

Women in the Indian Agricultural Sector: Enhancing Economic Outcomes

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I. Introduction

Globally, the overall proportion of the workforce in the agricultural sector is declining, with the proportion of women in the sector also declining. In India, however, while the overall proportion of the labor force in agriculture is declining, the proportion of women in the agricultural labor force is increasing. A rising share of farm work is undertaken by women, with increased out-migration of men to urban areas resulting in changing roles for women in the agricultural sector. However, women's increasing participation in the agricultural sector may not necessarily be a positive phenomenon and could point to (i) agrarian distress and the feminization of such distressⁱⁱⁱ (ii) reflect disguised unemployment and underemploymentⁱⁱⁱ and (iii) be counter to women's own aspirations^{iv}.

The Indian agriculture sector is undergoing rapid transformation, diversifying away from cereals to more value-added and cash crops, and to allied sectors such as fisheries and dairy. These now make up an increasing proportion of total production value. Although the agriculture sector faces significant challenges, including low productivity, declining size of landholdings and high climate variability, pockets of Indian agriculture are dynamic and competing globally. Exports of agricultural commodities have grown five-fold over the past two decades, rising from INR 6,012 crores (\$724 million) in 1991 to INR 30,830 crores (\$4.7 billion) in 2021.

Evidence from other countries shows that gender differences in adoption of cropping patterns and cash crops leads to differences in agricultural income^v. It is important therefore to explore the extent to which women are making the transition to Higher Value Agriculture (HVA) and participating in more dynamic segments of Indian agriculture, and the types of interventions that can improve their participation in these transitions and improve economic outcomes for them. Closing gender gaps in agriculture is not only important in and of itself, but also for improving the performance of the Indian agrifood system and overall economic welfare. The Food and Agriculture Organization (FAO) estimates that bridging gaps in agriculture would help women farmers to improve productivity by 20-30 percent and increase overall agricultural output^{vi}.

This note seeks to (i) review recent available sources of data to quantify participation of women in the agricultural sector (ii) summarize evidence on gaps and barriers to women's full participation in HVA; and (iii) highlight best practice interventions to inform intervention design. The note seeks to bring India-specific context and data analysis to the broader regional and global recommendations.

II. Methodology

The note uses the most recent available data sources to compare agricultural parameters by male and female-headed households. The main data source used is the Situation Assessment of Agricultural Households and Land and Livestock Holdings of Households in Rural India [SAAH, 2019], which offers the most recent representative sample of rural agricultural households in India. The SAAH was conducted over two visits conducted in January to August 2019 and September to December 2019 across 45,715 agricultural households as part of the 77th Round of the National Sample Survey (NSS) under the National Statistical Office. The survey covered households that were considered agricultural production units – defined as households that generate at least INR 4,000 from agricultural activities in the year and has at least one member who is self-employed as an own-account worker in agriculture as a primary or

subsidiary economic activity. This excludes households that only have members who are exclusively working as agricultural laborers. The SAAH 2019 also collects gender disaggregated information of household members.

However, an important methodological limitation is the lack of clear data on women operators of farms as there is no clear indicator to identify the primary decision maker for farm operations. First, the primary variable that can be used for gender-disaggregated analysis is the gender of the household head¹. However, due to the circumstances under which women usually become household heads – i.e., widowhood or divorce – using this metric may significantly undercount or mischaracterize women farmers and agricultural workers who belong to male-headed households but operate or play a significant role in managing and making decisions on farms. Second, the overall proportion of female-headed households captured under SAAH 19 is low at 8.5%, making further disaggregated comparisons less robust due to the small sample sizes.

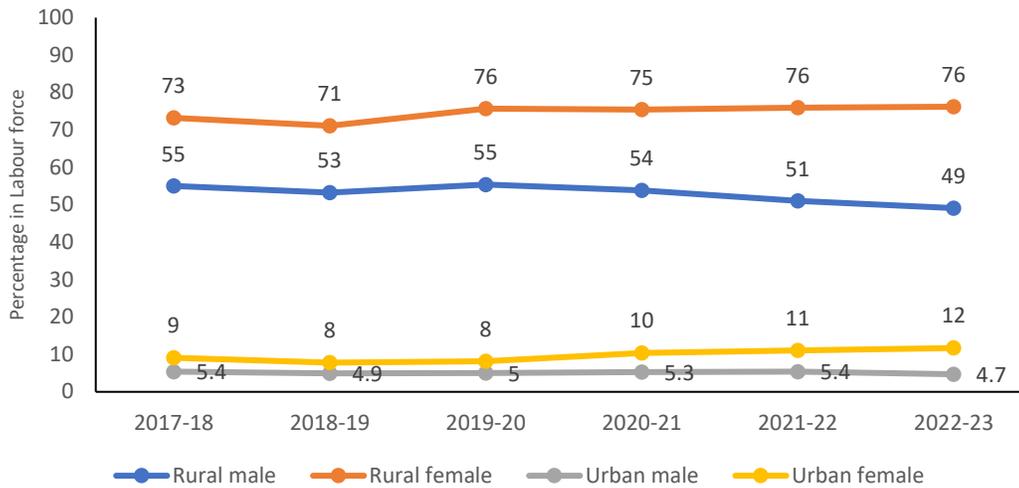
In addition, the note refers to data from the Periodic Labor Force Survey (PLFS, 2022-23), Indian Human Development Survey (IHDS 2011-12), the National Family Health Survey 5 (NFHS5) and data from the International Crop Research Institute for the Semi-Arid Tropics (ICRISAT 2015). We define high-value agriculture (HVA) as the cultivation of non-cereal cash crops for the purpose of analysis in this note.

III. What does the data tell us about India?

A higher proportion of women workers are employed in the agricultural sector, but they are concentrated in the lowest end of the value chain as casual workers, and they earn less than men. Agriculture contributes 16 percent to the Gross Domestic Product (GDP) and employs the largest proportion – 45.8 percent - of the workforce^{vii}. Women are more likely to be employed in the agricultural sector with 64 percent of working women in India engaged in agricultural work compared to only 37 percent of men^{viii}. Figure 1 shows trends in the agricultural labor force, with a rise in women's participation over the last six years and a decrease in men's participation. 2019-20 remains an anomaly to this trend, with COVID-19 shocks resulting in a shift in employment from other sectors to agriculture and a rise in agricultural wage labor for both men and women.

¹ The suitability of the household head as a proxy for farm decision maker is supported primarily by trends observed in the IHDS-II [Indian Human Development Survey – II] (2011-12) which captures the gender of the households and the member of the household who is the primary decision maker of the household operated farm. As per the IHDS-II 92.2 percent of primary decision makers in farms are the household head. While this overlap is lower among female headed households- 78 percent female headed households have the household head as the primary decision maker on the farm- it is still significant that it is still a suitable indicator for decision maker on the farm.

