FWWB
FRIENDS OF WOMEN'S WORLD BANKING INDIA

Scoping Study

Gender Role in Agriculture, Climate Change and Food Security

JUNE 2025

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Acknowledgement

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Definitions/glossary

- **Farmer Producer Organization (FPO)**

  Here, the terms FPO and FPC have been used interchangeably. However, unless otherwise specified, FPO is used as a generic and umbrella term encompassing all forms of registered farmer collectives, including those formed as producer companies, cooperatives, or societies.

- **Climate-resilient and Sustainable Agriculture (CSA)**

  It refers to an approach in agriculture that sustainably increases productivity, enhances resilience (adaptation), reduces/removes GHGs (mitigation) where possible, and enhances long-term higher productivity and farm incomes under climate variabilities. The term has been used to resonate climate resilient and sustainable practice(s) adopted by farmers in the study area.

- **Practising farmers**

  Farmers, who adopt and promote CSA practice(s), and often serve as early adopters and community influencers.

- **Non - practising farmers**

  Farmers, who are involved in conventional chemical - based farming, or are practising very rudimentary forms of CSA which has very limited impact overall on sustainability.

- **Mixed FPOs**

  FPOs where women constitute less than 80% of shareholders; typically feature a mix of male and female governance and participation.

- **Women FPOs**

  FPOs where more than 80% of shareholders are women.

- **Men FPOs**

  FPOs where more than 80% of shareholders are men.

List of abbreviations

AKK	Abhayam Krishi Kendra
AI	Artificial Intelligence
APEDA	Agricultural and Processed Food Products Export Development Authority
APCNF	Andhra Pradesh Community Managed Natural Farming
APMAS	Andhra Pradesh Mahila Abhivruddhi Society
APY	Atal Pension Yojana
ATMA	Agricultural Technology Management Agency
AAP	Annual Action Plan
AP	Andhra Pradesh
BoD	Board of Directors
B2B	Business to Business
CBBO	Cluster-Based Business Organization
CEO	Chief Executive Officer
CEEW	Council on Energy, Environment and Water
CSA	Climate Smart Agriculture
DRE	Decentralized Renewable Energy
ERP	Enterprise Resource Planning
FAO	Food and Agriculture Organization
FIG	Farmer Interest Group
FGD	Focus Group Discussions
FPO	Farmer Producer Organization
GoI	Government of India
HH	Household
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
ICS	Internal Control System
ICAR	Indian Council of Agricultural Research
IIMR	Indian Institute of Millets Research
IoT	Internet of Things
KII	Key Informant Interview
KVK	Krishi Vigyan Kendra
MANAGE	National Institute of Agricultural Extension Management
MKSP	Mahila Kisan Shashaktikaran Pariyojana
NABARD	National Bank for Agriculture and Rural Development
NABKISAN	NABKISAN Finance Ltd (a subsidiary of NABARD)
NGO	Non-Governmental Organization
NCDC	National Cooperative Development Corporation
NMSA	National Mission for Sustainable Agriculture
NMMI	National Mission on Micro-Irrigation
NPOP	National Programme for Organic Production
NOP	National Organic Program
NRLM	National Rural Livelihood Mission
OMM	Odisha Millet Mission
PMFBY	Pradhan Mantri Fasal Bima Yojana
PMJJBY	Pradhan Mantri Jeevan Jyoti Bima Yojana
PMKVY	Pradhan Mantri Kaushal Vikas Yojana
PoPs	Packages of Practices
PPF	Public Provident Fund
PG	Producer Groups
PKVY	Paramparagat Krishi Vikas Yojana
PI	Promoting Institution
QR	Quick Response (Code)
RKVY	Rashtriya Krishi Vikas Yojana
SBI	State Bank of India
SHG	Self Help Group
SMART	State of Maharashtra Agribusiness and Rural Transformation
SFAC	Small Farmers Agribusiness Consortium
STIBs	Socio-Technical Innovation Bundles
UN-WOMEN	United Nations Entity for Gender Equality and the Empowerment of Women

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Executive Summary

Introduction

Agriculture is the principal source of livelihood for a majority of women in India, yet they continue to face systemic exclusion from land ownership, financial services, decision-making, and access to climate-resilient agricultural resources. Climate change has further amplified these disparities, deepening women farmers vulnerability due to increased workloads, reduced adaptive capacity, and limited participation in institutional frameworks. In this context, **Friends of Women's World Banking -India (FWWB), through its Agri and Climate Action Program,** undertook a comprehensive **scoping study** to understand and address the gendered impacts of climate change on agriculture FPOs. The goal was to build a gender-transformative, climate- resilient ecosystem where women-led farm collectives thrive and lead.

The study aimed to explore the role of women in agriculture, especially within FPOs, and assess the extent of their leadership, decision-making, and adoption of CSA practices. It also examined the institutional and ecosystem-level factors that enable or hinder women s participation in sustainable agriculture. **The research focused on four states- Andhra Pradesh, Gujarat, Maharashtra, and Odisha,** included focus group discussions (FGDs) with FPO representatives and marginal and vulnerable farmers, along with key informant interviews (KIIs) with experts, NGO partners, and government officials. **Approximately 73% of FPO representatives and 86% of farmer respondents in the study were women, underscoring FWWB's commitment to centering women's voices.**

Findings of the Study

The findings revealed significant gender disparities in agricultural value chains and governance. Women are deeply involved in production and post-harvest activities but are largely absent from decision-making roles and market-facing functions. **Women FPOs**, however, showed stronger financial discipline, higher transparency, and better uptake of CSA practices due to their grounding in Self Help Group (SHG) models and community solidarity. These FPOs tended to diversify into food security crops, promote sustainable techniques, and emphasize community health and wellbeing. In contrast, **men FPOs** were more likely to pursue high-value commercial crops and centralized operations, often backed by better access to finance and infrastructure but weaker governance systems and shareholder benefits and inclusiveness.

Challenges

Despite the progress, several challenges remain.

Many women FPOs struggle with limited capital, inadequate infrastructure, weak market linkages, and lack of exposure to government schemes.

Governance systems within FPOs often reflect gender biases, with women being sidelined in decision-making, particularly in mixed and men dominated FPOs.

Time poverty, cultural norms, and mobility constraints further limit women's capacity to engage in leadership and capacity-building activities.

The study also highlighted that while ecosystem support, especially from NGOs and state government initiatives, has enabled progress, it remains fragmented and not sufficiently gender-sensitive.

Overall Recommendations

This study thus lays the groundwork for transforming India's FPO ecosystem into a more inclusive, resilient, and gender-equitable space, where women farmers are not only participants but leaders in building climate-resilient agricultural futures. Based on these insights, the report recommends an integrated, gender-transformative approach to FPO strengthening.

Targeted capacity building for women in leadership and financial management

Comprehensive value- chain analysis

Enhanced access to low-cost, Decentralized CSA technologies

Stronger parterships for market access

Flexible financing aligned with women's needs

Governance reforms within FPOs to ensure women's representation and voice

Designing inclusive public policies that recognize the intersection of gender, agriculture and climate resilence

FWWB, with its history of empowering women and promoting sustainable agriculture, is committed to building an enabling environment for women farmers. The organization plans to use the findings of this study to develop a Proof of Concept model by supporting 30 FPOs in the coming three years. The vision is to position these women farmer collectives at the forefront of Indias climate-resilient agriculture movement, ensuring not just improved farm incomes and food security, but greater agency and equality for rural women.

Through this work, FWWB aspires to be a leading knowledge and resource institution in the space of gender-equitable, climate resilient and sustainable agriculture.

01 Introduction

1.1 Context

Agriculture forms the principal employer of women globally and in India. **Women represent more than 70 percent of the agricultural workforce in many parts of the world, despite facing persistent problems compared to men in participating as equal economic agents in agribusiness value chains (UN-WOMEN, 2021).** In India, the agriculture sector employs 80 percent of all economically active women, 33 percent in the labour force, and 48 percent as self-employed. Women's participation is 75 percent in crop production, 79 percent in horticulture, 51 percent in post-harvest work, and 95 percent in animal husbandry and fisheries. Women are engaged in agricultural activities mainly as - wage labourers, cultivators on their land, and managers of agricultural activities through labour supervision and certain post-harvest activities (ICAR, 2020).

Climate influenced male-out migration is seen to be an intensifying factor for the feminisation of agriculture in some regions, particularly in South Asia and Central America. Women members of the house who are left behind are burdened towards managing agriculture and domestic responsibilities with less family labour, further exacerbating their vulnerability (Huyer, et al., 2021).

Despite women's dominance of the labour force, intensive involvement, and leadership in many areas of agribusiness (market - facing roles), the majority of women continue to be in low-value crops, concentrated in basic production and low productivity activities, and struggling to leverage lucrative aspects of the value chain (UN-WOMEN, 2021).

There is a **gender gap of 24% in land productivity** with higher production seen by men, and a gender pay gap in wage employment where **women earn only 82 cents for every dollar earned by men** (FAO, The status of women in agrifood systems, 2023).

Evidence shows that women farmers are found to adapt less to climate change due to limited access to information, technology, and decision-making and greater workloads.

With varying abilities to cope and adapt to climate change, their needs, priorities, and realities are often underrecognized and inadequately addressed (CGIAR, 2021).

Women have poor access to family labour, basic agricultural technologies and substantially suffer from increased workloads. Women in India further face an extreme disadvantage in terms of wage pay parity, land ownership, and poor representation in local organizations. These gendered differences in agriculture affect their access to climate change-adaptiveness, which builds a strong case for support for gender equality and climate resilience by adopting a gender-responsive climate-smart agriculture (CSA) approach (FAO, CGAIR, & CCFAS, 2016).

However, women have the potential to significantly enhance the output by 20% to 30%, if they are provided equal access to productive resources as their men counterparts. This could lead to a 2.5% to 4% increase in agricultural food production, subsequently reducing the number of malnourished people by 12-17% (FAO 2017). There is evidence that reduction in gender-based inequality greatly contributes to improving food security and nutrition. Thus, it is through adaptation of climate resilient and mitigation strategies improvements in the lives of small and marginal farmers can be realized. (UN-WOMEN, 2021)

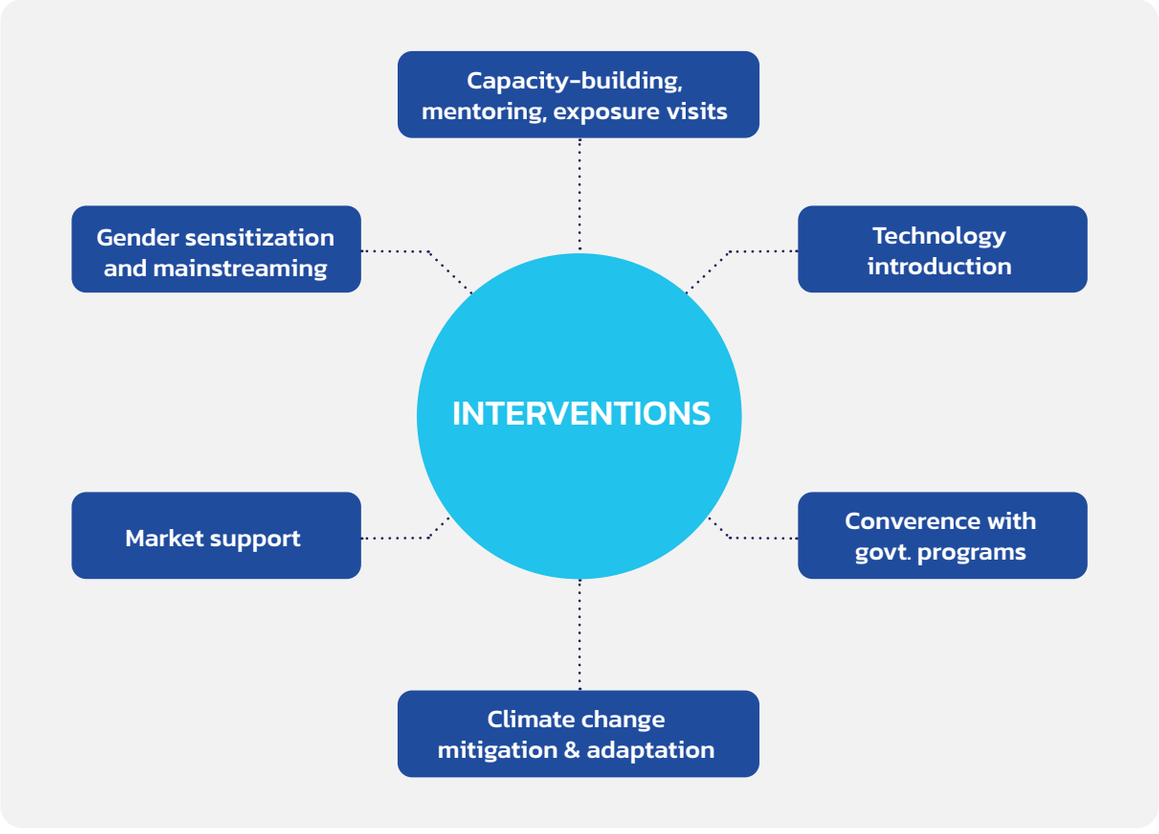
Thus overall, there is a need for adoption of a gender-responsive climate-smart agriculture (CSA) approach and a supportive environment, well-designed interventions, and group-based approaches such as women farm collectives/ FPOs. It is therefore crucial for women collectives to unite and capitalize on the growing commercialization in agriculture and related fields. Supporting institutions that are owned and managed by women is pivotal in enhancing their participation in the food system. This support can be achieved by providing access to vital information and technology, which helps them retain control over decision-making and income from such businesses. Capacity building aspects should be designed and integrated exclusively to create managerial skills and decision-making capabilities, providing exposure to market systems and resilient practices concerning climate change.

1.2 Friends of Women's World Banking, India (FWWB)

Friends of Women's World Banking, India (FWWB), founded in **1981,** empowers women and agri-collectives from low-income households by providing financial and capacity-building services, fostering self-reliance, and addressing barriers like gender, poverty, and limited access to knowledge and resources.

Agri Building and Climate Action Program

Figure 1: Interventions



Over the past decades, FWWB has made substantial progress in the agriculture sector by offering steadfast support to smallholder and marginalized farmers, particularly women. This support has empowered farmer producer collectives and fostered climate resilience across geographies. FWWB recognizes the transformative potential of women's involvement in decision-making and leadership at the Farmer Producer Organization (FPO) level. The agri capacity building and climate action program focuses on empowering women farmers through capacity building, enabling them to adopt climate-resilient practices, enhance economic empowerment, and take on leadership roles. To facilitate access to credit, seeds, equipment, and agroecological knowledge to support value addition, marketing, and sustainable farming. Additionally, promotion of indigenous and sustainable agricultural practices by identifying, documenting, and scaling up climate-resilient methods. The impact includes improved climate resilience, increased economic empowerment, gender equity through leadership, and strengthened food security, benefiting women farmers, their households, and communities while contributing to long-term environmental conservation.

Outreach

Having presence in **9 states and a Union territory,** the program has worked with a strong gender angle, done mentoring, training, and capacity building of over **95 FPOs, 150 women farmer groups, impacting 65000 farmers in India.** The farmers have been linked to govt. schemes, markets and credit. In the coming years, FWWB aims to comprehensively understand, nurture, document, and build evidence by designing a capacity-building strategy and support **30 gender focused farmer collectives from Gujarat, Maharashtra, Andhra Pradesh, and Odisha. It also aims to develop "Proof of Concept"** for promoting climate resilience in agriculture, as it poses a significant threat to global food security and establish itself as a resource institution in the space of gender and smart agriculture space.

FWWB has enhanced gender representation in more than 40 agri-collectives, with at least 22,000 women farmers directly getting impacted by our work and adopting sustainable farming practices through capacity building and on-field demonstrations.

1.3 Purpose and scope of the study

The purpose of the study was to create an enabling ecosystem fostering gender equality in agriculture, enhancing women's role and their access to resources in agriculture, and strengthening climate resilience and sustainability. Also, the aim is to well equip farmer collectives with robust systems and skilled personnel for seamless functioning.

Objectives of the study

In this study, FWWB aimed to explore and underastand the following:

A. Women's role at the farmer collectives' level

- To understand the current efforts of collectives in building climate resilience and sustainable agricultural practices
- To identify women's participation in decision-making and leadership roles (in areas such as sustainable agriculture, governance, financial management, and technology)
- To assess the challenges and constraints faced by collectives in building climate resilient practices and women's participation in the leadership roles

B. Women farmer's role in climate resilience and sustainable agriculture

- To assess the understanding of women on sustainable agricultural practices, knowledge and skills.
- To identify gaps and challenges faced in climate resilient technology access and utilization.

C. Identify key stackholders, and their roles in promoting women's role in Climate resilient and Sustaibale Agriculture (refer to as CSA hereafter)

- Identify stackholders involved in agriculture, gender, and CSA initiatives, and explore their strategic focus, limitations, capacity-building needs and potential collaborations with FWWB, India to strengthen the ecosystem.

02 Literature Review

2.1 Agriculture in the face of climate change

Agriculture in recent decades has been influenced by myriad factors such as urbanization, globalization/de-globalisation, tariff wars, diversification within agriculture and fast growing rural non-farm sector, developments in value chains, start-ups, technological changes including IT, developments in climate change, and emphasis on sustainability. There has been an increase in crop production, especially food grains fruits and vegetables (Dev, 2018).

According to farmer's perception of changes in climatic conditions, most observed changes in perceptions (delayed onset of monsoon, decrease in rainfall, erratic rainfall, decreased rainy days, decreased snowfall, early withdrawal of monsoon, intense rainfall, increase in rainfall), followed by changes in temperature (increasing average temperature, rising summer & winter temperature, decrease in winter period, increase in hot months), and wind pattern and cloudiness (stronger wind, warmer wind, decrease in cloudy days). Some of the common adaptation strategies include changes in sowing and spacing, soil nutrient management, pest and insect management, water management, livestock management, avoiding climatic exposures, use of improved transplanting techniques, shift to climate-ready varieties, upscaling farming, incorporation of efficient irrigation methods, farm mechanization, shifting to the new crop system, changes in land use and labour allocation, changes in employment pattern, locational agricultural field shift, etc. (Datta, Behera, & rahut, 2022).

2.2 Women in agriculture

Feminization of the agrarian distress, has expanded the concept of 'feminization of agriculture' to understand it as a concept that addresses the extent to which women define, control and enact the social processes of agriculture, i.e., how feminization is being played out in agriculture. This definition considers labour, farmland and other resources ownership, decision-making power, and recognition of women's contribution in the public sphere, especially in matters previously understood to be primarily part of the male domain. It was observed that women's participation in agriculture is higher when agriculture is less viable as a livelihood option. The rate of decline of men's participation in agriculture is higher, while the decline in women's participation as cultivators in supervisory roles, decision-making roles and allocation of resources are seen higher.

The relative feminization of agricultural labour and managerial responsibilities will likely guarantee empowerment in a declining and unprofitable profession. They still lack decision-making power concerning access to assets for viable livelihood alternatives and are involved under duress in economic activities left by men. Such type of involvement is termed as 'feminization out of compulsion' or the 'feminization of agrarian distress'. Moreover, the 'feminization of poverty' is seen when women are found to be concentrated as 'agricultural labourers' and 'other workers'.

Several inter-related factors are contributing to this such as fragmented land holdings, degradation of soil and water resources, the decline in access to traditional seeds and other inputs, unreliable and confusing market incentives of crop choice and technology available, labour shortages, mechanization, and limited socio-economic protection (Pattnaik, Lahiri-Dutt, Lockie , & Pritchard, 2017).

In contrast, another research talks about the complexity of gendered power dynamics in the feminization trends and challenging myths such as the feminization of agriculture as a global trend and disadvantageous for agriculture, women as passive victims, and homogeneity in challenges faced by women farmers. It emphasized understanding how women express agency and the factors supporting/inhibiting their ability to enhance HH food security. There is a need to mitigate the factors hindering women's participation in the agri-food system and acknowledge their potential to transform the sector. It sees the higher participation of women as an opportunity to strengthen food security (Kawarazuka, Doss, Farnworth, & Pyburn, 2022).

