

INDIA

In June 2003, the FAO project "Health Management of Shrimp Aquaculture in Andhra Pradesh" (TCP/IND/2902) took off in India. This project addresses one of the main problems that the shrimp sector in Andhra Pradesh has had to deal with in recent years. Indian shrimp culture production increased from about 30 000 metric tonnes (mt) in 1990 to around 100 000 mt during 1999-2000. This fast development was not homogenous; it showed a rapid growth between 1990 and 1995, when it reached 97 500 mt. However, in 1997, production decreased to 54 500 mt owing to a viral disease epidemic caused by the White Spot Syndrome Virus (WSSV). Of all the coastal states, Andhra Pradesh (AP) witnessed the largest growth, expanding from 6 000 ha of ponds in 1990 to 84 300 ha in 1999. Simultaneously, the state has also been most drastically affected by the WSSV epidemic.

The fast expansion of the sector in the east coast states in the early 1990s generated a large demand for shrimp postlarvae that could not be met by the hatcheries built at the time in India. The uncontrolled importation of postlarvae from other Asian countries that had already been affected by the WSSV in the early 1990s led to the introduction of the virus in 1994 in Tamil Nadu. The virus spread rapidly throughout the country, leading also to infection of crustacean resources in the wild. The economic losses that have been attributed to the mortalities caused by the virus have been enormous and are estimated at over US\$200 million during 1999-2000.

The WSSV has been affecting both traditional and extensive farms, and the lack of plans of action to combat the disease has led to cross infection of farms in the same watershed. Many of the farmers in Andhra Pradesh are small farmers with holdings between 1.0 and 1.5 ha, and measures to identify and to manage the disease are not commonly applied in the affected areas. The lack of alternative forms of aquaculture to utilize the unused shrimp ponds further contributed to the social and economic difficulties that the rural poor communities are now facing.

At the request of the Department of Fisheries (DOF), FAO is providing assistance under this



Mr Subasinghe examining shrimp larvae at a hatchery in Kakinada, India

Michael Philipps, NACA

project in support of the sustainable growth of the shrimp aquaculture sector in the state. The immediate objectives are:

- To improve the capacity for health management and reduction in risks of shrimp disease outbreaks in Andhra Pradesh;
- To improve the sustainability of the sector through Integrated Coastal Area Management (ICAM), the use of Geographical Information Systems (GIS) technology, and appropriate institutional arrangements; and
- To support better management of the sector through organizing farmers, improving farmer-farmer and state-farmer contacts, and diversification.

It is felt that a multidisciplinary approach is required to obtain positive and permanent results.

Apart from FAO, there are other national, regional and international organizations providing assistance for sustainable development and management of the shrimp aquaculture sector in AP. They include the Australian Centre for International Agriculture Research (ACIAR), the Network of Aquaculture Centres in Asia-Pacific (NACA) and the Marine Product Export Development Authority of India (MPEDA). The activities of the FAO project are designed to take advantage of the complementary assistance and inputs by ACIAR, NACA and MPEDA. In future issues of the FAO Aquaculture News-

letter we will certainly come back to you with the experiences of this project.

For more information on the above project, please contact Dr Rohana Subasinghe at (rohana.subasinghe@fao.org).

URUGUAY

An FAO Technical Cooperation Project titled "Development of Aquaculture in Uruguay" (TCP/URU/2904) started in November 2003. The Ministry of Livestock, Agriculture and Fisheries of Uruguay asked for FAO assistance to develop the aquaculture sector in the country, which is almost insignificant at present. In 2001, the total aquaculture production of Uruguay was only 17 mt, while marine capture fisheries accounted for 104 583 mt and inland fisheries for 468 mt. The production from capture fisheries is declining rapidly due to over-exploitation by a relatively modern fleet. This has caused a decrease in fish exports and the availability of fishery products for the domestic market.

Therefore, the Government considers the development of aquaculture as one of the main opportunities to maintain and/or increase fish consumption (now 7 kg/caput/year). It worked together with FAO on the improvement of a legal framework for the fisheries sector in 2002, increased fisheries research efforts and carried out an analysis of the national fisheries sector with INFOPECA in 2001.

