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Women and collective action: lessons from the Indian dairy cooperative sector

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Abstract This article scrutinizes key effects of women's empowerment through cooperative membership. Since the 1980s, over 3000 women-only dairy cooperative societies have been founded in Karnataka, India, with the objective of economically and socially empowering women. First we review the broader literature on gender and collective action in a development context and then empirically assess empowerment levels among fifty-eight female dairy farmers in Karnataka. We discriminate between membership and non-membership status in women-only versus mixed-gender dairy cooperatives and compare empowerment levels among those groups, borrowing categories from the Women's Empowerment in Agriculture Index. We find that, in a context of rural poverty in which women-only cooperatives are promoted without offering additional development opportunities for men, the empowering effects remain limited to increased leadership abilities. Cooperative membership as such does not automatically enhance women's control over income or their intrahousehold decision-making power. In fact, members of women-only cooperatives perceive themselves as having even less control over dairy income and productive decisions compared with unorganized female dairy producers. These findings suggest that collective organizations in the dairy sector which systematically exclude men may fail to increase women's empowerment at the household level. At the same time, women face entry barriers to participation in mixed-gender cooperatives. We conclude that policies in support of women-only cooperatives and female members in mixed-gender cooperatives may require more rigorous evaluation.

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Introduction

In India there is a strong tradition of promoting women's participation in community activities through various forms of women-only groups that have the purpose of facilitating economic and social self-help (Lahiri-Dutt and Samanta, 2002). The group approach has in many cases successfully contributed towards improving women's livelihoods and social status. However, intrahousehold dynamics and gendered social structures may limit the benefits of such group activities for women, and their income and assets may be diverted to other household members. Similar effects have been observed in programs targeting livestock-transfers to women in Bangladesh (Roy *et al.*, 2015).

Our article seeks to contribute to the growing discourse on gender and collective action in agriculture (Meinzen-Dick and Zwarteveen, 1998; Alkire *et al.*, 2013; Quisumbing *et al.*, 2015) by studying the effects of dairy cooperative membership on women's economic situation and decision-making power in the Indian state of Karnataka. In rural India, village collection points operated by dairy cooperative societies are essential for connecting dispersed producers to the national dairy value chain. Dairy cooperative members obtain a regular cash income, which is crucial for them to maintain their household and farming economies (Candler and Kumar, 1998; Kurup, 2001). Though women typically perform the majority of activities related to milk production, they are underrepresented in the membership and board structures of mixed-gender dairy cooperatives in India (Cunningham, 2009). Considering the important role of women in dairy production and their lack of participation in dairy organizations, the Government of Karnataka and the Karnataka Milk Federation (KMF) have established over 3000 women-only dairy cooperative societies with their stated aim being to economically and socially empower and benefit women in the state (KMF, 2014, 2016).[1] The objective of this study is to empirically explore whether membership in dairy cooperatives actually does enhance women's economic empowerment in the intended ways.

In the next section, we review the literature on the role of gender in collective action. In the third section, the methodological approach of the study, based on the Women's Empowerment in Agriculture Index (WEAI), is introduced. After presenting the data set, we then discuss the results of the empirical study, and the final section draws implications for policy making and future research.

1 Since 1997, around 2,000 women-only cooperatives have been supported by the Support for Training and Employment Programme for Women (STEP), which has been more recently replaced by the Ksheera Sanjeevini programme.

Gender and collective action

In the international development discourse, collective action and community-based development programmes are increasingly being promoted as a means to empower marginalized social groups (Weinberger and Jütting, 2001; Thorp *et al.*, 2005; Janssens, 2010). The gender composition of such groups is an important determinant of their performance and choices made regarding specific group activities (Meinzen-Dick and Zwarteveen, 1998; Molinas, 1998; Agarwal, 2009). Pandolfelli *et al.* (2008) identify gender as a key aspect of a person's willingness and ability to participate in groups and as one source of identity around which collective action can be organized. In behavioural experiments, women frequently exhibit a higher propensity for collaborative behaviour (Eckel and Grossman, 1998; Heinz *et al.*, 2011). It is argued that women depend more on informal networks compared with men, since they have less access to formal organizations and economic assets (Agarwal, 2000). The benefits and costs of participation in collective action are also mediated by gender relations and power structures within a society (Agarwal, 2000). For example, women generally face more difficulties trying to participate in collective action than men because of high household workload-generated opportunity costs and time constraints (Mayoux, 1995; Weinberger and Jütting, 2001).