> In India, despite being the major contributor to agriculture, only 13% of rural women who are engaged in agriculture own land (OXFAM, 2018).

The absence of land rights for women has been a critical barrier to access their rights and entitlements, such as credit, agriculture input subsidies, technology, information and extension. This restricts women's adaptive capacities towards CSA significantly more than men- due to limited access to assets, resources, credit facilities, markets, and information and technology (N.Sharma, Kumar, Ravula, & Tyagi, 2016).

Women often perform a wide set of critical activities throughout the crop cycle, from sowing to harvesting and post-harvesting. They are also primarily responsible for producing secondary crops such as pulses and vegetables, which are key sources of nutrition for their families. However, they rarely participate in agricultural activities that involve travelling outside the

village such as for buying inputs, selling agriculture produce in markets, attending awareness events, or exposure visits to demonstration sites (Nyasimi & Huyer, 2017). Clearly, there is a gendered labour allocation of tasks with women taking more laborious tasks such as composting which disincentivises women in adoption. Limited rights of women in land access and ownership and limited technology ownership has restricted their access to information (Jost, Kyazze, Naab, & Neelormi, 2015). Furthermore, dissemination of information on new seed varieties primarily targets men, while women are often left out owing to cultural norms, restricted mobility, limited access to best agricultural practices, and their negligible decision-making power (Galiè, Jiggins, Struik, & Grando, 2017).

Thus, there is an absolute necessity to focus on women farmers' needs and preferences to achieve complete benefits of CSA (Gumucio, Huyer, Hansen, & Huysen, 2019) in a more organised and collectivised manner through Farmer Producer Organisations (FPOs).

2.3 Collective action through FPOs

The farming community, especially the small and marginal farmers has remained mostly unorganized. With the production costs increasing faster than productivity and production, studies have found that the profit a farmer earns has been declining across the various categories of produce (Birthal, Negi, & Khan, 2014). **Instead of seeing agriculture as a livelihood, it is to be viewed as agribusiness, which necessitated the expansion of extensions beyond just production-based to market-led extension, bottom-up planning, and gender mainstreaming.** The emerging convergence of multiple extension organizations at various levels has gained centrality for strengthening, sustaining, and effective functioning of FPOs (Lakshmi & Chinnamnaidu, 2021)

FPOs have emerged as a powerful platform that brings farmers together, enabling them to collectively overcome challenges and embrace new opportunities.

By **fostering collaboration, knowledge-sharing, and resource pooling**, FPOs empower farmers to navigate the complexities of modern agriculture more effectively.

Furthermore, FPOs are **catalysts for rural development and economic growth.** By promoting value addition, processing, and marketing, FPOs encourage the development of Agri-based industries, generate employment opportunities, and contribute to the overall prosperity of rural communities.

The cascading benefits of a vibrant agri-business ecosystem stretch far beyond individual farmers to impacting a country's food security (Rajiv B. Kale, 2024).

By strengthening collective action, farmers benefit from accessing resources, infrastructure, credit, market, extension services and skill training, transfer of technology, minimizing the cost of production and marketing costs through aggregation. This would lead to the retainment of economic control in operations, integration of environmental consideration through innovation and technology adoption, reduction of transactional costs through bulk buying and selling, of bargaining power, absorption of price risk through product diversification, amplification of farmers' voice, improved income, risk management and achievement of economic viability (SFAC, 2019).

In other parts of the world, producer organization business models are advantageous for women as they enable the creation of favourable outcomes for them such as the creation of paid job opportunities and access to markets, and social services such as training, childcare, and maternity leave. Thus, supporting women to participate and enjoy the benefits of the labour market on an equal footing with men. Within such cooperatives less than 1/3rd of middle and senior level roles are occupied by women, and a few undertake distinct strategies or activities to tackle gender inequality within their structures (Bolin, 2020).

2.4 CSA efforts globally and at India level

Climate change jeopardizes food and nutrition security as it adversely affects food production, diminishes food security, and restricts access to food due to rising prices (Tripathi & Mishra, 2017). Farmers are changing their agricultural practices to the observations seen in the climate, and food security and financial initiatives are considered equally important reasons for this change. Farmers mostly employ short-term adaptation strategies (crop and livestock diversification, altering or optimizing planting dates, land, pest and nutrient management decisions, insurance, and temporary migration), with only small proportion taking long-term and capital-intensive adaptation (like changing crop type and location, modernization of farm, and practicing new/innovative technologies, improved water management practices and permanent migration of labour) (H.D., N.S., & Mathew, 2023).

There has been an increase in access to a smartphone and online tools which has increased the presence of Artificial Intelligence (AI), blockchain, and Internet of Things (IoT) which in turn has increased farmer's access to transparent and real-time data updates on soil health, weather patterns, crop health, biotic and abiotic stresses, advisories, financial and storage services, price fluctuations and much more.

A study scrutinized the effectiveness of various interventions promoting CSA in enhancing farmer's knowledge, the benefits of different CSA approaches and its adoption in low- and middle-income countries. It found a positive impact of knowledge diss emination and capacity-building interventions such as farm field schools, video-mediated learning, and agricultural extension services on improving farmer's knowledge and adoption of pest management and climate resilient seed varieties. However, the scalability and sustainability of these practices are a challenge. There was higher adoption of technology and innovation among farmers who have received knowledge and skills through training programs. The study also underlined **the need for gendered specific tailored interventions as CSA adoption was seen as higher among women.** It emphasized the need for a gender-responsive approach that considers social norms, access to resources, and decision-making dynamics within farming households to be integrated into the interventions (Saran, Singh, Gupta, Sujata, & Rao, 2024).

2.5 Programmatic and policy level efforts so far

The Government of India amended the Companies Act, 1956, by incorporating Part IXA based on the Y.K. Alagh Committee's recommendations in 2002, to establish producer companies, enabling primary producers to operate as corporate entities. In collaboration with state governments, the promotion of FPOs, structured as member-based entities, began as a **pilot program in 2011-12 under the Department of Agriculture and Cooperation (DAC), Ministry of Agriculture**. The year **2014 was declared as the 'Year of FPO'.**

The **Central Sector Scheme 'Formation and Promotion of 10,000 Farmer Producer Organizations (FPOs)'** was formulated to support the formation and growth of FPOs by providing them with financial assistance. In terms of institutional support, there are various agencies supporting FPOs such as NABARD (59%), SFAC (12%), state governments (7%), NRLM (2%), other organization/trust and foundation (19%), self-promoted (1%) (Pani, Jena, & Parida, 2020). All the current categories of FPOs are gender-neutral or gender-agnostic (NAFPO, 2022).

Similar strides are seen in promoting the adoption of CSA in the country. In India, the focus shifted from increasing production to sustainable development **in 2010 when the National Policy on Agriculture came into force.** The climate-centric agriculture policies were further strengthened with the National Action Plan on Climate Change, of which the National Mission for Sustainable Agriculture (NMSA) is one of the missions that covers aspects such as water use efficiency, nutrient management, and livelihood diversification through the adoption of sustainable development pathway by progressively shifting to environmentally friendly technologies, adoption of energy-efficient equipment, conservation of natural resources, and integrated farming.

With such a programmatic and policy thrust, farming communities can now access extension services through pluralistic extension, convergence and public-private partnership models. Pluralistic extension involves planning, implementing, monitoring and evaluation of extension programs through the active partnerships and collaboration with NGOs, CBOs, govt, private and public organizations with the aim to bring sustainable development.

Some of the national policies to support the adoption of CSA include:

The Mission on Micro-irrigation (NMMI)	for adoption of drip and sprinkler irrigation
Rastriya Krishi Vikas Yojana (RKVY)	for promoting agri-business by creating agri-infrastructure
Mahila Kisan Shashaktikaran Pariyojana (MKSP)	the women in Self Help Groups (SHGs) engaged in agricultural activities are empowered by enhancing their participation and productivity
Pradhan Mantri Fasal Bima Yojna (PMFBY)	provides support against risks through insurance

2.7 Gaps faced by FPOs in India

As per the 2023 study (Chandegara, et al., 2023) FPOs face multiple challenges that hinder their growth and impact.

Institutional and policy constraints, such as complex registration processes and bureaucratic delays, affect nearly 45% of FPOs, limiting their access to necessary permits and government support.

Managerial skill gaps restrict efficient financial management, marketing, and value chain integration, with around 60% of FPOs struggling due to inadequate training.

Financial and infrastructural limitations further weaken FPOs, as over 70% face funding shortages, restricting investments in technology and quality inputs, while inadequate storage, processing, and transportation facilities reduce market competitiveness.

Social and cultural barriers, including gender disparities, where only 10–15% of FPO members are women, and caste-based divisions, further restrict participation and collaboration.

Other issues FPOs face include a smaller number of shareholders and equity, internal conflicts and governance concerns.

Overcoming these challenges is crucial for FPO sustainability and success. Solutions include improving credit access through financial partnerships, strengthening infrastructure support, and streamlining regulatory processes. Capacity-building initiatives on governance, financial management, business planning, catalytic credit and market linkages to enhance managerial and technical skills, while policies promoting gender inclusivity and social equity can drive holistic growth. Encouraging research, innovation, and direct market linkages can enhance FPOs' efficiency, profitability, and sustainability (Chandegara, et al., 2023).

03 Research Framework

This section briefly outlines the methodology and sampling strategy adopted to meet the objectives of the study.

3.1 Method used

This study's research methods comprised of a review of relevant secondary research combined with primary data collection. **Qualitative methods** were used for this purpose.

Secondary research

The secondary research involved exploring and pooling data from multiple sources, reports, academic papers, and documents prepared by the Indian Council of Agriculture Research (ICAR), CGIAR, FAO, UN-Women, Govt and non-govt agencies working on gender in climate-smart agriculture. Also, relevant insights were gained on women in agribusiness in the face of climate change. This provided an overview of the gender dynamics in agriculture, women's role, and their access to resources in agriculture and sustainability. Also, it helped in developing an understanding of gender roles, women leadership and decision making in farmer collectives.

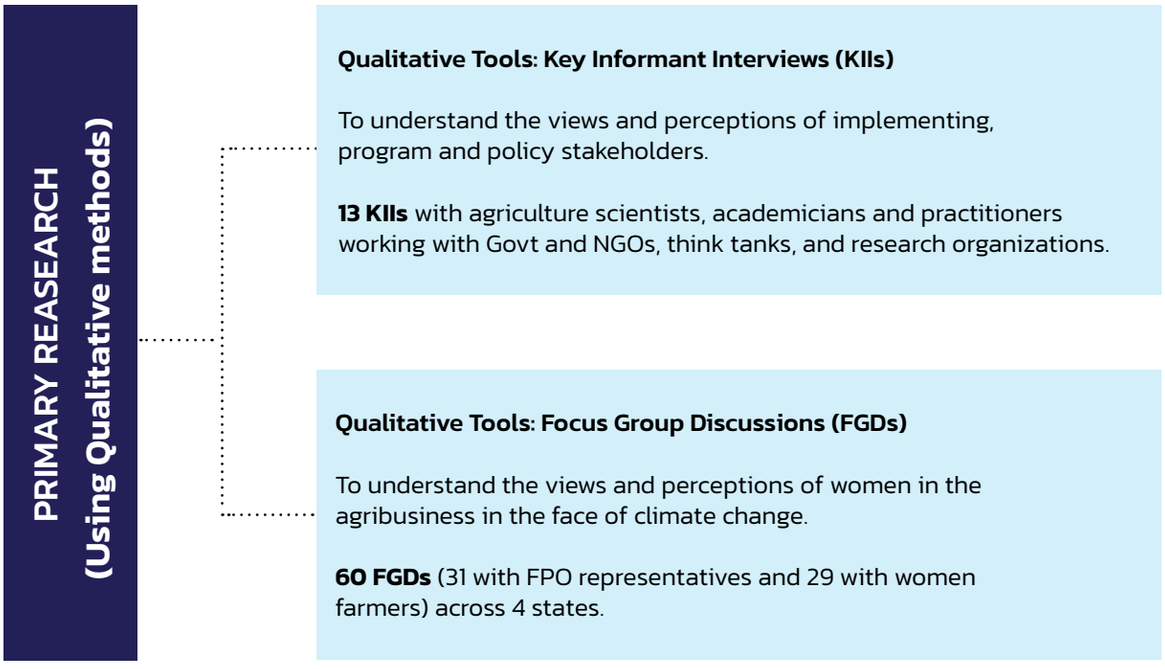
Primary research

As this study aimed to capture the experiences of women in agribusiness and agriculture in the face of climate change, qualitative methods were preferred to capture descriptive insights. Thus, questions like "why" and "how" were used in the open-ended study to capture the experience of women on sustainable agricultural practices, knowledge and skills.

3.2 Data Collection tools

Qualitative interviews, including **Key Informant interviews (KIIs) and Focus Group Discussions (FGDs)** were organized with relevant stakeholders to obtain contextual information and feedback and enable the triangulation of insights emerging from the secondary research.

Figure 2: Tools used



3.3 Sampling strategy

The sampling frame for this study is defined as the set of women farmers, representatives of farmer collectives- FPOs and stakeholders involved in thematic gender, climate change and agriculture.

Qualitative

The sample size for the qualitative data collection is much smaller, identified based on a purposive sampling approach. Under this non-probability sampling approach, only those respondents were selected for the FGDs and KIIs, which could provide significant insights into gender roles in agriculture with climate change. Given the limitations of time and resources, the study used a more convenient yet purposeful sampling to select **31 farmer collectives and 13 KII respondents.**

Selection of Farmer Collectives/Farmer Producer Organisations

The sample selection for FGD was undertaken at four levels and based on the criteria mentioned

A. The selection of geographies- states
B. The selection of farmer collectives
C. The selection of representatives of FPOs
D. The selection of women farmers

Selection of states

Gujarat, Maharashtra, Odisha, and Andhra Pradesh were the four states identified for the study. Equal representation of FPOs from each state was to be considered for the study. **Around 7-8 FPOs were selected from each state.**

Selection of farmer collectives

An equal proportion of FPOs were selected from each state, based on the following criteria:

Nature of the business	FPOs should be engaged in a wide range of agricultural activities.
Women FPOs	At least two women FPOs selected per state, totalling at least eight women led FPOs (out of 30).
Age and maturity	FPOs having a minimum operational history of 1 to 3 years depending on the phase of the FPO.
Membership size of the FPO	The FPO has a minimum of 300 active members to ensure the FPO's capacity to mobilize resources and foster community involvement.
Active business operations	FPO having an established and currently active business ensures that the FPO is engaged in ongoing economic activities, making it eligible for further development through the project's interventions.
Partnership with local institutions	The selection of FPO also factored in the involvement of local CSOs, NGOs and other institutions, as these institutions are essential for the ongoing development of FPOs in the region.
Scope for capacity building	Preliminary assessments revealed a clear need for capacity-building support in governance, documentation, compliance, financial management and accounting, marketing, and value-chain development for the FPOs. Addressing these needs would help strengthen the FPOs' operational frameworks and ensure long-term sustainability.

Selection of representative of FPOs
At least 8-10 FPO members were selected representing the Chairman, CEO, Secretary, Treasurer, women members involved in different value chain of the agribusiness and women farmer members. **1 FGD was organised with the group per FPO, totalling to 31 FGDs across four states. Annex 1.2** is enclosed for the FGD discussion with FPO members.

Selection of women farmers
At least 1 FGD was organised from each FPO area with women farmers group comprising of non-practicing CSA farmers (less than 2.5 acres and not practising CSA), big (more than 2.5 acres and not practising CSA) and practicing farmers (those practising CSA). **Each group constituted at least 5-6 women farmers engaged in agriculture, totalling to 29 FGDs across four states. Annex 1.3** is enclosed for the FGD discussion with women farmers.

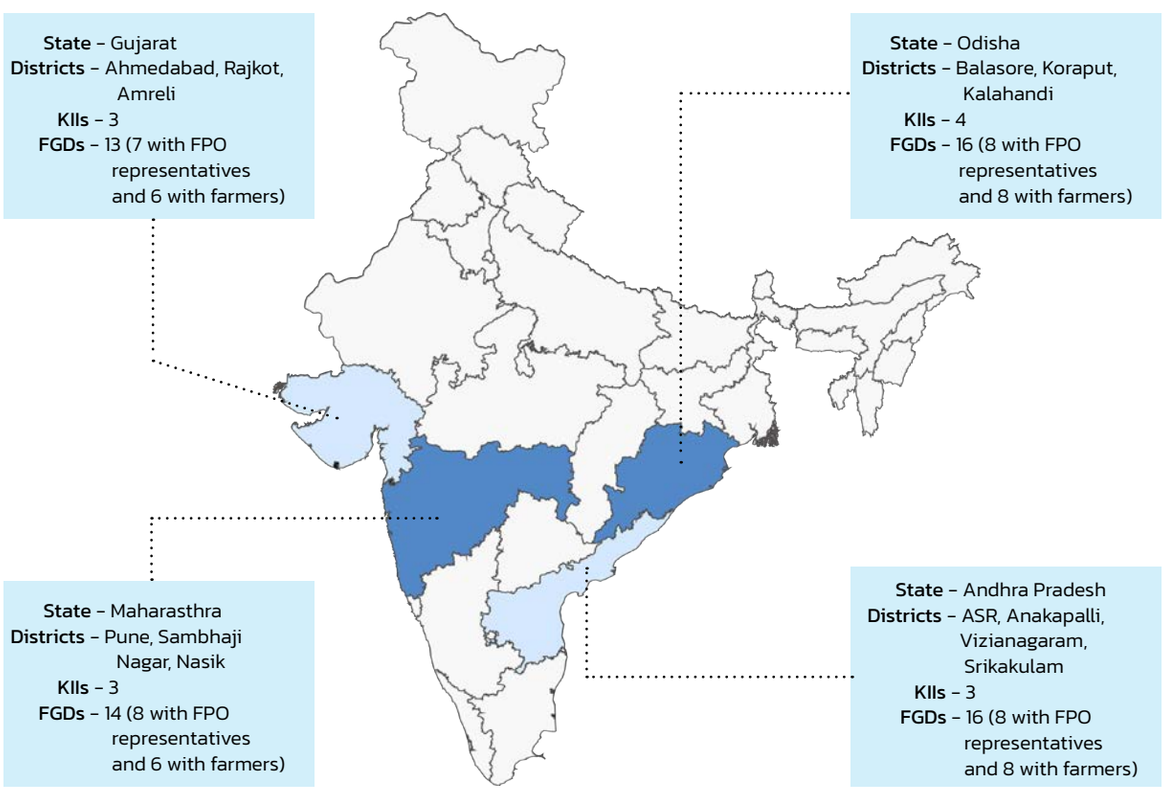
Selection of Key Informants

The study used qualitative, in-depth KIIs with key stakeholders to examine the impact of climate change on women farmers & climate smart agriculture practices currently adopted. The KIIs were organized with key stakeholders from agriculture scientists, academicians and practitioners working with Govt & Non-Govt organisations, think tanks, and research organisations working on gender roles in agriculture and women in climate smart agriculture. **Annex 1.1** is enclosed for KII discussion.

3.4 Sample selected

The study was conducted across **four states—Andhra Pradesh, Gujarat, Maharashtra, and Odisha**—through KIIs and FGDs with FPO representatives and farmers. In total, **13 KIIs** were conducted with

Figure 3: Sample sites of the study



agricultural scientists, academicians, and practitioners from government and NGOs. Additionally, 60 FGDs were held, including **31 discussions with FPO representatives and 29 with farmer groups.** The study engaged **31 FPO** representatives, of whom approximately 73% were women. **A total of 376 farmers participated, with 86% being women; among them 53% were small and marginal farmers, while 47% were categorized as progressive farmers.**

3.5 Data collection and analysis method

Initially, preliminary assessments were conducted in the four states, understanding collectives' perspectives and identify key themes. Based on the observations from the pilot, the tools were further revised. The interviews and FGDs were conducted using a combination of English and local languages, such as Hindi, Gujarati, Marathi, Odia, and Telugu, with the assistance of enumerators and interpreters to ensure accurate communication.

