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THEMATIC ESSAY

Women's Role in Agriculture and Food Security: Learnings from Gujarat and West Bengal

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Abstract: Ushering in the next phase of agriculture in India requires a deeper understanding of the growth process across regions and socio-economic contexts with an emphasis on strengthening the role of women. This paper argues that it is critical to capture socio-cultural diversity across various agro-climatic zones to arrive at a more detailed understanding of women's labour contributions within the changing landscape of food security. The paper is based on an extensive survey carried out in the states of Gujarat and West Bengal. The analysis shows the immense contribution of women in the agricultural sector. Women's contribution in farms is higher in West Bengal than Gujarat, but in Gujarat their contribution in the allied sector is significant. Women's work in farms and their involvement in decision-making are the important determining factors for maintaining household food security. Thus, women's roles in the farm need to be strengthened for the next phase of agriculture.
Keywords: Agrarian distress, feminization, food security, Gujarat-West Bengal and logit model

1. INTRODUCTION: GENDERED CHALLENGES

Agriculture in India is changing. Changes in land-use patterns and the availability of natural resources on the one hand (Chand *et al.* 2011; Gupta *et al.* 2018) and socio-economic impacts on the other (Agarwal 1994; 2012) are impacting landholding size and productivity. How far these have influenced—positively or negatively—rural communities in the diverse regional contexts of India is yet to be determined. Two aspects demand

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particular attention: ensuring the sustainability of agriculture and ensuring women's role therein. The latter is especially important given agriculture's role in providing food security to India's poor. Women's dual role in farming households—where they grow and prepare food for consumption—is influential in steering how the household consumes food, thereby inextricably linking their participation in agriculture to food security. This paper investigates these aspects based on an extensive field survey carried out in two states in India. It attempts to understand, first, the trend of overall agricultural growth processes and their implications for natural resources; second, it examines the specific role of women farmers, and in particular, captures the conditions under which they perform their roles and whether their labour contributions benefit them or not; and third, it analyses women's role in maintaining household food security. It is assumed that a specific focus on women's role in agriculture within the overall changing scenario will help bring attention to women's contribution to sustainable agriculture and poverty reduction, which is an overlooked link in Indian agriculture.

The sudden changes caused by the COVID-19 pandemic have laid bare the urgent need to ensure food security for the rural poor. India, with 22% of the world's poor (Government of India 2018),[1] represents how global development has been unsustainable and requires re-envisioning. Food security can be ensured only in a healthy rural environment in which there is equity and protection of natural resources.

Scholars (Quisumbing *et al.* 1995; Krishnaraj 2005; Mehra and Rojas 2008) have highlighted the key role of women in ensuring food and nutritional security within rural households. The lack of secondary data on the extent and nature of women's labour in India continues to remain a major obstacle, and the innumerable ways women help farming families remain invisible (Siddiqui *et al.* 2017). The role of allied activities in the agricultural economy—such as dairy farming in Gujarat[2] and fisheries in certain parts of West Bengal[3]—are also not well recognized, and there is a particular lack of studies on how women's participation in these sectors strengthen and

[1] According to the 2021 Global Hunger Index, India is ranked 101 out of 116 countries. India's score is 27.5, which implies that the country has a level of hunger that is serious (von Grebmer 2021).

[2] During 2017–2018 in Gujarat, dairy constituted 20% of the total agricultural sector (dairy sector constitutes only 9% of the total agriculture-allied sector in West Bengal; Government of India 2020a).

[3] During 2017–18, fisheries in West Bengal constituted 14.5% of the total agricultural sector (fisheries constitute only 3% of total agriculture allied sector in Gujarat; Government of India 2020a).

sustain farm and farming households. Further, women's roles vary by context, and these diversities must be recognized for a better appreciation of their labour contributions.

