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ADVANCED EXTENSION TECHNIQUES FOR HARNESSING POTENTIAL OF FISHERIES SECTOR

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Fisheries extension envelops the fisheries development in action (Ananth, 2010). Cole (1977) has opined that that fisheries extension service is mainly intended to achieve all-round development of the fishing sector. In India, though both the central and state governments formulate policy guidelines, the states have the major role in executing the extension programs at field levels through their respective Departments of Fisheries (DoFs). The Union government also provides financial support through its schemes to provide technical, financial and extension support to aqua farmers (Kumaran et al., 2003).

Apart from providing the information and services needed and demanded by fishers and other actors like processors in rural settings, the extension has the onus to carry out different activities to assist them in developing their own technical, organisational, and management skills and practices so as to improve their livelihoods and well-being (GFRAS, 2012).

Table 1: Functions of Fisheries Extension Services

Area of Work	Objectives
Technology transfer	Improved techniques of mariculture and aqua culture Introduction of modern craft and gear material for fishing Scientific post- harvest practices Diversified technology application in fisheries Introduction of innovative technology application methods
Information And support services	Information support to fishermen about prices, types and availability of known and new fishing inputs
Food safety and quality.	Awareness creation on importance and methods of hygienic handling of fish. Promotion of food safety and quality standards among various stakeholders.

Marketing and distribution	Provision of real time marketing information to fishermen about wholesale and retail prices, ultimate market places etc. Strengthening the position of the fishermen against middlemen by organizational and financial support of marketing through fisher women and co-operatives
Sustainable fisheries	Advising and educating fishermen in resource conservation methods and responsible fishing practices
Credit and finance	Facilitating direct contact between banks and fishermen Facilitating indirect institutional finance through self help groups, co-operatives, credit societies etc. Implementing welfare schemes for the development of poorer fishermen Promotion of institutional savings
Organizational and capacity development	Facilitating the development of fishermen organization to promote collective action. Capacity development of various actors in the value chain.
Entrepreneurship development	Identification and promotion of entrepreneurial possibities in fisheries sector Development of entrepreneurial capacity of students, rural youth, fishermen and women Incubation support to potential entrepreneurs Facilitating technology commercialisation
9. Safety measures	Awareness generation about life saving equipments, risk communication devises and survival strategies. Skill development on use of communication devises and survival techniques
10. New extensionist approaches	Networking, promotion of interagency collaboration, facilitation, creating many-to-many relationships among the wide range of actors.

(Sajesh et al,2018)

The scenario mentioned above points to the need for an '*extension- plus*' approach synergising both technology and non-technology services demanded by the fishermen.

Table 2. Extension- plus: Key shifts

From	To	Strategies
Technology dissemination	Supporting rural livelihood	Enabling fishers to develop livelihood assets through skill

		development, facilitating access to capital, community mobilization, hazrd mitigation and infrastructural development
Improving productivity	Improving income	Price information, market intervention, avoid exploitation by middlemen
Forming fishers group	Building independent fisher operated organisations	Reorienting existing fishers organizations and apex agencies for upscaling and outscaling their efforts
Providing services	Enabling fishermen to access services from other agencies	Liaison with agencies in public, private and civil society segments for inputs, credit, research, technology extension, marketing and capacity building
Market information	market development	Forge networking with supply chain actors, processors

(Adapted from Sulaiman & Hall, 2004)

Shifting focus from technology dissemination to supporting rural livelihood; improving productivity to augment the income of the producers; providing service to enable fishermen to access service from various agencies and building independent fishermen-operated groups are some of the key changes required in this context (Sulaiman & Hall, 2004). Operationalisation of such changes requires strategies like skill development, community mobilization, infrastructure development, market intervention, reorienting existing fishermen organizations for upscaling and outscoring their efforts, liasoning with various agencies in public, private and civil society segments, forging linkage with processors and other supply chain actors etc.