Mixed-gender participatory organizations may marginalize women (Mayoux, 1995; Cornwall, 2003). Commercialization of agricultural activities by means of collective action can even lead to a decrease in women's control over income and production activities if gender inequalities are not explicitly tackled (Fischer and Qaim, 2012). Consequently, especially in environments where cultural barriers to men and women working together are high, women-only groups may be the most feasible way to target women's needs and allow their full participation in collective action (Pandolfelli *et al.*, 2008).

Cunningham (2009) offers an overview of studies considering the effects of mixed-gender dairy cooperatives in India on women, most of which date back to the 1980s and 1990s and focus on female employment, workload and nutritional benefits rather than on a broader concept of empowerment (Terhal and Doornbos, 1983; Sharma and Vanjani, 1993). Considering women's control over income, Bennett (1991) concludes for the prominent Operation Flood Project that 'for non-member women producers, Operation Flood has too often meant more dairy work but no increase, and sometimes even a decrease, in their access to dairy income'.

More recent assessments of dairy value chain upgrading through producer groups in Bangladesh find no significant improvement in women's control over dairy income and asset ownership, but rather an increase in women's workloads. The dairy producer groups do, however, have some

potential for empowering women by increasing their mobility, building social and human capital and changing perceptions about women's roles and capabilities (Quisumbing *et al.*, 2015).

Even though many women-only dairy cooperatives have been set up in the last two decades in India, research on the effects of membership in such cooperatives on women's economic autonomy, time use and decision-making power is scarce (Kaur, 2010; Meera and Gowda, 2013; Kornginnaya, 2015). Yet there exists a vast but inconclusive accumulation of research about other sectors characterized by women's self-help groups (SHGs), especially in the microfinance sector, and their effects on different dimensions of women's empowerment (Kabeer, 2001; Holvoet, 2005; Lahiri-Dutt and Samanta, 2006; Sanyal, 2009; Baily, 2014; Husain *et al.*, 2014). The problems found for women participating in such groups include increased domestic violence against women (Rocca *et al.*, 2009), lack of women's control over the use of credit (Goetz and Gupta, 1996; Garikipati, 2012) and insignificant improvements in women's status within the household (Garikipati, 2008).

Drawing on the experience obtained from women's microfinance groups and the literature on gendered flypaper effects,[2] theoretical expectations about the actual effects of dairy cooperative membership on women's empowerment are ambiguous. Therefore, our empirical study includes a variety of aspects related to empowerment and is guided by the following research questions: Does dairy cooperative membership economically benefit rural women? Does membership in dairy cooperatives increase women's participation in household decision-making? Are women-only dairy cooperatives more effective for women's empowerment compared with mixed-gender cooperatives?

In the following section, we conceptualize empowerment and introduce means to measure and compare it.

Conceptualizing and measuring empowerment

There are a variety of definitions of empowerment in the context of gender and international development (Kabeer, 1999; Mosedale, 2005; Narayan-Parker, 2005; Alsop *et al.*, 2006), though they do have some common elements. First, empowerment as a process is defined as a change towards greater gender equality rather than a final outcome. Second, empowerment implies agency, understood as the ability to act on behalf of oneself. In

2 'Flypaper effect' refers to the observation that assets and income derived from interventions specifically targeted to women may be diverted to male household members. This has recently been discussed for a livestock-transfer intervention in Bangladesh (Roy *et al.*, 2015).

other words, women themselves need to be actors of change (Malhotra *et al.*, 2002). Third, empowerment is a multidimensional concept and can be operationalized at different levels, such as the household, the community or the state, and in different domains such as the economic, political or sociocultural environments.