Data collection was carried out through voice recordings and note-taking, after which the recorded interviews were transcribed and systematically compiled into a shared database.

For analysis, a manual thematic approach was employed, wherein FGD responses were coded based on key themes emerging from the experiences and reflections of FPO representatives and farmers. This method facilitated an in-depth understanding of participant insights, and allowed for identifying recurring patterns within the data.

3.6 Ethics

FGD and interview participants provided verbal consent to participate in this study, to be recorded, and as well as consent for taking their photos. Participant identities were kept FGD and interview participants provided verbal consent to participate in this study, to be recorded, and as well as consent for taking their photos. Participant identities were kept confidential throughout data analysis. The data collection was participatory and scheduled at the convenience of the participants. Qualitative researchers of the study had a prior understanding of farmer collectives, agricultural systems and gender.

3.7 Sampling concerns

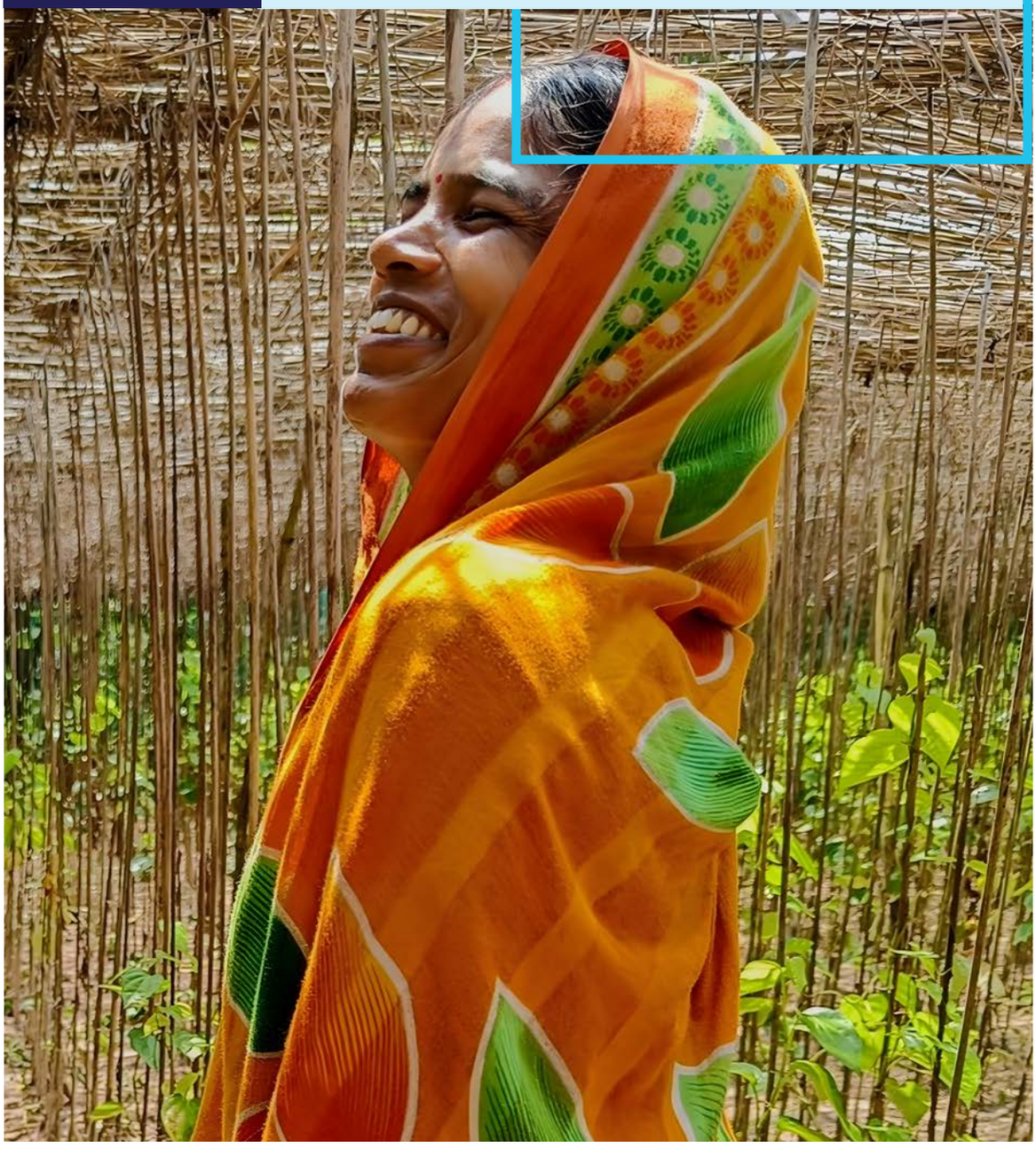
As per the sampling strategy, at least two women FPOs were to be selected from each state. Though 13 women FPOs have been identified across four states, only one could be selected from Gujarat. This was primarily because the women FPOs that existed were newly formed or non-functional.

3.8 Data collection

Participants residing in remote locations faced challenges attending due to difficult terrain and limited transportation facilities. To overcome these challenges, efforts were made to conduct data collection near participants' homes or in closer proximity. In FGDs with presence of male FPO representatives, male participants often dominated the conversation, limiting women's contributions. Some male participants exhibited scepticism about the gender-related issues discussed. The research team employed constructive engagement strategies to foster dialogue, encourage reflection, and position male participants as potential allies in gender equality efforts.

Women's participation was lower than anticipated due to overlapping social (marriage season) and agricultural commitments. The research team rescheduled discussions based on participants' availability to address this issue, ensuring a better representation of women's perspectives. The research team actively encouraged women to share their insights and emphasized the depth of their knowledge.

04 Profile of the FPOs and Farmers Covered



This chapter presents an overview of the FPOs and the farmer demographics involved in the study. It examines their geographical spread, organizational structures, financial performance, and membership compositions, with a particular focus on the women's role. This profile sets the stage for understanding their diverse operational contexts of the FPOs.

4.1 FPO profile

Geographic Spread & Age of FPOs: The gender-based categorization of FPOs, as shown in **Table 1**, is based on the composition of the shareholders and divided into **3 categories– Women FPOs (>80% women shareholders), Men FPOs (>80% men shareholders, Mixed FPOs (women as shareholders ranging between 21-79%).**

Table 1 elucidate the distribution of FPOs across the four states of **Andhra Pradesh, Gujarat, Maharashtra** and **Odisha. Gujarat** shows the lowest number of women FPOs-only one due to the limited availability of women FPOs in the project location. **Over 80% of FPOs (25) are at least three years old (formed by 2022).** The uptick in FPO registrations during FY 2016-2019 coincided with an uptick in the support provided by government agencies such as Small Farmers' Agribusiness Consortium (SFAC), National Bank for Agriculture and Rural Development (NABARD) and other central and state government schemes, with almost 6000 registrations across India, especially during the last quarter of financial year indicating the rush to meet the project milestones (Govil, Neti, & Rao, 2020).

Table 1: Geographical spread of FPOs

States	Districts	FPOs (Nos)	Type Of FPOs			Age (In Years)	
			Women FPOs	Mixed FPOs	Men FPOs	Years	Average
Andhra Pradesh	ASR, Anakapalli, Vizianagaram, Srikakulam	9	4	5	-	2016-2023	6
Gujarat	Rajkot, Bhavnagar, Amreli	6	1	1	4	2021-2022	3
Maharashtra	Pune, Sambhaji Nagar, Nashik	8	5	2	1	2016-2022	5
Odisha	Balasore, Kalahandi, Koraput	8	3	5	-	2016-2024	5
All	**13**	**31**	**13**	**13**	**5**	**2016-2024**	**5**

BOD, Shareholder, and Women Representation

Except one, all the other FPOs have a minimum membership of 300 and a maximum of 2400, as can be seen in **Table 2**. **Gujarat** has comparatively lesser shareholders due to the FPOs being formed more recently. FPOs with a longer existence tend to have a larger shareholder base as older FPOs have more time to mobilize farmers and expand membership. However, FPOs that provided essential services, especially during the pandemic, saw a rapidly increase in membership, irrespective of age. This was evident in an FPO that used its procurement activities as a strategic tool for growing shareholders.

Gender representation: Table 2 shows women's representation across four states at the BOD and shareholder levels. **Women have demonstrated greater participation in women FPOs than other FPOs. Chapter 7** will discuss gender representation in FPOs in detail.

Table 2: BOD and Shareholder size & Gender representation across FPOs

States	FPOs (Nos)	BOD Min-Max (%)	Women Shareholders (%) (Min - Max)
Andhra Pradesh	9	20 - 100	29 - 100
Gujarat	6	0 - 100	8 - 100
Maharashtra	8	13 - 100	9 - 100
Odisha	8	10 - 100	29 - 100
Total	**31**	**20 - 100**	**48 - 100**

Business activities of FPOs

Most of the FPOs are engaged in input and B2B (business-to-business) activities with limited and small-scale value-addition and processing being carried out.

The data reveals a **gendered pattern in the business activities (commodities) of FPOs, with women and mixed FPOs engaging in a wider variety of products**, the majority of them as food crops. **In contrast, men FPOs and men dominated FPOs primarily focus on high-value, commercially profitable products and services** such as organic fertilizers, poultry and cattle feed, oil seeds, cotton, sugarcane, and ginger. These commodities require significant investment but offer higher market returns, aligning with men's stronger financial access and decision-making power in market negotiations.

Figure 4: Major Commodities (State - wise)

States	Type of Commodities
Andhra Pradesh	• **Food Crops**: Pearl millet, sorghum, and bajra, green gram, black gram, custard apple, and tamarind. • **Cash Crops**: turmeric, sesame and sesame oil, groundnut, ginger, black pepper, broomsticks, seeds, cashew • **Plantation Crops**: Coffee
Gujarat	• **Food Crops**: Millet seeds such as sorghum and pearl millet, tomato, garlic • **Cash Crops**: Cumin seeds, groundnut, cotton, onion
Maharashtra	• **Food Crops**: Soybean, maize, sweet corn, millets, rice, vegetables, and also • **Cash Crops**: Onion, pomegranate, Carnelias, cotton, sunflower, groundnut, safflower, and sugarcane.
Odisha	• **Food Crops**: Paddy, millets, vegetables, pulses like black gram and arhar, coconut, millets (ragi, jowar), honey • **Cash Crops**: Ginger, turmeric, groundnut, and betel vine • **Plantation Crops**: Coconut, areca nut

Figure 5: Major Commodities (Composition-wise)

States	Type of Commodities
Women FPOs	• **Food Crops:** Millets (including pearl millets and bajra), sorghum, pulses (black gram & arhar), maize, vegetables, paddy • **Cash Crops:** Sesame, turmeric, groundnut, black pepper, onion • **Plantation Crops:** Coffee
Mixed FPOs	• **Food Crops:** Custard apple, all millets, paddy, groundnut, vegetables, soyabean, maize, sweet corn • **Cash Crops:** Broomsticks, carnelian flowers, forest produce, black pepper, betel vine, turmeric, tamarind, ginger, cumin seeds • **Plantation Crops:** Coffee, coconut, areca nut, pomegranate, cashew
Men FPOs	• **Food Crops:** Maize, vegetables • **Cash Crops:** Ginger, groundnut, safflower, sunflower, sugarcane, pomegranate, cotton

In Gujarat, men FPOs concentrate on organic fertilizers, cattle feed, and cotton and groundnut, reflecting a narrower yet capital-intensive business model. This difference suggests that while men focus on scalability and profitability, women prioritize diversity, household food security, and sustainable farming practices. This contrast in business operations underscores the critical role of women in agricultural resilience, food security, and value addition.

Financials of the FPOs

In **Table 3**, the financials of FPOs across **Andhra Pradesh, Gujarat, Maharashtra, and Odisha** reveal a wide variation in turnover, with most FPOs operating below ₹1 crore in revenue and low profit margins (<5%).

As per **Table 4**, among different types of FPOs, **women FPOs demonstrate stronger financial performance, with turnover ranging from ₹0-310lakh (₹90 lakh on average) and average share capital as ₹9 lakhs, the highest among the 3 categories of FPOs.**

A similar insight is found in a study where it was shown that many women FPOs outperform others financially through higher average share capital, indicating women are actively contributing financially, investing in FPO's growth, practicing robust financial engagement, better accounting practices and risk management that strengthens FPOs revenue stability and business sustainability (NAFPO, 2022).

Table 3: Financials of the FPOs (State-wise)

States	FPOs (Nos)	Turnover (In lakhs)		Share Capital (In lakhs) Range	Share Capital (In lakhs) Average
		Range	Average		
Andhra Pradesh	9	80-130	68	3-12.30	7
Gujarat	6	0-35	19	0.35-8	3
Maharashtra	8	15-310	98	5-25	9
Odisha	8	10-230	60	2-15	5
Total	**31**	**4-310**	**61**	**0-25**	**6**

Table 4: Financials of the FPOs (Composition-wise)

Type of FPO	FPOs (Nos)	Turnover (In lakhs)		Share Capital (In lakhs) Range	Share Capital (In lakhs) Average
		Range	Average		
Women FPOs	9	80-130	68	3-12.30	7
Mixed FPOs	6	0-35	19	0.35-8	3
Men FPOs	8	15-310	98	5-25	9
Total	**31**	**4-310**	**61**	**0-25**	**6**

***Note**: Average share capital is calculated by removing the 1 FPO with 0 share capital, as they have yet to file their audit report.*

> *"The women have been in practicing financial management related activities for several years in their respective SHGs. These women have become more experienced in managing financial resources and building financial discipline and this value is carried on when they are now working in FPOs to maintain transparency and accountability. They have strong skills in cost analysis. They are more careful about labour and production costs, unlike men who are more focused on markets."*
>
> **- BoD of a Mixed FPO in AP**

Farmer profile

Table 5 illustrate that **47% of the respondents were farmers not practising CSA (30% marginal farmers, and 70% big farmers) while 53% were CSA practising farmers**. Among those, 87% of the farmers were women.

Table 5: Profile of FGD farmers

States	No. of Farmers Covered		
	Practising CSA	Non-Practising CSA	Total Participants
Andhra Pradesh	53 (38%)	88 (68%)	141
Gujarat	45 (60%)	33 (40%)	83
Maharashtra	43 (55%)	34 (45%)	77
Odisha	51 (55%)	42 (45%)	93
Total	**178 (47%)**	**200 (53%)**	**394**

05 FPOs' Evolution And Performance

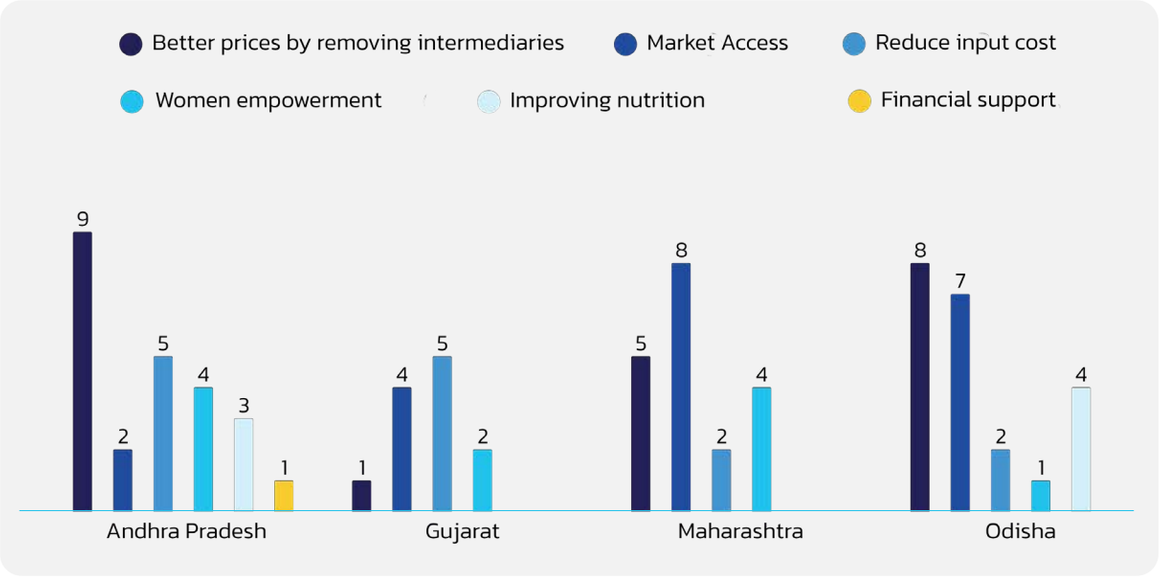
The findings presented here highlight both similarities and distinctions in the formation, performance, and ecosystem support available to the FPOs. This shows the factors shaping FPOs experience and evolution.

5.1 Rationale for the formation of FPOs

More than two-third of the FPOs, as shown in **Figure 6**, shared the **two most common reasons for formation- achieving better prices by removing intermediaries and improving market access for farmers.** Another common reason for the formation of FPO was reducing input cost as shared by half of the FPOs.

In **Andhra Pradesh (AP) and Odisha**, all the FPOs cited the reason for the formation to get better price realization by removing intermediaries. **Women's empowerment and reduction of input costs have been cited as reasons for the formation** in one-third of FPOs across the four states, with almost 1/2 of the FPOs of AP and Odisha indicating the latter. **In Gujarat, the majority of FPOs (>4) were formed to reduce input costs and access better market linkages**. Over the years, these four FPOs have diversified their business activities to input supply and procurement for the sale of agricultural produce.

Figure 6: Major Commodities (State - wise)



In Maharashtra and Odisha, almost all the FPOs cited market access as their intention for formation. In both the states, the state government has taken proactive steps in launching FPO centric marketing programs such as Odisha Millet Mission (OMM), and Hon. Balasaheb Thackeray Agribusiness and Rural Transformation (SMART) Project. Studies have established a link between the registration of FPOs (found in the previous chapter) with government policies and programmes, such as the 10,000 FPOs scheme launched in 2020 and the National Policy on FPOs in 2013. This indicates the strong influence exerted by govt. policies and institutional support for the FPOs (Govil, Neti, & Rao, 2020).

Many of the producer companies in **Maharashtra** are initiated, are being managed by NGOs and govt policy is focused on creating an enabling marketing ecosystem; Odisha has tried to reduce the business related compliance burden on FPOs by treating them at par with cooperatives, **Gujarat** FPOs emerged with support from various farmer collectives and federations as their promoters, in AP govt and

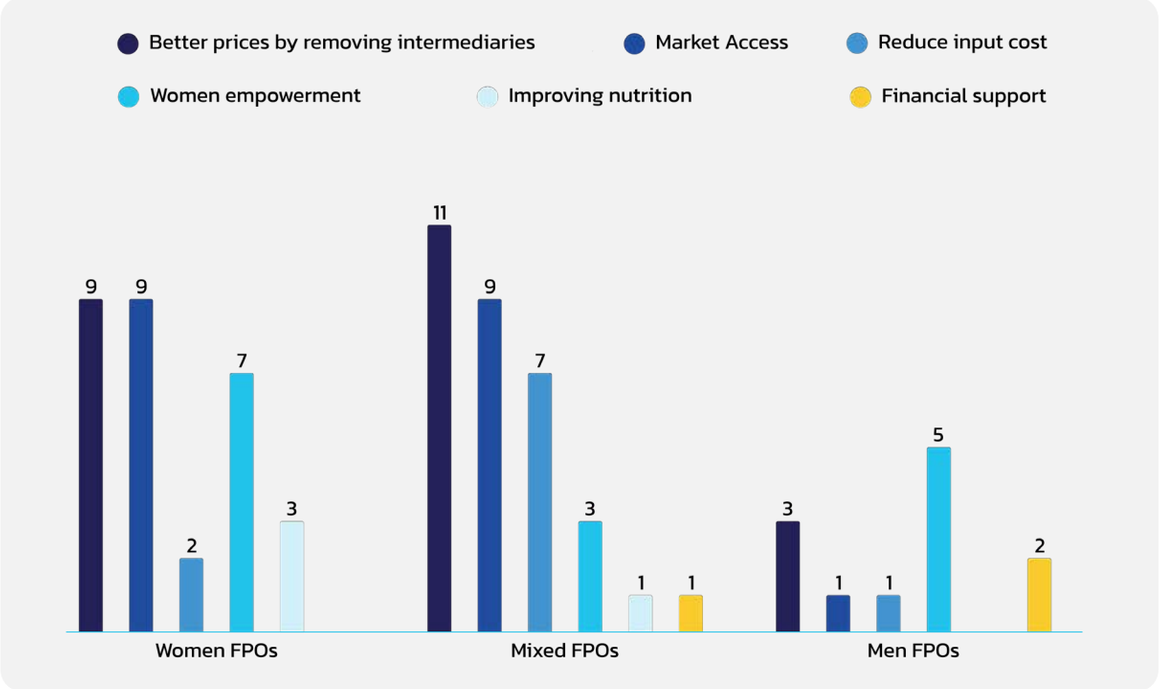
> *"Earlier we were FIG dealing with vegetables and observed that even if we aggregate and sell it in the market, the volume was not big enough to earn a decent profit margin. So, 10 FIGs came together to form FPOs to increase profit by increasing volume and skip the intermediaries to get higher profit. Later on, we switched to sweet corn produce where we are providing good quality inputs to farmers at a price lower than the market rate and procure from the same as well. In this way, we ensure that a uniform produce is received through the farmers, giving us greater negotiation power with the trader and establish stable market linkage."*
>
> **– Chairperson of FPO in Pune, Maharashtra**

non-profits have majorly focused on providing production and marketing by providing professional support by working in decentralized and closed quarters with FPOs by agencies such as ATMA (Prasad, 2021).

