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## Caste-gender intersectionalities in wheat-growing communities in Madhya Pradesh, India

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### ABSTRACT

This article addresses the patterns of women's engagement in wheat as decision-makers and laborers in India. Qualitative research conducted twice in one village in Madhya Pradesh explored gender norms and agency changes over time. Quantitative research was carried out in the same village and 17 additional villages. Four questions are asked: (1) Is decision-making in wheat feminized? (2) Is labor in wheat feminized? (3) In what ways do interactions between caste and gender determine and limit the spaces within which women can act? (4) In what ways are women challenging their gender and caste identities to enhance their livelihoods by influencing their roles, responsibilities, and decision-making in wheat? The findings show that only a few women consider themselves "farmers" and participate actively in discussions around wheat. Over the last decade, women of all castes have been employed as laborers in wheat, driven by aspirations to improve their lives. Women also fund the wheat system through self-help groups. However, their participation in the labor force is threatened by agricultural mechanization. A strong, positive association was observed between women's agency in crop production and their agency in household expenditures.

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Intersectionality; gender; caste; wheat; women's empowerment; feminization of agriculture

## Introduction

This article examines a neglected domain of enquiry within the loose body of global research exploring agricultural feminization processes – the role of women in the wheat-based farming systems in the Indo-Gangetic Plains (IGP). Jafry (2013) reported on a "Scoping Study on the Integration of Gender and Social Equity in R4D on Wheat-Based Systems in South Asia" that data on the role of women and marginalized groups in wheat in the IGP were limited. A second study (Badstue et al., 2017)

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conducted in 43 communities in eight countries (including Afghanistan, Bangladesh, India, Nepal and Pakistan) found that although women value wheat innovations, strong normative discourses which associate men with production and women with the household obscure women's contribution to farming. This finding is echoed by Jafry (2013, 2016). Despite significant empirical evidence regarding women's participation in wheat production emerging during discussions with the rural advisory services, policymakers and researchers, almost none of the stakeholders recognized women as farmers, and thus virtually no gender-specific interventions had been designed or developed (*ibid.*; see also Farnworth et al., forthcoming). Without a good research base, it is impossible to know if wheat is undergoing "feminization" or indeed "masculinization" and from thence, to develop appropriate policy and advisory service responses.

Our study focuses on India. We began our research by hypothesizing that the institutional narrative exposed in studies by Jafry (2013, 2016), that women have a limited role in wheat-based farming systems, is unlikely to hold in practice. We speculated that women are engaged in wheat in different ways and, indeed, potentially "feminizing" specific aspects of wheat production systems. To test this hypothesis, we considered the following research questions:

1. Is decision-making in wheat feminized?
2. Is labor in wheat feminized?

Furthermore, we decided to explore caste-gender interactions, which led us to ask:

3. In what ways do interactions between caste and gender determine and limit the spaces within which women can act in wheat-based systems?
4. In what ways are women challenging their gender and caste identities to enhance their livelihoods by influencing their roles, responsibilities and decision-making in wheat?

As suggested in the first two questions, we chose to work with the concepts of managerial feminization and labor feminization (Doss et al., 2021; Slavchevska et al., 2016; Gartaula et al., 2010; Jiggins, 1998). For research purposes, we treat these as distinct concepts. Our particular focus for labor feminization is the work women conduct in wheat as hired laborers and as unpaid family labor. We use the definition of managerial feminization provided by Pattnaik et al. (2018; p. 2): "the extent to which women define, control, and enact the social processes of agriculture." To obtain an understanding of the normative context of decision-making, we explore whether women are considered to be "farmers" in their community. We continue by looking for evidence of women's participation in knowledge networks, in household decision-making around wheat, and with respect to how wheat farming is financed.

Our third and fourth questions consider gender-caste interactions. The caste system in India is a hierarchy of endogamous groups (marriage expected within a specific caste). Caste identity is transmitted on a hereditary basis (Bidner & Eswaran, 2015; Deshpande, 2011; Olcott, 1944). Dumont (1980; p. 21) describes the caste system as an

institution that “divides the whole society into a large number of hereditary groups, distinguished from one another and connected together by three characteristics: separation in matters of marriage and contact ... ; division of labor ... ; and finally hierarchy, which ranks the groups as relatively superior or inferior to one another.” Through this system, historically, people were classified into four hierarchically ranked castes called *varnas* (Deshpande, 2011). Outside the caste system were people considered “untouchables” or *Dalits*, who occupied the lowest rung of the social ladder (Dumont, 1980). After Independence, the Indian government introduced a categorization scheme whereby the most marginalized castes were categorized as Scheduled Castes (SC), followed by other marginalized castes. [We believe that the term “backward” in the government-approved caste category, “Other Backward Castes” or OBC in short form, is stigmatizing, and hence use in this paper the term “Other Socially Marginalized Castes” (OSMC) instead]. The OSMC generally represent a middle caste category, comprising of several individual castes that vary in the degree of their social advantage or disadvantage. Indigenous (*Adivasi*) people are categorized as Scheduled Tribes (ST) and are generally understood to stand outside the caste system. The rest, the socially non-marginalized castes (NMC), commonly known as the “General Caste” category, forms a powerful minority in any community. Hundreds of sub-castes (*jatis*), characterized by endogamy, exist within each of these caste groups. Each *jati* has its own social norms, traditions, and belief systems that determine everyday life, including women’s roles and responsibilities (Lamb, 2013; Waughray, 2013).

Caste-gender intersectionality has high relevance for everyday life in Indian rurality. Not only are the structural inequalities by caste affected by gender, but gender relations are central to the caste structures (Arya & Rathore, 2020). In an overview of feminist contributions to the analysis of poverty and inequality in international development, Kabeer (2015) draws special attention to the intersection between vertical inequalities, defined as class-based or economic inequalities, and horizontal inequalities understood as discrimination based on marginalized social identities, such as gender, race, and caste. Kabeer points out that the intersection of gender and other forms of inequalities lead to a scenario in which “women and girls from the most marginalized caste, ethnic, and racial groups, have poorer levels of health, nutrition, and education, and very often suffer higher levels of violence than other women, including women from similarly poor backgrounds” (Kabeer, 2015; p. 194). The manifestation of gender-caste inequalities in agriculture, determining farmer access to inputs, information, and markets, are addressed by several recent studies (Krishna et al., 2019; Paudel et al., 2020), although the intersectionalities are assessed by only a few (e.g., Hansda, 2017).

To examine the link between caste and gender, we employ both quantitative and qualitative research tools. The qualitative research, conducted in a wheat-growing village in Madhya Pradesh in 2015 with a follow-up visit in 2019, forms the core of this paper. Quantitative research carried out in this same and 17 additional villages in Madhya Pradesh in 2019 enriches the qualitative findings.

The remainder of this article is structured as follows. We expand the existing literature on the feminization of agriculture by examining what is now known about gender and caste in wheat-based systems in India. Due to the ongoing paucity of data

specifically on gender in wheat systems, we bring in more generalized findings in that session. This is followed by a description of our research sites and methods. The findings from the qualitative and quantitative research are then presented in that order. The discussion highlights key learning points, followed by the conclusion.

## Literature review

Our literature review is in two parts. We first explore the evidence for managerial feminization and then labor feminization in India.

### *Managerial feminization*

Dhakal et al. (2018; p. 207) comment provocatively that “if women get more work and [are] just involved in the feminization of labor and [have] no influence in decision-making processes, the ‘feminization of agriculture’ will be just female exploitation, not feminization.” Yet, in the IGP, deep-seated and often unquestioned social norms privilege men as agricultural decision-makers and breadwinners (Aryal et al., 2020; Farnworth et al., 2019; Jafry, 2016; Kandiyoti, 1988; Neve, 2019; Rao, 2011; Sinha et al., 2012). Social norms can be sticky and difficult to change. They are constituted of (usually) unwritten codes and informal understandings that define what we expect of other people and what they expect of us (Young, 2015). Agarwal (1997) notes that gender relations are not only constituted in terms of labor but also in the ascription to men and women of “different abilities, attitudes, desires, personality traits, behavior patterns, and so on.” These qualitative ascriptions, she argues, differentially affect the bargaining power of women and men within and beyond the household.

