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Empowering Indian Agriculture Through Participatory Innovation: Scaling the Farmer FIRST Programme for Sustainable Development

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India's agricultural transformation is central to achieving Sustainable Development Goals (SDGs) such as poverty reduction, zero hunger, and environmental sustainability. The Farmer FIRST Programme (FFP), launched by the Indian Council of Agricultural Research (ICAR), embodies a participatory, farmer-centric approach to agricultural research and extension. Implemented since 2016, the programme has demonstrated significant improvements in farm income, cropping intensity, organic inputs, and nutritional security across India. This article presents a critical overview of the FFP's framework, its multi-dimensional impacts, and its alignment with national and global sustainability priorities. With recent policy and technological shifts, the article argues for the programme's upscaling as a model for inclusive, climate-resilient, and sustainable agriculture.

Keywords: Farmer FIRST Programme, sustainable agriculture, participatory extension, SDGs, farm income, cropping intensity, nutritional security, Indian agriculture

Introduction

India's agriculture sector remains the backbone of its rural economy, supporting nearly 43% of the country's workforce despite contributing only 18.6% to the national Gross Value Added (MoSPI, 2023). In this context, ensuring sustainable growth, improved incomes, and food security for over 86% of Indian farmers—who operate on small and marginal landholdings—has become imperative (Agricultural Census, 2021). India's agricultural development trajectory has undergone various transitions, from post-independence land reforms to the Green Revolution and, more recently, to climate-smart and nutrition-sensitive agriculture. However, a common challenge persists: the limited reach and relevance of conventional top-down agricultural research and extension systems. To address this, the Farmer FIRST Programme (FFP) was launched in 2016 by ICAR, aiming to democratize agricultural innovation through farmer-centric, interdisciplinary, and location-specific approaches. It seeks not only to increase productivity but also to empower rural communities by enhancing their role in the research-to-practice continuum.

The Farmer FIRST Programme: An Inclusive Agricultural Model

Purpose and Vision: FFP stands for Farm, Innovation, Resources, Science, and Technology. Its core philosophy is to make farmers not just recipients but active partners in agricultural research and extension. The programme is tailored to meet the socio-economic and agro-ecological needs of diverse Indian farming communities. It integrates scientific research with local knowledge and practices, ensuring that the solutions are sustainable, adoptable, and scalable.

Multi-Dimensional Goals Aligned with SDGs: The FFP aligns with multiple SDGs, particularly:

- **SDG 1: No Poverty** – by improving farm incomes through diversified, high-yield technologies;
- **SDG 2: Zero Hunger** – by promoting food and nutrition security;
- **SDG 3: Good Health and Well-being** – by encouraging reduced pesticide use and greater dietary diversity;
- **SDG 12: Responsible Consumption and Production** – by promoting organic manure and resource-conserving technologies.

Technology Assemblage and Livelihood Integration: Rather than promoting single solutions, FFP employs a technology assemblage approach, integrating crops, horticulture, livestock, fisheries, and natural resource management. For instance:

- In the Southern Zone, farmers adopted livestock-based models (goat rearing and poultry) alongside paddy and millet cultivation.
- In the Central Zone, integrated farming systems involving sweet corn, vegetable crops, and piggery improved incomes and employment.
- In the Eastern and Northeastern Zones, backyard poultry and mushroom farming were introduced alongside rice cultivation to ensure food diversity and income stability.

Outcomes and Transformative Impact

Economic Upliftment: The FFP resulted in substantial increases in farm income across regions—up to ₹83,407/ha in the Western Zone. By encouraging high-value crops and allied enterprises like dairy and horticulture, farmers diversified their income streams, reducing risk from market and climatic shocks.

Improved Cropping Intensity and Land Use: Cropping intensity—a critical indicator of land-use efficiency—increased by as much as 18.5% in some regions. This was achieved through intercropping models and the introduction of short-duration, climate-resilient varieties of pulses and vegetables.

Nutritional Security: With the incorporation of home gardens, egg and dairy production, and diversified cropping, household-level **nutritional security** saw marked improvement. The average increase in cereal equivalent consumption ranged from 5–7 kg per capita per month, contributing to better health outcomes.

Environmental Sustainability: In regions like the **Southern Zone**, where pesticide use was high, the introduction of **integrated pest management** and **organic farming** reduced chemical inputs significantly. The promotion of organic manure and composting practices enhanced soil health while reducing costs and ecological degradation.

National Relevance and Global Parallels

The FFP's success dovetails with India's broader goals under initiatives such as:

- **Natural Farming Initiative (2023–24)** – which promotes zero-budget, chemical-free farming;
- **PM-PRANAM Scheme** – offering incentives to states reducing synthetic fertilizer use;
- **National Mission on Sustainable Agriculture** – promoting resilience through conservation agriculture.

Globally, the **CGIAR Agroecology Initiative (2023)** and the **IFPRI (2024)** report on smallholder resilience have highlighted participatory models like FFP as effective strategies for scaling innovation, especially in climate-vulnerable contexts.

The Way Forward: Scaling and Institutionalization

To replicate the FFP's success at a national scale, the following strategies are recommended:

- **Strengthen Krishi Vigyan Kendras (KVKs)** as nodal points for FFP delivery;
- **Foster Public-Private Partnerships (PPPs)** in seed systems, agri-tech tools, and training modules;
- **Digital Extension Platforms** should be integrated to share real-time advisories and monitor outcomes;

- **Gender-Inclusive Interventions** are critical—given that over 59% of FFP participants were women;
- **Targeted Youth Engagement** through skill-based modules in organic farming, agripreneurship, and livestock management.

Conclusion

The Farmer FIRST Programme represents a paradigm shift in Indian agriculture—away from prescriptive research to participatory innovation. Its demonstrated ability to raise incomes, ensure food and nutritional security, and enhance environmental sustainability makes it a flagship model for achieving agricultural transformation in India and beyond. As India advances towards achieving its SDG targets and navigates the complex landscape of climate change, the expansion and institutionalization of the FFP model can ensure that “no farmer is left behind.”

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