

Transforming rural livelihoods: Tribal women-led agripreneurship under the Farmer FIRST Programme

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The Farmer FIRST Programme (FFP) has significantly enhanced rural livelihoods in the plateau region through resource based interventions and focusing farmer participation and integrating indigenous knowledge with scientific advancements. This participatory approach bridges the gap between researchers, extension workers, and farmers, fostering collaborative problem-solving to overcome the limitations of traditional top-down models. This study highlights the transformative journeys of Smt. Albina Ekka and Smt. Sukarmani Kharkhusa, who adopted integrated farming system and enterprise-based module respectively to diversify income sources and create a roadmap to self-reliance.

Keywords: Enterprise-based module, Farmer participation, Integrated farming system, Interventions

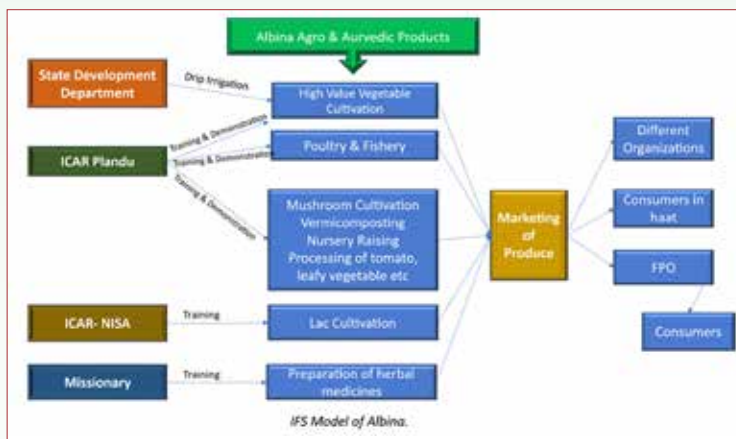
THE Farmer FIRST (Farm, Innovations, Resources, Science, and Technology) programme, launched by the Indian Council of Agricultural Research (ICAR), aims to establish a strong partnership between farmers and researchers. It was initiated to address the long-standing gap between scientific research and its practical application in agriculture. The programme emphasizes farmers' active participation in identifying problems, setting priorities, and testing innovations directly on their farms using local resources. By valuing farmers' experiential knowledge alongside scientific expertise, Farmer FIRST promote need-based, location-specific, and sustainable agricultural solutions. Farmers work along with scientists to conduct research. The village as a whole or a chosen group of farmers participates in monitoring experiments with scientists to determine the research questions. Ultimately, it seeks to enhance the relevance, adoption, and long-term impact of agricultural technologies across rural India.

Among beneficiaries of Farmer FIRST Programme (FFP), two tribal women were resource-constrained; one small and the other landless farmer. Recognizing their distinct conditions, the FFP team recommended differentiated modules, such as the Integrated Farming System (IFS) and enterprise-based modules, to effectively enhance their livelihoods and ensure sustainable empowerment.

Interventions under the Farmer FIRST Programme

IFS-Based Module

Smt. Albina Ekka, a tribal woman farmer from Kharsidag village in Ranchi district, Jharkhand, who owns five acres of land but faced low productivity, irregular income, and limited livelihood options due to traditional farming practices, weak market linkages, and less technical knowledge. Her family often depended on informal loans and wage labour to sustain basic needs. The Farmer FIRST Programme team of ICAR-RCER, FSRCHPR, Plandu identified her farm through Participatory Rural Appraisal (PRA) and found suitable for an integrated farming system module that



Integrated farming system module

would integrate high-value, short-cycle activities with medium-term enterprises and value addition to enhance income and sustainability. In 2018, the Farmer FIRST team carried out a farm diagnostic and co-designed a farmer participatory plan centred on an integrated farming system module to ensure year-round income and improved resource use.

Key elements of the intervention :

- **Participatory farm diagnostic and planning:** It was to identify available resources, fallow patches, labour capacity and market windows.
- **Promotion of integrated enterprises:** High value vegetables cultivation, oyster mushroom cultivation (short-cycle, high-value), composite fish culture in pond, backyard poultry, lac cultivation, vermicomposting, nursery raising for vegetables and timber plants and cultivation of medicinal herbs for processing.
- **Provision of critical inputs:** Mushroom spawn, polypropylene (PP) bags, formalin, bavistin, fish fingerlings, poultry chicks, brood lac, vermibed, quality seed/ planting materials for vegetables, timbre, and medicinal herbs.
- **Capacity building:** Hands-on training on mushroom cultivation, composite fish culture, poultry husbandry and basic animal health, vermicomposting, simple processing (mushroom *badi*, pickles, tomato ketchup, etc.); packaging, and basic bookkeeping and marketing.
- **Institutional linkages:** Facilitation of contact with Jharkhand State Livelihood Promotion Society (JSLPS), ICAR-NISA, ICAR-IIAB, KVK and support for the formation and functioning of a Farmer Producer Organisation (FPO) for collective input purchase and marketing.