Technology dissemination should be the core, but the focus has to be broadened. There needs to be a range of objectives like mobilisation and strengthening of producer collectives, promotion of linkage with various agencies in the public, private and civil society segments, and entrepreneurship development while being sensitive to the ecosystem and environmental protection. In addition to technology transfer, it is important to strengthen locally relevant innovation processes and knowledge systems (Sulaiman & Hall, 2004). Innovations can be in the realms of technology (eg: technologies for responsible fisheries), organization (eg: group mobilization or restructuring), institutions or decision-making (eg: decision to adopt) and need not be promoted by research or extension systems. The innovation capacity of the fishers and

other actors in rural settings depends on the skills to develop and assimilate internal and external resources for problem-solving and to leverage opportunities (World Bank, 2012), which in turn requires harnessing the synergy of pluralistic stakeholders in a complementary manner. It starts with the identification of multiple actors and their roles as well as the ways by which they can be effectively converged for the larger goal of making fishermen better managers of the sector and organizations.

Role of collectives in fisheries extension

Extension- plus approach, to be effective, requires the convergence of various agencies and schemes to optimise their contribution towards the welfare of the fisherfolk. This, in turn, requires a suitable platform for harnessing the strength of diverse actors across the value chain. As discussed earlier, collectives like fishermen/fisherwomen groups have the potential to act as such platforms. The efficacy of such collectives depends on the extent of self-mobilization. These collectives should be linked to larger innovation networks composed of fishermen, fishermen organizations, private and public firms, researchers, extension agents, government agencies, funding agencies and financial agencies. Major activities to foster the emergence of innovation networks include creating trust among potential partners, identifying common goals, establishing the bases of collaboration and developing innovation capabilities (Ekboir, 2012). The extension has an important role to carry out these activities as well as to enhance the ability of other actors to support fishermen in an integrated way. Reorienting the fisheries extension system to address the varied concerns of the sector requires policy-level interventions in terms of human and financial resources (Sajesh et al., 2018) and organisational innovations.

Cooperatives and producers' organizations open a new avenue for the smallscale producers by facilitating various multiple linkages with institution/organization to spread awareness and strengthen the policies and procedures to boost productivity and help farmers to adapt changing organizational conditions. Offering of extension services by cooperatives have positive impact on performance. Beyond that they often offer social services and building of physical infrastructure in rural areas

Research institute-cooperatives linkage for technology dissemination

Research institute-cooperatives linkage for technology dissemination refers to the association between institutes and cooperatives to transfer information and technology for enhancing the production practices and hence to improve the return from farming/ cultivation(Sajesh,2023). Technologies and practices generated at research institutes often fail to reach smallscale producers owing to multiple reasons. Cooperatives, being owned and by the rural producers and farmers, can help in disseminating research outcomes to wide range of end users making use of their networks and membership base.

In addition to technology dissemination, institutes can join hands with cooperatives in the field level evaluation of the technologies and customizing them as per the feedback of its members. In this way the collaboration can facilitate better adoption of technologies by the members of cooperatives as they are involved in the technology assessment and refinement process. Further, the linkage can also promote capacity building for farmers and rural producers. Research institutions can provide technical assistance and skill support to cooperative members on innovative practices. Also, cooperatives can serve as a platform for farmers and rural producers for cross learning and knowledge acquisition.

While fomenting the collaboration, the roles of research institutes and cooperatives can overlap and be complementary. For example, research institutes can work with cooperatives to identify research priorities and to co-design research projects that address the needs and interests of fishers and processors. Cooperatives can provide access to fishing communities and facilitate communication and knowledge exchange between research institutes and fishers. Together, research institutes and cooperatives can collaborate to disseminate new knowledge and technologies, and to promote the adoption of sustainable and socially responsible fishing practices.

