

Small is Nutritional

A recent workshop in Dhaka, Bangladesh, focused on the role of small indigenous fish species in ensuring incomes and nutrition for the rural poor

The Regional Workshop on “Production and Conservation of Small Indigenous Fish Species (SIS) for Improved Food and Nutrition Security and Livelihoods of Rural Populations of South and Southeast Asia” was held during 3-4 December 2008 in Dhaka, Bangladesh. Its purpose was to bring together stakeholders to share knowledge and develop guidelines for sustainable technologies for production, management and conservation of SIS for the benefit of the people of the entire region. The workshop attracted around 40 participants from seven countries of South and Southeast Asia.

The one-and-a-half-day workshop, co-organized by the Department of Fisheries Management, Bangladesh, the Bangladesh Agricultural University and the Department of Human Nutrition, University of Copenhagen, Denmark, was a follow-up to an earlier workshop held in 2003.

The Director General, Department of Fisheries, Bangladesh, inaugurated the workshop, and Shakuntala Thilsted, Department of Human Nutrition, Faculty of Life Sciences, University of Copenhagen, Denmark, delivered the keynote address.

Fish is an important part of the daily diets of the populations of South and Southeast Asia. The age-old saying “Rice and fish makes a Bangladeshi” emphasizes that fish is an important constituent in Bangladeshi diet, next only to rice. Thilsted pointed out that international discussions on malnutrition stress the need to increase the availability of protein for the rural poor. Though protein is important from a nutritional point of view, micronutrients are the real growth limiting factors, she said.

Fish is generally seen as a rich source of both protein and micronutrients. SIS are especially important as a source of micronutrients as they are mostly eaten whole, along with the bones and sometimes the gut contents as well. They are rich in Vitamin A, zinc and calcium. The Dhaka workshop, Thilsted added, was also an opportunity to share the results of 10 years of research and extension on the contribution and production potential of culturing SIS in pond polyculture in Bangladesh. Such projects are now undertaken in countries other than Bangladesh, like Cambodia, India (in the Sundarbans region of West Bengal) and Nepal (in the Terai region). The projects are important for these countries whose

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populations figure high in the list of those suffering from malnutrition, she added.

Interventions on nutrition should understand local food patterns, Thilsted said. According to the Food and Agriculture Organization of the United Nations (FAO), countries of the Lower Mekong basin report an average per capita fish consumption of over 20 kg per year, while in India and Bangladesh, it is 4.7 kg and 13.6 kg per year, respectively.

Past projects, Thilsted pointed out, had focused mainly on the contribution of meat and milk to nutrition. Evidently, those projects were based on consumption patterns of the West.

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A scene from an experimental pond in the Bangladesh Agricultural University. Aquaculture of high-value species like the Indian carp shown above fetches rich dividends for fish farmers in Bangladesh

Fish and fish products, an important dietary component of the people of South and Southeast Asia, were largely ignored.

To be a meaningful source of nutrition, a food item should be nutrient-rich and frequently eaten. It is seen that in countries like Bangladesh and Cambodia, SIS constitutes 50-60 per cent of the fish eaten during the production season, which could be the case for other countries of South and Southeast Asia. The high intake of SIS by the local population of Bangladesh qualified it to be the target species for studies on malnutrition and the contribution of SIS in alleviating it.

However, analysis often fails to take note of the fish that are caught and consumed locally and those that contribute greatly to the nutritional intake of the local rural poor. SIS figures high in the fish intake of the rural poor, and about 140 of the 260 freshwater fish species in Bangladesh come under the category of SIS; yet they continued to be regarded as trash fish and thus failed to figure in the production statistics.

The Dhaka workshop saw many presentations on the role of SIS—especially the readily available and locally preferred mola (*Amblypharyngodon mola*)—in ensuring nutrition and livelihood security of the local population. The workshop also stressed the importance of conservation of SIS.

The various presentations at the workshop indicated that freshwater polyculture using nutrient-rich mola, along with other high-value species cultured for the market, like the Indian major carps (*catla*, *rohu* and *mrigal*) and the giant freshwater prawns (*Macrobrachium rosenbergii*), is very profitable. Since mola is a self-recruiting species, its culture does not incur recurring costs on fingerlings. The short time span between the fingerling stage of mola and its harvest stage, unlike the case of other high-value species, which take about eight to nine months to achieve harvestable size and thus permit only an annual harvest, allows mola to be harvested thrice a year. This scale of mola production has disproved the belief that introducing SIS in fish polyculture will decrease the output

of high-value species. On the contrary, it was seen that production of mola actually increased the total output from the ponds by 10 per cent.