The current FAO project aims to assist the Government in the formulation of a development vision (short-medium and long term) based on the existing potential for aquaculture in the country and taking in consideration economic, financial, social, technological, institutional and human capacity issues. The findings of this project and the insights and visions obtained should feed into a national plan for the development of the aquaculture sector in Uruguay, which will be developed under a future FAO Technical Cooperation Project.

For more information on this project, please contact Mr Jose Aguilar-Manjarrez at FAO/FIRI (jose.aguilarmanjarrez@fao.org) or Mr Angel Gummy at FAO/FIPP (angel.gummy@fao.org).

UGANDA

The FAO aquaculture project in Uganda titled "Assistance to Fish Farmers in Eastern Uganda" (TCP/UGA/0167) is almost coming to its end. This project, which started in early 2002, helped the Fisheries Resources Department of the Ministry of Agriculture, Animal Industry and Fisheries in establishing sustainable, private-sector-driven fish farming in eastern Uganda by ensuring reliable private supplies of quality fish seed and introducing farmer-friendly aquaculture technologies to both farmers and extensionists.

This year, the project brought in TCDC aquaculture management and hatchery operations experts from Asia (Thailand and Vietnam) to assist private-sector fingerling (tilapia and catfish) producers in their activities. Some private-sector fingerling producers and relevant government staff went on a study tour to Thailand (organized in cooperation with the Network of Aquaculture Centres in Asia-Pacific (NACA)) to learn from the Asian experiences with these species. Moreover, the project delivered pond-side training to a large number of fish farmers in Iganga, Kamuli and Tororo districts in Eastern Uganda. The training sessions included record keeping, marketing, pond management, feed management, fish reproduction etc.

A socio-economic survey of the fish farmers' activities in various districts in Eastern Uganda was carried out in late 2002 and early 2003 and revealed among others, the following issues:

- The number of places where fingerlings can be purchased is low, which results in low levels of competition. Farmers are currently price-takers as far as fingerling prices are concerned.
- Mixed culture of species (tilapia, carp and catfish) is practiced by over 30% of the farmers, although the practicing farmers have no idea as to the best combination of species to culture. Stocking densities are generally too low to justify the current labour inputs. Moreover, the best sex ratios of broodstock are not known and feeding schedules based on the weight of the fingerlings/fish are generally not used.
- Most farmers seem to have started aquaculture out of interest in the activity, on a hobby basis, using rudimentary general farming knowledge, through trial and error, taking into account their farm resources



R. van Anrooy

Hatchery in Mbale district Eastern Uganda

(especially water supply and own-farm feed availability for aquaculture), trying to diversify their farm activities to increase farm income earning opportunities, guarantee a stable income, and decrease farming-related risks.

- Although the farmers, when asked for their overall objective of doing aquaculture, generally mention "making profits", this should be seen in the light of their technical, labour and economic capabilities. The profits sought are generally not achievable, due to a combination of limited technical knowledge in aquaculture, low labour productivity and limited farm management and marketing skills. It is clear that the farmers interviewed would benefit from (additional) elementary technical training in aquaculture.
- The aquaculture practices of the average farmer in Eastern Uganda are characterized by low stocking densities (average of 1 fish m²) and low feed inputs, which result in low outputs. The system used can be therefore called a low input-low output system.
- As the opportunity costs of most farmer's 'labour are higher than the costs of hired labour, it would be cost-effective for the farmers to hire more labour than is now done, and to use less of their own labour.
- In view of the current high costs involved in security/guarding of the ponds (sometimes more is spent on security than the value of the fish in the pond), it is advisable that

farmers have their ponds closer to home, so that control/monitoring of the pond is easier and can be done at no additional costs to the farmer.

- A comparison of three systems, "catfish-tilapia", "tilapia only" and "carp-tilapia", showed that only the carp-tilapia farmers are currently making profits. This can be explained by the fact that this system is characterized by smaller ponds (around 500 m² instead of 1000 m²), lower mortalities of fish during the growout period and no security costs.

The project is currently (November 2003) finalizing its training programme and conducting a study on the economic aspects of hatchery production. The last activity of the project will be a national workshop (mid-December 2003) to disseminate the results of the project and discuss follow-up activities.

For more information on this project please contact Mr John Moehl at FAO/RAFI (john.moehl@fao.org) or Mr Raymon van Anrooy at FAO/FIPP (raymon.vananrooy@fao.org).