Figure 1: Share of agriculture in Labour Force across men and women [PLFS 2017-2023]



There are two reasons why women’s increasing labor force participation in the agricultural sector cannot be read as a positive phenomenon. First, women are more likely to be casual laborers and unpaid household workers rather than farm owners and operators (Figure 2b). 66 percent women in the agricultural labor force report being self-employed, which is significantly higher than the proportion of self-employed women in the non-farm sector at 28 percent². However, only 26.25 percent of these

Figure 2(a) : Gender split of Labour force by work type in agriculture [PLFS 2022-23]

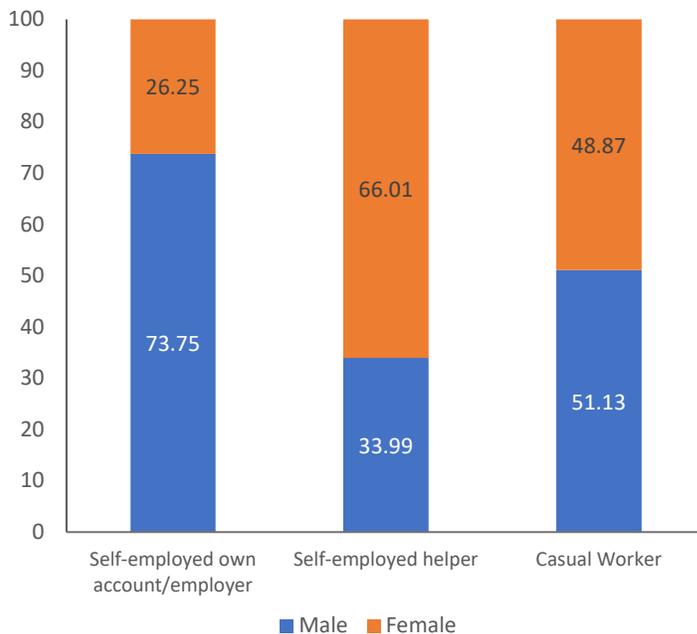
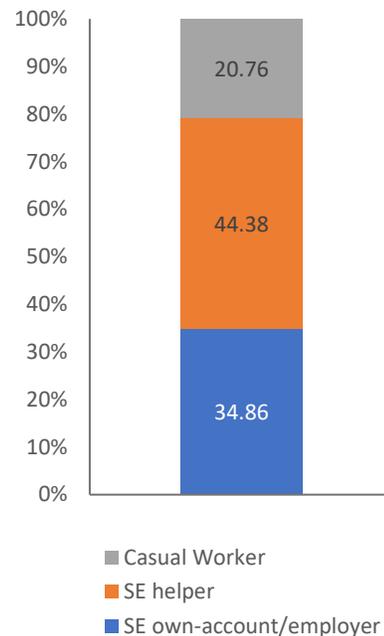


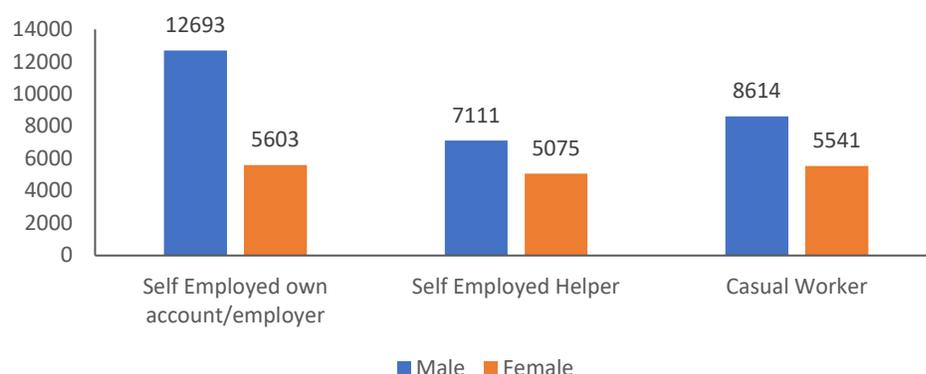
Figure 2(b) Split of women in agriculture by the type of work



² The type of work or work status is defined in the Periodic Labour Force Survey into three primary categories. (i) Self-employed (ii) Regular wage/salaried employee (iii) Casual labor. In the rural agricultural context, very few of the workforce falls under the regular wage or salaried categories, so this is omitted and instead the self-employed category is divided into 2 categories. The first is self-employed own account worker/employer, which includes Self-employed persons who operated their enterprises (farms in this context) on their own account or with

women report being own account workers / employers, with the remaining 66 percent reporting being self-employed helpers in household agricultural operations. This is in sharp contrast to the figures for men, where 73.75 percent report being own account workers /employers and only 34 percent report being self-employed helpers. This is corroborated by SAAH 2019 data where the percentage of agricultural households headed by women is only 8.5 percent.

Figure 3: Average monthly wage in INR among men and women by type of engagement in agriculture [PLFS 2022-23]



Second, women earn substantially lower wages compared to men across all types of agricultural work (Figure 3). The wage gap is highest among those who are running /managing their own farms with male self-employed agricultural workers earning INR 7,090 more per month than their female equivalents. Hence, when women are farm managers/owners, they report earning 56 percent less than their male counterparts. This disparity holds across other employment types, with female self-employed helpers on family farms earning 28 percent less than men and female casual laborers earning 36 percent less than men.

Existing data sources do not show a disparity in participation in HVA, but better data on women farmers is needed to make robust comparisons. As per SAAH 2019, 40 percent of Indian Agricultural households are engaged in HVA, i.e., growing non-cereal cash crops. This proportion holds across both male and female-headed households, although as noted above, the data on female-headed households grossly undercounts the number of female operated farms. SAAH 2019 reports that 8.5 percent of agriculture households had women as household heads³. This value remains constant when looking at the gender of the head of agricultural households across cereal and HVA during both cropping seasons (Figure: 4a). These gaps marginally increase when seen intersected with caste. Schedule Caste (SC) women-headed households form only 6.6 percent of the high value cultivators, which is approximately 1.5 percentage points lower than “Others” and Other Backward Caste (OBC) group individuals. Furthermore, male headed farm production has higher returns when engaging in HVA than women-headed farm operations engaged in HVA. In the Kharif season [June – November], male-headed HVA households produce 30

one or a few partners and who by and large, ran their enterprise with or without hiring any labor. The second is self-employed helper which refers to persons who were engaged in their household enterprises (farms in the agricultural context), working full or part time and did not receive any regular salary or wages in return for the work performed were considered as helpers in household enterprise. They did not run the household enterprise on their own but assisted the concerned person living in the same household in running the household enterprise.

³ This could be individual or joint operation. Additionally, 10.6 percent of self employed in household farming activity are women- the concurrent value for this in PLFS is 22%. This is likely a result of the sampling for this survey, the reporting is done by the household head and not the individual themselves. For this note we utilize the gender of the household head as the primary gender indicator for heterogeneity since being self-employed in the household enterprise does not mean that the women has decision making power on the income or workings of the farming activity. There is indicative qualitative evidence to this in literature.

percent more than female headed HVA households (Figure 5) compared to a gap of only 18 percent among cereal crop producing households. The gender earnings gap is standard across the Rabi season at 23 percent for cereal and cash cultivation.

