or even exacerbated existing power relations between landowners and landless.

To leave group formation up to the context and the farmers without implementing guidelines, however, turned out negatively in one case. One highly unequal group of a male

landowner and his male family members as well as female laborers was formed in Dholaguri. This case later demonstrated that the collectives approach can reproduce existing social inequalities due to gender and class if rules and selection criteria on membership are not meaningfully communicated and enforced.

Taking more time for community engagement prior group formation by a variety of stakeholders, as well as discussions with farmers on group formation criteria and rules could have avoid imbalanced groups. Based on these experience, a clearer set of selection criteria for gender, caste and landownership balance within groups could have evolved through stakeholder discussion as well as farmer discussions. We also note that the formation was neither sufficiently documented nor scientifically monitored, and that it was difficult for researchers to influence the NGO-led group formations.

Three important selection criteria which influence group functionings are:

1. **Family and work relations between members**: we found several father-in-laws and mother-in-laws with their daughter-in-laws in a group, or landlords with their laborers.
2. **Age:** a youth-specific approach could be a decisive factor to encourage young people and ensure sustainability of the groups. Youth seemed interested if profitable, but in all regions, mostly older members joined because agriculture is seen as unprofitable and possibly, because they are more approachable due to cultural norms of authority and respect related to age. Although the project was motivated within the context of male out-migration, only few young women could join, but dropped out because of child care and household responsibilities. In

Mauahi and Kanakpatti, however, some youth joined and reported to try agriculture as alternative to migration. They said they prefer staying with their families for social reasons. As the literature pointed out, youth can bring innovative solutions and develop business models in agriculture if resources are provided.

3. **Gender composition, group size and membership rules:** the group size varied greatly from 5 to 12 members, and due to gendered norms, many groups stated to require labor help from family members, e.g. women only groups from male for irrigation, and male-dominated groups from female for harvesting, weeding etc. This had the effect that group membership was not clearly defined and some members were frequently substituted by other family members in meetings due to other important domestic of productive tasks. This highlights the need for meaningful participation and targeted incentives for women, as well as youth, in these groups.

5.2. Farmers' motivation and intra-household challenges to join groups

Farmers were primarily economically motivated to join the groups, not by the group farming approach itself. This was due to traditionally family-run farming practices and to existing mistrust between households. Receiving irrigation equipment such as pump sets and receiving agricultural inputs such as seeds and fertilizers was especially encouraging to join. Several farmers stated the incentives of sharing costs and possibly increased income through collective farming, when they can improve their vegetable farming skills and knowledge within groups.

Across all farmer groups in the village, vegetable cultivation during the dry season was another motivating factor. Although farmers were not confident on whether it will be an beneficial investments, this was one of the main factors highlighted by the NGO in Madhubani to motivate the farmers to form collectives and encourage them to cultivate during dry season. A woman tenant farmer, a member of one of the pure collectives in Bhagawatipur, stated:

> *'We were told we can earn good profit and cash by selling the vegetables. Earlier grew vegetables in small quantity and for self-consumption. Once we become a part of the project, we will get agricultural input support (seeds, fertilizers and irrigation). We thought this will be beneficial'.*
>
> *(female tenant in pure collective in Bhagwatipur)*

Similarly, in Saptari, the primary motivation was assistance of water technologies, as these are expensive for farmers to purchase on their own. Marginal and tenant farmers do not perceive investing in tubewell and pump in their own limited land or landlord's land profitable. In addition to provision of water infrastructure coupled with capacity building and agronomic skill transfer, potential increase in income was another motivation to form the groups. In the West Bengal site of Uttar Chakoakheti, a tribal village with almost no prior experience in farming, the motivation of farmers was to explore farming and to cultivate fallow land. In contrast, in Dholaguri, prior successful experience with agricultural trainings by project partners encouraged farmers to try dry-season farming.

However, there were several intra-household challenges particularly for women. In Saptari, Kanakpatti, the husband of one group member told her not to be part of group initially. He said, "Project work will require her to go talk with project staff. She might run away with other men".