The findings of an extensive survey carried out in the states of Gujarat and West Bengal, which captures their intrinsic agro-climatic and socio-cultural diversities, is presented to understand the role of women in agriculture and in maintaining household food security. The micro-level study aimed to capture different agricultural systems rather than make direct comparisons. Four districts were selected in each state based on a maximum-variation principle to capture the variations in local agro-climatic and agro-ecological contexts. With two villages covered in each district, a total of 16 villages were sampled. Given the specific focus on women's contributions to agriculture, only landholding households were selected.[4] A complete house-listing exercise was carried out, which covered 3,235 households in Gujarat and 2,770 in West Bengal. Stratified random sampling was used in the survey of 800 women farmers (comprising around 10–12% of the landed households in each village).[5,6]

The paper is structured as follows: first, the context of women's employment in Indian agriculture is presented in brief to show how the farm sector is increasingly being feminized. The second section discusses the agricultural growth process and women's employment in agriculture in Gujarat and West Bengal. The third section presents the major findings, mainly capturing women's contributions to farming, livestock rearing, and households and their role in decision-making and maintaining food security. The concluding section provides directions for future interventions.

2. WOMEN'S LABOUR CONTRIBUTIONS IN AGRICULTURE

With the changes occurring in agriculture, women, who have long been treated as unpaid workers, are beginning to receive much-needed recognition as farmers. As men migrate out of rural areas, seeking non-

[4] Women in landless households were not selected because they do not take part in farm decision-making processes, except in terms of their indirect impact on the cost of labour, in which they are involved.

[5] In each surveyed household, we identified women who were "most involved in agriculture", since they were best equipped to respond as they were most likely to be involved a broad range of activities and decision-making functions.

[6] Questions were asked relating to land ownership (both at the household and individual level), women's labour contribution (in the household, farm, and livestock rearing), decision-making, food security, migration status, women's involvement in training and extension services, membership in community activities, women's like or dislike of farming, etc.

agricultural employment, the involvement of women in the farm sector has increased. Indian policymakers term this concentration of women's labour in agriculture as the "feminization of agriculture" (Government of India 2018). In fact, this is not an entirely new phenomenon in India (Agarwal 1985; Duvvury 1989). However, in the context of the deepening agrarian crisis (Mishra 2007; Singh, Kaur, and Kingra 2021), characterized by declining farm incomes, male out-migration, and worsening water shortages, the nature and causes of the feminization of the agricultural workforce and its implications for the future development of the agricultural sector are matters of concern. This is particularly important because, till recently, recognition of women as "workers" or "farmers" remained largely absent, leading to a lack of representation in policymaking and development programmes.

2.1 Agriculture: Gujarat and West Bengal

The economies of Gujarat and West Bengal differ substantially. The per-capita annual income in 2018–19 for Gujarat and West Bengal was ₹195,845 and ₹101,138, respectively, as compared to the national average of ₹126,521 (GOI 2020). The annual average growth rate of income from agriculture from 2011–2012 to 2016–2017 was slightly over 3% in Gujarat and slightly less than 2% in West Bengal (CSO 2019). This could be partly because Gujarat's agriculture has gained from groundnut and cotton[7] cultivation despite having a large proportion of dry land. Against this, paddy[8] is the dominant crop in West Bengal. Unfortunately, the relatively higher growth in Gujarat has not positively impacted the poor in a significant manner as the population below the poverty line is similar in the two states.[9]

A total of 65.01% of males and 88.08% of females are engaged in agriculture in Gujarat (Government of India 2020b). Better connectivity to urban areas, heavy urban industrialization, and migration are the causes of lower employment in the rural non-farm sector (Shah and Pattnaik 2021). In West Bengal, 50.02% of males and 57.12% of females are engaged in agriculture. The state shows higher rural non-farm employment than Gujarat.

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[7] The share of the area under cotton and groundnut farming during 2019–2020 was 24% and 14%, respectively (Directorate of Economics and Statistics n.d.).

[8] The share of the area under paddy farming was 60% during 2019 (Directorate of Economics and Statistics n.d.).

[9] The share of the population below the poverty line was 16.6% in Gujarat compared to 19.9% in West Bengal during 2011–2012. The share of the population below the poverty line was 21.9% across the whole of India during the same period.

