

Controlling Fish Diseases Through The use of ITK by the Fish Farmers of West Bengal, India

Biswajit Goswami¹ and Prabir Kumar Gangopadhyay²

1. SMS (Fishery Sci.), 2. Sr. Scientist and Head, Dakshin Dinajpur Krishi Vigyan Kendra, Uttar Banga Krishi Viswa vidyalaya Majhian, Patiram, D. Dinajpur, WB

Corresponding author e-mail: bisug2003@gmail.com

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ABSTRACT

A survey has been undertaken in the Dakshin Dinajpur district of West Bengal with an objective to study as to how the ITKs are adopted by the fish farmers for controlling the diseases. It was observed that since time immemorial a number of ITKs have been adopted by the fish farmers. It was also observed that the ITKs have been scientific explanation rather than superstition. The indigenous technological knowledge can be promoted through scientific approach as a mean of higher and sustainable fish production, which will be eco-friendly, too. Four villages from the district were purposively selected depending upon the concentration of fish farmers as well as known to use indigenous technical knowledge for various fish health management practices. Fish farmers adopt several ITKs in fish culture. Disease management in fish farming is very important. A number of ITK's have been identified which are popularly practiced in the area of fishery, be it small marginal or big farming. Farmers apply garlic pastewhich contain a chemical ALLICIN is antimicrobs to control disease. Farmers also apply mixture of garlic paste and common salt in pond to control fish disease as it is having disinfecting ability. Neem (Azadirachtaindica) leaf paste and lime in fish pond is being used to protect fish against external injuries reddening areas, lesions.

Keywords : Indigenous Technical Knowledge; Fish farmers; Fish disease; Scientific fish culture; DakshinDinajpur;

Indigenous Technical Knowledge (ITK) is characterized as the sum of experience and knowledge for a given ethnic group, which forms the basis for decision making in regard to familiar and unfamiliar problems and challenges. It can play key role in designing of sustainable farming systems including fishery practices thereby increasing the livelihood that rural populations would accept, develop and maintain innovations and interventions. For ages, human beings, in particular, the resource poor farmers and marginal societies around the world, have been utilizing locally available plant resources for formulating a wide range of plant based medicines for treating fishery diseases as an economical, accessible, efficacious and ecologically sustainable means to fish health care practices.

Indigenous knowledge as the participants' knowledge of their temporal and social space. Indigenous knowledge as such refers not only to

knowledge of Indigenous people, but to that of any other defined community, while Indigenous Technical Knowledge (ITK) is specifically with actual application of the thinking of the local people in various operations of agriculture and allied areas (Das et al, 2002). There has been quite a considerable number of Indigenous Technical Knowledge (ITK) for protection rearing and for different cultural procedure developed in the field of agriculture and its allied sciences for the protection management and processing of their commodities.

The indigenous knowledge is the accumulated knowledge, skills and technology of the local farmer derived from the interaction of ecosystem (Dohare, 1996). Since the evolution of mankind man has been entrusted with resources and location specific avenues like agriculture, fishery, dairy, animal husbandry, ayurvedic, medicine and weather study etc.

In rural areas, indigenous technical knowledge of fish farmers associated traditionally. Farmers' wisdom

is supposed to be thumb rule in the rural setting, which followed from generations to generations to cope up with different situational constraints (Gupta, 1990). The tested and proven innovation of ancestors needs to be valued and blended with new technological support (Das et al, 2002).

Traditional wisdom is time tested and understanding the dimension of technologies of the fish farming helps in asserting the degree and directional change through formal research. Thus, recording of indigenous innovation becomes important which would otherwise be obsolete soon without recognition to future. Currently the modern information system seriously addresses the issue of sustainability of productive system of the world. Persistent poverty, air and water pollution, soil degradation, global warming etc have raised doubts about the wisdom of pattern of development currently being pursued.

With the implementation of multifaceted knowledge and skills, substantial contribution to our productive efforts ensuring high yield, can be achieved through modern techniques of enhanced fish production in an economically sound manner.