Only through continuous social engagement efforts from the NGO, the male farmer was willing to let his wife join. In other cases, women felt they could not join as they need to care for children or the elderly at home. This was also dependent on their age and the composition of their household and in particular the number of young children and elderly to care for. This demonstrates that it was particularly for women a challenge to join groups as their increased mobility and leaving the domestic space challenged gender norms of purity and their role in reproductive labor.

5.3. Group membership based on individual labor contribution

The gendered relations in labor lead to additional family members of group members taking up these gender-specific tasks in the name of the family member in the collective groups. This raised the issue of defining membership as the collective approach requires individual membership which contrasts the traditional family- based farming systems. The cultural perception is that family labor and income is seen as one unit, however, multiple studies have demonstrated that family members benefit differently in terms of workload, food consumed and health outcomes. Therefore, we found it necessary to discuss a model which can create incentives and strong rules for individual membership.

Membership should be clearly defined individually, and not per household ("joint membership"). Everyone contributing labor from the intervention household should be accounted for, particularly of women. In the case where men are the members of group women may end up contributing labor for free without individual profits. However, one project staff raised the issue

that record keeping could destroy the trust between group members and create conflicts. However, social mobilization processes can change perceptions and initially questioning over time. Therefore, labor documentation on who is contributing what and initiating discussion regarding the possibility of individual farmer's membership rules was recommended.

Currently, labor data is being collected almost every day by the field staffs. While collection of labor and other data is vital, it is equally important to convey the purpose and usage to the farmers. Efforts needed to train the farmers in the all the sites for documenting the individual labor contribution on a regular basis. We suggest to record full and half labor days input daily under the responsibility of the secretary in a table in the group's accounting books. This will ensure that labor calculations is not done in retrospective basis. For individual labor accounting, it is important to note down the exact names, and not simply allowing the substitution of family members as this has led to both women and men working for free without individual accounting of benefits. This is important as it addresses unequal gender relations as traditionally women's labor is unaccounted, while men are associated with earning money.

6. Bargaining within groups: group dynamics, cooperation and conflict

6.1. Farmer's oscillating motivation and group member fluctuation

The motivation of farmer groups oscillated since the group formations in 2015 and 2016. Those farmers who decided to join the groups after project inception, were highly motivated, also due to frequent interaction with the NGOs and because they received inputs such as pump sets and

trainings. However, over their first season working in a collective, labor input gradually decreased for several reasons. However, due to strong social mobilization from NGOs to continue and due to high crop yields and higher profits in case they were selling, motivation increased again. Obviously, the most important motivating factor is high yield and the realization that this would not have been possible on an individual or family-run farming basis.

We observed several group member fluctuations of both female and male farmers for gender-specific reasons. For female farmers, this was due to traditional gender roles such as the need to care for the family. In Bhagwatipur, one women dropped out of the group due to taking care of her sick father-in-law. In Uttar Chakoakheti, one woman was included in the group during her pregnancy and dropped out of the group after giving birth. Male farmers left groups because they either migrated or seeked other off-farm opportunities, particularly in Koiladi and Kanakpatti.

In a part collective in Bhagwatipur, one educated female farmer who is also a teacher, is blocking the group transition to pure collective, while the rest of the group is convinced and would like to farm collectively. They have received a pumpset which they share with another group, and dripkits are given but not used, and they receive agricultural input support and the opportunity to participate in trainings and activities. Therefore, the teacher states that there is no incentive to collectivize. Therefore, they work in individual plots sharing only pumpsets and exchange labor. This case demonstrates that women can overpower their male group members if they are better educated and hold a powerful position in the village.

In Dholaguri, a farmers club existed from prior projects with NGO and a university's support, therefore a strong bond of trust and social cohesion among farmers was already established. The farmers already knew that seeds and other benefits are provided to them, e.g. a young window, started mushroom farming earlier and attended several agricultural trainings by the university and hence was an important driving force to encourage other women to participate in the project.