Figure 4a : Split of household head's gender by caste group among cereal and high value cultivators [SAAH 2019]

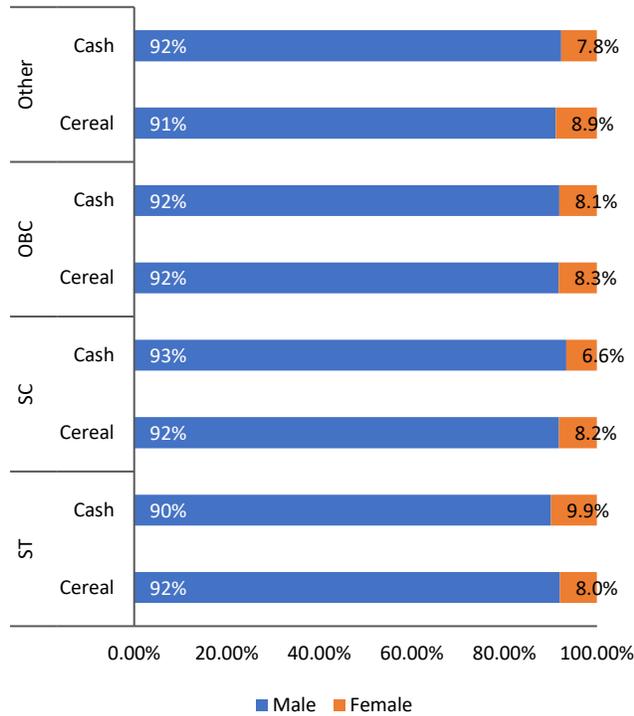


Figure 4b: Percentage of households by household head gender and majority high value crop per season

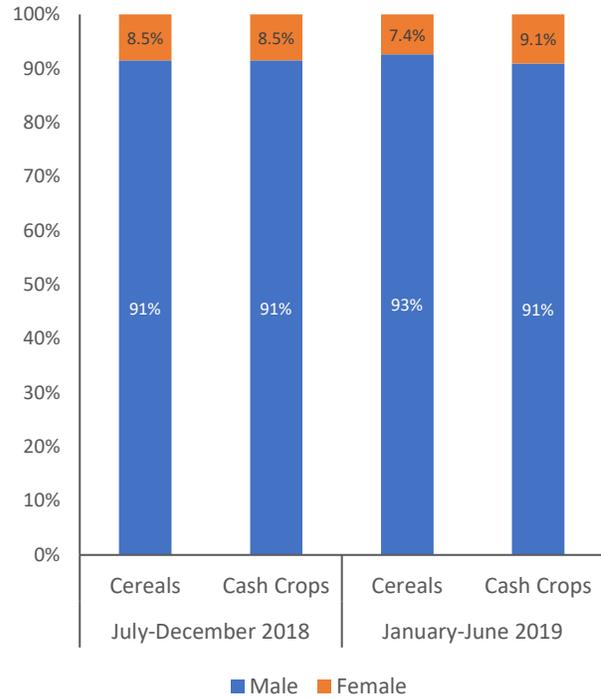
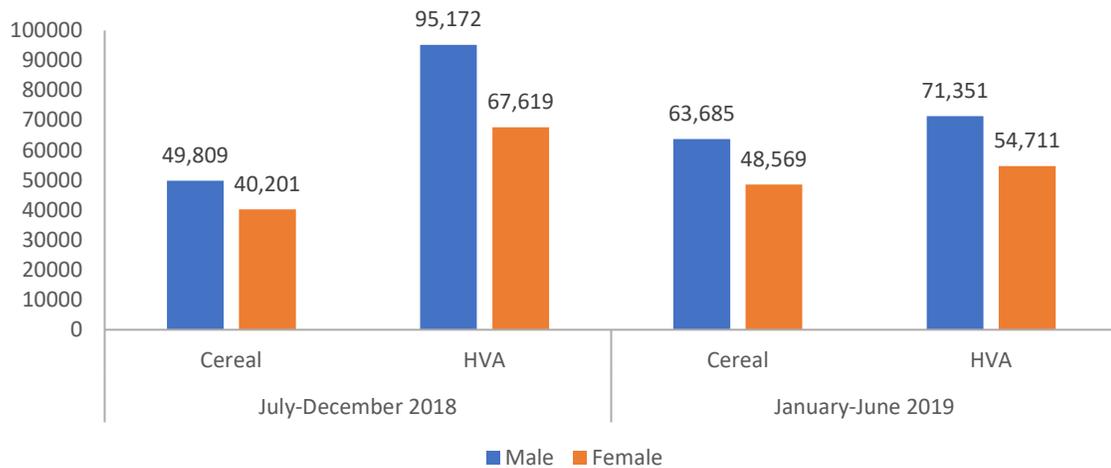


Figure 5 : Average total output value (in INR) by household head gender and majority high value crop per season [SAAH-2019]



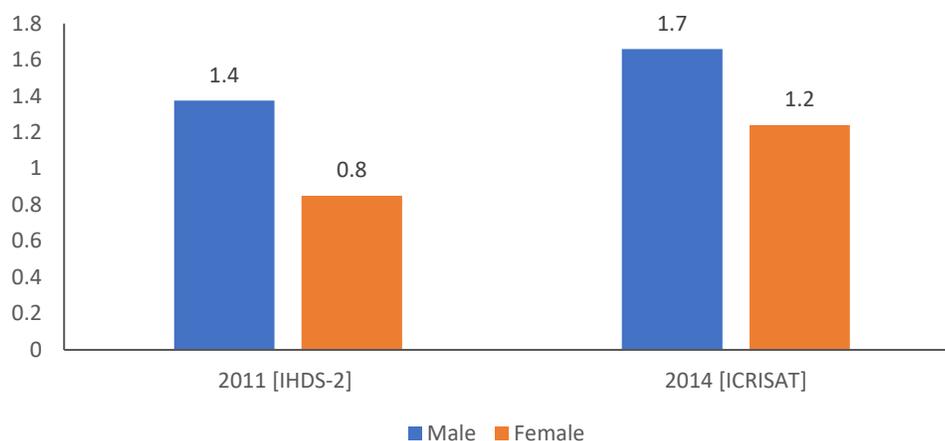
IV. Barriers to Women’s Engagement

Several studies provide evidence on gendered productivity gaps in the agricultural sector between women and men, with the magnitude of the gaps ranging between 10 and 28 percent depending on country and the crop cultivated^{ix}. These gaps are attributed to (i) gaps in endowments, for example, smaller land sizes and lower quality of land owned by women (ii) input gaps such as lower access to credit and inputs, and (iii) labor market imperfections, i.e., lower ability of women to employ male labor and lower returns from such labor. Broadly, these barriers can be categorized under two areas: endowment gaps, and differential access to services and inputs. In addition to these, there is also growing evidence on the impact of social norms on differential outcomes for women. This section focuses on the full range of barriers around economic outcomes with a view towards informing intervention design, enhancing food systems transformation, agricultural diversification, and better jobs in agricultural value chains for women⁴.

A. Endowment Gaps

Access to land is a major constraint for women in India. According to the latest round of the NFHS household questionnaire, only 11.6 percent households have women who own any agricultural land^{xi}. The prevalence of patriarchal inheritance laws and male-biased norms on inheritance has historically limited women’s access to immovable and productive assets such as land. The Hindu Succession (Amendment) Act, 2005 granted women (daughters) equal right to inherited property. The modifications to the law however have not translated into land inheritance for women. Women are more likely to inherit land as widows rather than as daughters^{xii}. Other modes of acquiring land are also skewed against women. For example, government initiatives to redistribute wastelands to landless households, recognize households as a single unit assuming the resources are distributed equally among all household members. However, evidence^{xiii} shows that both statutory and customary land tenure systems favor men, putting women at a disadvantage. Additionally, men and women do not necessarily pool resources within the household^{xiv}, leaving women vulnerable despite household ownership of land.

Figure 6: Average ownership of cultivated land by gender in hectare (2011 and 2014)



⁴ In the Indian context, given substantial production success in cereals, interventions focus on agricultural diversification, particularly into higher value and nutritional crops; increased capacity to link to markets through post-harvest infrastructure, processing and market information; and climate resilience and emissions reductions. Therefore, the note leaves out other sets of interventions with key gender linkages including intra-households dynamics and nutritional outcomes.