2.2 Trajectories of the Agricultural Sector over Time

Even during the early years following Independence, the growth of the agricultural sector of the two states followed different trajectories. In the 1950s, Gujarat's agricultural sector benefited from well irrigation and cooperatives producing milk, sugar, and cotton, which were mainly concentrated in the central, southern, and northern regions of the state. While the Saurashtra region (western region) did not benefit from cooperatives during this time, the agricultural sector saw some growth due to the immense political mileage gained from the groundnut oil lobby—*telia raja.*[10] After the 1990s, cotton also contributed significantly to the growth of Saurashtra's agriculture. Saurashtra, a dry region, has mainly depended on groundwater resources and farm power supplies to fuel its growth. The development of the dairy sector is another major factor that accelerated the high growth of agriculture and allied sectors (Kumar *et al.* 2007).

In West Bengal, on the other hand, the agricultural development process was significantly impacted by the land reforms that started immediately after Independence and were mainly designed to protect the rights of poor cultivators. In the early 1970s, land reforms and the decentralization of local self-government became the main political agenda (Rogaly *et al.* 1995). Unlike in Gujarat, the focus here was on defining the rights of the poor rather than supporting agro-based industrial development. It is important to note that only after liberalization in the 1990s, commercialization and rapid agro-industrialization were promoted in West Bengal (Shaw 2020). Since the 1990s, the share of non-food grain cropped areas and areas under potato farming have significantly increased. How the agricultural growth process has helped unlock various alternatives, especially for women, has been addressed in the following analysis.

3. MAJOR FINDINGS: WOMEN'S WORK, DECISION MAKING, AND FOOD SECURITY

3.1 Women's Work

Although increasing numbers of rural families are supplementing their household incomes by seeking jobs outside agriculture, this does not seem to have happened for women. Many women are engaged in more than one

[10] Producer and mill owners of groundnut oil in Saurashtra region are called *telia rajas* as they have strong connection with political leaders, interested guilds, apolitical outfits, political parties, the bureaucracy, and the government and all these begin with the price of the groundnut.

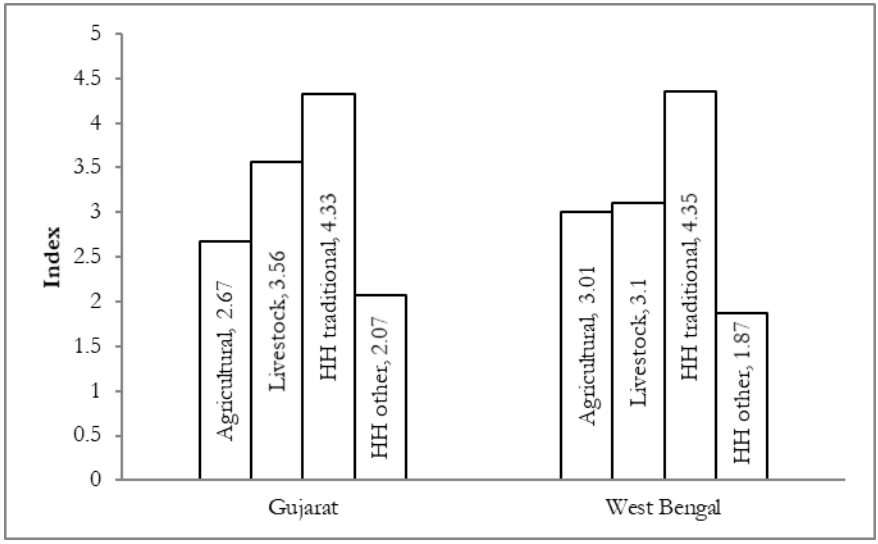
occupation, but mostly in the agriculture and allied sectors. The data show that 96% and 89% of the surveyed women are involved in the agricultural sector in Gujarat and West Bengal, respectively, as their primary occupation. The diversification (towards the non-farm sector) of the rural economy has had a limited impact on rural women workers, and men have gained more than women. Importantly, 71% of men and 74% of women in Gujarat, and 65% of men and 69% of women in West Bengal, are engaged in more than one occupation. However, women's occupations, outside of cropping, are limited to livestock-rearing in Gujarat and fishing in West Bengal.[11] In Gujarat, around 80% of women reported working in the dairy sector, either as a main or subsidiary occupation. In West Bengal, 49% of women reported fishing as a subsidiary occupation.