In short indigenous knowledge is traditional type of innovation by the farmers that is stored in peoples' memories and activities and it is expressed in the form of stories, song, folklore, proverbs, dances, myths, cultural values, beliefs, rituals, community laws, local language and taxonomy, agricultural practices, equipment materials, plant species and animal breeds (Jha and Shiyani, 1992).

The major advantages of farmers' innovation over other technological innovations is that it has little or no cost and is readily available. These innovations are socially acceptable, economically viable, and sustainable and involve minimum risk to rural farmers and producers, and above all, they are widely believed to conserve resources. The farmers' innovations encourage transparency and accountability (Goswami et al., 2006).

The use of farmers' innovation, skills and wisdom promotes active community involvement because people depend more on each other (Ratnakar & Reddy, 1991). People are less dependent on outside supplies; that may be costly, scarce and irregularly available. Keeping these facts in view, the present investigation was carried out with the following objectives:

- i. To identify the various types of existing indigenous technical knowledge (ITK) in fisheries.

- ii. To explore the use of indigenous technical knowledge (ITK) in fish farming in rural communities.
- iii. To find out the purpose and rationale of indigenous technical knowledge (ITK) to control fish disease management in fisheries.

METHODOLOGY

The study was conducted in two purposively selected blocks namely, Tapanand Gangarampur blocks of Dakshin Dinajpur district of West Bengal. The rationale behind selection of blocks included the possibility of predominance of traditional fish health management practices in such areas in comparison to other blocks. To document the indigenous fishery practices, two villages each from selected blocks were selected purposively namely, Shibpur and Mohukuri (Tapan) and Antal and Tousi (Gangarampur). Four villages from the district were purposively selected depending upon the concentration of fish farmers as well as known to use indigenous technical knowledge for various fish health management practices. Purposive selection of villages was necessitated to make at least two requirements, firstly, the village should have substantial population of indigenous people i.e. tribals and secondly it should have sufficiently large number of fish farming families. A total of 100 (twenty five from each village) tribal farmers served as respondents. Besides, key informants were selected for getting detailed information of indigenous farming knowledge. The collected ITK were thoroughly screened with the help of experts, which were exposed to resource persons to identify the most commonly used ITK. Thus, in total seven ITKs were selected for fish disease management practices.

RESULTS AND DISCUSSION

Fish farmers adopt several ITKs in fish culture. Disease management in fish farming is very important. A number of ITK's have been identified which are popularly practiced in the area of fishery, be it small marginal or big farming.

It was general observation that (i) all categories of farmers (Marginal/small/medium/large depending on the land holding area from <0.5 ha to >2.5 ha of law) exercised the available ITK as and when situation demanded (ii) Religion and castes also did not have any role over the practice of any ITK as and when required.

There have been a number of ITKs which were very popular practice in the farming community. They are described below.

Application of garlic paste to control disease: It is a popular practice to treat the fishes to cure whirling motion and balance lost due to viral attack particularly yearlings and fry-fingerlings of fishes.

General description: About 1Kg of garlic (*Allium sativum*) is ground to make a paste then it is thoroughly mixed with about 20 lit of fresh water. This solution is then sprayed over the infected pond. The farmers would get the positive effect but did not know the causes.

Rationality: The Scientists explains that garlic contain a chemical ALLICIN which is antimicrobs which helps to control the disease of fishes. Intensive study had been made on the larvicidal, antifungal and antibacterial effect of garlic (*Allium sativum*) on fishes (Amonkar & Banerji, 1971; Moore & Atkins, 1977). The positive effect in all the studies was found. Garlic is a useful drug in fishery as it contains antimicrobial compound called Allium. Inhibitory activity of garlic (*Allium sativum*) against *S.aureus*, *S.typhi*, *E.coli* and *Listeria monocytogenes* was found. All pathogenic strains were sensitive (80%) to garlic, *E.coli* was the most (Kamar & Berwal, 1998).

Application of mixture of garlic paste and common salt : To control fish disease in pond being found in the rural village ponds.

General description: The farmers generally make a mixture of 2 Kg garlic paste and 5 Kg common salt. Then it is diluted in 20-25 litre of fresh water before application to the fish rearing pond-water.

Rationality: Common salt having disinfecting ability its application along with garlic insulate fishes from fungal and bacterial infection.

