SCOUTING FARM INNOVATIONS – IMPLICATION FOR EXTENSION

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Aqua-farmers often experiment with their limited resources and available means for maximizing returns. Through years of trial and error, they had come up with locally tested and appropriate package of practices which gained popularity among the farmers in similar agro-climatic zones. These innovations often remain unnoticed and the talents of the farmers remain underutilized. Such innovations developed within resource constraints at the grass roots level have the potentials of wider scale dissemination through up-scaling. Authors underline that these innovations need to be nurtured, promoted and disseminated. They argue that the formal research system learns from the successful cases and tries to improvise the grassroot level innovations.

INTRODUCTION

In principle any idea, practice and object which is perceived as new by an individual is known as innovation. It emerges out of farmers' long experience and wisdom based on their own analysis of micro-level farming situation. These sort of innovations at grassroots level must be encouraged, recognized and disseminated among farmers of similar agro-climatic zones. Innovation developed within farmers' resource constraints is low cost or affordable to the people at the bottom of the pyramid. There exists scope for wider scale dissemination. It also has the potential to contribute for agricultural R & D. Fish farmers too have developed a lot of innovative practices that need documentation & popularization.

The words "creativity" and "innovation" are often used interchangeably, however, it should not be. Creativity deals with ideas while innovation is about "bringing ideas to life." While individuals may display creativity, innovation occurs in the organizational context only, by bringing creative ideas to life. Innovation is linked to performance and growth through improvements in efficiency, productivity and quality. Innovation by businesses is achieved in many ways; through formal research and development for "breakthrough innovations" as well as through less formal on-the-job modifications of practice-such as through exchange, personal experience and by many other routes (http://www.bia.ca/what-is-innovation.htm).

The term innovation refers to the understanding and use of a new idea, practice or method, which replaces something that an individual or organization has been using so far. Innovation can be conceptualized as a ''product'' (Rogers, 1995) or a process (Hall *et al.,* 2004). Recent approaches to innovation have their roots in structural adjustment programmes implemented during 1991 (Ortiz *et al.,* 2013). This resulted in shrinking

government spending on agricultural research and extension services. NGOs, private sector, farmer organizations, local governments, etc. began to contribute and also take lead in promoting agricultural innovations during the 1980s and 1990s (Bebbington *et al.,* 1993; Ameur, 1994; Umali and Schwartz, 1994; Ortiz, 2006). The effort of these stakeholders and the realization by donor agencies paved the way for strong linkage for technological innovation, for example, through participatory research (Chambers *et al.,* 1989), or for improving the share of information and knowledge (Kaimowitz *et al.,* 1990).

There are instances when innovations generated as a result of collaborative effort of public and private stakeholders, wherein research organizations have been a part of the initiative. Scholars and academicians started proposing concepts for explaining the dynamics of multiple stakeholders. The agricultural innovation system approach (Hall *et al.,* 2003, 2004; Hall, 2009) was initially used in the private sector in an attempt to explain and promote innovation.

The Indian Council of Agricultural Research (ICAR) institutions and SAU's are organizing 'Farm Innovators' meet. Selected innovators are invited by the Institutions to share their way of farming to scientists and other stakeholders. These meets act as an excellent platform for the stakeholders who get first-hand information about grassroots level innovations besides providing scientists direct feedback on the performance of the technologies. ICAR' publication "Farm Innovators 2010' compiled 139 innovations across the country ranging from crop, water management, livestock and fisheries etc. The documents are like goldmines for scientists. They get to know personal experiences of farmers, fine-tuning of recommended practices done at the farm level by farmers, and other modifications that have become successful. It also opens up opportunity for researchers to improvise farm innovations. The out-of-box solutions developed at the farm level needs merger of formal science for up scaling.

ICAR-Central Institute of Freshwater Aquaculture has brought out two volumes – Aquaculture Innovators (2011) that contains sixteen success stories from various states i.e., Uttar Pradesh, Odisha, Karnataka and West Bengal. Carp breeding, carp seed rearing, grow out carp culture, ornamental fish culture, integrated farming systems are some of the technologies that have enabled the farmers to become entrepreneurs. Aquaculture success stories (2012), the second in that series, is a compilation of a more varied and rich experiences of eleven successful farmers. The Krishi Vigyan Kendra's (KVK) are also documenting innovations by farmers, wherein KVK, Khordha recently came out with a publication christened as 'KVK success stories' which is a collection of fifty stories.

SELECTED AQUACULTURE INNOVATORS

1. Sri Manabendra Moharatha, Bhatapadagarh, PO-Harichandanpur, Khurda, Odisha

- Main objective to establish this farm was to increase productivity of unexploited unproductive hilly terrain land by constructing a series of ponds. He constructed a

series of nursery, rearing and stocking ponds on a hilly terrain to store rain water from about 125 ha of catchments area up hill.

- Utilization of stored rain water for culture of table size fish, brood stock rearing, breeding and hatchery operation, spawn production, fry, fingerling and yearling rearing
- Construction of a commercial carp hatchery.
- Strategic management of carp brood stock through water replacement from the stream water
- Breeding grass carp in the 1st week of April in stored rain water which is considered to be a record in Odisha.
- Use of larger ponds for spawn to fry, fry to fingerling, fingerling to yearling production in succession on commercial scale.
- Maintenance of continuous flow of water in ponds through a network of inlets and outlets using gradients.
- A significant advantage lies in making best use of huge quantity of water flowing from a large catchment area, including hills carrying rich organic matter and leaf litter with it. But this flows down into streams without any productive use. Conservation and storage of such nutritional water in ponds can enhance its biological productivity through aquaculture.