Furthermore, when women do own land, they are more likely to hold smaller landholdings^{xv}. For land that is owned by a single individual^{xvi} (single land holding) the average size of land owned by women is lower than that owned by men across all land size classes (See Figure 8). Seen in comparison to single land holding the average size of land in joint holding is slightly higher. Nevertheless, the same study shows that women are not only disadvantaged in the number of single and joint ownership titles but also in terms of the size of land parcels they hold compared to men. SAAH 2019 does not capture ownership of land title by gender. However, tabulating household owned agriculture land by gender of head of household shows significant differences in the pattern of land ownership between male and female-headed households. Over 65 percent of households that are headed by women have small or marginal land holdings compared to 48 percent of households that have men as their household heads.

It should be noted that household-head is not the best proxy for land ownership. A

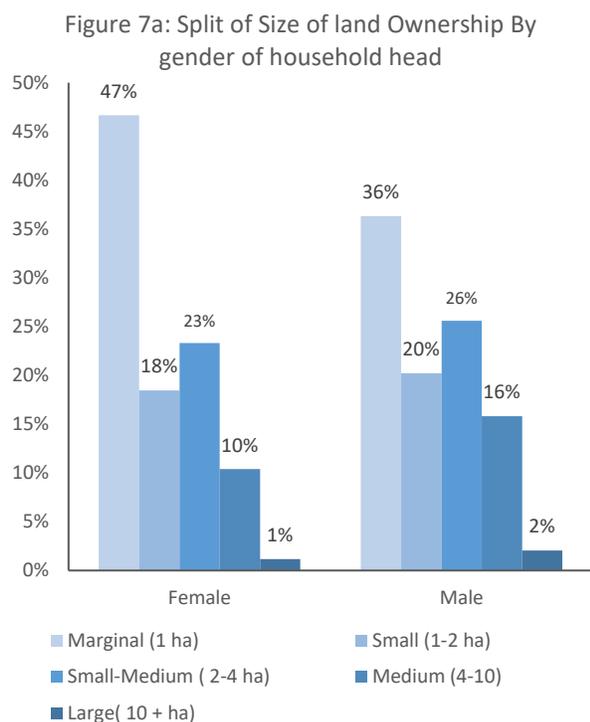
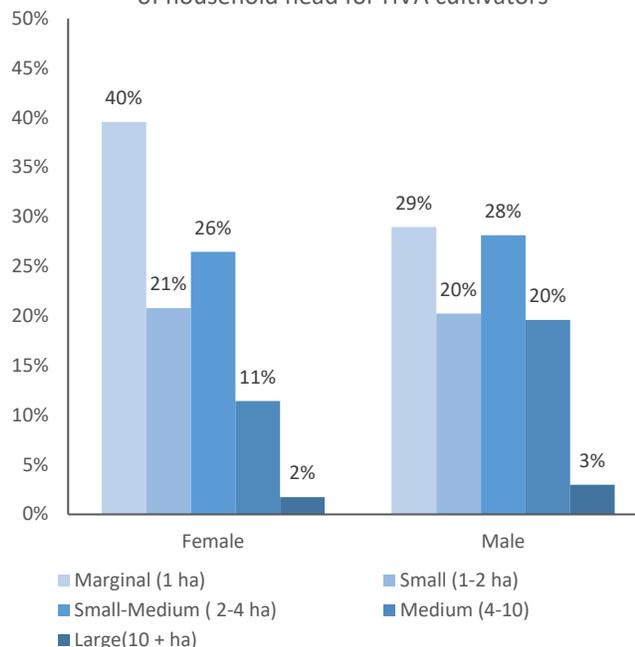


Figure 7b: Split of Size of land Ownership By gender of household head for HVA cultivators



2021 study^{xvii} found that only 41 percent of female household heads were also landowners, and not all female household heads will also hold land titles. Better data is needed to make more robust comparisons.

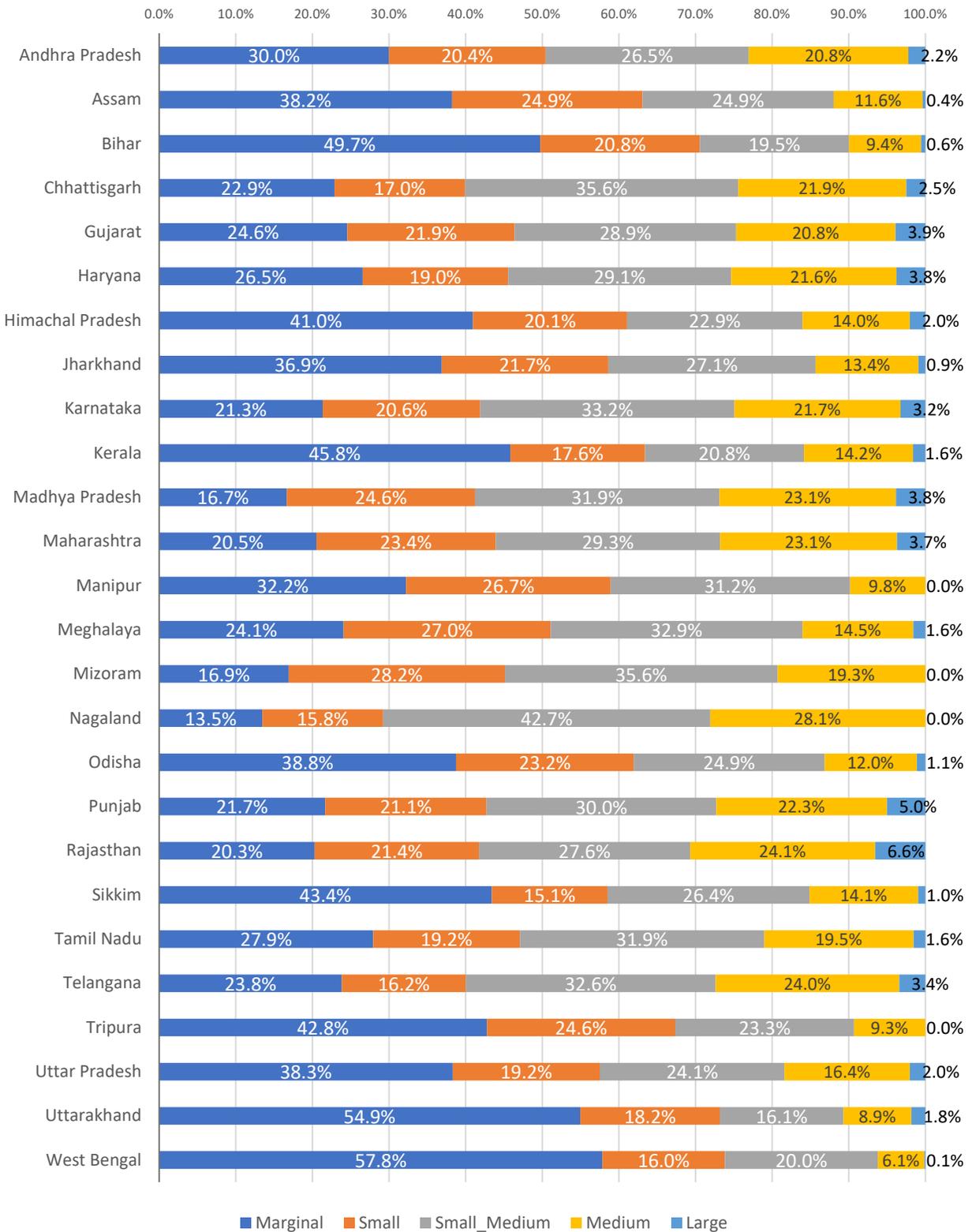
The picture does not change drastically for HVA cultivators. 60 percent of female household heads who are high value cultivators have small or marginal landholdings compared to 49 percent of male household heads in the same category. The average land parcels owned by men and women show significant variations across states in India. States such as Tripura (67.2 percent) Uttarakhand (66.2 percent) and Bihar (61.4 percent) have the highest number of female marginal farmers compared to states in the Northeast such as Nagaland (18.5 percent) and Mizoram (25.5 percent) that have the lowest number of female marginal farmers. On the other hand, Punjab (6.8 percent) and Gujarat (3.3 percent) have the most

female landowners who have large plots of land. Overall, we find that women famers' landholding size tends to be smaller than men's land holdings across states.