Women's increased labour participation in agriculture and allied sectors in Gujarat is mainly due to the major role played by women in the dairy industry. Another reason might be that men have been able to find opportunities in urban areas, leaving women to manage agriculture. Women do not seem to be receiving the same opportunities outside of agriculture as men in Gujarat, presumably due to the state's industrialized–urbanized economy which led more male migration. This situation is different from that in West Bengal where the rural manufacturing sector employs the major share of workers, both male and female (Government of India 2020b). Further, in West Bengal, though employment in the non-farm sector has been growing over time, more than 90% of businesses are own-account enterprises (home-based small businesses) that do not generate enough surplus incomes for employment (Rajeev and Bhattacharjee 2018).

Women's labour in households is higher in both states, followed by livestock-rearing and farming (Figure 1). Livestock-rearing is considered an extension of household activities, which are done almost exclusively by women, especially in Gujarat. The development of the dairy sector in Gujarat is also a political topic, which, over time, has brought women to the centre (known as The White Revolution; Kurien 2004). However, in West Bengal, fishing is mainly conducted for household consumption and only a small share is sold. Appropriate institutional support may have given a better push to the allied sector in West Bengal.

[11] A major share of women in West Bengal reported the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) as their subsidiary occupation. MGNREGA is a state-funded guaranteed employment programme that employs labourers for a fixed number of days and fixed wages.

Figure 1: Participation in Farming, Livestock-rearing, and Domestic Work in Gujarat and West Bengal



Note: 1. Agriculture: all kinds of farm activities; livestock: all kinds of livestock activities; HH traditional farming: activities that take place within the home; HH other work: activities related to marketing and managing budgets.
2. The indices are generated from a series of questions in the survey in which female respondents were asked the extent to which 11 different activities relating to their agricultural land (such as ploughing, weeding, harvesting, storage, marketing, etc.) were undertaken "entirely by men"; "mostly by men"; "equally shared by men and women"; "mostly by women", and "entirely by women". Responses were converted to numerical values by allocating a score (1 to 5) of 1 for each response that was marked as being undertaken "entirely by men" and a score of 5 for "entirely by women". The average of all scores was then calculated, so that the higher the score, the greater the participation of women. Other indices for livestock rearing, household activities, and decision-making were calculated similarly.
Source: Authors' fieldwork in 2016.

Moreover, women reported that labour-intensive activities such as weeding, farm cleaning, harvesting, and storing are mostly carried out by them; further, several crop-specific tasks are performed exclusively by women. These include extracting groundnut kernels (mainly in Gujarat in the groundnut belt of Rajkot district); cutting potatoes into pieces for planting (in Malda, West Bengal); and extracting fibre from jute (in Cooch Behar, West Bengal). In Gujarat, women primarily weed and harvest the land. In West Bengal, they carry out a much wider array of tasks: transplanting juvenile rice plants, winnowing wheat and pulses, cleaning and arranging

farm produce for sale, and drying agricultural products such as tobacco leaves. Furthermore, these activities are carried out manually due to a lack of mechanization. It is important to note that while mechanization has existed for a long time in both states, it has not reached the specific activities in which women are involved. The level of mechanization is lower in West Bengal, leading to women undertaking various strenuous activities.[12] How far the vast range of women's labour contribution in farms impacts empowerment (measured in terms of decision-making) is discussed below.