Methodology

In this study, the focus is on economic empowerment of women in the field of agriculture. Therefore, our conceptual framework is based on the WEAI, developed by Alkire *et al.* (2013). Methodologically, we use the categories of the WEAI for a detailed descriptive analysis of our primary data presented in the subsequent sections. The WEAI is constructed as an aggregated measure of five domains and respective sub-domains, derived from the concepts of empowerment described above:

(1) Production: decision making regarding agricultural production
   (a) Dairy production
   (b) Crop production
(2) Resources: access to and control over resources and credits
   (a) Land ownership
   (b) Control over assets
   (c) Access to and control over credit
(3) Income: control over the use of income and expenditures
(4) Leadership: membership in economic or social groups and confidence to speak in public as proxies for leadership in the community
(5) Time use: amount of time spent on productive and domestic tasks as a measure of workload

The ability to make effective choices (Kabeer, 1999, 2001; Alsop *et al.*, 2006) is reflected in a woman's decision-making power regarding various aspects of household and farming activities as well as in her access to financial and productive resources. Women's inclusion and participation in local organizations, as described by Narayan-Parker (2002), is captured in the domain *Leadership*. Women's time use is another aspect of women's empowerment, as they often face conflicting labour burdens posed by childcare, agricultural activities and wage employment. A change in time use not only affects a woman herself, but also her family. Therefore, observable changes in women's time regimes and availabilities are an important indicator for the costs or benefits of policy interventions targeting women (Alkire *et al.*, 2013). Empowerment in the five domains of the WEAI is assessed at the

individual level, with the underlying assumption being that much of women's subordination, including unequal intrahousehold allocation of resources and lack of participation in decision making, arises within the household (Agarwal, 1997).

For the purposes of our study, a simplified version of the WEAI was employed. For all questions regarding participation in decision making in the domains of *Production*, *Resources* and *Income*, a decision-making score from 0 to 100 percent was assigned. For each domain, three to four questions were asked to elicit who is the main decision maker regarding specific activities. The answers were then aggregated to obtain the individual decision-making score. If decisions are taken without a woman's involvement, the score is 0 percent. If decisions are taken by a woman alone, it is 100 percent, and a value of 50 percent indicates joint decision making between the respondent and other household members. At the aggregate level, the percentage indicates the average decision-making power of women in each domain. For *Land Ownership*, the percentage of the household's land registered in a woman's name was determined. The domain *Leadership* indicates how far women have acquired leadership abilities according to four selected criteria: group participation, leadership position, speaking in women-only groups and speaking in mixed-gender groups. For the domain *Time Use*, each woman's working hours as well as free and resting time were documented for one day.

The numbers reported in the results and discussion sections of this article refer to this index and are based on data collected through a survey.

Data and study area

The KMF is the second largest dairy cooperative in India, and the largest in South India. In the state, around 25 percent of dairy cooperative societies at the village level are organized as women-only cooperatives and 35 percent of all cooperative members are women (KMF, 2016). At the district level, milk producers are organized into thirteen Milk Unions, each consisting of one to four districts. Since over 80 percent of dairy production is concentrated in the southern part of Karnataka, two out of the eight Southern Unions were selected for this study, namely Mandya and Kolar Milk Union. They were selected based on their milk sales as an indicator of economic size, as they are close to the state average. The data for this study were collected in February and March of 2014 in Mandya and Chickballapur district. The latter is part of the Kolar Milk Union. Around 80 percent of the population in these districts lives in rural areas and the average farm size is 1.55 ha (Agriculture Census Commission, 2014). Along with agricultural and

horticulture production, dairy farming is a major income source for most of the rural population. At 66 and 25 percent, the rates of female literacy and rural poverty in Karnataka are similar to the national averages (Government of India, 2013; Anonymous, 2015; CIA, 2015).

We conducted surveys with fifty-eight women. Fourteen of them were members in three different women-only dairy cooperatives (two in Chickballapur and one in Mandya) and fifteen were members in one mixed-gender dairy cooperative in Mandya. The remaining twenty-nine respondents were non-members, selling milk at the private market (nine in Chickballapur and twenty in Mandya). A structured questionnaire was designed for the surveys, containing questions about socioeconomic characteristics of the respondents, characteristics of their households, crop production, dairy production, dairy cooperative membership and questions regarding empowerment. We used a purposive snowball sampling technique to approach the interviewees (Atkinson and Flint, 2001). Each survey required around 45 min, and all were conducted in the local language, Kannada, with the help of female translators. Surveys were mostly realized in the absence of male family members. Discussions with members of the management boards of each of the four dairy cooperative societies provided background information at the level of the village organization, such as year of foundation, number of members, frequency of payment and community activities.