Human and social endowments

Membership in group organizations enhances access to information, training and knowledge for women, but disaggregated data on membership of women in agricultural cooperatives is not uniformly available. There is evidence that increased social capital reflected in access to networks and membership in group organizations improves productivity of women-managed farms through enhancing access to information, training, and knowledge^{xviii}. For example, evidence from the World Bank supported Jeevika program that facilitated the development of women's community based agricultural extension systems shows that women were able to increase their farm-level return per unit of produce by 15 to 20 percent by collectivizing and forming Farmer Producer Organizations (FPOs) and Farmer Producer Companies (FPCs)^{xix}. Collectivization into cooperatives and FPOs has been a central tenet of agricultural development programs in India. Recent data released by the Government of India puts the total number of cooperatives in the agriculture and allied sectors as of 2024 at 26,876 and agricultural primary credit cooperative societies at 92, 516 (not including fisheries, livestock, and dairy cooperatives). In response to parliament questions in 2021 the Union Minister for Agriculture said that NABARD had promoted 5,073 FPOs, of which 178 or 3 percent were exclusively women's FPOs^{xx}.

Figure 8 :Percentage of female-headed agricultural households by size of agricultural land holding across states



B. Gaps in Access to Services and Inputs

I. Lack of access to Finance

India has made significant strides in women's access to credit through flagship interventions, but women-headed households take less agricultural loans than male-headed households and data on differences in loan sizes is not available. Women are often not recognized as a demographic in need of formal agricultural finance. Data from SAAH 2019 shows that 41 percent of women-headed households take loans compared to 51 percent of male-headed households. 50.9 percent of these women report taking agricultural loans, while 49 percent take loans for other purposes⁵. In comparison, a higher proportion men (62.4 percent) take agricultural loans.

Figure 9 : Percentage of agriculture households loan taking households with agriculture loans by gender of HH

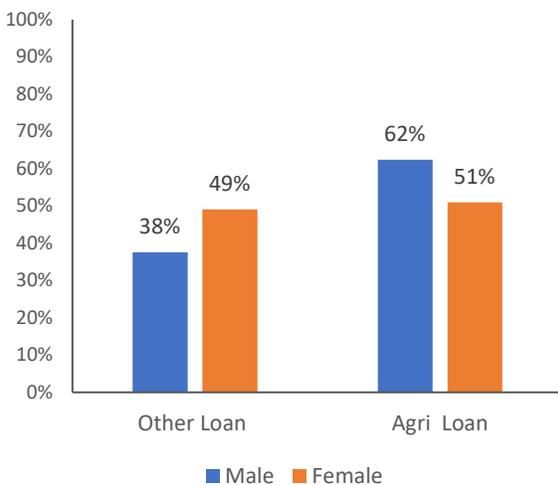
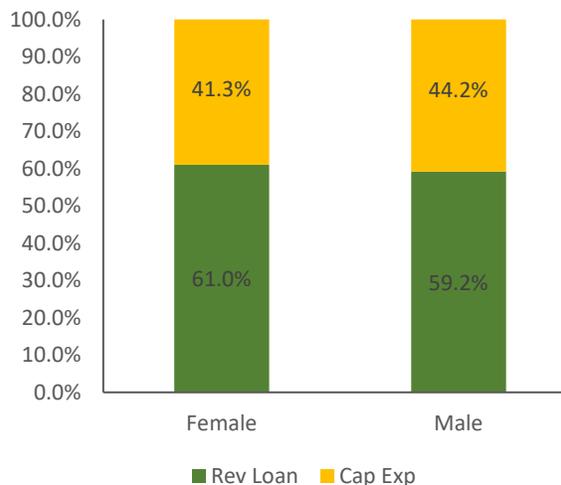


Figure 10 : Split of Revenue and Capital Expenditure loans for agriculture by gender of HH

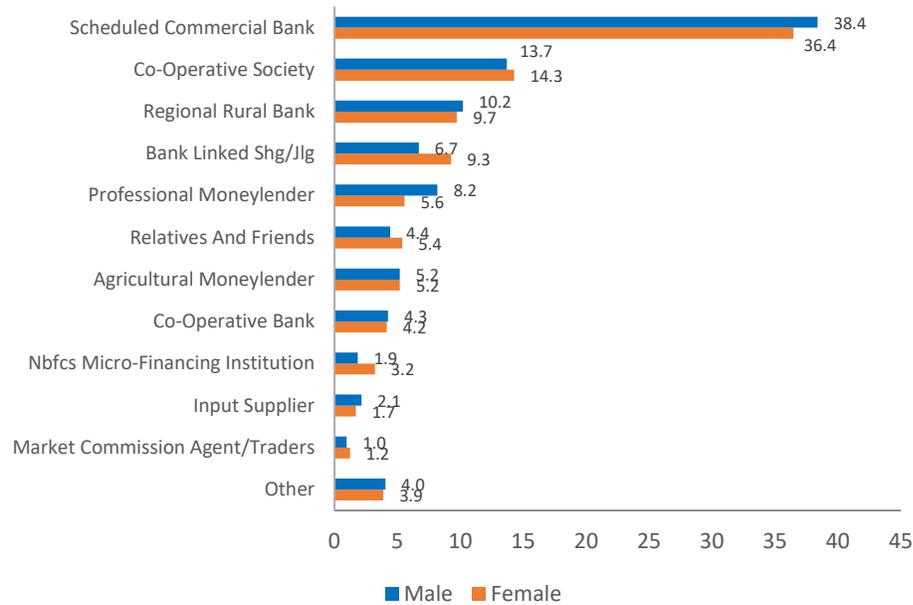


Furthermore, data is not available to ascertain if female household heads also own the land they cultivate, and it is possible that only women who own land have access to formal finance as they have collateral. Additionally, there is no data on the amount of loan taken, therefore we do not know if women are also getting smaller ticket loans owing to their smaller land holding sizes. The data also gives us little insight into ease of loan applications, or the access landless farmers (irrespective of gender) have to formal finance.

The available data however does show that women and men utilize loans for revenue and capital expenditures in the same proportion. The data suggests that once women gain access to finance their loan taking patterns for types of loans are similar to that of men. Figure 11 disaggregates loans by sources of finance, which do not show significant variation by gender of household head.

⁵ Other purposes include – Non-farm business, housing, marriage, basic necessities, education, medical, other consumption and anything else.