3.2 Women in Decision-making

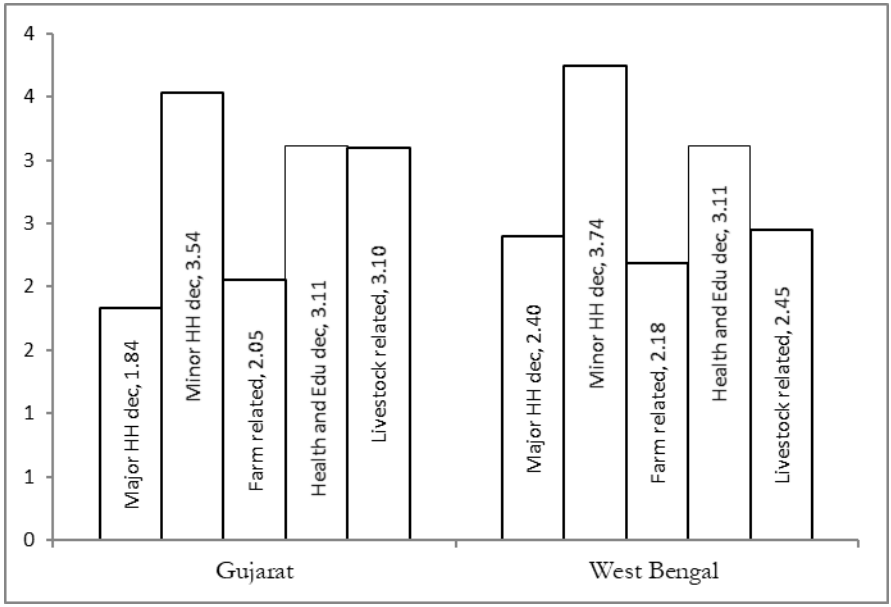
Three aspects of decision-making were captured in the survey: (1) decisions related to farming and livestock—which crops to grow, which farm inputs to buy, the amount of farm produce to be sold (food grains), purchase of new immovable assets and large household purchases, and purchase/sale of animals; (2) decisions related to daily household purchases, including which vegetables to buy and what foods to cook, and visits to family or relatives; and (3) decisions related to health and education.

we found that women's participation in farming-related decisions is quite limited (with scores of 2.05 and 2.18 in Gujarat and West Bengal, respectively; Figure 2). Compared to farming, however, their role in decision-making in other minor aspects is relatively higher than men in both states. Further, women's increased control over income and decision-making has been noted to have a positive impact on the health and nutritional status of the family (Meinzen-Dick *et al.* 2010). The present analysis finds that women's participation in decision-making regarding health and education is greater compared to other sets of decisions in both states. Women's participation in livestock management is higher in Gujarat compared to West Bengal.

The overall analysis shows that women are more involved in both labour and decision-making in West Bengal compared to Gujarat, which could be partly attributed to the different socio-cultural and political contexts (Pattnaik and Lahiri-Dutt 2020).

[12] Increasing labour hours or days does not necessarily bring in more income for women; rather, it further deepens the existing gender gap. Rural transformation has led to income diversification and facilitates men's outmigration from their villages in search of better paying jobs, whereas women remain confined to the family farm and as wage labourers in the village.

Figure 2: Decision-making on the Farm and at Home



Note: as explained in Note 2 in Figure 1.
Source: Authors' fieldwork in 2016.

3.3 Women and Household Food Security

Compared to the surveyed households in Gujarat, a relatively larger proportion of surveyed households in West Bengal are food insecure;[13] 48.23% of households in Gujarat and 59.12% of households in West Bengal reported being food insecure.

A logit model was constructed to examine the factors affecting household food security, with a focus on the contribution of women's work.[14] We

[13] Nine indicator questions were employed to capture food insecurity. The questions are related to food adequacy and financial constraints, including whether a condition has occurred during the four months prior to the survey. Each occurrence question is coded with a "yes" or "no". For example: Did you or any household member worry about your household not getting enough food? Did you or any household member go to sleep at night hungry because there was not enough food?

[14] A multivariate binary logistic regression model was used to examine the factors that influence the odds ratio of household food status. The odds ratio is the ratio of the probability that a household would always be food secure (Pi) to the probability that the household does not have enough food or is food insecure ($1 - Pi$).

considered a set of socio-economic and regional variables, along with women's work and decision-making.