A critical question is the degree to which norms are consciously held. Bourdieu (1977) offers the concept of *doxa* to denote norms which are taken for granted in a particular society, the experience by which “the natural and social world appears as self-evident”; a practice “goes without saying because it comes without saying” (Bourdieu, 1977, p. 167). Although *doxa* may appear to their holders as self-explanatory and natural, they are far from neutral in their application and effects. *Doxa* may favor, serve and maintain the conditions for interests (economic, social, other) important to a specific group which may have negative implications for another group. For example, *doxa* may favor the interests of a certain caste above other castes, one ethnicity above another, one gender above another, and so on.

Farnworth et al. (2019) used the concept of *doxa* to analyze data on women’s participation in decision-making in six wheat-based farming communities in four states (Bihar, Haryana, Uttar Pradesh and Punjab). The *doxa* under examination was that men are decision-makers in wheat. Overall, the study identified six clear strategies deployed by women to exert their agency. The strategies ranged from women simply acquiescing to men’s decision-making (which is nevertheless a decision) to women exerting full decision-making power on the farm. In no case did women appear to experience submergence within the *doxa* that men take all decisions, though some women mentioned that they did not recall having opinions in the past (= full *doxa*). The study further found that external actors, ranging from the rural advisory services to researchers,

make few efforts to include women in information and training events despite powerful evidence of women taking managerial roles in wheat. This suggests that such actors tend to be located within doxa for far longer than farmers themselves (ibid.).

Other research provides a mixed picture of women's decision-making in farming. Pattnaik et al. (2018) find there is no necessary correlation between men leaving agriculture and higher decision-making capacity among women left behind to work on the farm. There is some evidence, though, that women in households with short-term migrants are likely to have more decision-making power than those in households with non-migrating husbands (Chandrasekhar et al., 2017). Another study suggests that women in households with a higher share of remittance income are more likely to participate in decision-making (Aryal et al., 2013). A study (Gulati et al., 2019) examining the willingness to pay for mechanical rice planters (MRT) found that since rice is primarily planted by women, their willingness to pay for MRT is higher than that of men. However, women's willingness to pay is not reflected in intra-household adoption decision-making processes, with men exerting a higher influence relative to women. The study suggests that MRT are more likely to be adopted when they reduce male labor in the field or reduce the cost of hired labor; women's intra-household bargaining power relative to men's is too weak to affect this choice (ibid.).

Finally, Self-Help Groups (SHG) provide women with a means to access micro-finance and, it is posited, thereby become more empowered. A study (Kumari, 2017) conducted in Uttar Pradesh found that prior to membership in SHGs, only NMC women earned over 1000 rupees/month as they were employed in higher-paying jobs such as nursing and teaching. However, 76% of NMC women did not work. All other caste categories earned considerably less in a wide variety of low-paying work (4.9% OSMC and 7.6% SC earning over 1000 rupees). Following membership of SHGs, 44.2% OSMC and 47.3% SCs earned over 1000 rupees (ibid.). A systematic review of SHGs (Brody et al., 2017, covering 34 studies globally, including 18 from India) showed that women SHG members increase control over resources, become more politically empowered at the community level, more mobile, and exercise more control over reproductive health. However, the evidence on psychological dimensions such as self-confidence was less clear, and the review showed that very poor women did not join SHGs. Finally, the review found that gender-based violence – GBV – does not increase with SHG membership (Brody et al., 2017). Satoa et al. (2017) find that levels of GBV are reduced during the first 2.5 years of SHG membership but increase thereafter. Nandi and Kashyap (2020) find that whilst intimate partner violence (IPV) is widespread, SHGs, which deliberately address IPV, are central to providing safe spaces for women to enhance the outcomes of their economic participation and to make IPV a public concern.

### ***Labor feminization***

Overall, labor is masculinizing rapidly in India. The labor force participation rate (LFPR) of men is increasing, whereas the LFPR of women is decreasing. In 2019, around 20.7% of women were in the labor force, down from 31.8% in 2005 (Statistica, 2021). This data should be assessed in the context of apparently favorable conditions for

working women, including a considerable decline in fertility rates, increases in women's educational attainment, and significant structural transformation offering new opportunities (Azam & Han, 2020; Desai & Joshi, 2019; Lahoti & Swaminathan, 2016). One reason for this decline is a perceived loss of status when women enter the paid workforce. This particularly affects NMC and OSMC women. Furthermore, although gender parity in secondary schooling has been achieved, women with 10–12 years of schooling tend to withdraw from the workforce upon marriage due to social expectations, which appear to have remained stable over time (Klasen, 2019). *De facto* occupational segregation means that despite the wide range of occupations open to graduates with 10–12 years of schooling, men are much more likely than women to be appointed. Women also lack motivation due to wage discrimination (Mehrotra & Sinha, 2017).

The only exception to labor masculinization is in agriculture. In many parts of India, women provide labor across all productive and post-harvest farm tasks, regardless of caste. They work on family fields and as hired laborers on other farms and have done so for decades (Chayal & Dhaka, 2010; Garikipati, 2008; Ghosh & Ghosh, 2014; Guérin, 2013; Varma, 1992). The evidence of labor feminization is clear. In 1981, two-thirds of men (66.3%) and four-fifths (82.6%) of women worked in agriculture. The equivalent figures for 2011 are around half of the men (49.8%) and two-thirds of the women (65%) (Pattnaik et al., 2018).

However, feminization processes are complex. Declining agricultural profits from farming have resulted in lower use of labor and increasing casualization of labor, particularly female labor (Jafry, 2016). Consequently, the overall LFPR of rural women, particularly after 2005, is in significant decline. Between 2005 and 2012, for instance, rural female employment fell by 23 million, with a fall in absolute agricultural employment for women of 28 million (Mehrotra & Parida, 2017; Mehrotra & Sinha, 2017).

SC and ST women dominate the rural labor force. In 2011, 83.7% of ST women, 69.1% of SC women, and 59.9% of NMC women were working in agriculture (Pattnaik et al., 2018). Eswaran et al. (2013) use national data for six states to explore the caste differentials in women's employment in rural areas. They find, similarly to Pattnaik et al. (2018), that women are progressively less involved in paid labor across the caste hierarchy. Bidner and Eswaran (2015) attribute this to the enforcement of endogamy by the caste system, whereby NMC women are generally monitored and constrained more than women in marginalized castes.

Paid work brings differential benefits by gender and caste. Jafry (2016) reviewed a large number of research papers on women and agriculture across the IGP and found that SC and ST women are among the poorest in all transects. This is partly because the types of agricultural work open to women and men are not equal. Women are more likely than men to be engaged in low social status manual labor, which in itself is low paid, and women are much more likely to be paid less than men for the same work (Mehrotra & Sinha, 2017).

Furthermore, mechanization is expanding apace and affecting women's and men's work in different ways. Direct seeders, power weeders, harvesters and threshers are increasingly substituting for tasks predominantly performed by women. For instance, mechanized tilling resulted in a 22% fall in women's agricultural labor in India

between 1999 and 2011 (Afridi et al., 2020). There is some evidence of caste differentials in machinery ownership with SC and ST less likely to own machinery (Joshi & Veettil, 2018; Sahay, 2015; Singh, 2017).

The type of crop also matters. Some crops are more male- or female-dominant with respect to the gender division of labor in specific cultural contexts. When one type of crop replaces another in the farming system, this can have implications for the dominance of men's or women's labor. D'Agostino (2017) demonstrates this with respect to the introduction of high yielding varieties (HYVs) of wheat in India during the Green Revolution. Using data from 1956 to 1987 to estimate the effect of HYVs on gender wage inequality in wheat in agricultural labor markets, D'Agostino finds that the rising concentration of wheat production due to improved yields depresses demand for female labor but increases demand for male labor. D'Agostino finds that women are generally unable to secure other paid work and thus substituted away into unpaid household labor and subsistence farming.