Figure 7 elucidate that **two-third of women FPOs prioritized market access and better prices** indicating the existing disparity in women's earnings from agriculture and relatively lower price realization.

Women's empowerment (one third of the FPOs) and improvement of nutritional intake emerged as compelling reasons for formation. The former has been found mostly in **AP and Maharashtra,** especially in **women's FPOs**, where the women's movement has been strong historically. **FPOs had integrated 'Empowerment of women' as it has helped women derive greater agency and control** around the farm activities by enabling women's access to seeds and fertilizers, reduce costs, save time, and increase savings for women farmers.

Figure 7: Rationale for Formation (Composition-wise)



5.2 Well performing areas

Here, the areas where FPOs members perceived to be performing relatively well have been documented to assess the milestones achieved and the progress made up to that point.

Figure 8: Well performing Areas

Governance:
Mobilization, specialized committees.

CSA: CSA techniques training and information, input shops, bio-repellents, pheromone traps, and solar-powered tools, availability of credit, climate resilient crop adoption

Processing: Access to training, financial support, technical training, value-addition and establishment of infrastructure

Access to networks: Govt. and non-govt. networks (from National Bank for Agriculture and Rural Development (NABARD), Krishi Vigyan Kendras (KVKs), NGOs and private entities; Social networks (SHGs)

Marketing: Transparent, inclusive and fair procurement systems, pre-determined prices, timely payment, stable buyers

Table 6: Well performing areas of FPO (State-wise)

States	FPOs (Nos)	Marketing	CSA	Processing	Access to Networks	Governance
Andhra Pradesh	9	5	5	4	4	1
Gujarat	6	3	2	1	-	1
Maharashtra	8	5	2	4	3	5
Odisha	9	7	4	2	2	1
Total	**31**	**20**	**13**	**11**	**9**	**7**

Table 6 presents that **among the FPOs studied, the most common (almost 2/3rd) well- performing area is marketing**, with more than 1/2 of the FPOs in **Odisha, Maharashtra and AP** having indicated this. **Odisha and Maharashtra** are performing relatively better in terms of processing. In the previous section, it was noted there is a **stronger presence of government initiatives (marketing pathways, infrastructure support) and collectives' network (more reachability and trust establishment with farmers) in these three states which can explain the FPOs better performance in marketing.**

The FPOs in AP and Odisha are comparatively performing better in terms of CSA due to increased awareness, push from the government, and NGOs' advocacy support. Governance is the least well-performing area, especially in Gujarat.

Table 7 shows that **women FPOs demonstrate relatively higher efficiency in marketing (procurement of farm outputs), processing, CSA adoption, and governance, mainly due to strong social networks (SHGs, farmer clubs) as articulated by the women farmers.**

Table 7: Well performing areas of FPOv (Composition-wise)

Type of FPO	FPOs (Nos)	Marketing	CSA	Processing	Access to Networks	Governance
Women FPOs	13	7	6	7	6	4
Mixed FPOs	13	11	5	3	3	3
Men FPOs	5	2	2	1	-	-
Total	**31**	**20**	**13**	**11**	**9**	**7**

Women and mixed FPOs are leveraging the collective social capital (in which networks of cooperation can generate reciprocity and trust, and facilitate coordinated actions (Putnam, 1993) in raising awareness about sustainable agriculture and mobilizing women farmers toward collective action, especially in reviving millet (in AP). This finding resonates with studies that have established a link between women empowerment and varietal replacement of crop varieties by leading activities such as identifying and selecting suitable seed varieties for production, facilitating access to seeds and providing support for seed production to women farmers, conducting group based seed quality assurance, usage of decentralized and traditional seed storage mechanisms, and then each producer would be responsible for selling seeds within their social network and vicinity (Boef, et al., 2021). SHG members in **AP** are also encouraged to procure, distribute and support the production of millet varieties in their respective SHG groups and villages.

The favourable seed rate and assured productivity, especially in the face of climate change, encouraged FPOs' women shareholders to adopt millet, in at least a part of their land, which would at least cover their household consumption needs.

5.3 Areas where FPOs are struggling

Here, the areas where FPOs members perceived that they were floundering have been documented to identify high-priority areas requiring swift and concerted support.

Figure 9: FPOs struggling areas

Business growth: Restricted business scale-up limited access to finance and capacity-building, low profit margin, seasonal business activities, low share capital, lack of structured planning, lack of reliable bulk buyers, limited infrastructure, absence of bulk stock, poor quality value-additions devices, and strong competition

Operations: Difficulties in accessing institutional credit, infrastructure, mobilization, limited infrastructure, lack of expertise training and knowledge, difficult terrain and transportation cost

CSA: Limited training, access to technology, limited decision-making authority among women

Access to networks:
Limited access to wider networks.

Governance: Limited leadership training, higher conflict in men dominated governing bodies, limited inclusivity and decision-making participation, lack of transparency.

As seen in **Table 8**, FPOs face multiple structural, financial, and operational challenges that hinder their ability to scale and sustain their business effectively. **More than 2/3rd of the FPOs are facing constraints in business growth and operations. Other areas of concern faced by almost ½ the FPOs are governance, CSA and access to networks.**

Some concerns are emerging across four states which are influencing the performance of FPOs. In **Andhra Pradesh,** FPOs face infrastructural development issues, and access to training and other benefits, as the latter is mostly restricted to office-bearers. In **Gujarat**, FPOs are struggling in developing sense of ownership, value addition, competition from big players (hoarding of information and market channels, high investment required to attain product standardization, lobbying, et.), limited access to financial services, and networks. In **Maharashtra**, FPOs are facing issues such as a restricted sense of ownership, unavailability and inaccessibility of relevant training and schemes, and fierce gatekeeping by established players preventing entry into the global market. In **Odisha**, FPOs are struggling in inspiring serious dedication and a sense of ownership from directors.

For FPOs heavily **relying on external agencies,** the challenge is to transition from dependency on external agencies to self-sustained business models. Most of the time these agencies cannot continue the support after project elimination, disrupting member service offerings and fragmented learning processes for the

Table 8: Areas where FPOs are struggling (state-wise)

States	FPOs (Nos)	Business growth	Opera-tions	Governance	CSA	Access to Networks
Andhra Pradesh	9	9	5	2	4	3
Gujarat	6	6	5	5	3	5
Maharashtra	8	7	7	7	6	3
Odisha	8	8	4	2	1	1
Total	**31**	**30**	**21**	**16**	**14**	**12**

Table 9: Areas where FPOs are struggling (Composition-wise)

Type of FPO	FPOs (Nos)	Business growth	Opera-tions	Governance	CSA	Access to networks
Women FPOs	13	12	9	7	6	6
Mixed FPOs	13	13	6	4	5	3
Men FPOs	5	5	5	5	3	3
Total	**31**	**30**	**20**	**16**	**14**	**12**

collectives (Donovan, Stoian, & Poole, 2008). It has been found in several studies that both externally driven are not sustainable in the long-term (Donovan & Poole, 2008), while internally driven community organizations usually lack funds and inadequate capacities. **To arrive at an optimal balance, the role of ecosystem stakeholders should exist along with a parallel focus on developing the self-reliance, governance, and sense of ownership of the agri-collective itself** (Kumar & Kumar, 2022).

From **Table 9,** most women FPOs struggle with business growth, governance and operations due to limited access to finance and capacity-building support. **Operational challenges and governance issues remain significant in more than half of the FPOs**. Though the lower number of mixed FPOs are facing challenges related to the governance, there is a strong gendered element contributing to this where the decision-making authority is mostly enjoyed by male directors who can more easily avail market access and financial services. For men FPOs, business growth, governance and operations are some of the common concerns. **Men FPOs** struggle with mobilization to run their operations and often face higher conflict in men dominated governing bodies. Also, they show lower awareness among farmers about FPO activities, and women in these FPOs most often cannot articulate details about their roles, indicating **limited inclusivity and decision-making participation.**

5.4 Ecosystem support to FPOs

The ecosystem support includes support from government agencies, NGOs, financial institutions, technical experts, and corporate partnerships, all of which collectively strengthen FPOs' ability to engage in value

addition, market linkages, and climate-resilient agricultural practices. The support captured here takes into consideration support received by the FPOs at any point from their inception and is based on the recalling capacities of the participants. Another thing to be considered is that in some of the FPOs, many of the office bearers and CEOs have left or been replaced, thus, restricting the information available with the current members. All the FPOs in the study have received some type of support from govt, non-govt., and private agencies in a variety of aspects. **Training and information are the most common form of support, followed by financial and credit support as well as access to resources.**

From the **Table 10**, it can be deduced that **Odisha**, the support from govt. is higher and vice versa in **Gujarat** where access to non-govt institutions support (on training on agriculture practices, credit support, operational support) has been relatively higher than govt institutions (on information and training on different drip irrigation, solar pump schemes). In **Andhra Pradesh and Maharashtra,** support from both govt. and non-govt. agencies is strong and almost equitable. Though ½ of the FPOs have received financial services, only 10 have been able to access credit. It was observed that the highest number of FPOs receiving credit support are based in **Maharashtra (5), Gujarat (4) and AP (4).** In **Gujarat**, despite most FPOs being relatively young (less than 4 years), credit access was facilitated through proactive government support, and the presence of timely, low-interest credit with minimal credit history requirements, a result of FWWB's catalytic program. **In AP, stronger networking with CBBOs** has enabled access to credit. The purpose for applying for credit varied across FPOs and included reasons such as investment in procurement of agricultural inputs, technology purchases, working capital for aggregation, and asset creation. Notably, FPOs are more likely to apply for loans when paired with government subsidies or schemes, as these reduce perceived financial risk and repayment burden.

Table 10: Ecosystem support to FPOs (State-wise)

States	Govt. support			Non-govt. support			Others agencies (POPIs, CBBOs, etc)	
	Training & Information	Financial & credit support	Access to resources	Training & Information	Financial & credit support	Access to resources	Marketing Support	Agri-technology
Andhra Pradesh	7	5	1	6	4	3	3	1
Gujarat	4	2	2	6	4	-	1	-
Maharashtra	5	6	3	6	5	2	4	1
Odisha	2	3	1	1	1	-	1	-
Total	**17**	**16**	**7**	**19**	**14**	**5**	**9**	**2**

Table 11 shows that **women FPOs have benefitted significantly from NGO-led initiatives and SHG networks,** especially in states like **Andhra Pradesh and Maharashtra.** This external facilitation has supported mixed and women FPOs, particularly in value addition and market linkage activities. **Mixed FPOs** receive diverse support from NGOs, government schemes, and institutional training. Institutional interventions in mixed FPOs focus more on business development and market linkages. **Men FPO** receive support mostly in the form of training and information. The study uncovered distinct gendered patterns in credit availing behaviour.

Male-dominated FPOs often showed either a reluctance to take loans, citing stress and a preference for self-investment, or pursued larger loan amounts to establish centralized infrastructure and systems. In contrast, female-dominated FPOs were generally more open and receptive to borrowing, though the loan ticket sizes were smaller. These FPOs typically invested in low-cost, decentralized solutions aligned with their operational capacities and resource availability.

Table 11: Ecosystem support to FPOs (Composition-wise)

Types of FPO	Govt. support			Non-govt. support			Others agencies (POPIs, CBBOs, etc)	
	Training & Information	Financial & credit support	Access to resources	Training & Information	Financial & credit support	Access to resources	Marketing Support	Agri-technology
Women FPOs	7	9	2	6	4	1	1	-
Mixed FPOs	5	6	2	4	6	4	-	1
Men FPOs	3	1	1	5	4	-	1	-
Total	**17**	**16**	**7**	**19**	**14**	**5**	**9**	**2**

Figure 10: Ecosystem support recieved

Agency Names	Type of Support recieved
NABARD, KVK, Horticulture dept., NABKISAN Finance Limited, SMART Project, Coffee Board of India, Tribal Welfare dept., Agricultural Technology Management Agency (ATMA), National Cooperative Development Corporation (NCDC), Mission Shakti, Indian Council of Agricultural Research (ICAR), Indian Institute of Millets Research (IIMR)	• **Infrastructure support:** Warehouses, cold storage, and storage sheds for inventory management and reduce post-harvest losses; cleaning machines and processing units • **Financial support:** Grants • **Capacity building:** Training on business planning, financial management, and governance • **Value-addition support:** Training on processing, packaging, and product enhancement • **CSA:** Access to seeds, inputs and other resources
FWWB, Sabala, Sarada Valley Development Samithi (SVDS), Savitribai Phule Mahila Ekatma Samaj Mandli (SPMESM), Science for Society (also S4S Technologies), Samunnati, KVKs, Andhra Pradesh Community Managed Natural Farming (APCNF), Access Livelihoods Consulting (ALC), Watershed Organization Trust (WOTR), Yuva Mitra, Centre for Environment Education (CEE), NIGAM, Indian Grameen Services	• **Digital Integration:** Access to ONDC and e-NAM for bulk marketing and online trading • **Financial services:** Credit at subsidized rates, gap funding for infrastructure development and business expansion • **Technology:** Installation of technologies like maize gritto and solar dryers to enhance processing • **Capacity building:** Training on branding, packaging, product differentiation, business planning, financial management, and governance support • **Access to resources:** Technical expertise for improved efficiency • **CSA:** Establishment of demo plots for hands-on training on CSA

06 Gender Dynamics In FPOs

This chapter focuses on the **gender dimensions within FPOs** and **delves into women's representation in leadership roles and shareholder positions**. It examines the disparities in decision-making and governance, and discusses how these dynamics impact the FPOs' overall effectiveness. It sets the stage for targeted interventions to enhance gender inclusivity.

6.1 Women's Representation in the FPOs

Table 12: Women's Representation in FPOs are struggling (Composition-wise)

Type of FPO	FPOs (Nos)	BoD (Min-Max)(%)	Women Shareholder (Min- Max)(%)
Women FPOs	13	70-100	85-100
Mixed FPOs	13	0-100	22-76
Men FPOs	5	0-20	8-20

In all the FPOs in **Andhra Pradesh,** 1/2 of the shareholders are women, but are proportionately lower in the board (refer to Table 2 for figures on State-wise women representation in FPOs). Higher participation of women as shareholders have enabled FPOs to focus on aspects beyond agriculture, to include community development, health, nutrition and water. In **Gujarat**, the women's representation is between 0%-10% in the BoD, and less than 16% women's representation in the shareholder in the men FPOs. In **Maharashtra**, women's representation is high in women FPOs. Except for mixed FPO, their representation is less than 20% at the BOD level and less than 40% at the shareholder level. In **Odisha**, overall, it can be deduced that women's representation in FPOs is significant. The study revealed that 6 FPOs had 50% or higher representation of women, and all the FPOs had women participating on their boards.

Figure 11: Roles played by women in FPOs and challenges faced

Roles	Challenges
• Procurement, market negotiations, and financial management • Monitoring operations and engaging with buyers • Mobilizing members and integrating community interests • Addressing health, nutrition, and water management issues • Ensuring accountability, transparency, and sustainable business practices	• **Limited Decision-making power:** Lack of authority at the management level, decisions influenced by male members or external advisors • **Capacity gaps:** Lack of vision development and structured business planning, limited access to training, exposure visits, and capacity-building programs, low awareness of shareholder rights and responsibilities • **Social and structural barriers:** Limited educational qualifications, time-poverty and burnout

Table 12, indicates **women FPOs witness the highest women representation, the mixed FPOs report a lower range between 22-76% of BoD positions and 0%-100% of shareholders,** with the even starker story in men FPOs where their representation plummets to a mere 0-20% in the BoD and 8-20% at

shareholder level. In all the **men and mixed FPOs**, there is a lower proportion of women in leadership and office bearer positions than at the shareholder level.

This discrepancy suggests that while **women actively engage in agricultural production and contribute to the economic base of FPOs, they often lack the authority to shape decision-making at the management level.**

The study identified a range of **structural and socio-cultural constraints** hindering women's effective engagement in leadership and decision-making roles and processes.

Figure 12: Constraints faced by Women to participate in Leadership Roles

Knowledge & Awareness Gaps:
Limited technical expertise and operational guidance, lack of exposure to market operations, unclear roles and responsibilities, low awareness of shareholder rights and benefits

Workload and Time Constraints:
Extensive domestic and agricultural responsibilities

Mobility:
Limited safe and accessibly transportation available

Limited decision-making Power:
Involvement limited to functional roles and operational support, not leadership

6.2 Perception around adequacy of Women's representation & engagement

Table 13 shows that in **Andhra Pradesh**, all representation and participation in BoD and shareholders is higher than in other states. Low indicates women's participation is < 65% of the existing members. In **Gujarat**, all representation of women as shareholders and BoD is low as most of the FPOs are men FPOs. In **Maharashtra**, representation as BoD is low in mixed FPOs, while shareholders representation and actual participation is high. In **Odisha**, women hold a significant representation in most FPOs, 28% - 100%. However, there is still a significant gap over ownership of assets, agency over decision-making, and credit.

Table 13: Perception around adequacy of women's representation

Type of FPO	FPOs (Nos)	BoDs		Shareholders		Actual engement	
		No	Yes	No	Yes	Low	High
Women FPOs	13	5	-	5	-	**5**	**0**
Mixed FPOs	13	8	5	**7**	**4**	**6**	**6**
Men FPOs	5	3	10	**6**	**7**	**-**	**10**
Total	**31**	**16**	**15**	**19**	**10**	**11**	**16**

Representatives from more than ½ and 2/3rd of the FPOs believe that women's representation in the BoD and shareholders list is adequate. There is a **higher perception of inadequacy of representation and engagement of women in men and mixed FPOs than women FPOs.** However, even among the women FPOs, there is a perception that though the representation is enough, the number of women shareholders needs to increase. The mixed FPOs perceive that there should be an increase in both women's representation and the number of women.

Though men FPOs believe that the number of women BoDs and shareholders needs to be increased, the general perception is that the **social norms, domestic responsibilities and lower knowledge and naivety of women make this unlikely or very difficult.** The men FPOs also want to increase the number of shareholders, though there is no interest based on the gender of the new shareholders; they just want to increase the shareholders so that the share capital and scale of the business increases. **The proportion of young women, especially married, is low in FPOs.** This phenomenon of lower presence in AP is connected to their lower presence in SHGs/FIGs. In **Maharashtra, the unpredictable and volatile high risks in farming** due to the agro-ecological conditions and higher education, push young people towards non-agricultural jobs. **In Gujarat, men migrate to industrial hubs such as Surat for steady pay, and women are too overburdened and face stricter gender and social norms to get time for engaging in other activities.** Thus, limited involvement in SHGs, high risks, labour shortage, social norms and reproduction responsibilities restrict the youth participation in FPOs.