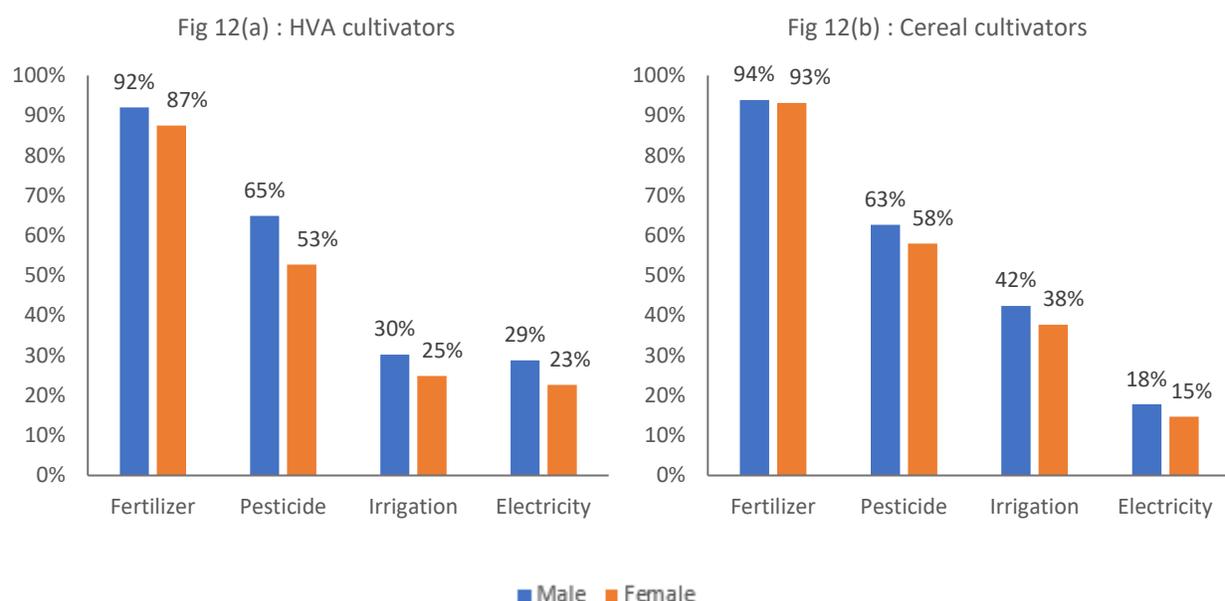
Figure 11: Percentage of agriculture loans by source among male and female led agriculture households



II. Access to farming inputs

Women-headed households are significantly less likely to be using pesticides, irrigation and electricity, but the gap in usage rate of fertilizers is small. Male-headed households report marginally higher utilization of fertilizers at 88 percent compared to female headed households at 84.5 percent. The overall utilization for inputs such as irrigation and electricity are much smaller with only 35 percent and 19 percent of agriculture households reporting having used irrigation or electricity in their operations across both crop-cycles. The low overall utilization is uniform across genders with a gap of around 5 percentage points observed in irrigation (35 and 30 percent) and electricity (20 and 15 percent) for male and female-headed households respectively. However, both overall utilization and gender gaps in utilization are higher for pesticides. Male-headed agricultural households (60 percent) use pesticides by 10 percentage points more than female headed agriculture households (50 percent).

Figure 12: Percentage of Households by gender of household head that utilized different inputs SAAH - 2019]

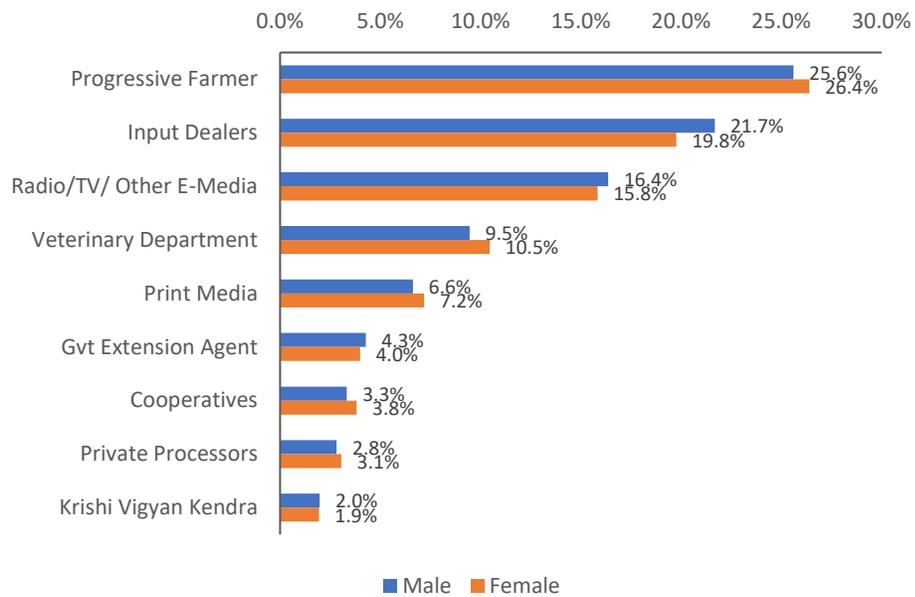


Further cross-section by crop-type shows higher utilization of inputs by agricultural households cultivating cereals for all inputs barring electricity. The utilization gaps between cash and cereal crop cultivation are marginal for the more commonly used inputs - fertilizer and pesticide - ranging from 1.9 percentage points to 4.3 percentage points across both male and female headed households. Conversely, irrigation and electricity see higher gaps by crop type although these gaps are similar for both male and female households. Hence, there is no clear trend in gender gaps when intersecting with crop-type that is cultivated.

C. Extension Support and Technical Advice

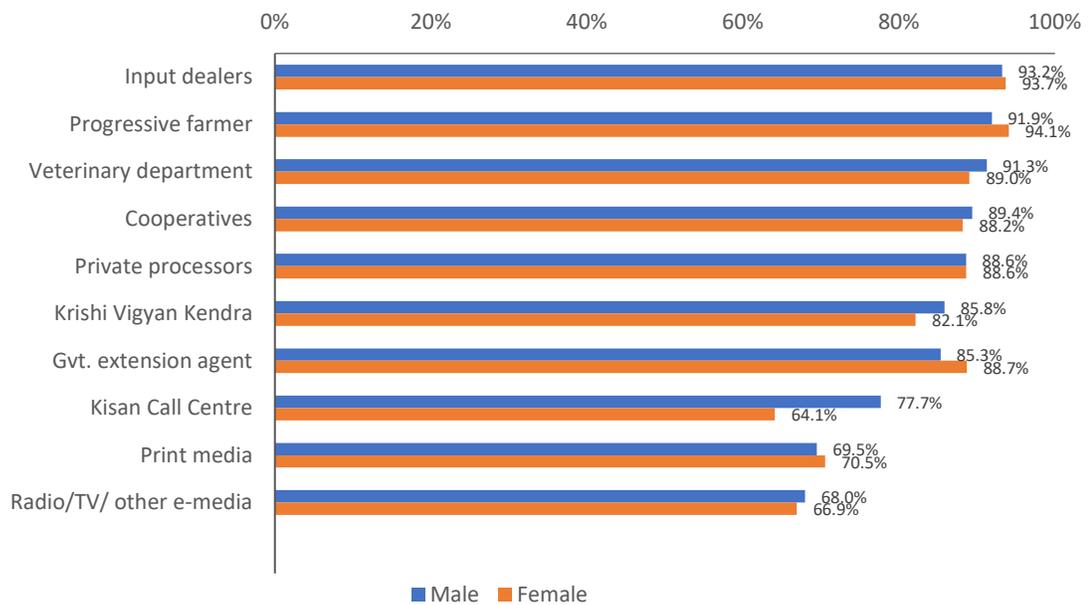
While available data does not show significant differences in access to extension services by gender of household head, there are significant differences in the adoption of improved practices by source of extension support. Access to technical advice on the latest agricultural practices is crucial in enabling farmers to improve productivity. A study conducted by the World Bank across countries in Africa showed that structural constraints such as domestic and household duties, care work, and social and cultural norms limit women's access to and use of extension services and technical advice. As extension services are not tailored to meet women's needs, these services often benefit men more than they do women^{xxi}. In India, The SAAH 2019 reports that 86 percent of the agricultural households received some form of technical advice. 25 percent of agricultural households receive this technical advice from progressive farmers, which includes farmers or farmer organizations or associations that provide information and advice to farmers. This is followed closely by input dealers. There are no significant gender differentials visible in which sources are accessed by male and female-headed households.