We round off this section on labor feminization by pointing out that it can be very difficult to capture with precision who is doing what in rural economies. Male household heads can be reluctant to report the degree to which women participate in farm work, as this can be associated with a loss of social status for men (Drucza & Peveri, 2018). Normative biases also exist among researchers. A comprehensive literature review on gender in wheat-based systems in Pakistan found that research design typically reasserts "cultural norms and gender roles, rather than question their persistence or attempt to examine them. Binary thinking, which simplistically identifies men with technology and farming and women with tradition and home, accompanies much gender-blind work" (Drucza & Peveri, 2018, p. 8). Mehrotra and Sinha (2017) describe the same phenomenon in India, whereby farming women devote considerable labor to household subsistence, yet this work is rarely captured in quantitative research. "Household" work includes working in the kitchen garden, orchards, livestock care, processing of primary products, collecting firewood, livestock fodder, preparing cow-dung cakes for fuel, getting water, sewing and tailoring (Mehrotra and Sinha (2017)). Rao (2012) reflects that women's work may literally not be perceived at all. She recalls seeing women in Uttar Pradesh, India, busy in the wheat fields from the early hours, yet neither men nor women acknowledging this as happening in her fieldwork interviews. "What one saw seemed almost the opposite of what one heard" (ibid, p. 1044).

## Materials and methods

We conducted qualitative and quantitative surveys in the state of Madhya Pradesh, the second-largest Indian state by area and the fifth-largest by population, and one of the least developed states in the country (Global Data Lab, 2021). Three-quarters of the population resides in rural areas. About 21.1% of the population are ST, 15.6% are SC, 41.5% are OSMC (which includes 68 caste entries in the state), and 21.5% are NMC (Government of India, 2018).



## Site description

The qualitative village case study was conducted in the village of Jamari (name changed to ensure anonymity), which is reportedly approximately 250 years old and inhabited primarily by farmers in around 250 households. Most people belong to the OSMC, ST, and SC categories with just six resident NMC families. Jabalpur, the district capital, is about 30 kilometers distant. In 2011, the sex ratio in Jamari was 853 women to 1000 men, much lower than the rest of Jabalpur district (929) and the state as a whole (931) (Government of India, 2021). This data suggest a strong son preference, and it chimes with national data on sex ratios in wheat-producing states. Trend data on sex ratio (census 2011; Government of India, 2021) for the ten largest wheat and rice-producing states (in terms of absolute production) show that the average sex ratio for wheat-producing states is 920, and the median is 921. For rice-producing states, the average sex ratio is 954, and the median is 961. Uttar Pradesh, Punjab and Bihar overlap in the two data sets. The sex ratio is, therefore, higher in the rice-producing states (Government of India, 2021).

Male and female literacy rates are low in Jamari (66% men: 50% women) compared to Jabalpur (83% men: 62% women), and they are lower than the state average (*ibid.*). Extension coverage exhibits caste and gender biases. The public extension officer works only with the largest NMC farmers and visits once a year. Women are excluded from public extension because land ownership is a criterion for registration as a farmer, and cultural norms more broadly do not recognize women as farmers. Men are targeted for government assistance programs, such as credit, not women. No private extension services visit. This is unfortunate because some private extension services in India, including Madhya Pradesh, employ women extension agents and target women as farmers. They also do not marginalize OSMC and ST/SC.

The total geographical area of Jamari is about 553 acres of which 400 acres constitute agricultural land. The primary crops grown are wheat, rice, pulses, and some vegetables. Large farmers comprise 2%, small farmers 60%, and the rest are marginal farmers. One NMC family holds 125 acres but all other landholdings, including those held by other NMC households, are between 0.1 and 3 acres, with the majority around 1.5 acres. A striking feature of Jamari is that the NMC and OSMC manage the land on one side of the village, which is flat with black rich soils and simple to irrigate. The ST and SC manage the land on the other side of the village, where the soil is of poor quality, hilly and hard to irrigate, and borders on the national forest.

An important source of off-farm income generation is a marble carving factory. Around fifteen years ago, government investment facilitated the development of a small factory with machinery and storage space and the Millennium Development Society promoted carving skills. Many younger men work at the factory or have set up carving units at their homes. An *Anganwadi* center supports early childhood development, including vaccination and health care for pregnant and lactating women. Jamari lacks a primary health care center and veterinary services. There is a governmental primary school. Secondary pupils need to travel to another village to pursue their education. Although not far, some girls are not permitted to leave the village or to ride bicycles to get there, meaning they are more likely than boys to cease schooling early.

**Table 1.** Respondent classification with respect to caste and age across the studies.

	Gennovate (2015; FGDs)	Qualitative Study (2019)	Quantitative household surveys (2019)
Number of participants			
Overall			
Male	25	36	413
Female	29	36	405
SC & ST			
Male	8	7	132
Female	10	17	136
OMSC & NMC			
Male	9	29	273
Female	9	19	277
Youth (<25 years of age)			
Male	8	–	5 <sup>#</sup>
Female	10	–	14 <sup>#</sup>
Average age in years (range) of respondents			
Overall			
Male	38.4 (17–55)	49.0 (30–70)	46.8 (22–84)
Female	30.1 (16–55)	48.3 (17–80)	44.1 (20–85)
SC & ST			
Male	49.1 (39–55)	56.3 (35–80)	45.8 (23–75)
Female	36.6 (39–55)	41.7 (30–60)	43.3 (21–85)
OMSC & NMC			
Male	45.2 (35–55)	47.2 (17–75)	47.3 (22–84)
Female	36.4 (25–50)	54.2 (40–70)	44.5 (20–81)
Youth (<25 years of age)			
Male	20.1 (17–24)	–	23.0 <sup>#</sup> (22–24)
Female	17.8 (16–24)	–	22.3 <sup>#</sup> (20–24)

<sup>#</sup>Included also in different caste groups.

### Qualitative research methods

The qualitative research team visited Jamari twice. The first time was in 2015 as part of a larger research initiative on gender norms, agency, and agricultural innovation, called GENNOVATE (Petesch et al., 2018). In India, the study covered 12 sites, including Jamari, across five major wheat-producing states. Study sites were grouped into four potential categories based on combinations of key parameters: high and low gender gaps and high and low economic dynamism. Jamari was classified as a “high gender gap, low economic dynamism” site. Primary research methods utilized in GENNOVATE include focus group discussions (FGDs) and associated exercises together with key informant interviews (KIIs). Trend analyses were also developed, with respondents being asked to compare the current situation with the situation ten years previously. For Jamari, the baseline year is 2006 (Petesch et al., 2018). All data production exercises were sex-disaggregated apart from the community profile.

In Jamari, 57 respondents (25 men, 29 women) participated in the Gennovate study (Table 1). Following transcription, the data underwent a rigorous process of systematic

**Table 2.** Involvement and decision-making in different economic activities by gender and caste.

	Conditional on participation, the percentage of household in each caste category where decisions are made by											
	Number [%] of respondents participated in the activity			Self			Spouse			Others <sup>#</sup>		
	Overall	SC&ST	OSMC	NMC	Overall	SC&ST	OSMC	NMC	Overall	SC&ST	OSMC	NMC
<i>Self-involvement, according to female respondents (n = 413) in</i>												
Cash crops for markets	149 [36.1]	8.1	8.0	8.0	75.8	74.0	78.4	63.6	16.1	18.0	13.6	27.3
Livestock production	287 [69.5]	13.1	13.8	10.9	51.9	43.6	58.1	33.3	35.0	42.6	31.0	33.3
Food staples	400 [96.9]	7.6	8.5	7.1	59.4	54.6	62.9	50.0	33.0	36.9	30.0	41.7
Non-farm businesses	60 [14.5]	30.0	24.0	35.3	41.7	52.0	35.3	INO	28.3	24.0	29.4	INO
Wage employment	80 [19.4]	26.3	36.7	20.0	26.3	16.7	31.1	INO	47.4	46.6	48.9	INO
<i>Self-involvement, according to male respondents (n = 405) in</i>												
Cash crops for markets	200 [49.4]***	79.4***	84.8***	76.8***	4.0***	3.4***	4.8***	0.0***	16.6	11.9	18.4	20.0
Livestock production	281 [69.4]	53.8***	59.1***	50.9***	13.4***	14.0***	13.5***	7.7	32.8	26.9**	35.6	38.4
Food staples	398 [98.3]	73.8***	77.2***	72.4***	3.6***	3.9***	3.7***	0.0***	22.6***	18.9***	23.9	30.4
Non-farm businesses	80 [19.8]**	65.0***	65.4***	64.0***	10.0***	7.7***	12.0***	INO	25.0	26.9	24.0	INO
Wage employment	162 [40.0]***	60.0***	59.9***	63.7***	9.4***	13.2***	6.3***	INO	30.6***	28.9*	30.0**	INO

<sup>#</sup>“Others” category mostly includes parents, elder siblings, or other close relatives of male respondent or husband (in case of female respondents). \*\*\*, \*\*, \*. The difference with the male respondent group is statistically significant at 0.01, 0.05, and 0.10 levels, respectively. INO: Insufficient number of observations.

content analysis and coding using Nvivo, a software supporting qualitative data analysis. The findings were written up as an unpublished synthesis report.