Women show relatively higher involvement in the FPOs. They are also involved in community work and have strong awareness and agency. Many of them hold responsible positions of Anganwadi workers, ASHA workers, community volunteers of any NGO, etc.

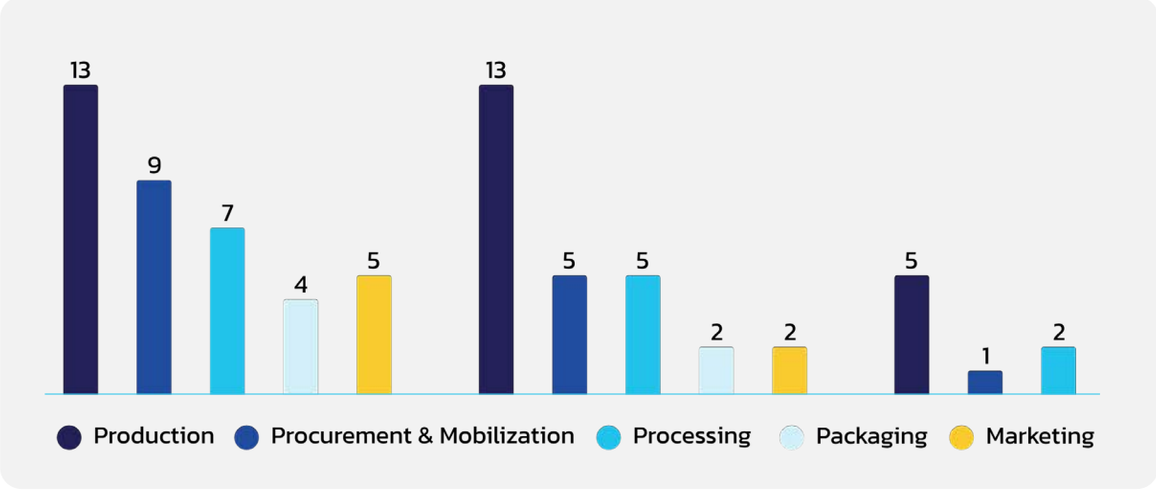
> ***"In many places, it is mostly older women, such as mothers-in-law, who are part of SHGs, and when the time comes, they pass their place to their daughters-in-law—but only after they have finished raising children. When a young bride joins the family, she has many responsibilities—looking after children, cooking, managing the household. She cannot take on this work immediately. They don't have the time to join these groups. And unmarried girls? They usually leave the village after marriage, so they are never considered for membership. Since most FPO members come from SHGs, it is no surprise that you hardly see young women in FPOs either."***
>
> **– (Shareholder of an FPO in Vizianagaram, Andhra Pradesh)**

6.3 Areas in the value-chain with highest participation/concentration of women

Women's highest participation in FPOs is observed in low-paid, and labour-intensive nodes such as farm-based production, processing, packaging, followed by procurement and mobilization, and local-level marketing.

Their engagement in aggregation, mobilization and collective action within FPOs is growing, as they build networks with farmers for produce collection. **Due to limited mobility, technical skills, and time poverty, in many women FPOs,** the marketing, financial management, and compliance are looked after by men, usually the appointed CEO, director or chairperson.

Table 14: Concentration of Women in the Agriculture Value-chain (Composition-wise)



Not only inter-node, but also intra-node variations in participation of women have been observed as well. In **Maharashtra and Gujarat,** it has been observed that processing is mostly done by immigrant landless women who had accompanied their male members of the HH (husbands and fathers), the latter having arrived searching for work in the industries in rural areas. These women are preferred over local women farmers, who, despite being FPO shareholders, struggle to participate due to time constraints and land management responsibilities. Even when local women can engage, their availability is often seasonal or irregular, which does not align with market-driven processing requirements that demand continuous production. This work usually requires minimal skills and thus, pays very low wages on piece-meal basis. Immigrant women are willing to accept these conditions because of limited feasible alternative livelihood opportunities and no requirement of prior skills. A similar finding was observed in a study where it was shown that **women's 'disposable' labour is exploited in a scenario where there is limited employment options available** (Kawarazuka, Doss, Farnworth, & Pyburn, 2022). **These irregular, informal, low-skilled, part-time and labour-intensive roles usually fall into the domain of women**, making them more vulnerable.

In **Gujarat**, primary processing work (cotton seed cleaning, grading) is done by home-based women workers, later to be taken and aggregated by men shareholders. In some of the

FPOs of AP, young college-going girls can also be seen working in processing. In **Odisha**, women in some FPOs have shown deeper involvement in processing and packaging after receiving technical training and regular mentoring. **Another intra-node variation is seen in mono-crop practicing male-leadership dominated mixed FPOs** who hire male labourers to harvest top graded produce from the farms. This is done as they believe women lack this skill and keep better quality produce for household consumption. Thus, **the belief that women lack the necessary skills for high-value harvesting and their inclination toward HH nutrition**, results in them being restricted to lower-value agricultural tasks showcasing gender disaggregation in intra-node activities.

> ***"Our area is characterized by undulating hills, dense forage, limited metalled roads veining into the villages, and early onset of sunset. There are few women with higher formal education who can understand the complex process of compliances. The youth are not interested in joining FPOs, even when they join they switch soon to other livelihood option by migrating. We have to have a male CEO who can cater to the mobility and technical related demands that arise from marketing. If supposedly, a call comes that a particular amount of goods has to be sent to a buyer within a few hours, a woman cannot stop her work and go fulfil it. Any delays would threaten our service quality among the buyers. Women don't even know how to ride a scooty. Without him, our FPO cannot function."***
>
> **– Woman director of a women FPO in Koraput district of Odisha, when asked why their CEO was not a woman.**

FPOs are not just conventional businesses, backed by government support, they were initiated with the vision of collective ownership and empowerment. If women shareholders are systematically absent from key value-chain activities, FPOs risk replicating the same exploitative labour structures they were meant to challenge. When processing is outsourced to vulnerable workers, rather than strengthening the capabilities of women FPO members, the gap is filled by women with the least bargaining power, chosen for their cheap and easily replaceable labour. It creates a cycle where marginalized women remain at the bottom of the agricultural value chain, with little possibility of moving up.

Women's engagement in financial decision-making, large-scale marketing, price negotiations, and supply chain management, remains low due to systemic barriers such as lack of market linkages, training, and access to financial resources. **In some other FPOs, their participation is observed as particularly high in value-added activities that require precision, care, and manual dexterity**. There is high participation in post-harvest processing and packaging, particularly in value chains related to millet, coffee, spices, and dairy products. **This includes activities such as cleaning, drying, milling, grinding, and fermenting, which are labour-intensive yet considered suitable for women due to the perceived alignment with their domestic roles.** The preference for these roles arises from low mobility requirements, flexibility in work schedules, and higher cultural acceptance of women handling these responsibilities.

Sense of Agency experienced by Women

The FPOs where the women's sense of agency was found to be higher were characterized by higher women's participation in diverse and

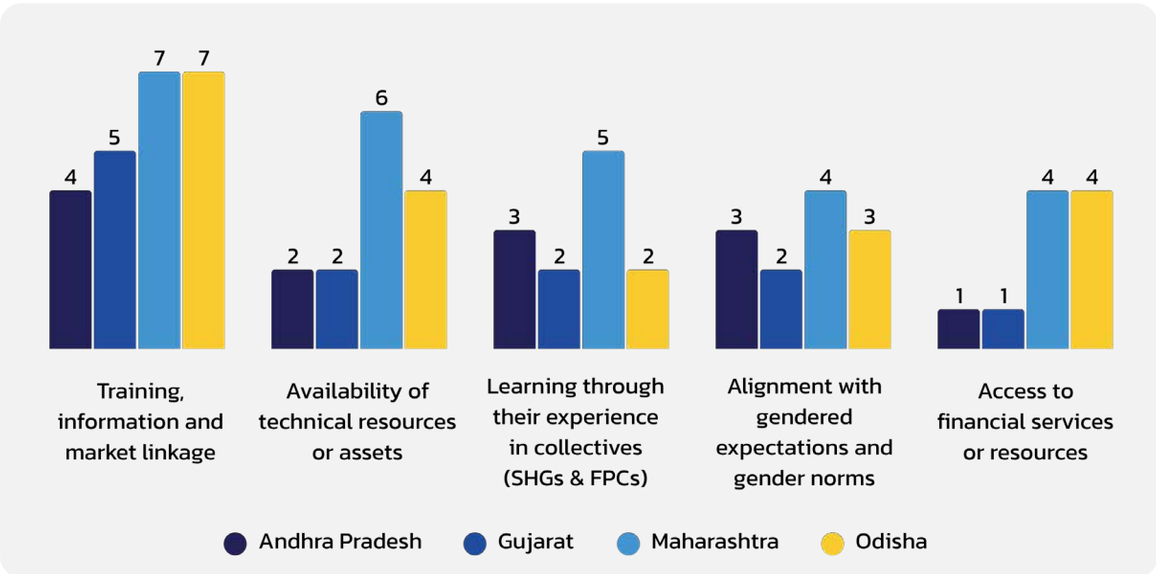
higher nodes of value-chains, thus, showcasing a direct link between women's participation in different nodes of value-chain with higher sense of agency. **Figure 13** showcases where women's agency is seen what are the constraints to the agency.

Figure 13: Sense of agency exeperienced by women and reasons for limited agency

Sense of agency	Reasons for limited agency
• Participation in multiple nodes of value-chain and greater visibility within the FPO structure • Increased financial agency over household expenses, investing in assets, and accessing credit.	• **Socio-economic barriers:** Triple burden of domestic work, childcare, and farm labour; Gendered land ownership; Confinement to lower value activities • **Limited mobility and access:** Male-centric market structure, processes and requirements; limited access to formal education or expertise attainment; absence of enabling and accommodative environment for women's participation. • **Undervalued and secondary status:** Women's role often considered secondary and income as supplementary to men farmers, especially when there is alternative source of profitable income in the household.

6.4 Enablers & constraints to women's participation in agri-value chain

Figure 14: Enablers to women's participation in the agri value chain (state-wise)



In **Figure 14**, **training, information and market linkage has emerged as the strongest enablers** influencing women' participations in the value chain as found in over two-third of the FPOs. At least 1/3rd of the FPOs identify the availability of technical resources and assets, collective learning, and alignment with gender norms and expectations (proximity to house, family health priorities, lower wage

rates, etc.) as enablers propelling women's participation in the value-chain. Women farmers in **Maharashtra** show the highest number of enablers followed by **Odisha**. At the same time, those in **AP** seem to have limited number of enablers with women farmers in **Gujarat** having the least enablers supporting their participation in the different value-chains.

Table 15: Enablers to women's participation in the value-chain (composition-wise)

Type of FPO	FPOs (Nos)	Training, information & market linkage	Availability of technical resource or assets	Learning through their experience in collectives (SHGs & FPOs)	Access to financial services or resources	Alignment with gendered expectations and gender norms
Women FPOs	5	4	2	1	1	2
Mixed FPOs	13	8	6	5	5	7
Men FPOs	13	11	6	6	4	3
Total	**31**	**23**	**14**	**12**	**10**	**12**

Economic necessity, cultural norms, institutional support, and access to resources shape women's participation in different value chain nodes within FPOs. The enablers that positively influence their involvement include institutional support, social networks, training programs, technology access, and financial inclusion. These factors determine the extent and nature of women's roles, ranging from production and processing to marketing and decision-making within the FPOs. **Women's contribution in unpaid/low-paid labour often remains unrecognized, forming an invisible yet crucial backbone for the FPO's survival, especially when capital constraints prevent hiring paid staff.**

Most constraints on women's participation in FPOs depend on gender norms and performance of the FPOs. Despite the numerous constraints, women can devise strategies to navigate through them by wielding silence as a tool, using digital mediums, and, most importantly, believing in their capabilities.

> *"Women in FPOs face higher scrutiny. If an FPO does not generate profits quickly, their husbands question its relevance and discourage participation. If we start earning through FPO business, then no one will say anything. I don't react to any digs made by my husband, as it might escalate things. I am waiting for the day when I can retort by saying that you earn money, now so do I."*
>
> – **(Shareholder of a Women FPO in Sambhaji Nagar, Maharashtra)**

> *"To be able to leave home for FPO meetings, women must prove their whereabouts—either by bringing their husbands along or showing video calls. This is how they navigate social restrictions."*
>
> – **BoD, FPO in Maharashtra**

> *"If there's a meeting to attend, or start an enterprise, I try to encourage more 4-5 women from my village to accompany me. Going alone raises a lot of suspicion and criticism, but if I go in a group, then many think they we are going to earn money. When more women do it, it becomes more acceptable."*
>
> **– Shareholder, FPO in Maharashtra**

Figure 15: Enablers & Constraints to Women's participation in value-chain

Enablers	Constraints
• **Institutional support & capacity building:** Strong social networks, continuous training programs, and financial inclusion help women integrate into the Agri-value chain. Targeted training in value addition, negotiation, and financial management, leveraging SHG experiences, enhances their economic agency. • **Infrastructure & market access:** Improved access to land, storage, and processing facilities, along with strengthened market linkages, enables women to move beyond subsistence farming. • **Technology and resource accessibility:** Ensure women's access to user-friendly agricultural technologies and equipment (e.g., solar dryers, maize gritto). • **Gender-responsive policies & leadership development:** Flexible meeting times, mandated representation in governance (e.g., at least one-woman signatory), and structured leadership training. • **Confidence building & exposure:** Regular handholding support in public speaking, exposure visits to women-led enterprises, and peer learning opportunities • **Behavioural & social norm shifts:** Gender sensitization programs for male members	• **Structural barriers and land ownership:** The gendered division of labour limits women's participation in higher-value activities like market negotiations and decision-making. Limited land ownership also prevents access to formal credit, agricultural loans, and financial independence. • **Skill & knowledge gaps:** Limited exposure to modern agricultural practices, post-harvest processing, branding, machinery operation, skill development and technical training prevents them from fully leveraging agricultural innovations. • **Limited access to tailored resources & services:** Many extension services, machinery designs, and capacity-building programs are not tailored to women's specific needs. • **Market & mobility challenges:** Restricted mobility, low bargaining power, and lack of access to real-time market information reduce women's ability to sell produce competitively and negotiate better prices. • **Superficial leadership roles:** Even when women hold leadership positions in FPOs and cooperatives, they often lack real influence over business strategies and financial planning, limiting their role in shaping agricultural enterprises.

6.5 FPO gender-centric intiatives and areas for improvement

In four states, FPOs engage with women primarily through SHG and village-level groups that act as important nodes for receiving and disseminating information and learning to other women. The FPOs conduct regular meetings and training for their members to develop a sense of belonging. In **AP and Maharashtra,** almost 1/2 of the FPOs have initiated women centric capacity-building programs on business planning, digital services, marketing, financial management, and networking. FPOs provide training on goat rearing, financial literacy, trainings at the village level and during the off-season, appointment of on-field technical experts, and timely payment transfer directly to the account. However, FPOs rarely conduct refresher training programs, limiting women's ability to retain and implement their learnings.

Figure 16: Current Women-centric initiatives of FPOs

Current Efforts
• Awareness programs and exposure visits to successful women FPOs to build confidence
• Training programs on leadership, financial literacy, governance entrepreneurship, CSA and business management
• Flexible meeting schedules, accessible training locations, hybrid (in-person and virtual) meeting options, refresher training and rotational responsibilities
• offering incentives (monetary, resource access)
• Encouraged initiated the transfer of land
• Specialized committees- finance, procurement, and market linkages

In **Gujarat**, women lack direct access to training and information, as communication is typically channelled through male family members, and training invitations are extended primarily to men. In **Odisha and AP**, FPOs value and prioritize year-round contiguous engagement FPO member on topics not directly related to FPO business such as nutrition awareness, visits to exhibitions, etc. In women FPOs of **Maharashtra**, directors are incentivized by routing any resource benefit first to them.

Areas for Improving Women's Participation as Shareholder and Leaders in FPOs

Areas for improving women's participation as shareholders and leaders in FPOs include training on roles and responsibilities, team-building activities, business development support, governance and leadership training, financial management, value addition, market access, and structured training programs based on the requirements and priorities of the FPO.

Figure 17: Areas of improvement to increase Women's Participation in Shareholder and leadership

At BoD Level	At Shareholder Level
• Value-addition training, the need for asset ownership and decision-making • Technical training and skills (operation centric), training on financial services, market linkages, and digital technology • Year-end increased continuous engagement with FPO activities to increase relations.	• Emphasized value-addition training and resource building support, financial support, • Access to credit, creation of accessible communication channels and providing farm-related resources and training • Gender sensitisation, creating accessible communication channels, handholding support

07 Women in Agriculture

This chapter highlights the indispensable role of women throughout the agricultural value chain. It outlines the **multifaceted contributions of women, from pre-production, and production to post-production**. It discusses the challenges they face, including labour intensiveness, and limited access to resources and support available.

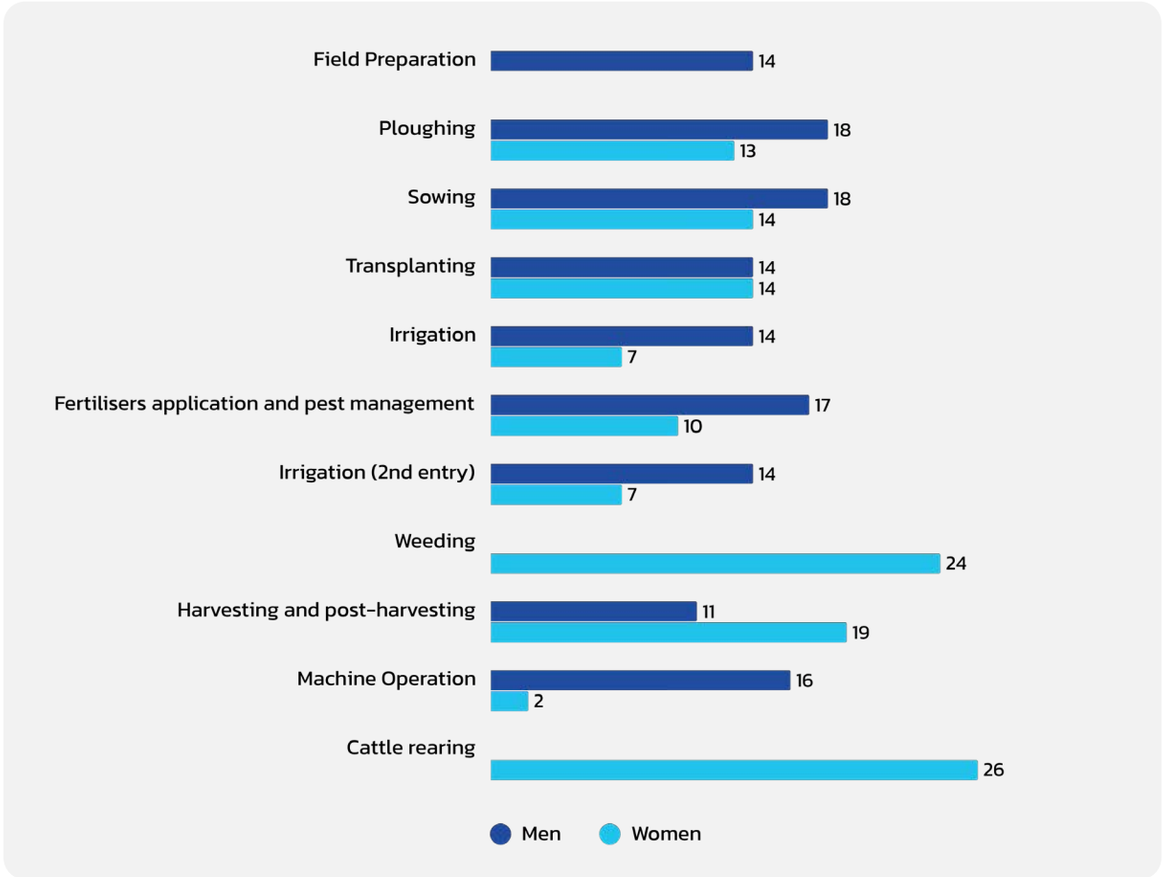
7.1 Women's involvement in agriculture

In **Figure 18**, it shows that **women are predominantly engaged in low-paid and labour-intensive agricultural manual work** such as sowing weeding, transplanting, harvesting, and manual fertilizer application. In some regions, women are preferred due to their lower wages and ability to perform tasks requiring precision.