Earlier studies have identified various determinants of household food security. Income, one of the main economic variables, is considered a fundamental factor in determining poverty and food security (Sarkar & Shekhar 2017). Hence, as per-capita income increases, the household's food security is expected to improve. In rural households, livestock is a supplementary source of income. The higher the number of farm animals, the better the household's food security as dairy products are a major source of protein consumption (Ramachandran 2003). Moreover, selling livestock for cash is also used as a coping strategy during times of crisis (Mukherjee & Nayyar 2011). Thus, the number of ruminants owned by the household might influence its food security status. Migration, specifically male migration, can have a diverse (positive or negative) impact. While the flow of remittances may positively influence household food security (Szabo 2015), it could impact some negatively because most of rural migration is distressed in nature (Keshri and Bhagat 2012); in the absence of remittances, the left behind women-headed households may be adversely affected (Choithani 2019). The demographic characteristics of a household also determine its food security and their impacts vary similarly. On one hand, the bigger the family, the higher the demand for food, leading to a greater risk of malnutrition (Gupta and Mishra 2014). On the other, a larger family might also have more labour supply, which is a vital factor in agricultural production, especially in poorer regions (Zakari, Ying, and Song 2014). Land is an important asset in rural areas, making it another important variable that might influence a household's food security. Lastly, sociocultural indicators such as caste and ethnicity are important factors that define the social position of the family in India (Rao 2005). Since caste is a major factor, it is hypothesized that lower caste groups are more food insecure than higher ones. Besides these economic and socio-cultural factors, a set of independent variables that capture women's decision-making (mainly farm-related) and control or management of household income are considered for the logit model (Table 1). For example, income from livestock is important for household cash flow, which is particularly evident in Gujarat; hence, women's control over dairy income is considered an independent variable (however, allied activities—for example, fishing in West Bengal—are not included because of their limited contribution to the total household income).

The dependent variable is the status of food security. The household's food security status, the dependent variable, is coded in binary form, that is, food insecure = 0 and food secure = 1.

The logit model for Gujarat is defined as below:

$$Y_i = \beta_0 + \beta_1 LnPCI_i + \beta_2 TAC_i + \beta_3 IRRI_i + \beta_4 LK_i + \beta_5 FT_i + \beta_6 NIS_i + \beta_7 MIG_i + \beta_8 WC_i + \beta_9 WA_i + \beta_{10} STSC_i\, \beta_{12} OBC_i + \beta_{12} WLI_i + \beta_{13} WPC_i + \beta_{16} DIST_i + e_i \quad (1)$$

The logit model for West Bengal is written below:

$$Y_i = \beta_0 + \beta_1 LnPCI_i + \beta_2 TAC_i + \beta_3 IRRI_i + \beta_4 LK_i + \beta_5 FT_i + \beta_6 NIS_i + \beta_7 MIG_i + \beta_8 WC_i + \beta_9 WA_i + \beta_{10} ST_i + \beta_{11} SC_i + \beta_{11} OBC_i + \beta_{12} WPH_i + \beta_{15} WMI_i + \beta_{16} DIST_i + e_i \quad (2)$$

where, $y^*$is the dependent variable, β represents the vector of parameters to be estimated, and e is the error term. Table 1 presents the descriptive statistics of the variables used in the model.

Table 1: Descriptive Statistics of the Variables Used in the Model

Sl. No.	Variable	Description
1	Per capita income (PCI)	Numerical
2	Total area under cultivation (TAC)	Numerical
3	Share of area under irrigation (IRRI)	Ratio
4	Total number of livestock (LK)	Numerical
5	Type of family	Binary
6	Number of income sources of the family (NIS)	Numerical
7	Migration (MIG)	Binary
8	Women as cultivators or working in family farm (WC)	Binary
9	Women as agricultural labour (WA)	Binary
10	Caste: general caste as reference category	Binary
11	Caste: ST and SC (STSC)	Binary
12	Caste: Schedule tribe (ST)	Binary
13	Caste: Schedule caste (SC)	Binary
14	Caste: Other Backward Caste (OBC)	Binary
15	Women's control over livestock income (WLI)	Binary
16	Women participating in decisions related to what crop to grow (WPC)	Binary
17	Women participating in decisions related to how much crop to keep for home consumption (WPH)	Binary
18	Women managing total household income (WMI)	Binary
19	Districts	Binary

To avoid the problem of heteroscedasticity, robust standard error (clustered) was calculated. Additionally, the variance inflation factor (VIF) was measured to check the problem of multicollinearity. To explain the effects of confounding variables directly, the marginal effects of both continuous and discrete explanatory variables were estimated.