A follow up qualitative research study was conducted in 2019. The two unpublished Gennovate reports were used to identify one village for in-depth research. Jamari was selected because it exhibits high caste diversity and hence was considered ideal for developing a deeper understanding of caste-gender intersectionalities in relation to if and whether managerial and labor feminization processes are occurring.

The researchers developed semi-structured sex-disaggregated FGD, and KII exercises, seasonal agricultural calendars, decision-systems mapping exercises, and transect walks around the village and fields. Although questionnaire guides were prepared, the research team equally aimed to be “respondent-led” to allow respondents to raise issues they found important within the broad parameters we had set (Farnworth, 2009). Respondents were purposively selected by gender and caste and had to be wheat farmers or hired laborers in wheat. Research activities were conducted in gender and caste-specific groups. NMC and OSMC caste were treated as one caste for research purposes despite the team’s original intention to meet them separately. This is because the number of NMC respondents is low in the village, and they requested joint meetings with OSMC respondents. SC and ST respondents were met together (apart from one meeting). KIIs were conducted with the village health worker, village input supplier, members of SHGs, and young women and men. We also met the staff at the Borlaug Institute for South Asia (BISA), Jabalpur Station, to understand wheat dynamics more broadly. In total, 72 village respondents participated, 36 women and 36 men (Table 1).

All the interview notes were typed up and cross-checked, and the data was then analyzed using manual line by line open-coding to highlight key themes. Open coding allows concepts to emerge from the raw data, which can then be grouped into conceptual categories. In this way, we developed a rich multi-dimensional framework for analysis which we then restructured for this paper. The GENNOVATE research data was integrated into this analytic framework.

A final comment on ethics: at the beginning of each data collection activity (in 2015 and 2019), facilitators read out an ethical statement. This explained the study’s purpose, assured confidentiality, and informed study participants that they had the right to not answer questions and could end their participation at any time. In Jamari, consent was not immediate. Respondents had many questions about the purpose of the research. We took time to answer their queries carefully and honestly and to ensure that they really wanted to participate. Respondents were not paid, but snacks and drinks were provided.

### **Quantitative research methods**

Primary data collection for the quantitative study discussed in this paper was conducted in 2019. The research team reinterviewed households already met in 2018 in the course of a separate study. The selection process involved selecting three districts in Madhya Pradesh for the household survey and then randomly selecting villages in each district. In addition to the fifteen villages thus selected, we purposively added

three villages that had participated in the GENNOVATE study in 2015, including Jamari. For the quantitative survey, 28 farm households were included from each of the nine largest villages (a total of 336 households) and 14 households from each of the six smaller villages (a total of 84 households). To qualify for inclusion, farm households had to have grown wheat during any of the previous three years (2015/16–2017/18 wheat seasons). Table 1 presents the number of respondents in the last column.

Women and men were interviewed separately by a person of the same gender. Alongside details of agricultural activities and socioeconomic characteristics, respondents were asked about their role in decision-making regarding agricultural and associated activities and with respect to decision-making around income generated from these activities. In cases where the respondents were not in charge of decision-making, a follow-up question was asked on the occurrence of input provision in decision-making. Conditional on participation in an activity (1 = participated in an activity; 0 = did not participate in the activity), the involvement of decision-making was modeled as a binary variable (1 = decision made by self; 0 = decision made by others). The role of gender and caste in respondent participation and involvement in decision-making was elicited through estimating a maximum-likelihood probit regression model with sample selection. (For details of model specifications, see Van de Ven & Van Pragg, 1981). We included two dummy variables; one for SC (=1 for SC, =0 otherwise) and another for ST households (=1 for ST, =0 otherwise), keeping OSMC and NMC as reference dummies. We also included gender-caste interaction terms. In addition to gender and caste, household- and individual-specific variables (e.g., age, education, landholding size, region, etc.) were included as explanatory variables. The marginal effects were elicited for a combination of participation and decision-making, and decision-making conditional on participation in an activity. We hypothesized a negative effect of respondent's gender (a lower agency of women) and statistically significant coefficients for gender-caste interaction terms (intersectionality).

## Results

We first present our qualitative research findings in relation to managerial feminization processes, then labor feminization. This is followed by the quantitative research findings, taking both themes together.

### *Managerial feminization*

We commence this section by presenting the qualitative data on managerial feminization in wheat in Jamari in three parts. First, we examine interactions around social norms regarding whether women are considered “farmers.” Second, we explore gender and caste interactions in knowledge and procurement networks. Third, we ask how women and men contribute to the financing of wheat farming.

### *Can a woman be a farmer?*

We hypothesized that the ability to exercise managerial decision-making power in farming was reliant, at least in part, on whether women were constructed as “farmers” (*Kisan* in Hindi) in Jamari. The wider literature indicates that it is considered socially undesirable for women of higher-caste status to work in the fields. To understand the situation in Jamari, we asked NMC and OSMC men and women respondents as to whether they perceive women as farmers. In the women’s FGD, four women contended that they did not see themselves as farmers, but three others argued, “We all work on the land. Why would only a man be a farmer? Why wouldn’t I be a farmer?” (NMC/OSMC women FGD, 2019). When asked to explain their views in more detail, one NMC woman said, “My husband takes decisions. It has always been like that,” whereas another NMC woman responded that “We make decisions together. I have an equal say. The final decision is with my husband though I speak as much as I want to.” NMC and OSMC women agreed that women take the lead around how much wheat to set aside for household consumption. Women also claimed knowledge around wheat, including in domains normatively ascribed to men. For instance, the women listed all the wheat varieties grown in the village and discussed their properties. They displayed enthusiasm for the local landrace, Sharbati, which tastes good and explained that if they have enough land, they grow Sharbati for home consumption and HYVs for sale. However, if their land size is less than one acre, they only grow improved HYV varieties for sale and consumption as they need to prioritize getting an income.

Although NMC/OSMC women are interested and knowledgeable about the wheat varieties, their ability to express wheat preferences in intra-household discussions varied. One woman commented that “My husband takes the final decision on which wheat variety to buy.” However, another said, “In my case, if I disagree, I plant my choice on my land, and he plants his choice on his.” (This is the only woman in the village with land in her own name.) A third explained that “If I try to influence my husband’s selection of wheat variety, I will be hit,” and a fourth, “For me, it’s an equal decision. No one has a greater say. I also help to buy wheat seed.” Taken together, these remarks suggest that men experience substantial decision-making power and tend to have a larger say in agricultural decision-making. Nevertheless, there is no “normative” situation. This allows for certain nuances of the decision-making process, with some women asserting equality.

NMC and OSMC men did not concur with women’s views. They acknowledged women work alongside them in the field, but all men respondents strongly denied women status as farmers. “Women clean land, weed and sometimes harvest. These are easy and useless activities” (OSMC men FGD, 2019). Another man added, “We tell women what to do, for example, to weed, or to go and work as a hired laborer on another farm.” One man expressed the mood of the FGD particularly clearly when he said, “Women don’t take decisions in farming. Farmers are men. Farming is a man’s job. We do farming. We make decisions.” It appears that in men’s eyes, women have a status very close to that of hired laborers, even when working on family land.