The strategy focused on combining rapid-return activities (high-value vegetables, oyster mushrooms, etc.) that provide quick cash flow with medium-term enterprises (fish, poultry, lac cultivation, herbal processing, etc.) that stabilizes income across seasons. Value-addition training was facilitated so that Albina could capture more value rather than relying purely on raw commodity sales.

Production practices and resource use: Albina’s integrated farming system module emphasizes resource efficiency and recycling:

- **High-value vegetable cultivation:** Grafted tomato, beans, strawberry, watermelon, cucumber, and other crops were successfully cultivated; dried vegetable leaves were used for vermicomposting, while poultry aided in natural pest management by feeding on field insects.
- **Mushroom cultivation:** Oyster mushrooms were cultivated in a dedicated room using straw-filled PP bags, yielding the best results from October to March. The spent substrate was utilized for vermicompost production, which was later applied to vegetable fields. Observing market demand for button mushrooms, she began procuring them from

local producers at lower prices and selling them in local markets for profit.

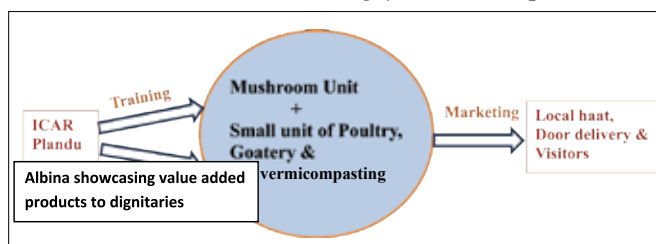
- **Fish culture:** Small earthen pond(s) were constructed/ renovated on marginal low-lying areas and stocked with composite fish culture (Rohu, Catla, Mirgala and Common Carp). Fish Pond based on affordable local feeds and farm-made supplements.
- **Poultry:** Backyard poultry of a small flock (20–30 birds) provides eggs and occasional birds for sale; poultry manure is composted and applied in vegetable fields.
- **Lac cultivation:** She received training on lac cultivation in ICAR-NISA and initiated cultivation on 37 ber plants (30 small and 7 big trees). A big tree yielded 20 kg and small tree 3 kg scrap lac per plant which was sold in the local haat.
- **Herbal cultivation and processing:** Selected medicinal/herbal plants are cultivated in small beds. Processing includes drying, preparation of medicines and packaging under hygienic conditions as taught by Missionaries.
- **Value-addition:** When fresh sales are constrained, Albina processes mushrooms into *badi* and pickles, and prepares tomato ketchup, packages herbal products in small, labelled packs for local markets. She also collects underutilized leafy vegetables, dry it, process and sell in the market. Enterprise-based Module



Value added products by Smt. Albina Ekka

Enterprise based module

Smt. Sukarmani Kharkhusa, a landless tribal woman farmer from Plandu village in Ranchi district, was the sole earner for her six-member family. Before joining the Farmer FIRST Programme in 2019, she worked as a maid and labourer, earning just ₹6,000 per month,



Enterprises based module of Smt. Sukarmani

Table 1. Year-wise production and income from the IFS module

Output of Albina Ekka IFS Module during 2024–2025						
Intervention	Production (kg/acre/ population/ plant)	Market Price (₹)	Gross income (₹)	Expenditure (₹)	Net income (₹)	BC ratio
High Value Vegetable Cultivation (French bean)	3200 kg/acre	70	2,24,000	25,000	1,99,000	8.96
Poultry (Desi)	500 kg	500	2,50,000	30,000	2,20,000	8.33
Fishery	150 kg	200	30,000	4,000	26,000	7.5
Mushroom (Trading)	5,475 kg	200	10,95,000	8,21,250	2,73,750	1.33
Lac Cultivation	375 kg	1,000	3,75,000	1,07,500	2,67,500	3.49
Nursery	1,500 plants	50	75,000	10,000	65,000	7.5
Herbal Product	2,000 bottles/packets	200	4,00,000	1,80,000	2,20,000	2.22
Paddy	1,520 kg/acre	19	28,880	15,000	13,880	1.93
Net annual income					12,85,130	

which was insufficient to meet her family's needs, forcing her children to drop out of school. She had also taken a ₹50,000 loan from a women self-help group to cover basic expenses.

During a home visit in 2019, the FFP team introduced her to the programme's interventions, particularly the enterprise-based module, which emphasized the establishment of small-scale, income-generating oyster mushroom unit that aligned with available resources. This module, coupled with a one-day training on mushroom cultivation in 2019 and a three-day advanced training in 2022 at ICAR RCER, FSRCHPR, Plandu, that motivated her to dedicate a room in her home to mushroom production. Under the enterprise-based approach, she received essential inputs including mushroom spawn, polypropylene (PP) bags, formalin and bavistin and regular monitoring by the FFP team to ensure success. This structured, enterprise-focused support enabled Smt. Sukarmani to establish a profitable, home-based mushroom enterprise, laying the foundation for sustainable income and household self-reliance. In addition to mushroom unit, she also maintains a small unit of poultry birds and goateries for supporting income sources specially during off season of oyster mushroom.