Socioeconomic characteristics

All surveyed women are Hindus and belong to castes classified as Other Backward Castes (OBC).[3] Fifty women were married; seven were widows and one had never been married. Corresponding to the regional average, 57 percent of the respondents were literate. Key socioeconomic characteristics of the women and their households are presented in Table 1.

In our sample there seems to be a systematic difference in socioeconomic characteristics of women in the women-only cooperatives compared with the mixed-gender cooperative. Their average farm sizes are larger and so is their annual family gross income. Larger than average farm sizes indicate a higher socioeconomic status in the rural economy, which is in turn influential for women's decision-making power in the household. In the Indian context, there is evidence for an inverse relationship between the socioeconomic status of the household and women's authority in the household (Bennett, 1991; Holvoet, 2005).

3 Although dairy production is an activity traditionally performed by OBC, nowadays Hindus of all castes can be found among milk producers, e.g. around 16 percent of DCS members belong to Scheduled Castes or Tribes (KMF, 2016).

Table 1 Socioeconomic characteristics of women in the study areas

	All respondents			Women's cooperatives	Mixed cooperative	Non-members
	Mean	Min	Max	Mean	Mean	Mean
Schooling (years)	4.6	0	12	5.9	6.3	3.2
Age (years)	41	25	65	37	43	41
Farm size (ha)	1.2	0	8.5	5.6	1.9	1.1
Irrigated farm area (ha)	0.7	0	2.4	2.3	1.6	0.6
Household members	5	2	13	6.5	4.4	4.6
Gross income (in thousand INR[a]/year)	258	16	1989	485	199	179
Number of female-headed households	7	–	–	0	5	2

Own data.
[a]Indian rupees; at the time of the study, 1 US dollar was equal to 61 Indian rupees (INR).

A methodological challenge to our study of empowerment was the difference in the number of female household heads among the groups of producers we analysed (Table 1). In women-only cooperatives, we did not find members who were household heads. In mixed-gender cooperatives we found five women who were household heads, and among the non-organized dairy producers we found two women who were household heads. This difference may be seen to provide evidence for the high entry barriers that tend to keep married women out of mixed-gender cooperatives: women that were at the same time dairy producers and household heads turned out to be widows. They had inherited the right to membership in a mixed cooperative after the male household head had passed away.

Economic benefits for cooperative members

In our sample, women who are cooperative members produce and sell larger amounts of milk per day compared with non-members. Members keep a larger number of animals, especially cross-breed cows, increase their use of concentrated feedstuff and have higher expenses for veterinary services. Consequently, they have attained a significantly higher productivity per animal, and dairy income is more important in their total household income than for non-members. Cooperative members are commercially oriented and keep a smaller share of the produced milk for home consumption. Nevertheless, given their higher productivity, they end up obtaining a higher amount of milk per person, indicating nutritional benefits for their families. All of the above is even more pronounced for members of women-only cooperatives, who seem to produce more efficiently than their counterparts in the mixed-gender cooperative. Potential explanations for this may

Table 2 Economic indicators of dairy production among three studied groups

	Women's cooperatives		Mixed cooperative		Non-members	
	Mean	SD	Mean	SD	Mean	SD
Herd size (heads)	5.6	4.6	4.1	2.1	3.0	1.0
Buffaloes	0.7	1.0	0.9	1.0	1.6	1.0
Cross-breed cows	2.9	2.3	1.9	1.6	0.4	0.8
Yield per animal (l/day)	8.6	2.3	6.6	3.1	3.4	1.6
Total milk produced (l/day)	24.9	24.9	13.3	8.0	5.0	4.7
Avg. price in the cooperative (INR/l)	21.1	1.0	22.9	1.3	–	–
Cost of dairy production (INR/day/animal)	33	17.5	38	21.3	10	20
Share of milk for home consumption (%)	9.4	6.4	13.7	6.9	25.3	15.0
Available milk (ml/per person/day)	388	187	337	192	218	118

Own data.

be the better-off position of married women in women-only cooperatives compared with widows and women from poorer households in the mixed-gender cooperative. Table 2 shows economic indicators of dairy production among the three groups.