Women are also tasked with domestic and care work; latter including animal care work. They integrate household nutrition in their farming practices by setting aside a plot for growing chemical-free crops for consumption due to increased awareness on the adverse health impact due to use of chemical inputs. Men's involvement in agriculture is concentrated in activities that require machinery, strength, or technical skills, such as ploughing, irrigation, and fertilizer spraying. In regions where mechanization is prevalent, they operate tractors and other agricultural machinery, as these tasks are considered physically demanding and require prior training, which women often lack.

In some tribal areas, men spend more time in agriculture due to difficult terrain and the need for nighttime vigilance against wildlife attacks. Additionally, male farmers play a key role in broadcasting seeds, particularly in **Andhra Pradesh**, where traditional sowing methods

Figure 18: Women's Role in Agriculture



(broadcasting) are perceived as requiring more strength. However, in states like **Maharashtra**, urbanization has led many men to take up non-agricultural jobs, making farm work a secondary occupation. Women take on greater agricultural responsibilities in such cases, while men focus on wage labour outside farming.

Figure 19: Most labour-intensive work for Women

The most strenuous tasks are **weeding, transplanting, sowing, and harvesting.** These tasks require repetitive motions, prolonged postures, and exposure to harsh environmental conditions, making them particularly challenging.

Weeding requires maintaining a single posture, either bending or squatting, for extended periods, which causes severe strain on the back and legs. In areas with high fertility and frequent rainfall, weed growth is rapid and aggressive, necessitating repeated weeding sessions throughout the season. The labour shortage further intensifies this burden, leaving women to spend long hours manually removing weeds. Transplanting and harvesting are difficult due to bending and prolonged exposure to moisture, leading to foot infections and joint pain.

7.2 Decision-making dynamics around farm-related matters

While farming decisions are often made collectively, **men tend to have greater control over financial and strategic aspects, while women play a crucial role in operational and labour-related decisions**. The extent of women's participation is influenced by household structure, financial access, and cultural norms. Most decisions are taken jointly after discussions with family members. However, the level of participation of men and women varies depending on the nature of the decision and the household structure. In nuclear families, women tend to have more influence, whereas men have a more decisive say in joint families (with more male members). While men typically lead the decision-making process for selecting crops, women actively contribute by sharing insights based on their close involvement in agricultural work. There is a tendency to assume men as the decision-makers. Women's experiences with previous harvests, pest attacks, and labour availability play a crucial role in shaping these decisions. In some cases, especially in households where men are less involved due to external employment or personal issues (such as alcoholism or gambling), women take on the primary role in decision-making to sustain household livelihoods.

> ***"If it becomes known that the husband is seriously considering the wife's opinion and acting on it, then he is ridiculed by being called as a 'baikochi mhaisa' or 'wife's buffalo/ draught animal."***
>
> **– A women farmer in Maharashtra**

> *"Some husbands drink a lot as they don't get any job opportunities here. Men have to travel far to get jobs. Some take 'Ganja' (cannabis). Some men are into rooster fights (kodi pendum) occurring throughout the year, where they go to gamble money. These men are usually not available, and the women can't wait forever for him to decide. So does what she has to do and takes matters in her own hands. "*
>
> – **Women Farmer in Anakapalli, AP**

> *"My wife and I both work on the farm, but when government officers come for meetings, they always call me, not her. Even though she knows just as much or even more, they assume only men handle farming decisions."*
>
> – **Male Farmer from Gujarat**

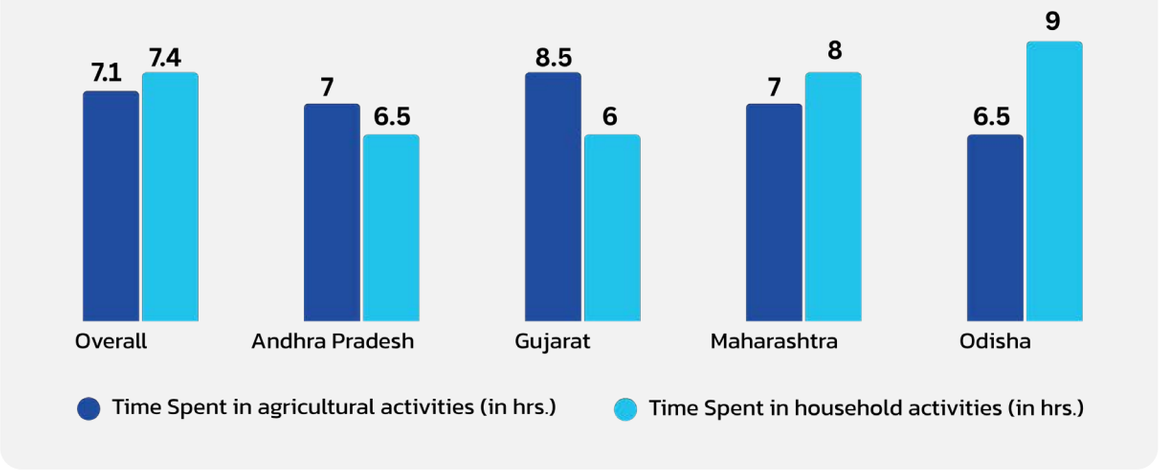
Resource allocation, including the purchase of inputs like seeds, fertilizers, and pesticides, is generally managed by men due to their financial control and greater access to markets. However, women influence decisions based on their knowledge of soil conditions and crop requirements. **Women generally take the lead in hiring women labourers**, as they have a better understanding of who works efficiently in the field. On the other hand, men make decisions regarding hiring male labourers for tasks such as fertilizer application and mechanized operations. Women, often exchange labour within the community, especially when there is either a labour shortage or a high-wage rate. Men usually handle the financial transactions, including accessing credit and selling farm produce. However, in some cases, women-headed households or women from SHGs can exercise greater economic autonomy.

7.3 Time Use of Women in HH and agricultural work (per day)

Figure 20 shares that women spend more time in household activities than in agricultural work. Women are expected to manage household duties regardless of their contribution to agricultural labour. In **Gujarat and AP,** women spend more time on agricultural activities, while in **Maharashtra and Odisha,** they spend more time on household activities.

During peak agricultural seasons, such as sowing and harvesting, women's working hours in the fields increase significantly, sometimes extending beyond their usual schedule. However, this does not reduce their household responsibilities, leading to extended work hours. They rely on manual labour due to limited access to mechanized farming tools and household appliances. This increases the time spent on both farming and domestic work. In some cases, they also engage in secondary income-generating activities, such as preparing value-added farm products or handicrafts. Shrinking family size is making is increasing women's burden. **Women are the key decision maker for bio fertilizer preparation** as they have cattle rearing responsibilities.

Figure 20: Time spent by Women in HH and Agriculture work



More frequent exposure to farm fields places women better able to catch any incoming biotic or abiotic stress and prepare accordingly. They are more engaged in meetings and community discussions. Women show greater enthusiasm for adopting new agricultural techniques.

The long hours spent balancing agriculture and household duties leave women with minimal personal time, often less than 1 hour daily. This affects their health, leading to exhaustion, malnutrition, and musculoskeletal disorders. Additionally, limited time for leisure or self-care impacts their overall well-being, restricting opportunities for skill development, education, or social participation.

> ***" If I am late returning from farm any day, then my husband and mother-in-law would get upset due to delay in domestic work, as I am still expected to complete the HH chores."***
>
> **– FPO Representative from Maharashtra**

08 Climate Change Effect And Adaptation

This chapter explores the **influence of climate change on agricultural practices and the adaptive strategies employed by farmers**. It discusses the integration of CSA within FPOs and examines both the opportunities and challenges in building climate resilience. The analysis provides critical insights into how environmental pressures are reshape the agricultural landscape

8.1 Perception around effects of climate change on agriculture

The increasing unpredictability of rainfall, extreme temperature fluctuations, and rising pest infestations have reduced agricultural productivity and increased economic distress among farming communities. These shifts in climatic conditions have altered traditional farming cycles, affected soil health, and led to financial uncertainty for small and marginal farmers.

As shown in **Table 16**, **in AP, prolonged dry spells, have made rain-fed agriculture highly unreliable. In Gujarat, heat stress leads to** lower milk production and higher feed costs. In **Maharashtra, erratic rainfall has shortened the sowing window,** increasing crop failure risks and is forcing farmers to switch to less water intensive crops many of which give low yield, have lower marketability in the local markets, and sell as comparatively lower prices.

In **Odisha and AP, the increasing humidity is damaging harvest**, which can be seen in crops such as ginger and black pepper, which are getting fungal attacks. The excessive rainfall in hilly regions has caused soil erosion and disrupted the formation of natural mulch, affecting the soil's nutrient content and crop health. Erratic rainfall has also disrupted sowing schedules, as seeds are often washed away due to early rains, requiring farmers to replant multiple times. There is increased dependence on irrigation, leading to higher water consumption. Unseasonal rains during crucial farming stages, such as paddy harvesting, have resulted in significant crop losses.

High temperatures during the day force farmers to start their work earlier in the morning and avoid mid-day hours when the heat is unbearable. Similarly, severe cold & excessive rainfall have limited the time farmers, particularly women, can spend in their fields. This disruption has reduced productivity & increased the work burden to complete farming tasks.

Table 16: Changes Observed in Agricultural Practices

States	Decline in productivity	Change in time spent in farming (increased & decreased)	Increase in use of fertilizers	Increase in use of pesticides	Increase in weed growth	Change in crop variety	Change in cropping pattern	Shift from traditional irrigation methods
Andhra Pradesh	5	9	4	4	3	1	2	1
Gujarat	6	4	6	5	6	4	4	2
Maharashtra	6	5	6	5	4	6	4	5
Odisha	6	4	6	6	4	1	0	0
All	**23**	**22**	**22**	**20**	**17**	**12**	**10**	**8**

Figure 21: Effect of Climate Change and Impact on Farm Income

Effect of Climate Change

Erratic weather patterns:
Unpredictable rainfall, extreme temperature fluctuations, and prolonged dry periods affecting farming cycles.

Soil degradation:
Excessive rainfall in hilly areas causing soil erosion, nutrient leaching, and loss of natural mulch, leading to reduced soil fertility.

Disruptions in sowing & growth:
Early rains washing away seeds, forcing multiple sowings, while excessive heat and cold lower flowering and overall crop productivity.

Crop damage & yield reduction:
Increased pest infestations, lower yields, and deterioration in crop quality affecting marketability.

Rising production costs & health risks:
Climate-induced stress requiring higher input costs (fertilizers, pesticides, irrigation) while also reducing labour productivity and increasing health risks.

Impact of Adoption of CSA (Techniques, Technologies) on Farm Income

Initial decline in **farm income & productivity**

Improved soil health, reduced dependency on **external inputs,** and resilience to climate variability leading to reduction in input cost.

Increased **labour cost**

Lowered **operational expenses**

> *"Our region used to have predictable rainfall, but now sudden downpours lead to soil erosion, while long dry spells destroy crops. We don't know when to plant anymore."*
>
> *"Earlier, we got good crops with natural farming, but now, the soil is weaker. We need more fertilizers, even for millet and pulses."*
>
> *"Vegetables that used to grow well in this season are not surviving. The heat dries up the soil too quickly."*
>
> *"The land is becoming dry and hard. Even with organic manure, the soil doesn't retain moisture like before."*
>
> **– Farmers in AP and Maharashtra**

8.2 FPOs role in CSA promotion

Figure 22: CSA practices promoted by FPO

States	CSA practices promoted by FPO
Andhra Pradesh	• **Crop & soil management**: Crop rotation, line sowing, multi-cropping, intercropping, and bio-fertilizers • **Climate-resilient technologies**: Increased cultivation of millets for household nutrition • **Water conservation:** Rainwater harvesting
Gujarat	• **Capacity -building & knowledge sharing:** Training on organic farming, exposure visits, and an organic farm school • **Soil & input management:** Soil testing and organic input shops • **Irrigation & pest management**: Drip irrigation and mulching, solar-powered light traps and pheromone traps.
Maharashtra	• **Bio-input & soil management**: Bio-inputs, vermicomposting, and annual soil testing • **Post-harvest & value addition:** Solar driers and aerators, demo plots, and training on bio-input preparation and organic farming • **Training & Exposure:** Exposure visits and knowledge-sharing sessions.
Odisha	• **Waste & resource utilization:** Cattle waste utilization in farming • **Post-harvest & dairy management:** Adoption of solar freezers • **Sustainable input & pest control:** Bio-pesticides and bio-fertilizers through FPO input businesses • **Technology adoption:** Use of solar-powered aerators • **Diversification & traditional practices**: Crop diversification, mushroom cultivation using leftover paddy straw, and local indigenous pest control methods.

Figure 23: CSA practices by Farmers

States	CSA practices promoted by FPO
Andhra Pradesh	• **Crop management:** Crop rotation, crop diversification, line sowing, multi-cropping, and intercropping. • **Soil health & pest management:** Use of bio-fertilizers, organic manures, composting, and planting trap crops such as marigold and pulses on bunds to enhance soil health and control pests naturally. • **Water conservation techniques:** Rainwater harvesting, mulching, and cover crop help in water retention and soil moisture management. • **Climate-resilient varieties:** Millets cultivation
Gujarat	• Organic crops and agroforestry, mulching, drip irrigation, solar-powered light trap
Maharashtra	• **Crop & soil management:** Short-duration crops, multi-cropping, buffer crops, and seed treatment • **Water & energy efficiency:** Drip and sprinkler irrigation, and solar-powered pumps • **Bio-input & pest control:** Bio-fertilizers like 'Ashpranak', organic fertilizers, vermicompost, and pheromone traps • **Technology:** Solar driers, solar pumps
Odisha	• **Post-harvest & dairy management:** Solar-powered freezers • **Sustainable input & pest control:** Bio-pesticides and organic fertilizers • **Diversification & traditional practices:** Adoption of crop diversification, mushroom cultivation using leftover paddy straw, and indigenous methods of pest control

FPOs are playing a crucial role in building climate resilience by incentivizing collective action, enhancing market access, improving infrastructure, and investing in climate-smart agricultural practices. They also provide access to resources through linkage with financial and extension services, which is contributing towards increasing resilience and income for farmers.

FPOs act as nodal point facilitating and mobilizing farmers for any training and access to resources conducted by other institutions. The CSA practices by farmers are more diverse than the those integrated by the FPOs in their value-chains. Due to membership in various groups beyond FPOs, farmers are able access more diverse CSA practices from govt. and non-govt. agencies such as ATMA, KVK, NGOs, etc. Unless there is reliable market linkage and price realization, FPOs are reluctant take up CSA practices in large scale.

Table 17 clearly shows that **at least ½ of the FPOs have tried to promote the adoption of CSA** among farmers through information and training, facilitating extension services, providing access to resources. **Only a quarter of the FPOs have been able to provide marketing support.** The FPOs' input shops often provide guidance on the appropriate use of fertilizers and pesticides, as well as access to organic input supply. They also facilitate capacity-building by linking farmers to training programs, exposure visits, and new agricultural technologies.

The FPOs in **AP** show the highest support provided to farmers in adopting CSA, especially in the revival of millet. The FPOs in **Gujarat** promote CSA by training and providing members with access to information by establishing farm organic farm schools. In **Maharashtra**, the FPOs promote CSA by facilitating training hosted by the govt. and non govt. agencies as well as identifying market

Table 17: Role of FPOs in CSA Promotion (state-wise)

States	FPOs (Nos)	Information and training	Access to resources	Extension Service	Marketing support
Andhra Pradesh	9	5	4	3	2
Gujarat	6	3	2	1	-
Maharashtra	9	3	3	4	1
Odisha	8	3	3	3	1
Total	**31**	**14**	**12**	**11**	**4**

Table 18: Role of FPOs in CSA Promotion (Composition-wise)

States	FPOs (Nos)	Information and training	Access to resources	Extension Service	Marketing support
Men FPO	5	2	3	2	-
Mixed FPO	13	5	4	4	2
Women FPO	13	7	6	5	2
Total	**31**	**14**	**12**	**11**	**4**

linkage. In **Odisha**, FPOs are encouraging CSA practice through technical training as well as higher income to farmers by linking them with the **Odisha Millet Mission.**

Table 18 shows that women and mixed FPOs perform considerably better in promoting the adoption of CSA than their other counterparts. Marketing remains the biggest challenge for all the FPOs. The involvement of men FPOs in CSA is limited as they are more inclined towards commercial crop varieties.

> ***"Farmers won't engage if you only talk about CSA or climate change. You need to link it to profit, soil health, and production for them to take interest."***
>
> **– FPO Representative**

8.3 Impact of CSA Adoption on Farm Income

Adopting sustainable agricultural practices has had both positive and challenging effects on farm income, influencing productivity. Though these practices offer long-term benefits such as improved soil health, reduced dependency on external inputs, and resilience to climate variability, the transition phase often comes with economic trade-offs.

Farmers who have shifted away from or partly reduced the usage of chemical fertilizers and pesticides by adopting organic alternatives such as compost, vermicompost, and bio-fertilizers have significantly **lowered their operational expenses**. The ability to prepare biofertilizers in-house further contributes to **cost savings.**

> *"If the yield goes down even a little, it hits our income hard. Organic farming takes so much more work—we have to do all the weeding by hand, make compost, and apply bio-inputs ourselves. It costs more because we need extra labour, and whatever we save on chemicals gets spent on wages."*
>
> – A Farmer in Maharashtra

8.4 Constraints faced by farmers in adopting CSA

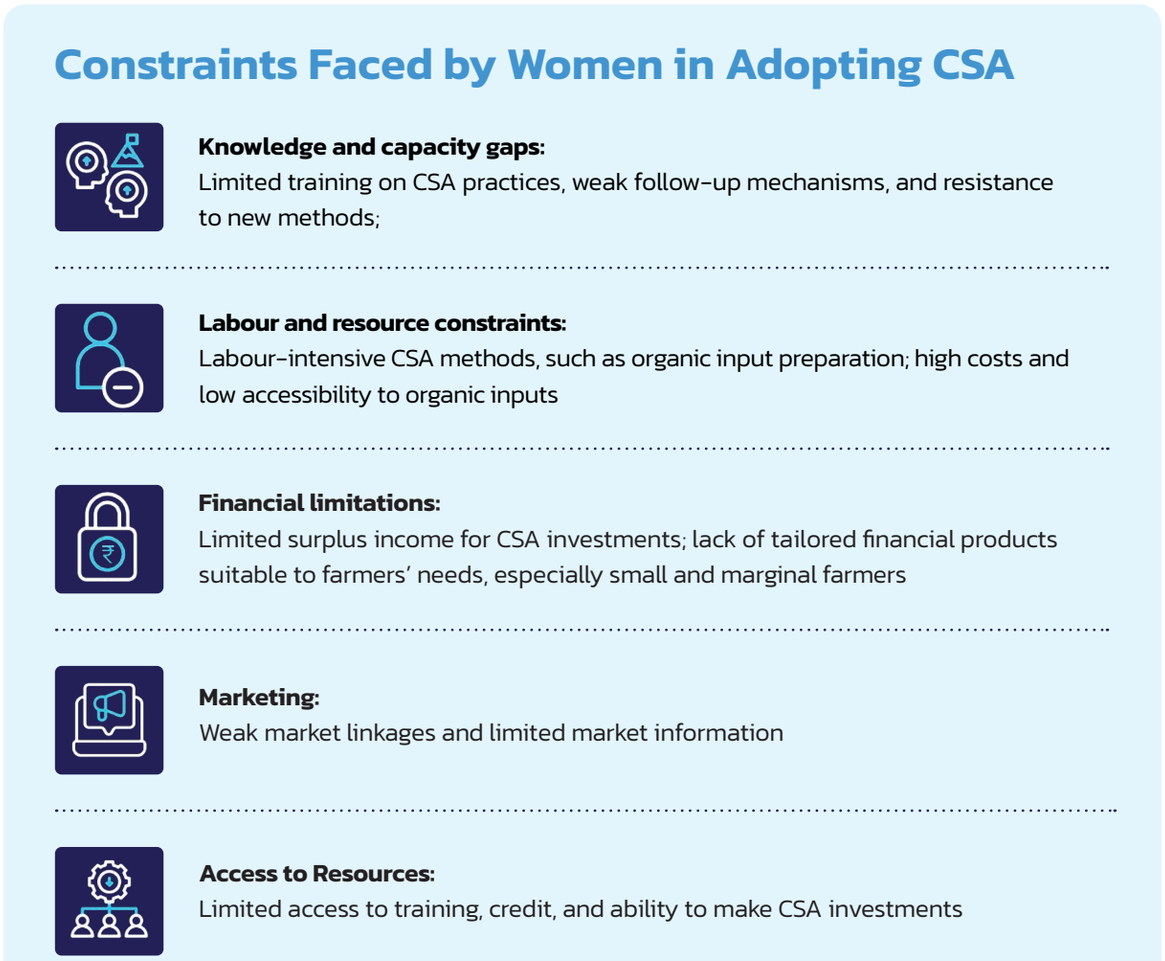
The absence of reliable market linkage for organic produce is the biggest deterrent to CSA. The low-price discourages farmers, especially marginal farmers who are very risk averse, from investing in CSA. **Lack of structured training, regular information updates about training, limited access to resources (input, technology), and limited convergence with government are the other constraints to the CSA adoption.**

As shown in **Table 19**, Farmers across all states face credit access challenges for purchasing innovative CSA inputs and technology due to repayment scepticism by financial institutions and unfavourable product terms (unaffordable product terms, documentation requirements, collateral concerns). Moreover, CSA adoption initially results in lower productivity and poor price realization, discouraging farmers. Farmers in **Andhra Pradesh, Gujarat, and Maharashtra** struggle with the absence of a market for organic produce, limited access to government support, and inaccessibility of organic inputs. Additionally, **Andhra Pradesh** farmers face difficult terrain and limited training on quality maintenance, while **Gujarat** farmers report limited awareness about the benefits of organic farming. In **Odisha** , the farmers shared additional constraints including higher costs due to limited subsidies, increased time and labour requirements for bulk preparation, and a lack of structured training to adopt best CSA.