Figure 13 :Percentage of Agricultural Households that have received technical support by source



Adoption of advice received is high with 85 percent of both male and female-headed agricultural households that receive advice adopting the practices. The highest adoption rate by source of extension advice is Input Dealers for male-headed households (93.1 percent) and Progressive farmers (94.1 percent) for female-headed households.⁶ The gendered gap in adoption rate is highest at 13 percent when advice is received from Kisan Call centers.

Figure 14: Adoption rates of technical advice by source for male and female headed agricultural households



⁶ The graph only shows adoption rates for sources that had more than 1 percent of the households receiving advice.

D. Normative barriers and aspiration gaps

Addressing harmful social norms and aspirations gaps are critical to enhancing women’s participation in HVA. There is significant evidence of the impact gendered norms have on women and men’s participation in and benefit from agricultural activities and programs^{xxi}. For example, in many countries in South Asia, tasks considered to be more difficult and physically demanding like ploughing are seen as masculine and the domain of men. Similarly, gendered norms dictate that women must consult with their husbands and other male household members before taking decisions about their own assets, limiting their decision-making power. Additionally, as evinced by data above, gender norms are an important driver of differential starting endowments and differential access for women. Gendered norms influence local property rights and inheritance practices and have led to women owning little to no land or smaller plot sizes and lower quality land. Often, land ownership determines control over and access to other resources, for example access to extension services and agricultural loans. Prevalent social norms have led to services excluding women from relevant knowledge and further alienating them from being recognized as farmers. Furthermore, women’s identity as farmers is diluted as they are often seen as the farmer’s ‘wife or daughter’ regardless of their contribution to farming activities . These issues become starker in the context of HVA and domains such as marketing, retail, and trade. These areas have traditionally been viewed as the men’s domains and have systematically excluded women from participating.

Another important area dictated by social norms is the disproportionate amount of unpaid domestic and care-work undertaken by women. Gendered expectations that women are primarily responsible for childcare and housework, while men take charge of productive activities makes invisible their contributions to household income^{xxiv}. The disproportionate burden of unpaid work also leaves women with little time to actively engage in other activities. For example, an assessment of time use patterns by women farmers in the Democratic Republic of Congo found that women spent 20 hours a week on domestic and care work, relative to only 7 hours for men, and that the women themselves considered the increased burden as a negative factor on productivity of their farms, and the farms they managed suffered from 26 percent lower productivity than those managed by men^{xxv}.

Related to restrictive social norms is the question of aspirations, specifically women’s aspirations to join the agriculture sector. There is increasing evidence on the importance of aspirations in affecting economic outcomes. Aspirations determine economic behavior^{xxvi} and lower aspirations among the rural poor are correlated with reduced investments and efforts in productive activities

^{xxix}, which looked at young rural men’s and women’s work aspirations and pathways in India, Morocco, Mali, Malawi, Mexico, Nigeria, and the Philippines found that gender norms that discriminate against women in agriculture discouraged young women from aspiring to agriculture-related work. Additionally, it found that gendered norms that characterize agriculture as a man’s job or a masculine profession tend to restrict women and girls from learning and trying out new and innovative agricultural practices, limit their opportunities in the agricultural space and move their aspirations away from agriculture^{xxx}.

V. Interventions for Enhancing Participation of Women in HVA

This section focuses on interventions to address the gender barriers described above, including interventions implemented under World Bank supported projects. Table 1 provides a summary of interventions.

Table 1: Summary of Interventions

Gaps / Barriers	Covered under existing Policy Framework	Covered under current public program design.	Summary of Interventions
Data on women's participation	Y	N	<ul style="list-style-type: none"> • Changing design of flagship sectoral surveys such as the SAAH to capture accurate information on women-operated farms. • Training and gender-sensitization of surveyors to specifically include women in the sample. • Adding gender-disaggregated data collection to flagship government schemes and interventions. • Regional sample surveys as part of project interventions.
Land ownership and title.	Y	N	<ul style="list-style-type: none"> • Raising awareness of women farmers on relevant legislation and their rights vis-à-vis land ownership and maintaining land records. • Deploying trained paraprofessionals to provide legal and administrative support to women.
Access to Farming Inputs			
Extension	Y	Y	<ul style="list-style-type: none"> • Increasing proportion of women farmers covered under extension programs and Field Level Demonstrations. • Addressing access barriers by providing extension services closer to farms; flexible timings; increasing the proportion of women extension service providers; and ongoing mentoring support to increase adoption rates.
Credit	Y	Y	<ul style="list-style-type: none"> • Supporting financial service providers, including digital financial service providers to expand coverage of women farmers.
Other Inputs	Y	N	<ul style="list-style-type: none"> • Increase proportion of women farmers covered by fertilizer and other input access programs through targeted interventions.
Aspirations and Social Norms	Y	N	<ul style="list-style-type: none"> • Identify specific problematic social norms and aspirations and transmission pathways. • Develop an engagement strategy and communications strategy. • Measure changes in targeted norms and aspirations as a result of interventions.

1. **Strengthening gender-disaggregated data collection:** A key intervention to address gender barriers is changing the design of flagship sectoral surveys such as the SAAH to capture accurate information on female-operated farms, which can allow for better comparison on gender gaps

between male and female operated farms. Specific regional surveys as part of project interventions can also identify gender gaps related to states, regions and crops that can support better targeting and intervention design for disadvantaged groups. Training and gender-sensitization of surveyors to specifically include women in the sample is also important given the evidence that women may be seen as only ‘helpers’ on the farm, and that their role as workers and primary farmers tend to be underreported, sometimes by women respondents themselves^{xxxii}. In addition, adding gender-disaggregated data collection to flagship government schemes and interventions, such as the Kisan Credit Cards, and disaggregated data for membership in cooperative societies and FPOs is critical to quantify existing gender gaps and enhancing participation of women in these schemes.

- 2. Enhancing access to and control over land:** Interventions in this area have focused on three aspects: training women to raise their awareness of their land-related rights; establishing legal assistance centers to support women on legal issues; and actual purchase and transfer of land to women. The World Bank supported Andhra Pradesh Rural Poverty Reduction Project (APRPRP) (2003 -2011) supported the Society for Elimination of Rural Poverty (SERP) in Andhra Pradesh to provide legal support services to rural poor women to enhance their access to land. SERP, which pioneered women’s Self-Help-Groups (SHGs) for access to finance and livelihood support interventions, identified several challenges for poor women to access their land rights including lack of awareness on land rights, lack of access to formal records, inaccurate or disputed formal titles and weak dispute resolution mechanisms. SERP developed a cadre of trained para-legals, undertook public consultations to identify land-related problems, coordinated with the revenue department to make land records publicly accessible and set up legal assistance centers to assist women with land-related disputes. Between 2006-2010 more than a 1.1 million land-related issues were identified, of which close to 90% were successfully resolved^{xxxiii}. SERP also implemented a land-purchase program under which productive irrigated government land was identified by SHGs, purchased through subsidized loans and grants, and transferred to women SHG members. A total of 2,718 acres were purchased and handed over to 3,137 beneficiaries^{xxxiii}.