Prices received by producers vary between 20 and 25 INR per litre of milk according to fat content, averaging 21 INR per litre for surveyed members of women-only dairy cooperatives and 23 INR for the mixed-gender cooperative.[4] Additionally, there is a government subsidy of 4 INR per litre paid irregularly to the farmers. In the case of the mixed-gender cooperative, members receive a bonus payment at the end of the year. The other cooperatives do not pay out the members but save the money for future investments. Non-members sell at the private, mostly informal, market. Here the sales price lies between 20 and 40 INR per litre, with an average of 26 INR. Out of the interviewed cooperative members, 80 percent perceive an improvement in their economic situation since they entered the cooperative. These results suggest that the households of the participating women do achieve economic gains by joining a dairy cooperative.

Empowerment through cooperative membership?

In this section, women's empowerment across the five domains under study (production, resources, income, leadership and time use) is compared between members of women-only cooperatives, members of mixed cooperatives and non-members.

4 Prices paid to farmers are determined at the Union level, but here we assess the individually realized prices at the farm level based on fat content.

Production

Members of women-only cooperatives report that they participate less in household decision making about dairy production, including the feeding, selection of cattle breed and health care of animals, compared with members of mixed cooperatives and non-members. The average decision-making score[5] of women-only cooperative members is 37 percent compared with 48 percent for members of mixed-gender cooperatives and 51 percent for non-members. For cooperative members, feeding, health care and the selection of breed come along with a higher level of commercialization and market transactions. Instead of using field residuals or grazing animals, feedstuff is purchased through the cooperative. Since women have a lower propensity to become involved in formalized market transactions, such purchases are mostly carried out by male family members, including sons and in-laws.

Decision making about crop production is generally male dominated among all three groups. But members of women-only cooperatives are notably less involved in such decisions, with a decision-making score of 8 percent, compared with members of mixed cooperatives (23 percent) and non-members (18 percent).

Resources

In the study sample, 88 percent of the women do not own any land in their name. None of the members of the women-only cooperatives have land registered in their name, whereas three women in the mixed cooperative and four non-members have registered land titles.

On average, women in the mixed cooperative feel that they participate equally in decisions about the purchase and sale of land and livestock in their households (decision-making score: 48 percent), while women-only cooperative members more often feel that decisions are taken mainly by the male counterpart (decision-making score: 23 percent). Non-members indicate an average decision-making score of 40 percent.

In our sample, cooperative members, both in women-only and mixed cooperatives, have better access to and higher control over credit compared with non-members. Among cooperative member households, 90 percent have access to at least one loan compared with 66 percent of non-members. This higher access to credit is related to the presence of women's microcredit SHGs in the villages where dairy cooperatives exist. Around one-third of all credit in the sample has been accessed through such SHGs. Moreover, women perceive that they have more control over credit obtained from a SHG than over credit from banks or agricultural credit cooperatives.

5 Decision-making score: 0 percent, if decisions are taken without the involvement of a woman; 100 percent, if decisions are taken by a woman alone and 50 percent for a joint decision.

Control over income

Corresponding to their relatively high decision-making power over production activities and economic resources, women in mixed-gender cooperatives have high levels of control over their household income, indicated by a decision-making score of 66 percent, compared with non-members (51 percent) and women's cooperative members (37 percent).

These results suggest that income derived from participation in dairy cooperatives does not automatically translate into more control over income for women. Considering dairy income, women who participate in dairy cooperatives are less likely to receive payments themselves, compared with non-members, who tend to receive dairy incomes directly. This is partly caused by the fact that usually private traders or neighbours who want to purchase milk come to the producer's house and pay. Meanwhile, a cooperative pays out money to farmers only weekly or fortnightly at the village milk collection point. Often husbands or other male family members rather than female members go to collect such money on the day of the payment. Only eight out of twenty-eight cooperative members stated that they receive those payments by themselves. Even if this does not necessarily imply a loss of control over dairy income, the data here suggest that the person who receives the payment is more likely to take decisions about the money received. The sampled women-only cooperative members seem to exert less control over their income compared with the other two groups, as shown in Figure 1.