Table 19: Constraints in Adoption of CSA

States	FPOs (Nos)	Awareness, information (knowledge gap)	Re-source con-straints	Accessibil-ity (time & location of training)	Limited govt. support accessed	Limited rele-vance/ benefits	Market link-age absent	Limited time and labour availability
Andhra Pradesh	9	9	9	8	9	8	8	5
Gujarat	6	4	4	3	3	3	6	3
Maharashtra	8	1	3	2	4	3	8	1
Odisha	8	6	6	1	6	6	7	3
All	**31**	**20**	**22**	**14**	**22**	**20**	**29**	**12**

Figure 24: Constraints faced by Women in Adoption of CSA



8.5 Awareness and accessibility of climate resilient agriculture schemes/ programmes (climate risk insurance/ weather insurance/crop insurance scheme)

Awareness and access to climate-resilient agriculture schemes, particularly crop insurance and credit support mechanisms (Pradhan Mantri Fasal Bima Yojana- PMFBY) and Kisan Credit Card -KCC), exhibit a mixed pattern among farmers. **While awareness is relatively high, accessibility and effective utilization remain limited due** to bureaucratic hurdles, gender disparities, fund disbursement, scheme applicability, and the complexity of claim processes.

Many farmers struggle with the claims process and report irregularities in receiving payouts despite regularly updating their details.

> *"Even though we have crop insurance and we provide our details in the tehsil office every year, the compensation we receive is very low, sometimes less than 10% of what we invest. Since last couple of years, there has been no payout. This insurance only covers certain crops, leaving us unprotected when other crops fail. We need an area-based model that considers climate-related losses across the entire region."*
>
> – A farmer in AP shared his opinion on govt. crop insurance

Farmers, generally, prefer schemes with immediate tangible benefits, such as subsidies for inputs like seeds, fertilizers, or irrigation equipment. In contrast, schemes that require complex application procedures and offer benefits only after prolonged processing, like insurance claims, are less popular. Many farmers report **technical barriers in the application process,** such as needing to visit cyber shops multiple times and paying additional fees to complete their applications. Furthermore, **changes in state governments and administrative processes have led to disruptions in fund disbursement**, further discouraging farmers from relying on these schemes.

Type of training received on CSA and additional support required

Over the past decade, government programs, NGOs, and agribusinesses have played a crucial role in training farmers, introducing new technologies, and promoting sustainable practices.

Over the past decade, government programs, NGOs, and agribusinesses have played a crucial role in training farmers, introducing new technologies, and promoting sustainable practices.

The role of government, NGOs, and agritech companies in supporting this transition has been significant. **Government initiatives, such as the Ryot Bharosa Kendra (RBK) and APCNF, have facilitated knowledge dissemination** through SHG representatives and extension services. NGOs, including SEWA, WOTR, and Gram Vikas, have provided crucial training on climate resilience, financial management, governance, and technological support like solar dryers and pheromone traps. FPOs have played an essential role in spreading awareness, providing free input supply, and establishing bio-input shops, strengthening the link between farmers and sustainable farming practices.

> *"Most of the time, it's the men who attend training sessions, but they don't share what they learn with us. We have learned things like vermicomposting, mushroom farming, and making incense sticks, but we still need more guidance. Many of us struggle because sustainable farming takes a lot of time and effort, while men see it as slow and low profit. Also, some of the machines and techniques they show us in training don't really work for our farms, making it harder to put what we learn into practice."*
>
> – Women farmer in Odisha

Farmers, particularly women in rural areas, have received various types of training related to sustainable agriculture. However, several gaps remain that need to be filled.

Figure 25: Additional Support required for CSA adoption

Awareness & mentoring:
Targeted awareness campaigns and regular field-based mentoring to address negative perceptions of sustainable farming as slow-yielding and labour-intensive.

Training & technical support:
Practical, hands-on training through exposure visits, covering technology-based farm management, branding, storage, market identification, business management, and value addition. This also involves ongoing technical guidance and support.

Financial & infrastructure support:
Enhanced financial assistance through dedicated credit schemes with lower interest rates, simplified loan procedures, and subsidies for sustainable farming equipment and decentralized renewable energy technologies, alongside support for infrastructure development.

Market & input linkages:
Improved access to bio-input centres and the creation of robust marketing linkages for organic produce to ensure a sustainable supply chain and better market opportunities.

Farmers have long been practicing the preparation and application of bio-inputs, but structured training and access to reliable information have significantly improved their understanding and implementation of organic and sustainable practices. Village-level training programs have allowed farmers to witness the gradual impact of CSA, leading to an increase in both yield and income. **Exposure visits, farmer interactions, and hands-on demonstrations have further reinforced the adoption of these practices**, allowing them to make informed decisions regarding soil health, irrigation, and organic input use.

> ***"Demonstration plots are critical for farmer buy-in. Farmers believe what they see. If one farmer produces 10 quintals using improved techniques while another gets only 5, it becomes a direct motivation."***
>
> **– An NGO representative**

09 Key Insighrts

Based on the insights gained through qualitative interaction with more than **60 FGDs with FPO representatives and farmers and KIIs with stakeholders,** nuanced findings around FPO's capacity-building needs, gender dynamics in FPOs, and CSA adoption across four states are presented below. The section below highlights the strengths, challenges, and emerging themes related to FPO performance, gender dynamics, and CSA adoption to inform future strategic interventions.

9.1 FPOs capacity building needs

Through the study, key capacity building needs were identified underscoring specific emphasis on institutional governance, operational management, financial access, infrastructure readiness, and member mobilization. State-wise differences are highlighted to enable targeted intervention design.

- **Andhra Pradesh:** FPOs mainly struggle with challenges in infrastructure development (warehouse, processing), the overburdening of a few individuals (poor sense of ownership), and restricted access to training mainly for office-bearers.
- **Gujarat:** Poor ownership (interpersonal conflicts, limited collectivization), value addition (lack of infrastructure, market linkages), competition from large players, limited financial services, difficulties in mobilization (limited understanding of benefits), infrastructure development and weak linkages have emerged prominently from discussions with Gujarat FPOs.
- **Maharashtra:** The FPOs struggle with aspects such as ownership (time poverty), access to relevant training (generic, not feasible adoptions due to high investment costs), and restricted entry into wider market channels due to established competitors, and access to credit. The limited availability of digital information and data management, hinders decision-making processes.
- **Odisha:** In the case of Odisha FPOs, the director's limited dedication, remote terrain complications (operational difficulties), competition from neighbouring states (for crops like ginger) and poor adoption of digital solutions (heavy reliance on manual processes and systems) impede logistical and business expansion.

Eco-system support to FPO

NGO and government support has been extended to FPO members training & information, access to resources, financial and credit support, agri-technology, though facilitating market linkages has been almost entirely driven by the non-government bodies. The support from government bodies has been especially critical during the inception stage of the FPOs for setting up the entity. In contrast, the continuous and prolonged support from the NGOs has enabled them to grow further by equipping them with the skills to run the institution. NGO/GO support has been accessed by all the FPOs at some part of the lifespan for different purposes such as training & information, access to resources, financial and credit support, marketing, and agri-technology. There are some variations observed across states. **Though most of the FPOs have received support from ecosystem players, it has been sporadic and one-time.**

- **Andhra Pradesh:** During the initial years, FPOs have received support from both government (CSA training and technology-cold storage) and NGOs (training, awareness, processing units). However, there has been a gap in terms of tailored skill training (based on CSA and value-addition, feasible technologies, and financial services support for business growth).
- **Gujarat**: In case of Gujarat, NGO/CBO support was found higher than that of govt bodies due to multiple support areas such as capacity-building training, financial services, and facilitation in entering digital market channels.

- **Maharashtra:** Strong and equitable support received from government bodies and NGOs. NGOs played a contributory role in enabling access to more suitable and feasible technologies, and bio-inputs. At the same time government support strengthened the FPOs' capacity to engage in marketing by building their infrastructure through financial support.
- **Odisha:** Many FPOs, especially in the tribal belts have received strong government support (price realization, agricultural training) but have demonstrated weak private and NGO interventions. There is a gap in tailored training, feasible technologies, value-addition skills and financial services.

9.2 Gender dynamics in FPOs

Gender representation in BOD and shareholder

- **Andhra Pradesh:** Women's participation as shareholders (48%-100%) and governance (20%-100%) is higher due to strong SHG and farmer club networks. However, due to limited marketing opportunities, infrastructure and skills training, their agency and participation remain restricted to the production nodes of the agricultural value chains.
- **Gujarat:** Women's overall participation is low in shareholders (0-100%) and almost absent in leadership space (8-100%), except in women FPOs. Women have limited agency and control within the agricultural value chain as they are restricted to production space and men are primary decision-makers regarding agricultural work.
- **Maharashtra and Odisha:** Women's representation is relatively better with higher women's representation in shareholders and boards (29%-100% for both states), but leadership gap persists. With limited agency in agriculture and lack of decision-making power, women's participation exists; however, their ownership and recognition need strengthening.

Women participation in different value chains: Women actively engage in production, procurement, processing, and packaging, particularly in farm-based and labour-intensive work. **Leadership, large-scale marketing, and financial decision-making remain male-dominated. The time spent by women on unpaid household activities (around 7.5 hours) is higher than those invested on agricultural work** due to patriarchal norms, limited opportunities in marketing, and restricted access to resources and services.

This triple burden of unpaid domestic, reproductive, and care work which disproportionately falls on women leads to opportunity costs from the resulting trade-offs women have to forgo potential income-generating activities, further entrenching their unequal status. **Due to climate change, women are pushed to spent more time on farm work and engage in wage labour work to offset the losses inflicted due to climate change**. To cope with increased work burden, women cut down on cooking time by compromising on the diet resulting in reduction in nutritional calorie.

Constraints for low women participation

Knowledge and capacity gaps	Due to limited participation, access to capacity-building training is a concern. Furthermore, due to limited training, women remain unclear about the roles and responsibilities they can assume.
Time and mobility constraints	Due to their disproportionate household responsibilities and the lack of safe transportation available, women are not able to attend training regularly.
Decision-making limitations	Women often hold functional roles without much influence in leadership and key decision-making roles.
Social norms	Youth and married women face restrictions due to cultural expectations. They usually leave their village and are confined to household duties during child-bearing time.

9.3 Adoption of CSA

Figure 26: CSA practices adopted by farmers across states

States	CSA Practiced by Farmers
Andhra Pradesh	• **Crop management:** Crop rotation, crop diversification, line sowing, multi-cropping, and intercropping. • **Soil health & pest management:** Use of bio-fertilizers, organic manures, composting, and planting trap crops such as marigold and pulses on bunds to enhance soil health and control pests naturally. • **Water conservation techniques:** Rainwater harvesting, mulching, and crop cover help in water retention and soil moisture management. • **Nutritional security:** Millet cultivation for household consumption
Gujarat	• Organic crops and agroforestry, mulching, drip irrigation, solar-powered light trap
Maharashtra	• **Crop & soil management:** Short-duration crops, multi-cropping, buffer crops, and natural seed treatment • **Water & energy efficiency:** Drip and sprinkler irrigation, solar pumps, and drone • **Bio-input & pest control:** Bio-fertilizers like 'Ashpranak', organic fertilizers, vermicompost, and pheromone traps • **Technology:** Solar driers, solar pumps
Odisha	• **Post-harvest & dairy management:** Solar freezers • **Sustainable input & pest control:** Bio-pesticides and organic fertilizers • **Diversification & traditional practices:** Adoption of crop diversification, mushroom cultivation using leftover paddy straw, and indigenous methods of pest control

- **Current efforts by FPOs:** FPOs facilitate information dissemination (information on the importance and benefits of CSA practices), training (methods and facilitating training through institutions such as KVKs, ATMA, and research institutes), and resource access (access to affordable and good-quality inputs, access to technology through linkages with govt. schemes). However, only a few provide marketing support. It has been observed that KVKs in close proximity with research institutes are well informed and showcase higher engagement with farmers leading to higher adoption of CSA by farmers. Women FPOs have found to play a stronger role in CSA promotion compared to men FPOs.
- **Adoption by farmers:** Farmers across the study states have demonstrated poor adoption of CSA due to a lack of markets for organic produce, inadequate access to government support, and difficulty in obtaining organic inputs. They also face additional challenges of high costs, labour-intensive processes, and lack of structured training.

Challenges in the adoption

The adoption of CSA practices faces multiple challenges that hinder widespread uptake among small and marginal farmers. **The principal constraint has been the absence of stable and reliable market linkages for organic and climate-resilient produce, resulting in low price realization and discouraging farmers from investing in sustainable practices.** Financial barriers, such as limited access to credit and high-risk aversion, particularly among marginal farmers, further limit adoption. Additionally, a significant **gap in structured training, access to appropriate technologies, and convergence with relevant government schemes,** makes CSA seem unviable. These challenges are even more pronounced for women farmers, who face gendered constraints such as higher labour demands, limited mobility, restricted access to financial products, and weak integration into market systems. Thus, for wider adoption of CSA, there is a need for exposure visits, demonstration plots, and practical hands-on training.

Insights across States

- **Andhra Pradesh:** Farmers in hilly areas mostly practice natural farming, but in lowlands, chemical-intensive farming is more prominent. They also face significant challenges due to the poor availability of ready-made bio-inputs, limited access to credit facilities, and weak market linkages.
- **Gujarat:** Awareness of CSA was generally low, especially among women resulting in poor buy-in. This was due to the poor availability of bio-inputs, limited access to institutional credit, inadequate market access, and a prevailing perception that CSA practices result in lower yields. Additionally, there was limited awareness and access to existing government programs, resources, and training opportunities related to CSA, further impeding its adoption.
- **Maharashtra:** Similar to Gujarat, Maharashtra also witnessed low awareness of CSA, with women farmers particularly lagging in adoption. Barriers included inadequate bio-input availability, labour shortage, limited credit access, weak market linkages, and a widespread belief that CSA practices lead to reduced yields. Moreover, a low reliance on farm income discouraged many farmers from investing in the adoption of innovative agricultural practices.
- **Odisha:** In the case of this state, awareness of climate change and CSA practices was limited among farmers. There was a lack of subject-specific training and minimal access to technical experts in the field. Furthermore, the absence of structured handholding and mentoring support significantly restricted farmers' ability to adopt and implement climate-resilient agricultural practices.

10 Recommendations

This chapter outlines **strategic, actionable recommendations informed by the study findings. It offers a forward-looking roadmap** for strengthening FPO institutions, mainstreaming women's leadership, and enhancing climate resilience through CSA initiatives. These strategies will guide policymakers, practitioners, and other key stakeholders in transforming agricultural practices over the coming years.

It has been well evidenced that women play a critical yet underrecognized role in agricultural value-chain activities. Despite their efforts, they often remain confined to low-value tasks, with limited decision-making power and minimal access to financial resources, training, and markets. Sociocultural norms further restrict their mobility, making it difficult for them to attend training programs, engage in market transactions, or participate in leadership roles. Additionally, women's lack of land ownership prevents them from accessing formal credit, keeping them dependent on male family members for financial decisions. These challenges make it essential to strengthen women's participation in agriculture by creating institutional structures that provide them greater autonomy, skill development, and market access.

FPO – Vehicle of change of women farmers

FPOs have the potential to serve as transformative institutions that bridge these gaps by offering women farmers a collective platform to access training, financial support, and market linkages. FPOs provide a structured approach to agricultural development, enabling small and marginal women farmers to collectively negotiate better prices, access high-value markets, and adopt sustainable farming practices. Empowering women within FPOs can lead to more sustainable and resilient agricultural practices, particularly in climate change. In agri-collectives, women's leadership in sustainable farming practices, post-harvest management, and climate adaptation strategies has demonstrated the ability to drive CSA by overcoming social and structural barriers (FAO, Women's access to rural finance: challenges and opportunities, 2019).

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However, most FPOs currently lack the resources and expertise to design gender-inclusive services, making it difficult for women to participate fully. Many products and services within the agri-value chain are either inappropriate for women or delivered in ways that do not accommodate their constraints. Women members often stay on the periphery, with little say in planning or strategic decisions while decision-making within FPO remains male-dominated. By strengthening FPOs as inclusive and transformative institutions, women farmers can take on leadership roles, contribute to climate-resilient agriculture, and play a central role in shaping sustainable food systems.

Recommendations outlined at the policy level and cutting across capacity building, access to resources and partnership/networking are presented below:

A. Policy-level changes

- **Tailored support models:** State-level policy support remains fragmented and insufficient, with no dedicated institutional framework for FPOs. Thus, there is **need of a central "FPO Development Board" and district-level agri-business schools** to drive tailored support, incubation, leadership development, and capacity building based on FPO's maturity, funding needs, and skill gaps. For e.g. long-term (5-7years) financial assistance in tapering mode can be developed for FPOs to cover core expenses (e.g., staff salaries, office costs, registration fees) in the long run alongside formulating exit strategies. FPOs to be trained on business risk management, diversification, and expansion. Alongside, exit strategies ensuring sustainability post-FWWB support be developed for each of FPOs.
- **Insurance schemes: Shift from crop-specific to region specific insurance models** for better alignment with local climate realities. Integrating climate risk mitigation through insurance and subsidies mechanisms such as Weather-Based Crop Insurance Scheme (WBCIS) and Pradhan Mantri Fasal Bima Yojana (PMFBY) to be tapped.
- **Cluster level weather sensing stations: A decentralized modern weather remote sensing weather measurement models** at panchayat/cluster level to provide real-time, localized weather data to optimize agricultural practices.
- **Gender Disaggregated Data:** A comprehensive data base on FPOs to track gender-disaggregated data to inform and design gender transformative agri-programs and policies.
- **Gender spaces:** FPOs must adopt **gender-sensitive policies to address the imbalance, including mandatory quotas for women in boards and key committees** Increased representation of FPO women members in local agricultural bodies such as Agriculture Producer Marketing Committee (APMC) board thus becomes critical. Additionally, promotion of inclusive public spaces such as markets (creches, restrooms, gathering places) and in hyperlocal transportation facilities to be instituted.
- **Increased recognition:** There is need to **expand definition of "farmer" to include women, tenants, and sharecroppers, and institutionalize women's recognition through joint or individual IDs** linked to schemes, training, and markets. Land ownership to be decoupled from land use rights. Women farmers need to be identified as cultivators and their names should be added on land records. The crops usually cultivated and managed by women, such as millets, pulses, vegetables, etc., are absent from MSP and least remunerative. Therefore, mechanisms to ensure better price realization for such crops to be instituted.