6.2. Labor input motivation in groups

One of the primary advantages of the collective is the opportunity it presents to save time, a key issue for women in the context of male outmigration, where the work burden has had a long lasting and negative impact on women's well-being. Labour intensive tasks such as plantation and harvesting traditionally require some hired-in labour, and finding workers on time can be a critical constraint. A delayed plantation can result in lower productivity. However, with collective production, all tasks could be done as a group and this ceases to be a problem. Group members also noted that in the past, each farmer would have to follow up on tasks such as going to the market to buy fertiliser. Now it can be delegated to one member, giving remaining group members time to engage in other activities – a significant benefit at a time when the female work burden has risen. Each group member also brings in new skills and experiences, and knowledge in the group is in effect, 'pooled' along with the land itself.

Farmers perceive that collective farming has some advantages. In Saptari, they mentioned that time can be managed efficiently "if it takes for me 3 days to get one work done at the field,

with group, it takes just half a day or one". Second is "bhaichara", which means a feeling of brotherhood which has developed. When farmers work together, there is sense of belongingness with each other. If one person is working alone in comparison to four people working, they do not feel as burdened as they would working alone, they state it becomes easier and they can multitask as more people can perform different work at the same time. Despite the realization, they mention managing everyone's time is a challenge.

Two Koiladi groups decided to become a pure collective after the experience of the first season they decided to farm partially collective. The primary reason as stated is:

> *"Vegetable farming requires a lot of work. We have to do wedding for potato, cauliflower, cabbage. We have to check whether the plants require water. On the other hand, wheat in winter require relatively less labor. We have to plough, apply fertilizer and give water after 25 days of sowing once and another time. Then it is not much task. If we do this in group, there will be conflict on who will do what. So, wheat farming individually works for individual farmers." (Koiladi group 1, March 2017)*

Engagement in alternative livelihood options limited the time for group plots. Apart from collective, farmers have other work as well. Project is operating in small plots of land of about 1 to 2 bigha by 6 to 8 farmers, and farming alone is not sufficient for their livelihood. Hence, they are engaged in other sources of income as well which leaves little time for them to contribute in the group field.

Perceptions of collective labor differed among men and women in Koiladi. Women seemed to agree with collective farming. They mentioned that everyone works together. Some women who

do not have husband at home have inclination towards collective. Hence working in group helps them to finish work fast. They mention "If we are alone and work alone, it takes longer time." (Koiladi, March 2017)

Some women farmers are unable attend training and group activities as often as other members of the group. This hampers collective activities and labor sharing in the group resulting in conflict among the members. When asked, why one woman does not participate in group activities, she says:

> *"I have not been able to participate in group as often as others. This is because I have to go take care of my husband who lives in Lahan and is ill. I had to be out of town for several reasons. I went to Dharan this month. It was for medical reason and I went for treatment." (Koiladi, March 2017)*

There is also a lack of proper discussion and communication among members on labor division. At Koiladi, group members do not inform about their time availability and non-availability. This lack of information makes it difficult for others present in the field who are working.

6.3. Conflicts over labor contribution

Across the collective groups, disputes over labour sharing and division is evident. In most groups, labor contribution led to internal group conflicts. In the women-only group of Bhagwatipur, for example, the oldest women, Urmila, complained as she is working more than others. She said that other group members are not reliable on giving time due to household chores and taking care of

family, but also of their unwillingness to contribute. She complains that it is challenging to bring women together and work sufficiently. One of the women in the pure collective women group in Bhagwatipur states:

"Often there are allegation such as 'I did more work than you'; 'I did all the work yesterday and you did not, you should do it today'; 'I harvested most of the paddy crops compared to others in the group' etc". (female farmer Bhagwatipur)

In Bhagwatipur, the division of labour seems to be more organized in the pure collective with 10-12 members than in the group of five farmers. Farmers in the small pure collective group expressed concerns over size of their group stating that it gets difficult for them to manage the labour division and time to work as a collective.