Leadership

In the studied area, perception of leadership is related to women's access to credit. The groups in which most women participate, apart from dairy cooperatives, are SHGs that provide loans to members. In the studied sample, villages with dairy cooperatives also have functioning SHGs, whereas in villages without cooperatives there is a lack of such groups. Generally, non-members show less leadership characteristics compared with members of women-only and mixed cooperatives. Six of the interviewed members of women-only dairy cooperatives have a leadership position in their cooperative. Moreover, the surveyed members of women-only cooperatives participate more often in training and meetings compared with women in mixed-gender cooperatives.

A significantly higher share of women in mixed and women-only cooperatives (80 percent) feels comfortable speaking up in groups where men are present, compared with non-members (48 percent). Thus, it seems that cooperatives offer a possibility for women to exercise and improve their leadership abilities. Nevertheless, women who manage cooperatives at the

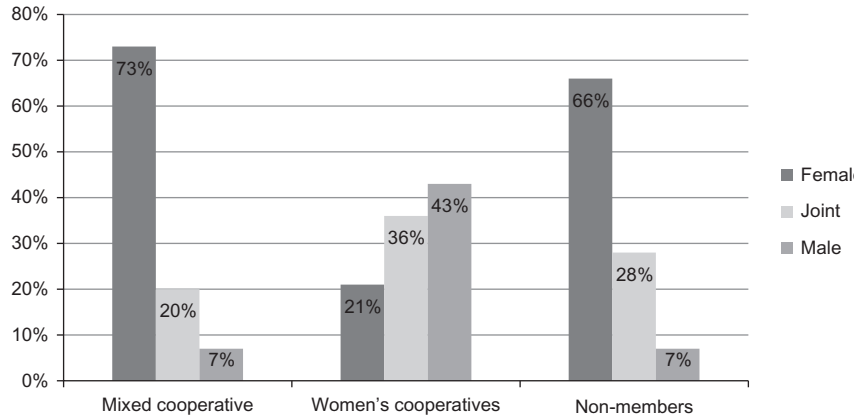

Figure 1 Decision making regarding the uses of dairy incomes among the three studied groups

village level often lack appropriate education and training. Therefore, they may easily become shadow managers, with actual decisions being made by influential men in the community. At the higher managerial levels of the cooperative system, most positions remain occupied by men; e.g. all members of the board of directors of the milk federation were male at the time of the study (KMF, 2014).

Time use

Members of women-only dairy cooperatives spend, on average, 4.0 h per day on dairy-related tasks, while members in mixed cooperatives spend 4.4 h and non-members 4.7 h on these tasks. The slightly lower time use for cooperative members, both in women-only and mixed-gender groups, seems surprising since they usually keep a larger herd of animals. But cooperative members, especially in women's dairy cooperatives, rely more on the support of their husbands and other family members for carrying out dairy activities than do non-members. Additionally, cooperative members tend to adopt more efficient production processes, such as the use of purchased cattle feed instead of herding grazing animals, which result in time savings for women. According to our results, there is no increase in dairy-related work for cooperative members compared with non-members. Members of women-only cooperatives, however, did not enjoy more free and resting time compared with non-members.

Discussion of key findings

In our sample, women in mixed-gender cooperatives felt notably more empowered than women in single-sex cooperatives in all of the five domains

we have explored: production, resources, income, leadership and time use. This difference in empowerment is especially important in income control, purchase and sale of assets and ownership of land. Even more interestingly, however, members of women-only dairy cooperatives felt less empowered than non-members in all but two domains: leadership and access to credit.

These results are puzzling and require further interpretation: when women-only dairy cooperatives are established in a village, it seems that men increase their focus on controlling dairy production compared with situations where such a dairy cooperative does not exist. With increasing formalized market transactions and greater economic importance of dairying for the household, involving themselves in dairying becomes more attractive for males. This is also apparent when looking at the control over dairy incomes, as discussed above.

Since KMF policy made the establishment of women-only cooperatives compulsory for villages joining the cooperative system after 2005 in the studied Milk Unions (Mandya and Kolar), households have to 'use' women to get market access through the cooperative. During our data collection, it became apparent that in the studied cases, influential men, such as Panchayat members, encourage women to come forward to build up dairy cooperatives.[6]

The results of our study may partly be explained by a limited degree of comparability between women registered as members in mixed dairy cooperatives and those women registered as members of women-only dairy cooperatives: In our sample, there are five female heads of household among the women in the mixed cooperative. These women reported having taken over their husband's cooperative share after his death. In this case, we would lean towards explaining women's perception of higher participation in decision making by the physical absence of a husband (widowhood) rather than by empowerment through democratic participation in a cooperative. In this line, Hunt and Kasynathan (2001) argue that husbands' absence increases women's control over loans obtained from microcredit groups.