Application of Turmeric Curcuma longa, lime and common salt: As preventive and protective measure against fungal and bacterial infection.

General description: A mixture of 500g turmeric, 1 Kg lime and 5 Kg common salt is found to be applied in fish farm.

Rationality: All the three ingredients help as disinfect. Lime also helps maintain the pH of the water and congenial for the growth of fishes.

Application of Neem (Azadirachta indica) leaf paste and lime in fish pond: To protect fish against external injuries reddening areas, lesions

General description: Neem leaves are ground to make

a paste and lime is added (Neem:Lime=1:2). The paste is divided equally in to 2-3 lots. Each lot is added with water in 25-30 liter water capacity containers, locally called "handi". The fishes having external injuries reddening areas, lesions in their body are dipped into the prepared solution for about half an hour and released back to pond. The remaining lots (if any) are mixed with water and sprayed into pond water.

Rationality: This might be due to anti-microbial activity of the paste which heals the above said disorders in fishes (Mukherjee M, 1996; Das et al. 1999).

Application of Neem leaf paste and turmeric in fish pond: For treatment of fishes showing lesions, reddening areas and other external disorders in their bodies.

General description: Neem leaves are ground to make a paste. Turmeric is added (250gm) in to the paste and mixed properly. The paste is then mixed with 25-30 liters of water and sprayed in the cultured fish pond evenly. This is practiced as prophylactic measure while there is disease outbreak in the locality. Used materials are readily available and cheap.

Rationality: Declination of fish mortality was found in dip treatment with Neem and Tumeric extract (Chakraborty & Chattopadhyay, 1998). It was reported that Neem (*Azadirachta indica*) having antibacterial activity against 4 pathogenic bacteria (*A.hydrophila*, *P.fluorescens*, *Myxobacteria* and *E.coli*) and the first three bacteria showed greater sensitivity of Neem than *E.coli* (70.14% 74.15%, 63.9% and 61.75% respectively) (Das et al. 1999).

Broadcasting of ash in fish pond: Used as prophylactic measure to check fish disease in culture pond.

General description: Paddy straws are burnt and the ash of it is broadcasted into fishpond or sometimes heaped in one corner of the cultured pond. The practice is used as prophylactic measure to check fish disease in culture pond. The practice involves least cost and materials are readily available. Applying burnt ash of paddy straw may keep pond water quality congenial for fish growth.

Rationality: It was reported that the neutralizing effect and increased alkalinity occur when ash is applied in the pond varies depending on the type of ash, the most effective being wood ash applied at 3 mt/ha (Jamu, 1990). Most of the farmers used rice-husk ash, whose value when compared to wood ash is not known. Higher doses of ash may give better results in disease prevention and control, although farmers might find it impractical to

adopt higher dosages. Of the different treatments tried, farmers preferred ash treatment, as they can obtain ash as a non-purchased input. This is particularly important, as farmers prefer to use non-purchased inputs, even though the results may not be completely satisfactory.

Bamboo logs fixed to fish pond: To manage fish louse and thereby control of the infestation.

General description: Bamboo logs are fixed to pond bottom. This is specially applied in the times when cultured fishes are affected with fish louse. During this infection, fishes use to rub their body against hard substances. Here bamboo logs provide scope for rubbing their body. Farmers use to practice for removal of fish louse by rubbing their body against bamboo logs and thereby control of the infestation. This involves less intricacy in arrangement of the bamboo logs and the practice is farmer's friendly.

Rationality: As a result of rubbing of body with bamboo log, lice are removed from the body.

CONCLUSION

The above mentioned indigenous technology is very much viable in combating the problems of the fish health management. Farmers knowingly or unknowingly employed such techniques in effective disease management of such systems. The basic difference of ITK from other scientific method or technologies is ITKs are adopted first depending on their positive response to the local people followed by sophisticated research work in the laboratories of the research institutions. The same knowledge and technologies may be further fine tuned in the days to come. It is imperative to analyse such technologies so that the scientific basis behind them could be properly understood. When this is completed, it will be possible to further refine and upgrade them by blending with modern scientific knowledge. Admitting the scientific approach of the above discussed technology one should protect this for betterment in fish culture for the near future.

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