Fisheries Extension System in India

Saroj Kanwar[1]*, B. Nightingale Devi[2], Chowa Ram Sahu[3], Shweta Singh[4], Mayuri Dubey[5] and Kamna Lahre[6]

[1,5,6]Research Scholar, [2]Assistant Professor, [3,4]Teaching Associate, Department of Fisheries Extension, LSPN College of Fisheries, Kawardha, DSVCKV, Durg (Chhattisgarh)

Corresponding Author
Saroj Kanwar
Email: sarojkanwar1265@gmail.com

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ABSTRACT

The fisheries extension system in India represents a crucial institutional framework for advancing sustainable fisheries development, enhancing productivity and improving the socio-economic well-being of fishers and aquaculture farmers. As one of the fastest-growing sectors within Indian agriculture, fisheries significantly contribute to income generation, employment, export earnings and nutritional security. This article examines the structure and functioning of the extension system, which integrates government agencies, research institutions, universities, Krishi Vigyan Kendras (KVKs), cooperatives and non-governmental organizations to facilitate the transfer of scientific knowledge and improved practices. Key activities include capacity building, training, advisory services and dissemination of technologies related to breeding, feeding, disease management, post-harvest handling and marketing. The increasing use of Information and Communication Technologies (ICTs), mobile-based advisory services and digital platforms has enhanced outreach and service delivery. However, the system continues to face challenges such as limited extension manpower, weak institutional coordination, inadequate reach to remote communities and poor feedback mechanisms. Furthermore, climate change, resource degradation, and market uncertainties demand more adaptive and resilient extension approaches. The study underscores the need for participatory, inclusive and technology-driven strategies, along with strengthened public–private partnerships and policy support, to ensure sustainable growth and long-term resilience of India's fisheries sector.

INTRODUCTION

Fisheries and aquaculture are major source of livelihood security for millions of people in India, including not only those in rural but largely in coastal regions, providing both livelihood and food security. Apart from providing employment opportunities, specify sectors are an important source of healthy animal proteins, which contribute approximately 1.09% to India's overall GDP and around 6.2% to the agricultural GDP, making it the largest contributor among all agriculture and allied sub-sectors in India (Food and Agriculture Organization of the United Nations, 2023). In recent years, improvements in technology of breeding, feeding and aquatic diseases, along with water management, have increased production and production. Small fishing communities, efficiently have not been able to benefit much from such developments because of a lack of awareness, difficulty in access and lack of technical assistance. Fisheries extension services have an important role in bridging this gap by providing a link between research institutions, government and fishing communities, translating research into practical solutions on-ground (Barman & Little, 2019). The application of sustainable aquaculture practices, aquatic diseases management, handling and value addition, not only improve production but also reinforce livelihood security in fishing communities in the country in a long-term manner (Mohanty *et al.,* 2021).

Importance of Fisheries Extension

The fisheries extension focuses on enhancing the efficiency and decision-making among fishers rather than merely increasing the physical effort of the fishing.

I. **Productivity Enhancement:** Extension programmes help fish farmers adopt improved culture practices and better feed management and disease prevention techniques, yielding higher yields.

II. **Environmental Sustainability:** The Fisher people are trained in responsible fishing and aquaculture practices that help conservatory effects on aquatic ecosystems and biodiversity (FAO,2022).

III. **Livelihood Support:** Training on post-harvest handling, processing and marketing provides them guidance that may help minimize losses and improve their earnings.

IV. **Technology Adoption:** Extension ensures that innovations developed by research institutes find practical application at the farm-gate level, as stated by Barman & Little (2019).

V. **Social Development and Inclusiveness**: Fisheries extension promotes the inclusion of women and marginalized groups by encouraging their participation in fisheries-related activities, thereby contributing to overall community development.

Structure of Fisheries Extension in India

The fisheries extension system in India operates through a multi-institutional framework involving national, state and grassroots-level organizations, ensuring effective dissemination of technologies and services across diverse regions (Kumar et al., 2020).

I. Central Level: At the national level, fisheries extension is coordinated by the Department of Fisheries under the Ministry of Fisheries, Animal Husbandry and Dairying. This body is responsible for policy formulation, financial allocation and implementation of major development programmes. Key initiatives such as the

Pradhan Mantri Matsya Sampada Yojana (PMMSY), Fisheries and Aquaculture Infrastructure Development Fund, and Kisan Credit Card (extended to fishers and fish farmers) aim to strengthen extension services, enhance infrastructure and improve access to institutional credit. These programmes play a crucial role in capacity building, modernization and increasing productivity in the fisheries sector (Government of India, 2020).