By contrast, in women-only cooperatives even women who are not empowered within their households become shareholders.[7] But in such cases, holding a share does not necessarily enhance women's perception of decision-making power within the household.

6 For example, Kaur (2010) finds that husbands may 'push' their wives to become members of a dairy society, and Holvoet (2005) writes that women were 'forced' to join microcredit schemes by men who were themselves attracted by the benefits.

7 Holvoet (2005) finds similar explanations for empowerment factors in women-only and mixed-gender microcredit programmes.

At the same time, we find that members of women-only groups come from comparatively better-off households, which are expected to apply gender norms more strictly compared with poorer households.

These selection effects may explain why women-only cooperative members appear less empowered compared with the other two groups. On the one hand, widows often act as household heads and take most farming and household decisions on their own; on the other hand, women from poorer families may have a higher degree of autonomy within the household.

Considering this limited comparability between groups, we still claim that our analysis challenges the assumption that the women-only cooperatives in our case study increase women's economic autonomy in dairy production. Looking at studies regarding other single-sex groups with similar findings (Goetz and Gupta, 1996; Holvoet, 2005; Kaur, 2010), we support the following arguments: First, women in single-sex cooperatives may be 'pushed' by men to participate in an income-generating programme, even if they are not themselves motivated to join. Second, men may feel threatened by the prospect of losing their breadwinner position within the household or village if important income-generating opportunities are exclusively provided to women. This politically driven effect may result in increased control by men over an agricultural activity – dairy farming – that has been traditionally undertaken by women, resulting in the latter's weak perception of their decision-making ability. Promoting women-only cooperatives may, thus, counter traditional forms of and roles within agricultural activities and increase conflicts within the household. Third, women-only dairy cooperatives are established using a top-down approach. While this is not specific to women-only cooperatives and is a more general feature of the dairy cooperative system in India (Rajendran and Mohanty, 2004; Cunningham, 2009), it may be particularly disadvantageous for women, as they are typically underrepresented in the planning and implementation agencies. Finally, women who are supposed to manage women-only cooperatives at the village level often lack adequate education and training. Therefore, due to lack of capacity, they may become marginalized if allocated the role of shadow manager.

Conclusions

In this article, we have empirically assessed women's economic empowerment across five domains: production, resources, income, leadership and time use, comparing members of mixed-gender and women-only dairy cooperatives with non-members. We found that in our sample women-only dairy cooperatives have only partly achieved the objectives their

promoters had in mind. While dairy cooperatives significantly contribute towards improving member's livelihoods, challenging questions remain regarding how far they can actually strengthen women's empowerment. Members of the sampled women-only cooperatives appear to have less control over their dairy incomes when compared with unorganized female dairy farmers or members of mixed-gender dairy cooperatives. This is not compensated for by higher involvement in other types of decision making. At the same time, women who live in male-headed households seem to face considerable barriers to participation in mixed-gender cooperatives.

In the wider development of dialogue on women's empowerment, it may thus be important to point out that women's participation in dairy cooperatives does not automatically lead to their greater economic autonomy and empowerment. Future projects targeting empowerment would have to be specified in terms of who is to be compared with whom prior to and after project implementation. Likewise, prior to project formulation, the expected relation between organizational structure and specific dimensions of empowerment, as well as the criteria on the basis of which effectiveness is to be monitored, must be specified. Our study suggests that one cannot simply assume that female members, once they are collectively organized, will experience empowerment, e.g. by taking control over decision making and the additional incomes expected from collective production and marketing.

In our study we find limited comparability between members of mixed-gender and women-only groups as regards control over household decisions. Future studies on women's empowerment through collective action should incorporate a larger sample size so as to better enable direct comparison between different groups of women and contexts. Another interesting option would be to comparatively analyse at different levels and phases and, first, compare collective action effects on organized versus unorganized farmers, then specify gender differences and, finally, look at the different functions and household types of members. Methods of matching may help to better account for comparability at all levels in future studies on women's empowerment in agriculture.

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