

Role of Agricultural Extension in Doubling Farmer Income through Value-Chain Strengthening

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INTRODUCTION

Agriculture in India is undergoing rapid structural changes driven by globalization, market liberalization, technological advancements, and climate variability. Despite progress, the majority of farmers still earn low and unstable incomes due to small landholdings, inefficient marketing channels, post-harvest losses, lack of value addition, and weak bargaining power.

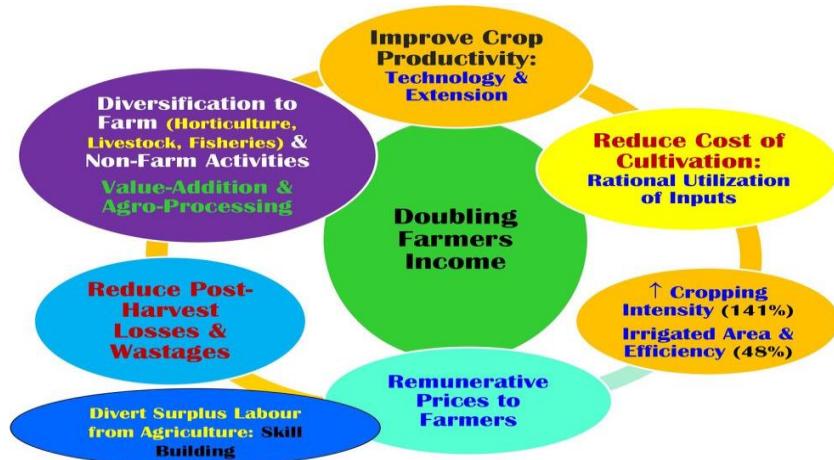
Doubling of farmers' income, as envisioned by the Government of India, places strong emphasis on shifting agriculture from being production-driven to market-driven systems. This involves interventions in extension services throughout the agricultural value chain, from input supply to processing and consumption. Agricultural extension today is not confined to the dissemination of technology but acts as a value-chain enabler, market facilitator, capacity builder, innovation promoter, and institutional link that helps farmers achieve better returns.

2. Concept of Agricultural Value Chain

Value Chain: The value chain refers to the complete sequence of activities needed to take agriculture produce from the farm to the consumer. It includes:

- Input supply
- Production
- Harvesting and post-harvest handling
- Storage and processing
- Packaging and branding
- Marketing and distribution
- Retailing/consumption

A strong value chain enhances the efficiency of every process while ensuring reduced losses, adding value, and increasing profitability. Agricultural extension plays a key role in strengthening each component.



Source: <https://www.polyeyes.com>

3. Role of Agricultural Extension in Strengthening Value Chains

3.1 Capacity Building and Skill Development

Capacity building is a core function of agricultural extension that equips farmers with the necessary knowledge, skills, and confidence to participate effectively in value chains. Extension services provide training on improved production technologies, integrated nutrient, pest, and water management, and scientific post-harvest practices to reduce losses and improve quality. Farmers are also trained in business planning, entrepreneurship development, financial literacy, and risk management to strengthen their decision-making abilities. Through institutions such as KVKs, ATMA, NGOs, and private extension agencies, farmers

receive hands-on demonstrations, field schools, and market-oriented training that enable them to meet quality standards, adopt value-added practices, and enhance their income-generating potential.

3.2 Promoting Farmer Producer Organisations (FPOs)

FPOs strengthen farmers' collective action, aggregation, and bargaining power. Extension professionals help mobilize farmers into groups, provide leadership and governance training, and support the preparation of business plans. They also facilitate linkages with markets, banks, and input suppliers. By reducing transaction costs, enabling bulk marketing, and encouraging value addition, FPOs significantly enhance farmers' income and market competitiveness.



Source: <https://sageuniversity.edu.in>

3.3 Enhancing Market Linkages

Agricultural extension plays a crucial role in connecting farmers with profitable and reliable markets. It provides timely market intelligence, facilitates contract farming agreements, and links farmers with processors, exporters, and

organized retailers. Extension also encourages participation in e-NAM and other digital marketplaces to ensure transparent price discovery. By promoting direct marketing options such as farmers' markets, fairs, and mobile vans, extension reduces intermediaries,

enhances price realization, and improves farmers' overall income.

3.4 Improvement of Post-Harvest Management and Value Addition

Post-harvest losses in India range from 10–25%, making efficient post-harvest practices essential for improving farmer income. Agricultural extension trains farmers in sorting, grading, and cleaning to enhance product quality, while promoting safe storage and appropriate packaging to reduce spoilage. Farmers are also guided in simple processing techniques such as dehydration, flour making, and pickling, along with branding, labeling, and meeting FSSAI standards. These value-addition activities increase shelf life, improve marketability, and open access to higher-value markets.