Table 3: Roles of Research Institutes and Cooperatives in developing the linkage

Attributes	**Institute**	**Cooperatives**
Research, technology validation and advocacy		
Research	*Conducting research*: based on the research needs of stakeholders, Research institutes can initiate research for solving various problems constraining effective value chain functioning in fisheries	*Identifying research needs:* Identify areas where further research is needed for effective value chain functioning in the agriculture or allied sector *Supporting research projects*: Cooperatives can support research institutes on executing studies by facilitating access to resources and various facilities of the members farmers or producers
Information dissemination	Through publishing research papers, reports, or other	Cooperatives can facilitate transfer of information and

	publications, as well as providing training and educational programs	technologies to their members through trainings, awareness programmes and other outreach activities.
Feedback	To redesign research as per the needs of stakeholders and suiting to the particular environment.	Cooperatives can provide feedback to research institutes and extension agencies on the effectiveness of the innovations being disseminated
Advocacy:	Research institutes can advocate for policies and regulations that support sustainable fisheries management practices	By collaborating with research institutes and extension agencies cooperatives can help in formulating advocacies for policies,practices and regulations for the benefit of fisheries sector.
Extension and Programme implementation		
Beneficiary Identification	Guidelines for beneficiary identification and selection	Selection of beneficiaries
Group mobilization	Facilitation of group mobilization	Mobilization of beneficiaries
Technology training	Conducting training programmes for developing required skills for technology application	Facilitation of training
Infrastructure development	Guidance regarding required infrastructure Incubation support	Developing required infrastructure required for technology use
Capital requirement	Possible assistance under Government schemes and programmes Assistance in developing	Provision of loans and financial assistance for acquiring the technology; or Facilitation of access to credit, subsidy etc.. ,or

	project report, proposal etc.	Technology acquisition and provision of access on custom hiring basis
Liasoning with other agencies	Collaboration with other research institutes, Universities KVKs etc	Convergence of various schemes and programmes of governmental and non governmental agencies to develop the value chain. Cooperatives can act as platform for convergence.
Marketing	Facilitating role	Promotion of marketing through various avenues
Monitoring	Monitoring follow up of adherence to package of practices Collecting feedback and remedial measures	Monitoring financial feasibility

(Sajesh,2023)

Entrepreneur led extension

Entrepreneurs can provide extension services in varying areas of fisheries for the welfare of fisherfolks and other stakeholders in the fisheries value chain. Agriclinics And Agri Business Centres as well as AgriBusiness Incubation Centres are major initatives in this direction.

The Agriclinics and Agri Business Centres (ACABC) scheme is being implemented by Ministry of Agriculture and Farmers' Welfare, Government of India, with NABARD acting as subsidy channelising agency. Agri-Clinics are envisaged to provide expert advice and services to farmers on various aspects to enhance productivity of crops/animals and increase the incomes of farmers. Agri-Business Centres are commercial units of agri-ventures established by trained agriculture professionals. These ventures may include maintenance and custom hiring of farm equipment, sale of inputs and other services in agriculture and allied areas, including post-harvest management and market linkages for income generation and entrepreneurship development. In the same line, Aqua Clinics and Aquapreneurship Development Programme (AC&ADP)" conducted by National Institute of Agricultural Extension Management (MANAGE) in collaboration with National Fisheries Development Board (NFDB), Hyderabad since 2018. MANAGE has initiated this program to create self-employment opportunity and make more and more individuals self-reliant. With the aid of 19 Fisheries Nodal Training Institutes (NTIs) across the country MANAGE has

trained 766 participants to promote entrepreneurship development, support innovative technologies(MANAGE,2023).

Opening up of 22 Agribusiness Incubators by Indian Council of Agricultural Research (ICAR) through its World Bank funded National Agricultural Innovation Project (NAIP) in 2008-09 (10 Agribusiness Incubators) and 2013-14 (12 Agribusiness Incubators) has given a boost to technology based entrepreneurship in Agriculture. These Agribusiness Incubators were housed either in Agriculture Research Institutes or State Agricultural Universities which are generators of Agricultural technologies . The agribusiness incubators (ABIs) provide shared facilities and equipment, business development, market access, technology assessment services, financial services; as well as mentoring and networking (Sivakumar and Sivaraman, 2014).

Conclusion

Extension has major role to play in harnessing the potential of fisheries value chain for the welfare of various stake holders across the chain. Extension-plus approach including forging collective action, research institute cooperative linkage and entrepreneur led extension are some of the major strategies which can be deployed for the development of fisheries sector.

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