Cultivation of oyster mushrooms under the Farmer FIRST Programme

by producing mushroom-based products like badi and pickles. By 2022, her business regained momentum and she also started cultivating milky mushrooms along with consistent cultivation of oyster mushrooms. To ensure zero waste in her operations, she efficiently recycles the spent mushroom substrate for vermicomposting, thereby promoting sustainable resource utilization.



Preparation of mushroom badi by Smt. Sukramani

Table 2. Economics of mushroom cultivation by Smt. Sukramani Kharkhusa

Year	No. of bags (1kg dry substrate per bag)	Yield (kg)	Average selling price (₹/kg)	Cost of cultivation (₹/bag of 1 kg dry substrate)	Gross Income (lakh rupees)	Net Income (lakh rupees)	BC ratio
2020–21	150	133	150	30	0.19	0.15	4.43
2021–22	1,500	1,335	160	35	2.1	1.6	4.07
2022–23	2,100	1,869	180	40	3.3	2.4	4.01
2023–24	3,000	2,670	180	40	4.8	3.6	4.01
2024–25	3,100	2,950	180	40	5.3	4.0	4.28

Output

Smt. Sukarmani successfully sold 133 kg of fresh oyster mushrooms in 2020–21 at ₹150/kg in the local markets of Rampur and Namkum. Encouraged by initial success, she decided to pursue year-round mushroom cultivation. However, her business faced a slowdown during the lockdown period due to reduced demand. To overcome this challenge, she diversified her business

Journey to self-reliance of tribal women farmers

Through the Farmer FIRST Programme, both Smt. Albina Ekka and Smt. Sukarmani Kharkhusa exemplify the transformative power of self-reliance and innovation in rural livelihoods. Albina, supported by FFP, built strong institutional linkages with JSLPS, ICAR-NISA, and the State Development Department, leading to the formation of a women's group, a FPO, and a mini cold

storage facility in her village. As a board member of the Namkum Farmer Producer Company, she plays a pivotal role in collective marketing and resource management, while also mentoring other women farmers. Trained in herbal medicine preparation, she now manages “Albina Agro and Ayurvedic Products,” which provides year-round employment to over ten women, and supports micro-enterprises such as LED bulb production. Her efforts have significantly enhanced her family’s income, nutrition, and social standing, positioning her as a role model for women-led rural entrepreneurship.

Similarly, Smt. Sukarmani Kharkhusa, once a landless labourer, achieved economic independence through FFP’s training and input support in mushroom cultivation. By establishing a home-based unit, diversifying into poultry and goat rearing, and adopting efficient marketing practices such as flexible pricing and local distribution, she ensured steady income, repaid her self-help group loan, and secured her children’s education.

Impact

Smt. Albina and Smt. Sukarmani’s success stories triggered a wider wave of rural transformation and women’s empowerment. Albina’s leadership in forming a women-led FPO through the IFS module, promoting market linkages, and conducting on-farm demonstrations encouraged replication across neighbouring villages. While the enterprise-based model of Sukarmani encouraged 83 farmers, many of them were women who adopted mushroom cultivation, including milky mushrooms, collectively generating an additional ₹4.46 lakh in net income in project villages. Her farm now serves as a training and demonstration hub for NGOs and government agencies. Both Albina and Sukarmani stand as living examples of self-reliant, tribal women-led agricultural entrepreneurship, showcasing how integrated, participatory models can drive inclusive and sustainable rural development.

Way forward

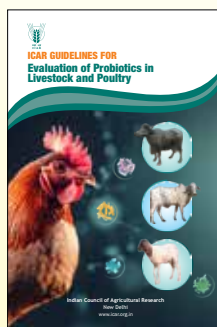
Scaling up the FFP module across similar agro-ecological regions can further strengthen women’s participation in agriculture and rural entrepreneurship. Focused interventions should continue to integrate short-cycle, high-value enterprises with medium-term and value-added activities to stabilize income and optimize land use. Strengthening FPOs, promoting market linkages, and providing targeted capacity-building and technical support will enhance adoption and profitability. Additionally, documentation of best practices and establishment of demonstration hubs can facilitate knowledge transfer, inspire neighbouring farmers, and ensure the sustainability of women-led, resilient, and inclusive agricultural enterprises.

SUMMARY

The Farmer FIRST Programme has demonstrated a transformative impact on tribal women-led rural livelihoods through the adoption of integrated farming systems and diversified enterprises. Smt. Albina Ekka, by integrating vegetables, mushrooms, poultry, fish, nursery production, lac cultivation, herbal medicines, and value-added products, achieved substantial income growth, improved nutrition, and year-round employment. Strong institutional linkages and continuous technical support from the FFP facilitated access to quality inputs, effective marketing, and minimized demonstration failures. Similarly, Smt. Sukarmani Kharkhusa leveraged FFP training and support to establish a profitable mushroom enterprise, achieved financial self-sufficiency, and secured her family’s well-being. Both cases illustrate how participatory, resource-appropriate interventions can empower tribal women, enhance household resilience, and catalyze the replication of sustainable farming practices in the plateau region.

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