Thus far, the data indicates that men consider that *they* are the farmers, they decide, and women carry out their instructions. Having and exercising decision-making

power is integral to how men conceptualize what it means to be a farmer, whereas women argue that the very fact of working on the land constitutes their farming identity. “We work equally on our family land. We work equally as hired labor” (NMC/OSMC women FGD, 2019). When men were asked to rationalize why they exclude women from decision-making, NMC and OSMC men asserted that “women aren’t intelligent enough to learn to be a farmer,” that they are less educated, and also that women do not have time since they have so much housework. They also suggested that men dominate marketing because women have less experience and may find it hard to make financial calculations. Some men acknowledged that younger women could be knowledgeable about seeds and inputs but emphasized that they do not make any decisions. The fact that some younger women are recognized to be informed suggests a generational shift in women’s ability as well as interest to acquire knowledge. However, men argued that women’s lack of decision-making power is not only because men exclude them, but also because “our daughters-in-law are just not interested in helping out on the family land.”

### *Gender and caste in relation to farmer knowledge and procurement networks*

Respondents repeatedly referred to the absence of an effective extension system. This was a major concern as their wheat varieties are hit by various diseases which they find hard to tackle. As noted above, the public extension services barely function, with an officer visiting only men NMC farmers once a year – and respondents were dismissive of the knowledge provided “They eat and drink, and then they fill out a mandatory form. Then they go and never come back” (NMC/OSMC men’s FGD, 2019).

Farmers have responded by creating their own knowledge and procurement networks. These are men-only and restricted to specific castes. OSMC men work closely together to obtain the best knowledge possible and to secure better prices for inputs. For instance, OSMC men regularly rent a vehicle jointly to go to Jabalpur to procure inputs. Group buying is a common practice because the local trader is expensive. Quality wheat seeds are sold within the village for Rs. 38 per kg. The same seed is available in the Jabalpur market for Rs. 22 per kg. As a consequence, the local trader primarily sells to “very small farmers.” These include some OSMC women and SC and ST men farmers, who lack the wherewithal to rent vehicles.

Furthermore, OSMC men travel in groups of five to ten to meet extension agents at Krishi Vigyan Kendra (district level agricultural extension center) in Jabalpur. One OSMC man explained. “In the absence of help from the extension agent who hardly ever comes here, we don’t have a choice but to go to Krishi Vigyan Kendra. The officers there are very helpful, and they listen to us and provide solutions. We have gone there with pest-related problems, and they have always helped us out. They also give us seeds.” The respondents explained that they actively disseminate knowledge with other farmers (primarily OSMC and NMC), roughly in a ratio of one group participant advising five others. ST and SC men are not included in these knowledge and procurement networks and do not have contact with any formal extension services.

Regardless of caste status, women are excluded from these agricultural knowledge networks. Their main sources of information are their husbands (if he is willing to share) and their empirical experience as hired laborers and on their own farms.

Women of all castes engage in fieldwork in wheat and thus become familiar with new technologies and practices. This helps them understand and reflect on the learning and to share their knowledge with other women. “Friends tell us. If I see my harvest isn’t good, I go and see what is happening on other fields. Which one has grown good wheat. When I see a good performance, I ask the farmer” (OSMC woman in NMC/OSMC women FGD, 2019). The local trader is important too. “He gets wheat seed for us and tells us their names” (OSMC woman in NMC/OSMC women FGD, 2019). These disparate sources of information help women to influence intra-household decision-making processes to some extent. Even so, women who want to innovate can find it hard to realize their plans. Young women (Young women FGD, 2015) said that “if a woman wants to do something on her own, such as plant a new crop, then she needs to consult her husband, in-laws and her sons if they are grown up.”

There are some caste differences. NMC women find it more difficult to get good information as they experience restricted mobility compared to other women and find that culture “prevents women from talking to strangers and even with other men in our society” (NMC women in NMC/OSMC FGD, 2019).

### ***Who finances wheat?***

Finally, we consider who finances wheat. Is it women or men? There are several sources of finance for wheat in Jamari. Fathers encourage their sons to work at the local marble factory or to set up their own stone carving units to help finance family agricultural production. Daughters and wives are sent to work as hired laborers, and some men work themselves as hired laborers. A few men have recourse to private lending. In such cases, men wishing to take a loan need to demonstrate that their wives are members of a self-help group (SHG). A few ST women said they borrow from friends and relatives.

The most important source of finance for farming, though, is women through women’s SHGs. The village has several SHGs with about 10–12 women members each. By-laws do not exclude women from specific castes, but most SHGs are attended by women of a specific caste, although some are mixed-caste. Basor women (the lowest subcaste within the SC) are not welcome in any SHG. Women and men explained that all caste groups use loans from SHGs for various needs, including buying stone-working machines for their sons, school fees, food, financing weddings, purchasing mobile phones for their husbands, buying agricultural inputs, and meeting other household needs. Women respondents claimed that they do not use the SHG to finance their own needs. One woman said, “We women never borrow money or take out loans for ourselves (laughs sarcastically). There are too many family-needs to be met first. The kids, the husband ... everything supersedes ...” (ST/SC SHG women FGD, 2019).

Regardless of caste status, men FGD respondents openly discussed deploying violence to force their wives to take loans for their needs from SHGs. “We get money from women for a drink. We fight with them for money. If they don’t, then we hit them to get the money” (NMC/OSMC men’s FGD, 2019). Other men described forcing their wives to sell jewelry or taking it and selling it themselves. SC and ST men agreed that “All men get loans for agriculture through their wives from the SHG. They get the money and give it to us” (ST/SC men FGD, 2019). At the same time, some women in



all castes said they were prepared to orally, and sometimes physically, fight back. “Society continues to be patriarchal, but since women are working very hard to support their families they don’t hesitate in protesting” (ST/SC women FGD, 2015), and some men reported that “Women will not take the abuse anymore” (NMG/OMSC men FGD, 2019).

Women are left with the responsibility of paying back loans. “When it is time for the woman to pay her SHG premium and she does not have money for that, her husband is not bothered. It is the woman’s responsibility to figure out how to do that. And her husband tells her to use her jewelry as collateral to get money to pay the SHG instalment” (NMC/OSMC men’s FGD, 2019).

### ***Labor feminization***

In the Literature Review, D’Agostino (2017) suggested that wheat is primarily a male labor crop. Is this really so in Jamari? Our qualitative study explored three aspects of labor feminization processes in agriculture and in wheat, more specifically: hired labor, the impact of mechanization, and family labor on wheat on the family farm.

### ***Hired labor***

Genovate fieldwork (2015) conducted in Jamari indicated that the most significant change by far over the previous decade from 2006 onwards was women’s increasing participation in the paid agricultural labor force. This applies to women of all castes. This finding runs counter to broader national statistics presented in the Literature Review, which suggest an overall decline in women’s paid LFPR in agriculture.

Respondents provided several explanations. First, the small size of almost all farms in Jamari means that it is hard for the majority of men, regardless of caste, to earn sufficient money on their own to maintain a family. Second, people across caste increasingly aspire to improve their economic status and, in particular, to better educate their children. Since 2006, many women have “joined their husbands in working for their livelihood; both work hard to give a better life to their families” (SC/ST women FGD, 2015). Third, women across caste are feeling much more empowered. In 2015 and in 2019, many women respondents were eager to demonstrate that their agency is strengthening. They are taking more decisions than in the past, including regarding household allocations of food, their children’s education and other domains, and women are less afraid to confront their husbands when they disagree.

Women of all castes now work as hired agricultural laborers. SC/ST men remarked that “women are very hardworking; they, in fact, work harder than the men. It is because of their support that many families have been able to improve their lives” (SC/ST men FGD, 2015). This view was seconded by community profile respondents who said, “the women of our village are very hardworking and shoulder the responsibility of their families” (Community Profile, 2015). Whilst in the past it was considered almost taboo for women to work for money, today “since all women are working there is no reason for anyone to object” and “no one thinks badly of working women; they are after all fulfilling their household responsibilities” (SC/ST women FGD, 2015).