Table 2: Result of the Logit Model

Variables	**Marginal effects (standard error)**	
Dependent variable: status of food security	Gujarat (Model I)	West Bengal (Model II)
Per capita income (in log-term)	0.06** (0.15)	0.20*** (0.25)
Total area under cultivation	0.001 (0.005)	0.08*** (0.14)
Share of area irrigated	-0.001 (0.003)	0.007 (0.002)
Total number of livestock	0.02** (0.07)	-0.003 (0.0.1)
Type of family (nuclear family as reference category)	0.18*** (0.22)	0.12** (0.26)
Number of income sources of the family	-0.004 (0.13)	-0.02 (0.10)
Household migration status	-0.21*** (0.33)	-0.09** (0.24)
Women as cultivators or working in family farms	0.05 (0.29)	0.04** (0.27)
Women as agricultural labour	-0.18*** (0.30)	0.05 (0.29)
Caste: General caste as the reference category		
Caste: ST and SC	-0.12** (0.48)	
Caste: ST		-0.11 (0.51)
Caste: SC		-0.05 (0.50)
Caste: OBC	-0.01 (0.36)	-0.07 (0.37)
Women's control over livestock income	0.11** (0.25)	
Women participating in decisions related to what crop to grow	0.09** (0.24)	
Women participating in decisions related to how much crop to keep for home consumption		0.07 (0.26)

Variables	**Marginal effects (standard error)**	
Women managing total household income		0.14** (0.27)
District fixed effect	Yes	Yes
Observations	400	400
Pseudo R^2	0.11	0.14
Log pseudo likelihood	-246.1	-236.10

Note: 1. Numbers in parentheses indicate robust standard error.

2. P<0.01 = *** and p<0.05 = **
3. In model I – VIF ranges from 6.22 (area cultivated) to 1.07 (type of family). Average VIF = 2.71.
4. In model II – VIF ranges from 4.80 (caste SC) to 1.06 (women as agricultural labour). Average VIF = 2.36

In Gujarat, factors such as income per capita ($p < 0.05$), ownership of livestock ($p < 0.05$), women's decision-making in farm-related activities ($p < 0.05$), and women's control of livestock income ($p < 0.05$) are found to be positively associated with household food security (Table 1). During the survey, it was found that farm income is mainly managed and controlled by men, but women retain the income earned from dairy. Households in which women are involved in the management of income[15] (along with men) are more food secure compared to those where women are less involved. Further, joint families are food secure compared to nuclear families ($p<0.01$). Scheduled Caste (SC), Scheduled Tribe (ST), and Other Backward Castes (OBC) households are found to be more food insecure ($p < 0.05$) compared to general caste households. However, migration has a negative impact on household food security ($p < 0.01$).

In West Bengal, factors such as income per capita ($p < 0.01$) and total area under cultivation ($p<0.01$) positively influence the status of food security (Table 1). As also found in the case of Gujarat, joint families are more food secure than nuclear families ($p < 0.05$) in West Bengal. Migration has a negative impact on the status of food security ($p < 0.05$). It was found that women's involvement in income management influences household food security positively in West Bengal ($p < 0.05$).

[15] During the survey, participants were asked who has more control over income in the family: 1= exclusively male, 2 = mainly male, 3 = male and female both, 4 = mainly female, and 5 = exclusively female. We constructed an index, and when the number is above 3, we report it as "women's involvement in the management of income."