Case Study: Anticipatory Action and Early Response in Madagascar, Kenya, Ethiopia, and Sudan

Anticipatory Action (A-A) is a proactive disaster risk management approach that uses forecasts, early warnings, and pre-planned measures to protect vulnerable communities. In countries like Sudan, Kenya, and Madagascar, A-A interventions, such as early seed distribution and drought forecasting have improved crop yields and food security. By acting before crises escalate, A-A reduces losses, enhances resilience, and ensures timely support to those most at risk.

Reference: (Weingärtner, Pforr, & Wilkinson, 2021)

B. Capacity Building Centric

B.1 Business management

Institutional strengthening through strategic planning through the village and FIG-level vision-building exercises and development of Annual Action Plans (AAPs) involving BoDs, CEOs, and staff to instil ownership, accountability, and long-term strategic focus. Vrutti is one such example which helps FPOs in strategy and plan development.

Meeting marketing compliances: FPOs aiming to enter high-value markets (e.g., exports, organic) must comply with **licensing and regulatory standards**. Sessions on current marketing compliances, licenses, and regulatory frameworks may help FPOs plan and execute their value-chains and operations accordingly and allow seamless access to markets.

Gender focussed value chain development: Women's roles in procurement, quality control, and aggregation can be expanded through **targeted skill-building, enabling them to participate across multiple value chain nodes.** With many low-investment, nutrition-critical crops (millets, pulses, vegetables) driven by women, making **'gender branding'** becomes paramount. Highlighting women's roles in agri-value chains appeals to conscious consumers who support ethical and inclusive production and will boost visibility and demand for FPO products, further ensuring fair pricing and reduce the gender wage gap. **Susag Millets** is one such model for reference.

CSA related: Climate education to be reintroduced in schools, KVKs, and Farmer Field Schools, and climate literacy embedded in all extension services. Pilot models for climate-smart value chains, and institutional strengthening of KVKs and farmer-led knowledge platforms on CSA is much needed.

B.2 Financial management related trainings on

Financial planning: Financial training is often limited to select members (CEOs or accountants) during the inception years, with a narrow focus on topics related to FPO's required financial mechanisms to meet FPOs legal mandates and rarely covers aspects of growth and pre-emptive planning against future risks. Clearly there is need to increase the participants and also revisit the content. Alongside, **refresher trainings on financial planning, risk management, and investment strategies stand critical** for safeguarding against foreseeable risk with preventive measures and to seek and utilize opportunities for stability and expansion.

Susag Millets – Empowering Women through Millets in Andhra Pradesh

In Vizianagaram district of Andhra Pradesh, a women FPO, promoted by SABALA has become a transformative force in reviving sustainable agriculture and improving women's health, decision-making, and livelihoods. Through structured training, better market access, and convergence with government schemes, the FPO empowered women to take leadership roles and actively participate in decision-making. The initiative became a successful model of how FPOs can play a pivotal role in promoting sustainable agriculture, ensuring food and fodder security, enhancing soil fertility, and fostering women's agency in farming systems.

Digital record keeping: Limited digital literacy keeps many FPOs reliant on outdated systems, undermining transparency and efficiency. Therefore, enabling access to digital platforms (applications) of accounting and record keeping through trainings has emerged paramount. **Tally, and Vyapar** are some examples which can improve record digitization, financial management and access to institutional credit.

Compliance training: One of the crippling issues found to be responsible for growth hindrance is non-compliance which leads to severe penalties upto ₹1 lakh. To prevent this, conducting **residential training on financial documentation, record-keeping, and RoC filings** is necessary. Content developed by organizations such as **Centre for Sustainable Agriculture, and KVKs** can be used for training FPOs on compliance management toward business growth.

B.3 CSA related

Contextual CSA practices and technologies: CSA training outreach has been constrained in yielding better price due to limited access to inputs, technologies and market. Moreover, poor price realization, lack of bio-inputs, poor knowledge, unsuitable technologies, and high upfront costs has necessitated the need for developing context-specific Packages of Practices (PoPs). Furthermore, there is a **need to promote adaptive planning and localised climate-responsive crop advisories** based on rainfall shifts; soil and water conservation, along with organic matter enrichment through climate literacy. Alongside, **promotion of peer-to-peer learning and on-field demonstrations** of climate-resilient technologies is much needed to enhance adoption, adaptation, and long-term sustainability. Examples of the **Council on Energy, Environment and Water (CEEW) and ICRISAT** can be looked at in this regard. Additionally, in **new-age farming, along with market linkages farmers** to be equipped with skills to adopt tech-based practices (drones, digital advisory) in agriculture and improve traceability.

ICRISAT – Science-Based Support for FPOs

ICRISAT supports FPOs through research-based innovations in crop science, water use efficiency, and soil health. It enables FPOs to adopt climate-resilient technologies and better agronomic practices. The institute partners with state governments to implement farmer-centric PoPs (Packages of Practices) and digital decision-support systems. ICRISAT also works on seed systems strengthening, providing improved seed varieties to FPOs and facilitating participatory varietal trials to suit local conditions of rural enterprises.

Source: https://www.icrisat.org/public/assets/Flyers/Thematic-Flyers/Digital-Agriculture.pdf

Council on Energy, Environment and Water (CEEW) Gujarat – Clean Energy and Climate Resilience Integration

The Council on Energy, Environment and Water (CEEW) has been into implementation of DRE (Decentralized Renewable Energy) interventions in Gujarat by integrating clean energy solutions into agricultural value chains. Its strategy includes deploying solar dryers, cold storages, and irrigation pumps tailored for smallholders, especially women. CEEW maps energy needs, assesses techno-economic viability, and collaborates with FPOs to ensure adoption. It also advocates for policy incentives and financing tools to scale up clean energy use in rural enterprises.

Source: https://www.ceew.in/blogs

FWWB India is one such institution which offers Capacity Building support to FPOs.

FWWB India – Capacity Building for FPOs

FWWB focuses on strengthening grassroots institutions through capacity building, leadership development, and financial literacy. FWWB promotes inclusive governance and works with banks to improve women's access to credit and renewable energy technologies. It also implements mentorship programs and exposure visits to develop women's confidence in entrepreneurship, governance, and market negotiation. It includes

Capacity building on governance, market linkage, financial management and business plan preparation

Licences and certifications

Digital Accounting systems such as Vyapar digital business accounting system for financial management and operational oversight

Credit linkage through catalytic funding support

Clean energy device adoption such as biogas, smokeless stoves

Convergence with government systems such as Pradhan Mantri Jeevan Jyoti Bima Yojna (PMJJBY), Pradhan Mantri Kaushal Vikas Yojana (PMKVY), Atal Pension Yojana (APY), Public Provident Fund (PPF), Soil health card, etc.

C. Partnership/Networking

Marketing: FPOs mostly rely on hyper-local markets such APMC mandis and other local traders to sell their produce at a vey limited profit margin. Market linkages need to be established to dversify marketing channels, by entering bulk sales, retail partnerships, and e-marketplaces. One such example is the **Odisha Millet Mission** which can be referred for creating market linkages by end-to-end value chain approach.

Odisha Millet Mission – Creating Market Linkages for Millets

Odisha Millet Mission adopts an end-to-end value chain approach, from production support to market development, for millets. It focuses on decentralized procurement through women SHGs and FPOs and links them with government and private markets. By promoting local processing and branding under a "local for nutrition" theme, it fosters sustainable demand. The mission also trains farmers in climate-resilient millet practices and supports women producers in marketing their produce through fairs and e-platforms.

Source: https://www.ceew.in/sustainable-agriculture-initiatives/odisha-millets-mission-government-scheme-for-promoting-millets-in-india

FPO members, **trust and traceability are key barriers** to accessing premium markets. Integrated grain commerce solutions, agri-tech solutions offered by **Arya.org** is example that can empower FPOs and farmers.

Arya.ag - Empowering FPOs and Farmers through Integrated Grain Commerce Solutions

Arya.ag is a digital platform tackling post-harvest losses and market access challenges for farmers and FPOs. It enables near-farm storage, allowing farmers to hold produce and sell when prices rise, often boosting income. Its digital marketplace connects users with 10,000+ verified buyers, ensuring transparent trade, better price realization, and secure payments through their tech-driven tools like AryaShakti, Prakshep, and Arjun.

Carbon markets should be reformed to adopt gender-inclusive "carbon credit plus" models. Partnerships with agencies offering **digital/blockchain solutions enhance transparency, traceability of their produce, and ultimately market efficiency of the FPOs.** By leveraging AI, blockchain, and real-time data, FPOs can ensure certification compliance, transparency in production practices, and real-time supply chain visibility—key to building buyer trust and unlocking high-value organic markets. **AgriFabriX** is one example in that light.

Digital Solution for Value-chain transparency-AgriFabriX

AgriFabriX, an integrated, data-driven platform that offers a suite of digital solutions tailored to support sustainable agriculture. AgriFabriX empowers FPOs through digital solutions for traceability, eco-input sourcing, credit access, efficient logistics, and carbon market integration, boosting credibility, income, and market access while aligning with organic and sustainable agriculture standards

Source: https://www.agrifabrix.in/

It is worthwhile to note that those FPOs that have established market linkages and provide farmgate solutions, demonstrate greater CSA adoption among farmers. However, many FPOs face impediments in acquiring organic certification, yielding to poor CSA adoption.

To address this issue, collaborating with recognized agencies for branding and certification for non-chemical /organic products would enable an increase agriculture income for farmers, and promote CSA.

Pathways for FPOs to avail organic certification by leveraging government support

To access high-value organic markets, FPOs to explore convergence with the National Program for Organic Production (NPOP) and the National Organic Program (NOP):

Leverage government schemes and convergence

- Tap into support from Paramparagat Krishi Vikas Yojana (PKVY), and state-level organic missions. The government has developed a web portal, www.Jaivikkheti.in (e-market place– Jaivik Kheti), as an online marketing platform for direct sale of organic produce by farmers to consumers.
- Converge with ATMA, KVKs, and State Agriculture Departments for training, subsidy, and documentation.

Collaborate with accredited certification agencies

- Partner with Agricultural and processed food products export development Authority (APEDA) recognized bodies like EcoCert, OneCert, Control Union, etc., for inspection, training, and certification services. FPOs can negotiate group certification under Internal Control System (ICS) to reduce cost and administrative burden.
- Private AgTech firms such as Heer Global and Shrey Management Forum help in facilitating the process between the organic certificate institute and the FPOs.

Source:https://agritech.tnau.ac.in/ta/org_farm/orgfarm_oc%20agencies.html#:~:text=Institute%20for%20Marketecology%20(IMO),manufacturing%20and%20international%20trading%20activities.

Women peer networking :Women in FPOs often face barriers to leadership and decision-making roles due to limited access to skill development, male-dominated governance structures, restrictive gender norms, and mobility constraints. Comprehensive and targeted leadership and technical training programs should be complemented by structured mentorship, exposure visits, and peer learning platforms to foster confidence and capacity among women members. In male-dominated FPOs, parallel or alternative leadership models, such as women-led value chains, women-exclusive produce clusters, or women-focused CSA initiatives, can create space for women's active participation in leadership and enterprise development.

To ensure inclusivity, interventions should incorporate flexible training schedules, on-site

and mobile-based digital literacy programs, video knowledge dissemination platforms and mentorship frameworks that promote gender-sensitive leadership. Embedding these components into the core design of FPO capacity-building efforts will not only improve women's representation but also strengthen the overall resilience and equity within the FPO ecosystem. One such platform is **'Virtual Neighbours'** which can help women farmers access digital knowledge resources and market places.

Virtual Neighbours: Partnering Urban Women SHGs with Rural SHGs

The concept of Virtual Neighbours finds practical ground through the partnering of urban women SHGs with rural SHGs, enabling them to work together on shared goals such as marketing rural products, resource sharing, and micro-enterprise development. The model also encourages urban women to become virtual members of rural SHGs. Through video conferencing and messaging platforms like WhatsApp, urban members can regularly participate in SHG meetings, contributing their insights, offering mentorship, or even providing financial or network-based support. These digital interactions, though remote, pave the way for strong emotional and social connections.

Source: https://www.linkedin.com/posts/shaji-john-64a9a718_virtual-neighbours-rural-women-empowerment-activity-7317590669374435328-OBwY/

D. Access to resources /services

Infrastructure related support

FPOs across states lack critical infrastructure such as storage godowns, cold storage units, drying platforms, and primary processing units, which leads to post-harvest losses and distress sales. The absence of value additional infrastructure like food processing machines, packaging units, and solar dryer limits market competitiveness. Moreover, the lack of logistic infrastructure, such as mini trucks and weighing tools, hampers efficient aggregation and business delivery. Additionally, FPOs are often faced with inadequate access to clean energy technologies such as solar-powered processing units and pumps affects productivity owing to poor access to business credit. **SMART project** is an example of project which offers infrastructural and financial support to FPOs in Maharashtra.

SMART Project, Govt. of Maharashtra – Infrastructure and Financial Support

The SMART (State of Maharashtra's Agribusiness and Rural Transformation) in collaboration project provides critical infrastructure, grants, and co-investment models for FPOs. Its strategy focuses on public-private partnerships to improve supply chains, agri-logistics, and value addition units. The FPOs are eligible to apply for a loan of up to 2 crores for non-horticulture produce and up to 3 crores for horticulture produce. SMART emphasizes enabling business planning for FPOs, encouraging investment readiness, and aligning with market demands. It also supports capacity-building of FPO boards and convergence with financial institutions to unlock capital for agribusiness ventures.

Source: https://smart-ms-cboapi.smart-mh.org/CMSAttachments/SMART_Project_Implementation_Plan_074323084348.pdf

Women centric: A key reason women remain concentrated in lower nodes of the agricultural value chain is limited mobility—often due to the absence of safe, women-friendly infrastructure in public and market spaces. This lack of enabling environment calls for a dedicated effort in establishing safe and accessible spaces that support women's active participation in economic activities. This can be achieved by **collaborating with organizations focused on gender inclusion to identify, develop, and strengthen women-friendly marketplaces, infrastructure, and working environments.** These spaces should ensure physical safety, access to basic facilities, and a supportive ecosystem for women to operate confidently. Women-centric technologies that reduce drudgery and time burdens can enable greater participation of women in FPO operations and leadership. For example, agencies such as **Science for Society (S4S)** provide solar dryer access to women farmers in Sambhaji Nagar.

Finance centric :FPOs on a growth path require investment but struggle to access finance at a reasonable interest rate, timely loan approval, documentation and favourable loan terms. To bridge this gap, there is a need to identify and establish partnerships with financial institutions such as **Samunnati or Caspian Debt or SBI for credit access** and financial sustainability of the FPOs.

Samunnati – Enabling Access to Credit for FPOs

Samunnati has pioneered an ecosystem-based approach to improve FPOs' access to working capital. It provides customized financial products such as trade credit, invoice financing, and input financing based on FPOs' transaction data and crop cycles. By de-risking FPO loans through partnerships and using cash-flow-based assessments rather than traditional collateral methods, Samunnati bridges the credit gap. Its integrated service model combines finance with market linkages, technical assistance, and digital platforms, thereby building creditworthiness and sustainability of FPOs over time.

Source: https://samunnati.com/farmer-collectives

SBI (State Bank of India)

SBI is financing Farmer Producer Companies to build agriculture term loan/Cash credit/ Demand Loan products for supporting agro processing and value-addition activities to build infrastructure for production, harvesting, procurement, grading, marketing, dairy, poultry, fisheries, and seed production.

Sources: https://coefpo.org/knowledge-services/info-desk/financing-FPOs-by-sbi.pdf

Caspian Debt

As part of Caspian Debt's Sustainable Agri Debt Fund, collateral-free funding options from INR 1 to 10 crore to those FPOs which are driving eco-friendly agricultural practices. They also supportive services such as connecting to input providers and services, and support precision agriculture, farm mechanization, post-harvest solutions, weather related data services, and renewable energy solutions for agriculture.

Source: https://caspiandebt.in/climate-smart-agri-impact-fund/

Abhayam Krishi Kendras (AKKs) is one such model which can be used for integrating agricultural solutions

Abhayam Krishi Kendras (AKKs): One-stop hub for Integrated Agricultural Solutions and Seeding Leadership in Women

The AKK model trains rural women as Community Resource Persons (CRPs) through a 40-day certification program by Pani India and CCS NIAM, Uttar Pradesh. These women become certified agri-entrepreneurs, running AKKs, local service hubs within gram panchayats, providing climate-smart agriculture services, inputs, market linkages, and advisory support. Despite initial socio-cultural resistance, CRPs have emerged as trusted professionals. The model fosters climate resilience, promotes gender empowerment, and strengthens rural entrepreneurship by equipping women with knowledge, confidence, and localized tools.

Reference: (INDIA, 2025)

There is a clearly a **call for strategic and inclusive interventions in the space of climate change, agriculture and gender**. The success of FPOs depends on technical interventions as well as transformative ecosystem support- grounded in local realities, collaboration among stakeholders, inclusive of women and their aspirations, and oriented towards climate resilience. Context specific and tailor made, gender equitable and practical CSA adoption planning is not just desirable but imperative for sustainable future.

Annex 1 – Data collection

Annex 1.1 KIIs conducted across four states

States	Kills
Andhra Pradesh (10)	Executive Director, Andhra Pradesh Mahila Abhivruddhi Society (APMAS) Hyderabad CEO, APMAS FPO Coordinator, APMAS Consultant, APMAS Capacity building Advisor, APMAS CEO, Andhra Pradesh Community Managed Natural Farming (APCNF) Hyderabad Consultant, APCNF Thematic Lead (Gender), APCNF Executive Director, Centre for Sustainable Agriculture (CSA) Hyderabad FPO coordinator, CSA
Gujarat (3)	Social Mobiliser, Agricultural Technology Management Agency (ATMA) Amreli Project Director, ATMA Bhavnagar Project Director, Agricultural Department Amreli
Maharashtra (4)	Extension Officer, Krishi Vigyan Kendra (KVK) Pune Scientist, KVK Nashik Director (Entrepreneurship Development) – Action for Agricultural Renewal in Maharashtra (AFARM) Pune Senior Thematic Lead (Programmes) –Watershed Organization Trust (WOTR)
Odisha (5)	Senior Scientist, Krishi Vigyan Kendra (KVK), Balasore Regional Director Mission Shakti, Bhubaneshwar Team Coordinator, PRADAN Senior Manager, Mahashakti Foundation, Bhubaneshwar Program Coordinator, Mahashakti Foundation, Bhubaneshwar

Annex 1.2 FGD with a group of 5-10 FPO representatives (Chairman, CEO, Director, Accountant, Shareholders, Members, Committee members)

Districts	Nos
Andhra Pradesh	
ASR	4
Anakapalli	1
Vizianagaram	3
Srikakulam	1
Gujarat	
Amreli	3
Bhavnagar	2
Rajkot	1
Maharashtra	
Pune	4
Sambhaji Nagar	3
Nashik	2
Odisha	
Balasore	4
Kalahandi	2
Koraput	2

Annex 1.3 FGD with a group of 8-10 farmers (women, small-marginal and progressive)

Districts	Nos
Andhra Pradesh	
ASR	4
Anakapalli	2
Vizianagaram	3
Srikakulam	1
Gujarat	
Amreli	3
Bhavnagar	2
Rajkot	1
Maharashtra	
Pune	2
Sambhaji Nagar	3
Nashik	1
Odisha	
Balasore	4
Kalahandi	2
Koraput	0

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