Poor men concurred that “it is a common sight to see women working, and so no one is bothered” (ST/SC men FGD, 2015).

There are caste nuances to the sense of empowerment. Wide-ranging discussions with respondents in 2019 indicated that the low social status of SC and ST women meant that although acceptance of such women in the fields is high, they are also not respected by other castes. The women themselves live with the burden of being low-caste regardless of whether they work or not, and so earning an income takes priority over attempting to improve how others see them. Normatively, caste norms still dictate that OSMC and NMC women should not work in the fields, yet almost all such women work in Jamari. One NMC woman explained, “all Brahmin [NMC] women and men work as hired laborers. This is because their landholdings are too small to afford sufficient income” (NMC woman, FGD, 2019). NMC women work on OSMC farms and, according to respondents, do not suffer any diminution in caste status as a consequence.

Though most NMC women seek paid work, their options are limited due to their low mobility. “Brahmin [NMC] women have always worked only in the village. All other women can leave” (NMC woman, FGD, 2019). Whilst norms indicate that NMC women should not express high agency, NMC women indicated quite high agency, with one saying she had an equal say with her husband. Normatively, many OSMC women would like to experience a similar caste status to NMC women, but OSMC women normatively experience more agency, including in Jamari. Tribal women exercise more agency than women in other castes. Across caste in Jamari, we can definitively say that all women are experiencing more agency compared to the baseline year of 2006.

Research in 2019 shows that women and men dissent regarding how many women work as hired laborers. NMC/OSMC women respondents said that the ratio is 2:1 in favor of men (twice as many men), but NMC/OSMC men said the figure was 5:1 in favor of men. It was not possible to explore this startling discrepancy in sufficient depth with respondents, but the reader is reminded of observations in the Literature Review which suggest that men can be unwilling, for status reasons, to report their wife’s engagement in paid labor, particularly fieldwork.

Despite women generally celebrating their improved agency, not all women want to work specifically as hired agricultural laborers. A few women reported being forced to do so by their husbands or fathers. Others reported enormous pressure to earn money – due to their desire to meet their aspirations for themselves and their families and to meet basic needs. Pregnant women “keep working for as long as possible, even up to 7 or 8 months of pregnancy, in the field. It is not easy for pregnant women to do arduous agricultural work. But they do it because they are poor. They suffer from fatigue and other health problems because of this” (KII, woman health worker, 2019). Overall, women in Jamari, regardless of caste, want to work and earn an income, but they would like more opportunities for off-farm paid work.

This also applies to young women. They now attend school at considerably higher rates than in 2006, but many are still expected to earn money once they have completed their studies, including newly married women. Young women have few work options and are mostly restricted to farm labor on their parent’s farm and as hired

laborers. Young men, however, work primarily off-farm, particularly in marble carving (Community Profile, 2015).

Inequalities in the daily wage are high. Women earn 120 rupees per day on average, whereas men earn around 250 rupees daily. In an irony that eluded men respondents, men justified wage differentials in fieldwork not in terms of intelligence but in brawn. “What men do needs more physical work than that which women do” (ST/SC men FGD, 2019).

### ***The impact of mechanization on women’s paid fieldwork***

At the very time women have begun to enter the paid labor force in large numbers, agricultural mechanization is eliminating jobs at a significant scale in Jamari. Mechanization began around 2014 and is accelerating. In 2019 almost all NMC and many OSMC households were increasingly renting rotavators, direct seeders, harvesters and threshers. As noted in the Site Description, one NMC family owns 125 acres. They have fully mechanized their operations, leading to significant loss of employment opportunities in the village. More wealthy OSMC households with holdings of 1.5 to 3 acres collectively rent machinery. Some farmers have installed tube wells. Caste biases ingrained over generations mean that SC and ST castes are, in general, more impoverished and thus find it more difficult to afford machinery. Furthermore, their hilly, poor quality land is unsuitable for most machinery.

The gendered and caste effects of mechanization were marked. NMC and OSMC women benefit directly from the use of machinery on family land. Previously, such women were “always up to their neck with work during the harvesting season” (Young men, FGD, 2015). All machinery is managed by men, apart from irrigation pipes which women also haul. NMC and OSMC men benefit because mechanization has eased their own workload, enabling them to seek off-farm employment. At the same time, NMC and OSMC women have lost a large number of paid days. Since NMC women are not permitted to leave the village, loss of paid work has serious implications. One NMC woman said, “I have to take care of my children. There are many things I want to do for them. I work as a hired laborer and the money I earn I spend on my children” (NMC/OSMC women FGD, 2019). Furthermore, NMC men in Jamari rarely work in the farm fields, some for health reasons and others because they do not feel fit for this work. This restricts the overall income to the home.

ST and SC women, who previously worked a substantial number of days per year as hired laborers, are now seeing this income vanish. One SC man remarked in 2015, “for rich farmers, machines have come as a boon, but for the poor farmers, they are a bane, especially for poor women farmers” (ST/SC men FGD 2015). Four years later, ST/SC women estimated that they had lost five months of work per annum due to mechanization over the years prior to 2019 (ST/SC women FGD, 2019). An ST woman explained, “We used to get a lot more work, particularly during the wheat and paddy harvest. Five years ago, they mechanized harvesting, and now we have no work harvesting. We used to clean the paddy field, but now they just burn the residues and use tractors and rotavators. We used to help with seeding wheat. The man would go in front with the bullock, and a woman would go behind sowing the seed. During harvesting, we had 1.5 to 2.5 months of work in wheat, and then we worked on lentils

and black gram. That work is gone. Even farmers with  $\frac{1}{2}$  an acre use machines now. There was so much to do" (SC/ST women FGD, 2019). Respondents added that "Now the only people who make money are the machinery owner and the driver," and commented that "All that is left is weeding. Only this. Some farmers call us because they haven't used enough herbicides. We get about 4–5 days work, ten days maximum" (ST woman, 2019). An OSMC woman commented, "Big farmers still take ten women to weed. But you can do the weeding in half a day, so you only get Rs. 50 or 60. What can we do with that?"

Most ST and SC women cannot find other paid work within the community. Some ST women now travel daily to Jabalpur to work in construction – the female wage is 100 rupees per day (men receive 200 rupees/day). Days are long with women returning only at 10 pm at night. In summer ST women enter the jungle to pick betel leaves used in making bidis (local cigarette), which they sell to a collector.

### *Family labor on wheat*

We asked SC and NMC/OMSC respondents to prepare seasonal calendars of their work in wheat on family land and as hired laborers. Only SC women prepared the seasonal calendar as ST respondents were unavailable. The findings show that women are heavily involved in wheat cultivation.

**SC seasonal calendar.** The wheat season starts in November and ends in May. SC women and men spend an equal amount of time in land preparation (15 days each). This involves removing paddy residue with a sickle. They spend one day in seeding. A mechanical seeder is hired, so the work involves the man supervising the driver and women preparing and taking food to the driver and husband. The seeder costs 500 rupees per hour with two hours required per acre (1000 rupees/USD 13.87 at time of study 2019).

A considerable amount of time (30 days each by men and women) is spent fencing land to protect it from animals as the wheat starts to grow in January. This is a complex task, with men going into the jungle to collect branches. Women and men make the fence, which is woven around poles, together. There are no bylaws to which SC farmers can appeal to prevent cattle grazing on their land. Cattle do not enter paddy fields due to water, but wheat is a dry season crop. The fence is used for cooking and heating during the winter, which is why this is an annual task.

Men water the wheat as much as possible during the growing season, from January through to March (about four days a month), and they apply fertilizer during each irrigation. In February, men and women spend one day applying pesticides. Women mix the pesticide with water. This activity is labor-intensive because water has to be brought to the plot. Women haul water in 10 kg containers up to 10 times a day from a distant canal. Both women and men are equally engaged in harvesting. This takes around eight days in April. Sorting, threshing, baling and taking the bales home take up two days of women's/men's time in May. Respondent women noted that they entered threshing as taking one day, but they work all day and night to get this done. Overall, women provide 68 days to family production of wheat, and men 81 days. Women were anxious to point out that they engage in time-consuming food

preparation for consumption in the field and that this should also count as a contribution.