Polyculture with SIS is not only profitable in terms of income generation, but also contributes to the health of the rural poor through the supply of nutrients and micronutrients. One of the workshop presentations noted that while 90 per cent of the high-value 'marketable' species were sold, 90 per cent of SIS went for household consumption. The lower price of mola also allowed poor households to afford the nutrient-rich fish.

The general lack of awareness of the advantages of SIS polyculture, combined with the misconception that culturing SIS will hamper the growth of larger species through feed competition, has been a major hurdle to the spread of SIS. Farmers used to clean the ponds of SIS before introducing the high-value species. This, over time, has drastically decreased the number of the once-abundant mola.

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Efforts are now on in Bangladesh to conserve the nutrient-rich SIS through techniques like breeding. Wide extension work is also being carried out to spread the message of the importance of SIS as a source of cheap and readily available protein in rural diets.

Efficient extension

The Department of Fisheries (DoF), Bangladesh, and the Bangladesh Agricultural University (BAU) are complementing each other's work. While BAU carries out research on the importance of SIS, the DoF is instrumental in implementing SIS projects in the field through efficient extension officers who have strong bonds with the fish farming communities and have found great acceptance among them.

Notes on a Field Trip

The SIS workshop was followed by a one-day field trip. A three-hour drive along a little bumpy but scenic road took us to the beautiful village of Mymensingh, situated on the western bank of one of the greatest rivers of the Indian subcontinent, the Brahmaputra. Several ponds, varying in size and shape, dotted the road to Mymensingh. The existence of so many ponds made it very clear that fish culture was being practised extensively in Mymensingh.

Mohammed Kamaluddin, the owner of one such pond, gave a short account of the type of fish culture he practised, the advantages and difficulties of mola polyculture, and the role played by the species in providing nutrition to his family. Kamaluddin's farm was divided into two portions, one small and the other, larger. In the smaller portion, he cultivated the exotic catfish from Thailand (*Pangasius sutchi*) using intensive monoculture, while the bigger portion (comprising about an acre of land) was used for carp and mola polyculture. Primarily agricultural land, the area was converted for aquaculture. Kamaluddin said that his earnings from aquaculture were about 10 times of what he used to earn from agriculture. He said that adding mola in polyculture with carps or other species did not require any additional feed inputs than what was already being fed to the bigger species. Mola does not hamper the growth of the larger species, he pointed out. Once recruited, mola can be cultured without incurring recurrent costs for stocking, as it is a self-recruiting species.

One problem that Kamaluddin faced in polyculture with mola was the mass mortality of the fish during winter. Professor Abdul Wahab, the country manager of the project on SIS in Bangladesh, indicated that further research needs to be done to understand this phenomenon.

However, the other advantage of mola in polyculture is the easy availability of fingerlings to stock the pond in any eventuality like the abovementioned mass mortality. Mola, though perfect for polyculture with carps and giant freshwater prawns, did not survive in intensive polyculture, where the ponds are heavily stocked with species like the exotic catfish, Pangas.

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The mola fish species cultured in the ponds of Bangladesh is an affordable source of protein for the poor

If the ponds are managed well, a harvest of around 40-60 kg of mola is possible every month, said Kamaluddin. The harvest was usually sold in local markets. Since mola is cheap and is part of the traditional diet, the rural poor favour it. Kamaluddin also added that a threefold increase in

the intake of SIS by farming households has been observed after the introduction of SIS in freshwater polyculture.

The market demand for mola has been increasing, he added. In some cases, mola was sold for as high a price as 200 takka (US\$3) per kg, while carps were priced at 150 takka (US\$2) per kg. Retailers also purchase mola for the larger markets in Mymensingh. This increasing market demand is good news for the proponents and practitioners of mola polyculture. However, the flip side of the situation is that the increase in prices that normally follows an increase in demand could result in the rural poor being denied access to their main source of micronutrient supply, the SIS.



Workers at a pond in the Bangladesh Agriculture University, where research on polyculture using small indigenous species is being carried out

The inclusion of SIS in polyculture not only increases the availability of protein and micronutrients for the culturing family but also increases their incomes (see box on field trip). Thilsted pointed out that the fish farming community would not accept a project if it guaranteed only nutritional security, while negatively affecting the total output of those species that are major income earners. Adding SIS to polyculture offers nutritional advantage without

hampering total production; it actually allows for increased output of greater nutritional value.

The model of SIS in polyculture could also be replicated in the Great Lakes area of Africa, where various SIS like *daaga* are found. Such projects are pertinent to other areas that face similar issues of poverty, livelihood and food security, large-scale versus small-scale fish culture, and export-oriented fish production and production for household consumption. 3

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