A similar intervention by LANDESA, in partnership with the Land Reforms Department in West Bengal, was initiated in 2016 to develop and implement the Women’s Land Literacy (WLL) program. Landesa collaborated with the West Bengal State Rural Livelihoods Mission (WBSRLM) to implement the WLL program across the state through WBSRLM’s network of women’s SHGs. Landesa provides training materials, Training of Trainers (ToT) and Monitoring and Evaluation support. Master Trainers trained through the project train SHG federation leaders, who in turn train SHG women on a variety of land-related issues including maintaining land-ownership records, managing land transactions, and legal provisions and protections for women’s land rights such as equal inheritance and joint titling. Sangha Service Centers (SSC) were established to support women and men on procedural work with the land administration apparatus. Assessments conducted with trained women six-months post participation in the WLL program found that women had increased awareness of procedures required to access land rights and of government departments dealing with land records.

- 3. Enhancing access to inputs and markets:** There have been several interventions that seek to enhance access of women to different farming inputs.

- a. Finance:** Targeted interventions that enhance timely access to credit can increase household incomes and support agricultural diversification. Interventions under World Bank projects include subsidized credit through community-led structures such as SHGs and SHG federations; and targeted technical assistance to women farmers to apply for agricultural loans. Deendayal Antyodaya Yojana - National Rural Livelihoods Mission (DAY-NRLM) has mobilized significant commercial credit to women's SHGs. As of August 2024, there are approximately \$32 billion in outstanding loans to 8.6 million SHGs. But individual loans taken by women within SHGs are typically of smaller sizes and cannot replace individual access to agricultural loans and credit programs. In an effort to universalize access to formal banking in India, 354 million individual no-frills bank accounts have been opened as part of the Pradhan Mantri Jan Dhan Yojana (PMJDY) as of August 2024. Of these, 296 million, across both urban and rural areas, are women account holders. While average deposits in these accounts are low at only \$79, the creation of individual bank accounts for women at scale provides an important opportunity for targeted agricultural credit interventions. Digital Financial Services (DFS) interventions have also shown promise in enhancing access to credit for women farmers, enabling them to make financial transactions without going to a bank branch. A recent intervention by the World Bank supported Technical Assistance (TA) to three financial service providers (FSPs) to scale up coverage of women farmers^{xxxiv}. The TA supported the FSPs to do a needs assessment, design new financial products, and tailor existing financial products to the needs of women farmers.
- b. Extension support:** Interventions in these areas include structuring extension programs to target women farmers and to be more responsive to their needs, including providing extension services closer to farms, having flexible timings for extension programs, and increasing the proportion of women extension service providers. A Randomized Control Trial in Mozambique found that female farmers were more likely to learn about improved technologies when female extension workers were added to the traditionally male-dominated extension network^{xxxv}. However, the study also found that adoption rates still lagged male farmers suggesting that additional support measures to women farmers are needed post-extension support to raise adoption rates.

In India, the primary node for last-mile agricultural technology demonstrations is the 731 Krishi Vigyan Kendras (KVKs). A critical intervention is to enhance outreach and effectiveness of the KVKs in targeting women farmers, including increasing the proportion of women being covered under extension programs and Field Level Demonstrations (FLDs). There are also several examples of enhanced extension support to women under World Bank supported projects. The Jharkhand Opportunities for Harnessing Rural Growth (JOHAR) project trained and deployed women community animal health service providers to provide extension support to livestock rearers, who tend to be women. The project hired a specialized technical agency to train 10 Master trainers, who in turn trained over 1,000 women livestock paraprofessionals. 70 percent of these paraprofessionals were then assessed and certified by the Agriculture Sector Skill Council of India (ASCI) to ensure a high common standard of services. The State of Maharashtra Agriculture and Rural Transformation (SMART) Project

explicitly targets women as part of their extension and technology-demonstration programs and has so far covered 9,000 women-farmers.

- c. **Other farming inputs:** Evidence from other countries suggests that once access constraints are addressed, the difference in adoption and usage rates of inputs such as fertilizers and improved seed varieties between male and female farmers is small, suggesting that focusing on enhancing access to these inputs to female farmers will lead to greater usage^{xxxvi}. An assessment of fertilizer use by male and female-headed smallholder farmer households found only a 4 percent difference in adoption of chemical fertilizers once differences in household and village characteristics were accounted for^{xxxvii}. Interventions that specifically target women farmers show significant impact in enhancing input usage. An intervention providing fertilizer grants to women farmers in Mali found that they significantly increased both fertilizer use and complementary inputs such as herbicides and hired labor^{xxxviii}.
- d. **Mobilization into groups:** In India, agricultural interventions have typically involved collectivization of women farmers into groups as a means to enhance access to specific inputs such as credit, inputs such as fertilizers, and access to markets. DAY-NRLM has, as of March 2024, mobilized approximately 103 million women into 9 million SHGs, and used groups as a vehicle to deliver access to credit and livelihoods support services. A recent impact evaluation^{xxxix} found that program households improved agricultural incomes by approximately \$53 over a five-year period, primarily due to enhanced access to credit for agricultural investments, and were 10 percent more likely to be engaged in HVA. In addition, between 2014-2020, more than 285,000 women farmers have been mobilized into commodity-based FPOs, with 10 particularly successful examples undertaking market transactions on behalf of 16,000 shareholder women farmers with each FPO's annual business turnover averaging \$1.2 million^{xl}.

However, group-based intervention models need to ensure that there are specific additional interventions particularly targeting desired agricultural outcomes. A recent review found that group-based models provided a means to reach large numbers of women with resources, information and training, but that they generated impact mainly in the core focus area of the intervention^{xli}. In other words, interventions that seek to enhance participation of women in HVA specifically need to include interventions that address agricultural parameters.

The State of Maharashtra Agriculture and Rural Transformation (SMART) project targets women who have already been mobilized into SHGs, drawing from this pool to form commodity-based FPOs; providing credit and extension support to expand their production of HVA crops; and providing ongoing hand-holding and mentoring support to help them link to commercial buyers. As of August 2004, more than 400 women's FPOs have been formed covering a range of HVA commodities.

- 4. **Changing social norms and aspirations:** Interventions that change aspirations are an important but under-served area of interventions under agricultural programs targeting improved outcomes for women. Interventions in this area include communication campaigns, individual and family

counseling and mentorship programs to change attitudes and social norms. Since outcomes of such interventions are hard to measure, it is important to build in measurement frameworks that can enable feedback and fine-tuning of interventions. Available measurement frameworks include the Women's Empowerment in Agriculture Index (WEAI), which has been adapted to measure specific aspects of aspirations and empowerment.

Project Concern International India (PCI India) has a well-developed intervention model for addressing women's aspirations across a range of sectors including in the agricultural sector. The model seeks to (i) identify through community consultations, specific social norms and aspirations that are barriers to women's full participation and the pathways through which they are being propagated (ii) Develop an engagement strategy to change these norms which includes community mobilization; and development of training curriculum and materials and training delivery structures; and a communications strategy (iii) and using surveys to measure changes in targeted norms and aspirations as a result of interventions. Specific social norms and related pathways PCI identified as hampering full participation by women in the agricultural sector include lack of recognition of women as farmers, mobility restrictions, access barriers to new, advanced technologies; and constraints on decision-making on farm and household issues.

Beyond targeted interventions with women there is a need to engage men and boys. Involving men and boys is a useful strategy to separate their own identities from constricting and harmful norms around masculinity. Work in Gender Based Violence (GBV) prevention shows that women alone cannot shift harmful norms; this requires the equal participation of men to deconstruct and reframe social relationships. While there is little work on transforming norms within the agricultural sector, there is a need for evidence-based frameworks on how best to engage men and boys in gender transformative agricultural programming.

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