'Many a times we could not apply water for vegetable cultivation as none of us had the time and the crops dried-up. The Brinjals (Eggplant) got damaged as we could not irrigate it on time. We don't have men to support us in our agricultural work. Sometimes my father-in-law helps' (female farmer in Bhagwatipur)

The workload and time to be invested in collective work were perceived as constraint, particularly if members are dependent on income as wage laborers, e.g. as in Dholaguri, where members tried to work under the MGNREGA scheme, or in Koiladi and Kanakpatti, where members were involved in time-intense wood collection and selling.

Hence, we suspect that the group size also matters in terms of conflicts over labor contributions. Since allocation of labor is a problem given different work hours and alternative commitment of

each member, we suggest to facilitate to some extent by enabling farmers to keep labor contribution records.

Figure 3: Members of the farmer collectives in Bhagwatipur, Madhubani (North Bihar, India) on their way to spray pesticides (Photograph: Stephanie Leder)

7. Gender relations in collectives

7.1. Gendered labor division in groups

We observed that gender roles in labor division sustained. Men were responsible for short-term physically labor intensive tasks such as land preparation (ploughing, hoeing) and handling irrigation facilities, particularly starting the water pump, while women were doing more time-intense labor such as weeding, planting seeds and seedlings, harvesting and post-harvesting activities. In terms of irrigation activities, we noticed variations across sites. In all women groups,

they were even more dependent on their male household members for starting pumps, renting tractors and land preparation. In their absence, they had to arrange a neighbour. In one village we observed a rather exceptional case in which women are using elective pumps and laying delivery pipes. Similarly, in a women's group in Baghwatipur, all women lay irrigation pipes themselves, but still require help with starting the pump. The traditional notion of handling irrigation activities i.e., operation of pump by men has strong hold in Koiladi. One of the member strongly said:

"How can girls operate pumps? I get scared to use pump, what if I am electrocuted? Look at my daughter, she does not know anything." (Koiladi group2, March 2017)

This statement reflects traditional gender roles in agriculture of carrying out machinery operation work by men. While the reluctance of operating pump is visible, this statement strongly hints that some traditional gender norms hardly dismantle or alter.

In Kanakpatti, spouses of female farmers assist to carry out tasks such as hiring tractor and purchasing inputs. One female farmer used to operate pumps of smaller capacity. Her husband taught her how to operate the group pump and assist when required. He helped their group to transport seed from the market on his motorbike. She mentions her husband is quite supportive. When asked if she is comfortable using the bigger pump now she said:

"You know, madame, when we (girls) were small, we were not allowed to ride bicycle or go to school. I have learned these skills to cycle and write. Similarly, I have learned how to operate pumps and sprays machine. So, I know I can operate it well in future." (female farmer in Kanakpatti, Mach 2017)

7.2. Gendered management of water and land in groups

Irrigation equipment and application in terms of water amount and time spent was only partially managed and shared collectively. Farmers stated that the decision-making over water application is done by the one who is physically involved in doing it, which means that it is men who decide when and for how long to irrigate. All groups have either a shallow tubewell and pumpset, or solar pumps which are meant to be shared collectively. These were given free of cost by the project, but the farmers are meant to share the investments such as the diesel and repair costs

Perception of men on women managing the pump is different in Kanakpatti and Koiladi. Traditionally women at Kanakpatti have experience in managing small pumps. Hence, women do not consider operating electric pumps much big of a task, and women are comfortable using solar pumps. They know how to operate electric pumps which includes switching the pump on/off and moving the delivery pipe to the field. In case the pump does not start discharging water immediately, there seems to be knowledge among some women on how to prime it, otherwise they still seek male assistance to repair it. The situation is different in Koiladi:

"How will women irrigate pump? Women know how to switch the pump on and off. They do not know what to do if motor does not draw water after switching the system on. In this case, women may damage the motor ("motor jalaile sakbi").. I know that if the motor does not function, I check the motor fan with a stick and switch on the machine again. Women can irrigate once it is functionin,g but if there are problems in the motor, women cannot fix it. For example, if the motor should be put 3 inch lower from boarding, otherwise it will not draw water properly."(male group member Koiladi)

It was interesting to note that one woman from the same group counter argued: “Women are operating pumps by themselves at house, how can you say we cannot do it?”

