

Introduction of Aquaculture and other Integrated Production Management Practices to Rice Farmers in Guyana and Suriname

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Trainer G. Juanich (Philippines) providing guidance to the rice extension staff trainees on the proper use of a liftnet which was constructed by the trainees themselves (Guyana)

In February 2004, the Governments of Guyana and Suriname were awarded by FAO with a joint project TCP/RLA/3003 "Introduction of aquaculture and other integrated production management practices to rice farmers".

The project objectives were to:

- ▶ build capacity of rice extension staff to carry out [Integrated Pest Management \(IPM\)](#) and aquaculture extension work;
- ▶ develop IPM strategies appropriate for small farmers through participatory [Farmer Field School \(FFS\)](#) training and action research; and
- ▶ integrate aquaculture into small rice-based farming systems to diversify production for increased income and improved nutrition.

This two year project represented the first occasion on the use of the [Training of Trainers \(TOT\)](#) methodology and the FFS approach for the implementation of rice-fish culture.

Rice farmers in Guyana and Suriname are using pesticides heavily, which results in unnecessarily high production costs as well as environment and health risks. This project sought to introduce aquaculture as a fundamental component and reinforcement of an IPM strategy, with training of rice extension staff being an integral part of the strategy. It was designed to follow the TOT methodology to rapidly increase the skills of rice extension staff, coupled with the FFS approach to empower farmers in the use of the new technology.

Two [Technical Cooperation among Developing Countries \(TCDC\)](#) Consultants implementing the project, Mr Wahyu Sutisna (Indonesia) and Mr Godardo Juanich (Philippines), skillfully guided the various activities under the project. Both Consultants spent time in Guyana and Suriname at the beginning of the project, getting a feel for the rice cultivation and aquaculture practices in both countries and subsequently using this information to prepare a suitable curriculum jointly with the trainees.

This curriculum was then used in a 15-week Season Long Training of Trainers programme at a TOT plot in the Black Bush Polder area, Corentyne, Guyana. Sixteen rice extension officers from both Guyana and Suriname were exposed to theoretical and practical aspects of FFS training in rice IPM and aquaculture principles.

Following the weekly training sessions, 16 extension staff fanned out to conduct six FFS in the Corentyne area, with an average of 15

farmers per FFS. The farmers usually met once a week, for several hours, observing and analyzing the rice agroecosystem, doing experiments in the field, constructing their own tools and implementing and discussing rice and fish-related topics. The TCDC Consultants maintained a flexible approach, lending support to various plots, as required.

Plots were planted with various high yielding rice varieties and stocked with Red Tilapia, reflecting farmer preference. As the rice in the plots approached harvest time, a small field day exercise was held at each plot, accommodating cross visits by farmers from other plots.

All of these activities culminated in a **General Field Day** held on 5th March 2005 at the TOT site in Black Bush Polder, Guyana. The general aim of the Field Day was to inform the persons directly associated with the project and the general public as to the objectives of the project and the progress to-date. The Field Day included visits to rice-fish trial plots, a photo exhibition, examination of the trial progress and presentations by Consultants, participating farmers and the trainees themselves. More than 200 farmers were present, representing all the rice growing regions of Guyana. Many people expressed interest in all aspects of the project, and farmers conveyed their desire to participate in the up-scaling of activities in the next season.

In the second season, six additional plots were established in other rice-growing regions of Guyana. Four plots were also established in Suriname. Over 180 farmers actively participated in the IPM and aquaculture participatory training exercises. The TCDC Consultants also supported these activities in additional plots in both Guyana and Suriname, made possible by the proximity of the rice-growing regions in the two countries. A farmer exchange visit was again facilitated, allowing for valuable exchange of views and experiences between farmers of Guyana and Suriname.

The project provided important additional training activities on aquaculture for rice extension staff, including attendance to the Integrated Freshwater Fish Farming (IFF) course in Wuxi, P.R. China and a tilapia seed production course organized at the Mon Repos Aquaculture Station in Guyana.



The Farmer Field School approach is action oriented - here farmers get ready to sample fish in the pond adjacent to the rice field to monitor growth rates (Guyana)

The results obtained at the end of the project, albeit preliminary, are extremely positive and include the following:

- ▶ The average Region 6 rice yield of conventional rice farmers is about 24 bags per acre (4 173 kg/ha). IPM farmers harvested an average rice yield of 28 bags per acre (4 869 kg/ha); representing an average increase of 4 bags per acre (696 kg/ha).
- ▶ There was an increased rice yield from the rice-fish plot. The average production of rice from seven rice-fish plots was 47 bags per acre equivalent to 8 173 kg/ha in Region 6! This significant increase can be attributed to the elevated attention that farmers provide to the crop in the generally smaller rice-fish plots, but also to the positive impact of the fish themselves as well as the fish farming practices favouring better growth of the rice plants.
- ▶ The quality of grain from the rice plot increased, with less damaged rice grains and a higher milling grade.
- ▶ There is a major reduction in the use of pesticides after the introduction of the IPM/FFS technologies. The average number of pesticide applications in the project area was reduced from 10 applications per crop to between 0-3 applications per crop. One farmer reported a 66 percent reduction in cost of chemicals after the introduction of the FFS/IPM technologies.

- ▶ Given the reduction in the use of pesticides, the increased rice yield and higher quality of the milled rice, farmers have experienced a substantial increase in their earnings.
- ▶ The technical viability of producing rice and fish has been demonstrated at the pilot scale level. Fish yields for a growing period of approximately 150 to 180 days from the ponds adjacent to the fields were variable, ranging from 346 to 1 240 kg/ha, indicating that rice-fish culture is a new activity for rice farmers with a lot of potential for increasing yield as experience grows. Farmers have expressed their desire to continue with this activity as part of the FFS. According to them, an important argument in favour of rice-fish farming is that revenues from the fish crop can offset losses which might occur in the rice crop. In general, since the introduction of IPM, farmers have observed an increase in fish biodiversity in rice fields.

The entire cycle of project activities together with over 200 excellent digital photographs has been documented. The FFS curriculum is considered particularly valuable since it will serve as a basis for introducing similar activities also in other countries and regions. It will be published as part of the series on "Aquatic biodiversity in rice-based ecosystems" available at <ftp://ftp.fao.org/FI/CDrom/AqBiodCD20Jul2005/default.htm> and is expected to be translated into other languages soon.



Father and son during harvest of their rice-fish plot (Suriname)

Looking at the larger picture, the adoption of IPM will not only mean savings for farmers in the form of money, but also a significant improvement in the health and well-being of farming communities. It is anticipated that the introduction of aquaculture practices will not only be sustained but be taken up by more farmers in Guyana and Suriname and possibly spread to the surrounding region.

For further information about the project, please contact M. Halwart of FIRI at Matthias.Halwart@fao.org, T. Geer of the Guyana Fisheries Department at tejnarinegeer@yahoo.com or R.J. Debipersaud of the Suriname Fisheries Department.



One of the highly motivated rice-fish farmers, Mr Kunjbeharry (right), together with the Senior Extension Officer Mr Ramlall, in front of his rice-fish plot in Region 6, Guyana, where he saved 66 per cent of expenses on unnecessary pesticides

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