This farmer used to supply quality seed to Khurda, Puri, Mayurbhanj, Bhadrak and Athagarh districts of Orissa. ICAR-CIFA has established "Aquaculture Field School" to use Mr. Moharatha as resource person and infrastructure of his fish farm for practical learning for cost-effective transfer of technology for the rural fish farmers in the region (Radheyshyam, 2011).

2. Shri B K Sahoo and Shri N C Panda, Village- Sarakana, Khurda, Odisha

- Engaged in fish breeding continuously for over 10 years.
- Well managed brood stock resulted in egg production of 20 liter/kg brood fish against 10-15 lit/kg.
- Phased increase of water level in spawn to fry rearing to enhance fry recovery.
- Rotational cropping of paddy cultivation and fish seed rearing in seasonal pond.
- Application of neem oil cake, an organic product as manure as well as for disinfection.
- Establishment of "Aquaculture Field School" for providing training and technical guidance to other farmers (Radheyshyam, 2012).

3. Sri Indresh Pandey, Village- Sirhir, Allahabad, U.P.

- The farmer has utilized the pond embankments of newly constructed ponds for growing pulse crop (Pigeon pea).
- Use of mixture of paddy straw, urea and cow dung to enrich detritus and grazing food chain in fish pond.
- To reduce damage of pond embankments by common carps, paddy straw was heaped on the shore of the pond.
- Urine was collected from 150 cattle and applied in pond to increase water productivity and prevent disease (Chandra, 2012).

4. Sri R. K. Paswan, Village- Peeperpati, Block –Partawal, Dist- Gorakhpur, U.P.

- Quadri-spawning of grass carp and 2-3 time breeding of silver carp, catla, rohu and mrigal in one season using same brood fish.
- Degumming of fertilized eggs of common carps by using a solutions of tanic acid, urea and salt.
- Thermal manipulation of 20-28°C in spawning and hatching pools by adding ground water when outside water temperature was 10-15°C in winter and 35- 40°C in summer.
- Use of community ponds in succession for producing fry, fingerling, yearlings and food fish with production of about 8 ton/ha/yr. (Radheyshyam *et. al.,* 2012).

5. Shri Ram Chandra Behera Village- Jasuapur, Dist- Puri, Odisha

- A liquid manure (100 kg cow dung + 25 kg single super phosphate + 20 kg potash + 8 kg di-ammonium phosphate + 5 kg urea) was applied fortnightly in pond to maintain sustained production of naturally occurring fish food organisms.
- The farmer has fixed over 200 bamboo poles in zigzag form in 0.56 ha water area to check poaching.
- Leaves and trunk of banana were chopped and used as grass carp feed. It also maintains suitable water pH and helpful in preventing fish suffocation during oxygen depletion.
- In newly dug out pond fish growth and yield are adversely affected for 2-3 years (Saha *et.al.,* 2012).

There is an increasing realization that the current extension system is not adequately responding to the emerging needs of the farming community. Often research system is not getting proper feedback to enable them to plan and conduct demand driven research, resulting in a huge gap in the quality of research output required at the farm level. There is a need to bridge the disconnect between research in one hand and farming community on the

other. Farmer-led research and the resultant grassroot level innovations need to be promoted more vigorously. Researchers in India and elsewhere have recommended for such innovations which in the long run would help empower farming community.

LESSONS FOR EXTENSION

- There would be a paradigm shift in research. Farmer led research would be the order of the day. Research will have to focus on field problems and will have client orientation in order to bring meaningful changes for farming practices. Research fraternity has to acknowledge the fact that farmers' sole attention is on more profit and all-out effort is needed to make farming an attractive vocation for the youth.
- Research Institutions are organizing innovator's meet to 'share and learn'. This holds significance as farmers are no longer considered as passive recipient of technology but as innovators and entrepreneurs. Active participation of stakeholders and pluralistic extension environment are the two dominant features of extension today.
- Formal research system will have to recognize and improvise grass root level innovations. Improvising small scale aquaculture and gender mainstreaming would require more research attention. Transfer of technology will have to shift from blanket recommendation of technologies to provision of location specific technology modules and business plans.
- In order to upscale farm innovations strong linkage will have to be built between R&D institutions, State Development Departments and Innovators.

SUMMARY

Farmers are known to experiment with their limited resources and available technologies for maximizing returns. Through years of trial and error, they come up with locally tested and appropriate package of practices which gains popularity among the farmers in similar agro-climatic zones. These innovations often remain unnoticed and the talents of the farmers remain underutilized. Such innovations developed within resource constraints at the grass roots level have the potentials of wider scale dissemination through up-scaling. These innovations need to be nurtured, promoted and popularized. It is time that the formal research system learns from the successful cases and tries to improvise the grassroot level innovations. The endeavour in this direction should not end with only documentation. The stakeholders should come forward and strive for fostering linkage between R & D institutions, line departments and innovators for up-scaling.

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