Women of female-headed households stated to be overcharged and underpaid due to limited knowledge on prices in irrigation and an increasing work burden due to labor shortage. Therefore they try to shift most tasks to other male in the household, such as their eldest son, or a male neighbor, even if he is still a child. Hence, women seemed to be **c**onscious about their capacities and bargaining limitations:

> *“People listen more to my husband, he can build pressure, but I can’t. As I am a woman, they take it easy. They ignore and neglect me because I am a woman. There is not much to do about it, I have to face it and run four times, if it is like that”(female farmer in Mahuayi)*

Some expressed emotional stress as they feel insecure, lonely, and worried about their husbands. However, with the introduction of the farmer collectives, one female noted: “I realized I can earn money myself when my husband is out”.

7.3. Decision-making on agricultural tasks and inputs

We noticed great varieties of empowerment within groups and also between groups. Farmers stated that all decisions are collectively taken but we observed that this was often dominated by the most vocal, mobile and influential ones in the group, influential factors were primarily gender, class,

age and education. However, many women noted that they started speaking up because of repetitive group meetings, and that they are happy to start to go out beyond household work.

In all groups, those with responsibilities and functions in the groups (secretary, treasurer, president) were the most empowered. Usually these are one or two leaders per group due to male gender, older age, being literate, owning more land, or even having a character of being more outspoken, particularly Dalits due to less restrictive norms of purity than higher caste women. In Madhubani and Bhagwatipur sites, outspoken female farmers were usually older women, while in Dholaguri, West Bengal, it was a young widow who returned to her maternal family and had no cultural restrictions of a daughter-in-law anymore in terms of mobility and speaking up. In Kanakpatti, women are culturally already more empowered, from Chaudhari caste, women are also more experienced with farming. Project staff stated that Dalit women started talking confidently to project staff requesting pest management. Interestingly, at a three-day farmers meet when male Bengali farmers met female Saptari farmers, they stated that women are equally empowered in decision-making, an out-spoken farmer noted briskly and doubtfully: "No women is here!" In Bhagwatipur, all group members stated that men listen to women because they are the majority.

In both Koiladi groups, there seems to be one usually male key person with previous experience on vegetable farming. Other group members are dependent on these key person to carry out tasks such as hiring tractor, negotiating with landlord, purchasing fertilizers and so on. While mobilizing technical knowledge within the group is a good thing, one person managing everything raises couple of concerns. First, one elder male person feels overburdened with group activities

and there is no division of labor. It is important for each member to have sense of ownership and accountability to ensure sustainability. Second, other members do not have the opportunity to learn beyond what they have been doing. Third, capacity building is limited. If one person is the focal person who manages the pump, especially women still rely on him to irrigate their land. Fourth, hegemony of one skilled farmer over the resource can be resulted in long run. Ultimately, this raises scope to irresolvable conflict if this matter is not looked on time.

8. Intersectionality in collectives: a case study

The extent of effective bargaining and decision-making on labor and capital input and profit-distribution is highly linked to the homogeneity of the groups, as in unequal groups, power asymmetries limit the bargaining power of the more marginalized. Group compositions reflect intersecting gender, class and caste relations. In one group in Dholaguri, West Bengal, the landowners are male, while the landless laborers are female. These unequal power relations were exacerbated in the collective group model on various levels. On the one hand, the following case study in Dholaguri demonstrates that women have internalized the devaluation of female labor, particularly since they remain in a dependency status on the landlord while working in the group. As the case in West Bengal showed, those contributing land receive “rent” through a much higher share of profits in the form of harvested crops, while labor is not being accounted for. On the other hand, the case demonstrates that illiteracy can contribute to economically wrong perceptions as labor and input accounting rules are not clear and cannot be followed up. Due to these findings, with the support of the local NGO, a new group of female landless farmers will be established.