***NMC and OSMC seasonal calendar.*** The wheat season opens by cleaning the paddy field, taking 15 days in total per acre. NMC and OSMC women work alongside men on this task. In Jamari, none of the older Brahmin men works in the field as they are disabled or ill, but a few sons supervise the work and participate in fieldwork. Due to low male participation, women have to work. As with SC women, NMC and OSMC women bring water for pesticide dilution, which they describe as arduous. Their sons irrigate and apply pesticides and herbicides. Irrigation is difficult because large pipes need to be hauled, and men must irrigate at 2 a.m. in the dark and cold (wheat is a winter crop) as it is only then that electricity is supplied. All NMC households use direct seeders and mechanical harvesters. Fodder preparation from the crop residue is important, with women and men (all household members) working together. Six people are needed to form one bale. Hired laborers are employed very rarely, only if no family men are available, for male tasks. General caste women devote 33 days, and men 23 days, to wheat farming on their own land. The biggest difference between the labor allocations of NMC/OSMC and SC respondents is that the former do not need to build fences. These women also noted that they spend much time preparing food for consumption in the field and saw this work as equal to that of working on agricultural tasks.

The final section in the Findings provides insights from the quantitative data on both managerial and labor feminization processes. It adds context through considering these issues across 18 villages, including Jamari, and allows us to consider whether Jamari is an outlier.

### ***Labor vs. managerial feminization of wheat cultivation: insights from the quantitative analysis from 18 villages in Madhya Pradesh***

Household survey data on intra-household decision-making were analyzed to understand the roles of men and women in farm and off-farm income-generating activities and decision-making. We considered five economic activities: food crop production, cash crop production, cattle rearing, non-farm business, and wage employment. As shown in Table 2, a significantly larger share of men than women are involved – either as farm managers or as unpaid family laborers – in cash crop production (49% of men vs 36% of women), non-farm businesses (20% vs 15%), and wage employment (40% vs 19%). The gender difference is not pronounced for food crop production and cattle rearing. However, conditional on participation (i.e., participation dummy takes the value 1), key decision-making roles in the household are mainly taken by men, with only insignificant inter-caste differences. For food crop production, while 97% of female respondents are involved in various productive activities, only about 8% opine that they oversee decision-making. From the men's perspective, the role of women in decision-making is even lower. Only 4% of men agree that their spouses take key decisions. The situation is similar for cash crop production and slightly better for cattle rearing. Where women are involved in non-farm activities, only 25-30% of cases, they

**Table 3.** Association between decision-making on food crop production and decision-making on household expenditure by gender and caste.

	Involved in decision-making in food production, %		Not involved in decision-making in food production, %	
	Participation in activities	Decision-making in activities, Self <sup>#</sup>	Participation in activities	Decision-making in activities, Self <sup>#</sup>
<i>Self-involvement, according to female respondents (n = 400) in</i>				
Major household expenses				
Overall	40.0	58.3	34.1	0.2***
SC & ST	45.5	60.0	37.7	2.2***
OMSC	41.1	57.1	32.3	1.4***
NMC	0.0	INO	31.8	0.0
Minor household expenses				
Overall	93.3	78.6	97.8	31.1***
SC & ST	90.9	80.0	97.5	31.6***
OMSC	94.1	75.0	97.8	30.8***
NMC	100.0	80.0	INO	INO
<i>Self-involvement, according to male respondents (n = 398), in</i>				
Major household expenses				
Overall	57.6	86.8	31.5***	29.4***
SC & ST	57.1	83.9	29.0***	33.3***
OMSC	57.4	89.1	34.3***	29.2***
NMC	62.5	80.0	14.3**	INO
Minor household expenses				
Overall	94.8	25.6	95.4	9.9***
SC & ST	93.9	23.9	100.0	17.2
OMSC	94.9	26.7	94.3	7.6***
NMC	100.0	25.0	85.7	0.0

<sup>#</sup>Conditional on participation. \*\*\*, \*\*: The difference with the decision-makers in food crop production is statistically significant at 0.01 and 0.05 levels respectively. INO: Insufficient number of observations.

are the sole decision-makers (taking decisions on whether to go for work on a given day, for example), whilst in the case of men, the chances of autonomous decision-making are 60–65%. Several male and female respondents indicated that, although they are the household leads, several decisions are taken by other members of the household (especially elder members), and the role of others is more pronounced in SC&ST and NMC groups.

In Table 3, we show a clear positive correlation between involvement in food production decisions and involvement in household expenditure decisions for both male and female respondents. Compared to women, men are more likely involved in decision-making concerning household expenditures. About 87% of men involved in decision-making on food crop production are also involved in decision-making on major household expenditures. The frequency of decision-making on household spending is low among those who did not involve in food crop production (29%). For minor household expenses, this pattern prevails as well (79% compared to 31%). The difference in women's share in decision-making on household expenditure with respect to their involvement in decision-making regarding food crop production is more prominent, irrespective of caste. About 58% of women involved in decision-making on food crop production are also involved in decision-making on major household expenditures. On the other hand, women's participation in this connection is 0.2% if they are not involved in decision-making on food crop production. For minor household expenses, a similar pattern prevails (79% if involved in decision-making on food crop production, against 31% if not).

**Table 4.** Factors affecting the probability of decision-making on crop production (food and cash crops) and off-farm employment activities by sample respondents.

	Probit models with sample selection	
	Model 1	Model 2
<b>I. Crop production (food and cash crops)</b>		
Women (=1 if respondent is women; = 0 otherwise)	-0.597*** (0.028)	-0.617*** (0.030)
SC (=1 if respondent belongs to SC; = 0 otherwise)	0.017 (0.070)	0.033 (0.074)
ST (=1 if respondent belongs to ST; = 0 otherwise)	0.038 (0.048)	0.080 (0.059)
Women × SC (interaction term)	-0.192* (0.101)	-0.197* (0.104)
Women × ST (interaction term)	0.029 (0.075)	0.057 (0.079)
Household specific variables	No	Yes
District dummy variables	No	Yes
<b>II. Off-farm employment</b>		
Women (=1 if respondent is women; = 0 otherwise)	-0.129*** (0.019)	-0.142*** (0.021)
SC (=1 if respondent belongs to SC; = 0 otherwise)	-0.005 (0.045)	-0.002 (0.031)
ST (=1 if respondent belongs to ST; = 0 otherwise)	0.087*** (0.034)	0.044* (0.026)
Women × SC (interaction term)	0.028 (0.053)	0.041 (0.068)
Women × ST (interaction term)	-0.045 (0.031)	-0.020 (0.030)
Household specific variables	No	Yes
District dummy variables	No	Yes

Notes: Dependent variable is binary in nature, which takes the value of 1 if farmer is responsible for the decision making and 0 otherwise. The marginal effects are reported with std. errors in parentheses. Due to small number of NMC respondents in the sample, it was clubbed with OSMC as reference category.

\*\*\*, \*. The marginal effects are statistically significant at 0.01 and 0.10 levels, respectively.

In the next step, we estimated the regression models on the probability of decision-making on crop production by the respondent to understand the role of gender and caste. The marginal effects are reported with standard errors in Table 4. Model 1 is without the socioeconomic variables and regional (district) dummy variables in the estimation, and Model 2 is with them. Marginal effects are estimated for participation and decision-making, that is, *Prob.* (participation = 1; decision-making = 1) for crop (both food and cash) production and off-farm employment (both business and wage labor). Across the models, the women dummy variable, representing the women respondents' decision-making probability, was found negative and statistically significant ( $p \leq 0.01$ ). The chance that a woman is involved in crop production with decision-making powers was 59.7% lower than a man, as per Model 1 (i.e., after controlling for caste alone). The coefficient did not change significantly after controlling the socioeconomic variables like age, education, region, etc., indicating that gender is the primary determinant of agency (or lack thereof) to make decisions. As per Model 2, the chance that a woman is involved in crop production with decision-making powers was 61.7% lower than a man. Similar patterns are observed with respect to the probability of participation in off-farm employment with the agency for decision-making. However, the gender disparity is lower in magnitude than for crop

production, with 12.9% (Model 1) and 14.2% lower (Model 2) chance for a woman than for a man.