II. **Research and Technical Support:** Scientific and technical support for fisheries extension is provided by the Indian Council of Agricultural Research through its network of fisheries research institutes, including the Central Institute of Fisheries Education. These institutions develop region-specific technologies, training modules and extension methodologies. Programmes such as the National Innovations in Climate Resilient Agriculture and various ICAR outreach initiatives support climate-resilient fisheries practices and strengthen knowledge dissemination. They also collaborate with extension agencies to promote adoption through capacity-building and skill development programmes (ICAR, 2019).

III. **State Level:** At the state level, State Fisheries Departments are responsible for implementing extension programmes by adapting national schemes to local conditions. They play a key role in executing centrally sponsored schemes such as Blue Revolution and PMMSY at the regional level. These departments coordinate extension personnel at district and block levels, ensuring effective delivery of advisory services, training, subsidies and welfare measures to fishers and fish farmers (Swanson & Rajalahti, 2010).

IV. **District and Grassroots Level:** At the grassroots level, extension services are delivered through Fisheries Development Officers, Krishi Vigyan Kendra (KVKs), fisheries cooperatives, non-governmental organizations and self-help groups. These institutions work directly with stakeholders to facilitate technology transfer through training, demonstrations and advisory services. Programmes such as Matsya Mitra under PMMSY and National Fisheries Development Board schemes initiatives promote last-mile connectivity, entrepreneurship and community participation. These efforts ensure practical adoption of improved fisheries practices and enhance livelihood outcomes (FAO, 2010).

Functions of Fisheries Extension

Fisheries extension is a communication-oriented support system designed to assist fishers, aquaculture producers and allied communities in enhancing their skills, increasing production efficiency and improving their overall livelihoods. It functions as a vital link that connects scientific research and public development programs with people who rely on fisheries as their primary source of income (FAO, 2010).

I. **Knowledge and Technology Transfer:** Fisheries extension helps fishermen and fish farmers implement research-based practices, such as better culture techniques, species management, water quality control, disease prevention and sustainable production systems (FAO, 2010).

II. **Capacity Building and Training:** To enhance skills and boost market competitiveness, need-based training and hands-on demonstrations in aquaculture, entrepreneurship, marketing and the use of contemporary equipment are offered (Swanson & Rajalahti, 2010).

III. **Advisory and Technical Support:** Farm visits, diagnostic services and soil and water analysis are examples of field-level support that lowers production risks and promotes well-informed decision-making (FAO, 2011).

IV. **Sustainability and Inclusion:** Extension encourages inclusive and ecologically conscious practices, guaranteeing the involvement of women, young people and small-scale fishermen.

V. **Linkages and Participation:** By strengthening ties with markets, financial institutions and government programs and encouraging participatory approaches, extension enhances innovation adoption and sustainable livelihoods.

Issues in Fisheries Extension

Fisheries extension in India is an important contributor to improving productivity and livelihood support; however, it encounters many critical challenges. One of the major challenges in this case is a lack of institution integration, which sometimes leads to ineffectiveness in service delivery (Sahoo & Jain, 2018). Fisher communities in distant or less developed regions sometimes are less aware of extension service support, thus failing to benefit much in adopting advanced aquaculture systems (FAO, 2022). The cyber gap can impede access to cyberspace-enabled online advice systems (ICAR, 2021). Additionally, environmental issues such as climate change, water pollution, and depletion of resources affect the sustainability of fishing as well as render extension service support less effective (Kumar *et al.,* 2020).

Understanding these kinds of critical challenges is important for improving productivity, sustainability and the livelihood status of fishing communities in India.

Future Perspectives

Fisheries extension emphasize the importance of adopting a dynamic, forward-looking and integrated approach to effectively address the emerging challenges within the sector.

Stronger institutional coordination: Improving collaboration among different fisheries extension agencies can help overcome gaps in service delivery and ensure more effective support to fishers and fish farmers (Mohanty et al., 2021).

Expansion of digital and mobile extension services: The use of digital platforms and mobile-based extension services can significantly improve outreach, especially in remote and underserved fishing areas (ICAR, 2021).

Focus on value addition and entrepreneurship: Greater emphasis on value addition, market awareness and entrepreneurship skills is essential to enhance income-generating opportunities within the fisheries sector (FAO, 2022).

Adoption of climate-resilient practices: Promoting climate-smart and environmentally friendly fishing practices among artisanal fishers will be crucial for ensuring long-term sustainability and resilience to climate change impacts (Kumar et al., 2020).

CONCLUSION

India's fisheries extension system is not a network of policies and programs alone, but a bridge that interfaces scientific knowledge with the daily lives of fishers and aquaculture farmers. The services stand committed to improving productivity, livelihoods and food security through support for technology adoption, sustainability and market participation. In the future, making extension services more accessible, inclusive, and responsive to the real needs and challenges

facing fishing communities will be important. A more robust and modern fisheries extension will, therefore, be called for as an essential ingredient toward building a resilient and inclusive fisheries sector.

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