3.5 Enabling Access to Credit, Insurance, and Government Schemes

Extension workers help farmers access essential financial services by promoting the use of Kisan Credit Cards (KCC), guiding them to avail crop insurance under PMFBY, and supporting applications for subsidies on processing units, cold storage, irrigation, and farm mechanization. They also encourage the adoption of digital payment systems. These interventions enhance financial inclusion, increase investment capacity, and protect farmers from income shocks, ultimately contributing to higher and more stable income.

3.6 Promotion of Digital and ICT Tools

Extension services are increasingly adopting digital technologies to deliver timely and accurate information. Mobile-based advisory services, AI-driven decision-support tools, weather forecasting apps, remote sensing, and drones enhance crop monitoring and decision-making. Additionally, online marketing platforms help farmers reach wider markets and sell produce directly to buyers. These ICT tools reduce information gaps, improve farm efficiency, and strengthen farmers' access to profitable market opportunities.

3.7 Support to Agribusiness and Rural Entrepreneurship

Agricultural extension plays a vital role in promoting agri-startups and rural enterprises by offering enterprise development training and facilitating incubation and mentorship support. It connects rural youth with schemes like RKVY-RAFTAAR, AC&ABC, and NABARD to enhance financial and technical assistance. Extension also encourages entrepreneurship in

processing, packaging, input supply, and custom hiring services, enabling farmers and youth to diversify income sources and build profitable agribusiness ventures.

3.8 Promoting Climate-Smart and Sustainable Agriculture

Extension services actively promote climate-smart and sustainable agricultural practices that enhance resilience and stabilize farm income. These include the adoption of drought-tolerant varieties, precision irrigation, and integrated farming systems that diversify production and reduce risks. Extension also supports agroforestry, soil health management, and resource recycling to improve environmental sustainability. By reducing vulnerability to climate shocks and enhancing long-term productivity, these practices contribute to improved profitability and secure livelihoods for farmers.

4. How Extension-Based Value-Chain Strengthening Leads to Doubling Farmer Income

4.1 Increased Productivity

Extension services help farmers to increase their knowledge of improved technologies and scientific practices, leading to increased yields and reduced post-harvest losses.

4.2 Reduction in Cost of Cultivation

Precision agriculture, balanced fertilization, and integrated pest management can enable farmers to avoid unnecessary input costs and enhance the efficiency of input use.

4.3 Value Realization Improvement

Direct marketing to consumers, support for FPOs, and the use of digital platforms help farmers capture a better share of consumer prices through reduction in middlemen.

4.4 Diversification of Income

Extension promotes value addition and diversified activities like livestock, fisheries, horticulture, and agri-startups, which can lead to multiple sources of income for farmers.

4.5 Better Bargaining Strength

Collective action through FPOs empowers farmers with better negotiating powers and access to credit and services from banks and input suppliers.

4.6 Risk Minimization

In this way, extension reduces farmers' vulnerability to climatic and market risks by facilitating crop insurance, weather-based advisories, and climate-smart practices for more stable income.

5. Challenges in Extension-Based Value-Chain Strengthening

- Limited extension manpower
- Poor storage, processing, and rural road connectivity
- Fragmented supply chains
- Weak farmer–market coordination
- Limited awareness about quality standards
- Low financial literacy of farmers
- Slow use of digital platforms
- Lack of specially trained extension professionals on agribusiness and value chains

6. Strategies for Strengthening the Role of Extension

6.1 Changing Extension to Market-Led Extension

Shift extension focus from mere production to market-oriented approaches, putting emphasis on market demand, price trends, and value addition.

6.2 Capacity Building of Extension Personnel

Train extension staff in value-chain analysis, agribusiness management, ICT tools, and entrepreneurship to comprehensively advise farmers.

6.3 Fostering Public–Private Partnerships (PPP)

Foster partnerships among agri-input companies, processors, startups, and NGOs to increase access to services, technology, and markets.

6.4 Empowering FPO Ecologies

Provide financial, managerial, and marketing support to Farmer Producer Organizations for improving collective action and bargaining power.

6.5 Establishing Rural Value Addition Centers

Establish at the local level mini-processing units, cold storage, and grading facilities that encourage value addition and reduce post-harvest losses.

6.6 Integration of ICT and Artificial Intelligence

Digital tools and AI will be used for real-time advisory services, traceability, digital marketing, and decision support.

6.7 Encouraging Youth Participation in Agripreneurship

Skill development and entrepreneurship promotion among youth through AC&ABC, KVKArya, agriincubation centers.

CONCLUSION

Agricultural extension is at the core of the vision to double farmers' income. The strengthening of value chains by extension services enables farmers to cut costs, enhance productivity, have access to better markets, adopt value addition, and build resilience against risks. Modern extension needs to be knowledge-intensive, digital-driven, market-oriented, and entrepreneur-friendly. Strengthening extension systems and their linking with value-chain actors will accelerate sustainable growth and prosperity in rural communities.

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