Per capita income influences the food security of both states. However, its impact is significantly higher in West Bengal compared to Gujarat. With a 1% increase in per capita income, the probability of a household being food secure is 6% in Gujarat and 20% in West Bengal. As West Bengal's agricultural growth rate is lower than that of Gujarat, a slight increase in income will greatly influence the status of food security.

Migration has a negative impact on food security in both states. With a 1% increase in migration, the status of household food security declines by 21% in Gujarat and 9% in West Bengal. Migration (predominantly male, as confirmed in our study), mainly being distressed in nature,[16] has not improved the food security of households. This is evident in the larger historical out-migration in Gujarat.[17] The intensity of the impact of migration (both in and out) on food security needs further analysis.

Livestock ownership is an important factor that affects household food security in Gujarat but not in West Bengal. In Gujarat, milk animals and milk products have long been a significant supplementary source of income for a large number of rural households, and the sector received significant institutional and state support (Shah and Pattnaik 2014). Against this, the lack of equivalent institutional and state support in West Bengal could be seen as the major reason for the limited attractiveness of rearing small/large ruminants.

Joint families are more food secure compared to the nuclear families in both states. Joint families, having undivided land and larger land size (except among the STs, as found in our survey), are more food secure.

The link between the social status of households and food security is captured through the caste indicator; caste was found to have a significant impact on food security in Gujarat but not in West Bengal. In Gujarat, SCs and STs are more food insecure compared to the general castes, which was also found in past studies (Chakravarty and Dand 2006). Caste inequality has always been higher in central and western India (Maharashtra and Gujarat) compared to eastern India (West Bengal and Odisha; Borooah, 2005).

It is interesting to learn that women's involvement in family farms is positive and significant in West Bengal but not in Gujarat. With a 1% increase in female participation in family farming, the family's security

[16] With most of the migration being distressed in nature, the flow of remittance was negligible.

[17] A large proportion of landed area in Gujarat is dry, and the state is historically known for seasonal migration.

increases by 4%. The association, while positive, is not as significant in Gujarat. This may be because poor quality of land and limited access to water have been major factors resulting in fluctuating agricultural income in Gujarat. Fluctuating agriculture on one hand and the availability of better work opportunities in the non-farm sector, on the other, make Gujarat farmers less dependent on farm income as compared to West Bengal.

Along with women's labour contribution, their role in decision-making and their control over the household income are also important variables that determine the status of food security. Women's decision-making and control over incomes also influence household food security in both states, highlighting their significant role. In Gujarat, a 1% increase in women's involvement in management of livestock income and participation in farm-related decision-making leads to an 11% and 9% increase in the status of household food security, respectively. In West Bengal, a 1% increase in women's involvement in managing household income leads to a 14% increase in household food security.

Overall, the analysis shows that food insecurity is higher in West Bengal than in Gujarat. This may be due to the types of crops cultivated and the importance of agriculture-allied sectors such as livestock in Gujarat having a significant role in shaping overall growth including women's roles. West Bengal, despite having strong land reform and better agro-climatic conditions, has somewhat lagged in its agriculture growth process. However, it is clear from the analysis that women's work on farms and involvement in the management of income has a positive impact on food security in both states. Thus, strengthening women's role is essential for ushering in the next phase of agriculture.

4. CONCLUSION

The analysis emphasizes the extensive role of women in the agriculture sector. While in Gujarat, women's role in agriculture is limited compared to West Bengal, their contribution in the allied sector (livestock/dairy) is significant. Women in West Bengal are engaged in a wider array of tasks in farming. However, women's involvement in farm-level decision-making is very low in both states. This shows a lack of empowerment among women although they contribute immensely towards shaping agriculture and allied sectors. It must be noted that women's labour contribution in farming and their involvement in decision-making related to farming influence household food security positively (along with other socio-economic characteristics of the household). Thus, improving the overall availability of food via better and women-friendly production technologies must go hand-

in-hand with women's control over income and decision-making processes. Hence, future farming must focus on strengthening women's involvement in decision-making by developing policies that recognize women as farmers. This requires that in the future, women's contributions and concerns should be at the forefront of every intervention in agriculture, both at the micro and the macro levels.

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