In both Model 1 and 2, the decision-making of men on crop production is not affected by caste dummies, as evidenced by the insignificant SC and ST dummies. Caste-gender intersectionality in decision-making is represented by the interaction terms (i.e., when  $SC/ST = 1$  and  $Women = 1$ ) in Table 4. We found that the Women-SC dummy interaction variable is negative and statistically significant, but not Women-ST interaction. Compared to women of OSMC and NMC, SC women have a lower chance (by 19–20% across the models) to become involved in crop production *with* decision-making powers. ST women have the same chance as women of OSMC and NMC to participate in decision-making regarding crop production. Finally, the coefficients of SC and ST interaction terms with women dummy variables were insignificant for models on decision-making concerning off-farm employment. These findings are surprising, as we expected more agency for women from the marginalized strata of society. One reason could be that women from the marginalized castes are more visible, as they are involved in on-farm and off-farm activities, and this visibility leads to assumptions that they experience stronger agency. Another reason could be the binary response type elicited during the quantitative interviews, which might prompt the respondents to lean toward socially accepted norms of behavior.

## Discussion

The literature review suggested that knowledge about women's decision-making in farming is slender. It is difficult to distinguish between norms – what should be – and what is actually happening. There is some limited, highly contextual evidence that women make decisions to varying degrees and that the rural advisory services and research institutes are lagging behind in capturing decision-making processes on the ground. Data on labor feminization shows that nationally, labor in India is masculinizing with feminization only in agriculture. However, women are increasingly moving out of paid agricultural labor into unpaid work. The literature review also suggested that wheat is a male-dominant labor crop and that mechanization and HYVs have propelled women out of paid labor. We now respond to our four questions in turn.

### *Is decision-making in wheat feminized?*

This query was difficult to answer in unambiguous terms. The quantitative findings suggest that, across all 18 study sites, men are key decision-makers. This supports the broader findings in the literature review on gender norms and the perception of men as farmers. When women were the respondents, they awarded themselves (albeit slightly) more decision-making power than male respondents were prepared to allocate women. Overall, men dominate by a large margin in a comparison of agencies. Less than 10% of women respondents were important decision-makers with respect to crop production. However, 25–30% of women said they could take an autonomous decision regarding whether to engage in paid work. This pattern was different for



men. Men experience limited autonomy concerning paid labor, with only 60–65% claiming autonomy, vis-à-vis 75% claiming autonomy in crop production.

The quantitative findings are somewhat similar to the qualitative findings. The difference is that the qualitative findings provide a less absolute picture. They point to a degree of intra-household negotiation between spouses. Normatively, men refuse to recognize women as farmers because, as they argued, men are the decision-makers. This pattern echoes the literature review. However, evidence of women taking an active part in discussions emerged during the in-depth discussions. Some women argued they were indeed farmers by virtue of their daily work – they *live* the farming experience. Women also displayed considerable knowledge of wheat varieties and their traits. The discussions around women's labor in the wheat field demonstrated that many have an acute knowledge of all associated agricultural practices. Nonetheless, our findings also showed that women are excluded from male-dominated knowledge networks. Women primarily “come to know” through observation, working in the fields, talking to other women, and the village trader.

Two further contradictory processes appear to be occurring. On the one hand, women repeatedly pointed to their increased agency compared to the baseline of 2006. Women work for an income, they contest gender-based violence, and some say “we are wheat farmers.” On the other hand, women are primary financers of wheat through the SHGs. This initially suggests that wheat is actually women-led. However, the evidence indicates that many men force women to provide money through their SHGs to enable them to grow wheat.

### ***Is labor in wheat feminized?***

The quantitative data suggest that men are much more involved in fieldwork than women, including hiring out their labor. However, in Jamari village, the qualitative data showed that women are extremely interested in earning money, including working as hired laborers in wheat. This is a relatively new phenomenon that has taken off since around 2006 – the precise juncture at which, nationally, women's LFPR began to decline steeply. Women in Jamari are motivated by financial needs as well as aspirations to live differently and better and to offer their children a range of possible futures. Women's work as hired laborers in wheat is an expression of considerable agency on the part of many women. Women of all castes seek paid work, regardless of social norms that frown upon women in the fields – particularly NMC and OSMC women. Having said so, we recognize that some women are pressurized by men to enter paid work. Men exert the most agency over unmarried daughters and sons in this respect.

It is of great concern that the mechanization of agricultural processes is closing doors at the very moment when a large number of women have exerted their agency and defied norms around seclusion. Our data demonstrate a large loss of paid labor days for women in fieldwork. Alternative income generation opportunities are few due to the gender-biased nature of the economy, including marble carving within the village, which is completely controlled by men. Gender in interaction with caste norms plays a role in structuring potential opportunities for women. NMC women can only work within the village confines, yet ST women find themselves working from dawn to late at night in very

arduous conditions in Jabalpur. We did not explore the implications of women's reduced income upon their goals, but we can tentatively posit that these are compromised.

***In what ways do interactions between caste and gender determine and limit the spaces within which women can act in wheat-based systems?***

We wanted to understand a bit more about the ways in which interactions between caste and gender determine and limit the spaces within which women can act in wheat-based systems. The quantitative data suggest that gender is a far more important variable than caste in structuring "who decides." Across the four caste groups, men are primary decision-makers, and the inter-caste differences are negligible. The qualitative findings from Jamari paint a different picture. ST and SC women generally experience more personal agency than NMC women and, in particular, experience higher mobility. Nevertheless, due to ingrained discrimination over generations, their agency is compromised. ST and SC women rely much more than NMC and OMSC women on paid fieldwork for their livelihoods because their own family lands are small, labor-intensive, and on poor quality hilly land. However, paid agricultural work is now falling away due to mechanization in Jamari village. ST and SC women are more flexible in seeking alternative work due to their higher levels of mobility, but such work is hard to find. It is even harder for NMC women to find work because their limited mobility means that they have no recourse to employment opportunities beyond the village (and currently, there are no alternative occupations open to women in Jamari).

***In what ways are women challenging their gender and caste identities to enhance their livelihoods by influencing their roles, responsibilities and decision-making in wheat?***

The findings show that over a decade ago, women, particularly of the NMC and OSMC caste, began to challenge gendered caste strictures that restricted them to unpaid agricultural work. All women appear to have experienced a flourishing of voice in intra-household decision-making, and they have become better informed about improved agricultural technologies. Gender-based violence has long been endemic, but now women are fighting back. At the same time, our evidence indicates a waning of men's voice as they age, particularly in relation to sons once they have married. Nevertheless, and perhaps as a consequence, men continue to insist, in contrast to women, upon cultural norms that privilege men as decision-makers. The endogamy of caste remains a significant issue.

**Conclusion**

Our research forms one of the first granular studies of the intersectionalities between caste and gender in wheat systems and how they are changing. As such, it brings out many significant patterns for consideration and for exploration in future research. We also suggest that the experience of Jamari is likely to be replicated in many locations. It is not an outlier. The quantitative research findings broadly support this view.

We conclude by noting that caste-gender dynamics are complex and subject to change. Our findings show that the doxa that men are decision-makers and key laborers in wheat is under significant challenge in Jamari. We note that while quantitative research highlights valuable patterns, qualitative research is particularly good at identifying nuances and potential entry points for development actors (researchers, policymakers, rural advisory services). Our article shows that no assumptions can be made regarding the extent of women's agency in relation to their caste, in relation to their participation in agricultural work and in relation to their sense of themselves as farmers. These are all areas worthy of further investigation. Finally, our data show how important the freedoms described in this paper are to women and simultaneously how easily they can be challenged and lost.

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