Case study Dholaguri site 1: Unequal gender and class relations in collectives

The group was formed under the lead of a relatively large landowner. His plot was selected as the location for the boring based on the projects' bio-physical assessment. He selected his brother and nephew living on the same compound with him, and his male neighbor as group members. The total land owned by landowner and his brothers is 12 bigha, whereas in the project they have contributed about 6 bigha land. In addition, he added his three female daily wage laborers who are landless and living close by, one of them is a widow.

The landlord contributed the land, and received the equivalent share for the rent from the harvested crops before they were distributed. This had the effect that he received double of the benefits of the compensation. As every member on average received 3 mon, his family received 12 mon. He received 6 as compensation for land rent, and his brother and nephew received 3 respectively. This was justified as all three contributed their labor to the group. While the female laborers planned to keep the paddy for self-consumption, the landlord's family sold most of the mon after the harvest and could benefit from a good price. The female laborers realized after a month that the crops started molding and therefore sold 1-2 mons on the market, but for a lower market price.

The landlord represents all three group representative functions as one as he fulfilled the task of the president, secretary and treasurer at the same time, responsible for book keeping and accounting and money management.

In-depth insights from an interview with a female laborer and widow demonstrated that she believes that the new model is beneficial to them. Although she was doubtful when she was contributing extensive labor during the season, she was happy that for the first time in her life, she received a big bag of rice at once.

However, they are at loss since labor input days are not accounted for. Calculating income from jute in June 2017 versus days labor days put in, women would earn 75 INR which is far below market rate of 200 INR.

The case also highlights the need for group homogeneity in terms of gender and class intersections, as well rigorous record keeping of both inputs, outputs and labor contributed to ensure accountability and motivation for equal contribution. Transparent rule establishment can contribute to stronger institutionalization of the groups.

9. Discussion: farmer collectives' sustainability and up- and out-scaling

Intra-household power relationships, gender norms and intersectionality strongly shape the formation of the collective groups as well as social relations concerning access to and control over land and water resources. Individual farmer's motivation to join the group or to support a family member join is strongly influenced by the respective household composition and the will to comply with the expected gender roles in terms of either domestic labor for females or economic income (e.g. through migration) for males. These gender norms vary according to other social markers, most importantly age and caste. Furthermore, gendered labor division shaped the rules and practices within the examined farmer collectives. For particular tasks such as transplanting and harvesting, female household members are supporting their male counterpart who is designated group member. On the contrary, male household members help their female group members in starting pumps for irrigation, or bargaining for the price of the produce. This reflects that gendered norms sustain in water and land management in groups, and that individual group membership challenges traditionally family-run farming systems.

Our results in Saptari/ Eastern Terai in Nepal, Madhubani/Bihar, and Cooch Behar/West Bengal in India demonstrate that a collective farming approach can strengthen marginalized

interests and voices through collective action at the grassroots level. We observe how some marginalized individuals can enhance their participation and control over agricultural production, and therefore their confidence to speak up. With their increased voice and mobility in the name of group activities, women challenge predominant gender norms. This is supported by strong social community engagement by local NGOs, which raises questions on the farmer collectives' sustainability and opportunities for up- and out-scaling. However, if groups are not homogeneous in gender and class, power relations can be even exacerbated, as the case study of a farmer group with male landowners and female landless laborers demonstrated.

The results of this qualitative study demonstrates the need for the institutionalization of farmer groups. This needs to be promoted by transparent, just and effective rules and practices concerning labor and capital input as well as benefit sharing. Furthermore, several farmer groups need to be organized in greater divisions through which they can benefit from institutional links to accountable stakeholders at the district level. Through this, farmer collectives can request and receive technical support, subsidies, market and value chain advice as well as social and agricultural capacity development.

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