

South Santo tilapia farmers gear up to increase production

In July 2015, the Vanuatu Fisheries Department (VFD) and the Aquaculture Section of the Secretariat of the Pacific Community (SPC) jointly convened a meeting of leading tilapia farmers in the southern part of Espiritu Santo. This was held to exchange ideas and plan ways to increase production of tilapia to meet the increasing need for fresh fish in Luganville and the inland parts of Santo. The work is being supported by ACIAR's (Australian Centre for International Agricultural Research) Community Aquaculture project, in which SPC, VFD, as well as WorldFish Solomon Islands are project partners.



Sompert Gereva, Principal Fisheries Biologist and Acting Manager, VFD Research and Aquaculture Division, with Lency Kukan, head of the VFD Aquaculture Section (behind fish), holding up a 2 kg tilapia from a pond at the fish farm of Tavui Sosomele (left).

A strategy being applied by the Community Aquaculture project is that of facilitating farm clusters, with each having lead farmers whose farms are maintained at standards that serve as examples for others to see and gain knowledge. One purpose of the meeting in Santo was to identify lead farmers, and then reach an agreement about what constitutes a 'lead farm' for tilapia fish. Collaborative work will then focus on bringing selected farms up to the agreed standards, and find ways to disseminate methods and knowledge from those demonstration farms to other places in Santo.

The expansion of tilapia aquaculture in the Pacific has seen a trend where many farmers rush to build farms and copy things they have seen or heard without waiting to seek out expert advice. The result has been construction of farms that are all of different shapes and sizes and, in some cases, difficult to operate. Similar experiences have been noted in the Solomon Islands; therefore, Daykin Harohau of WorldFish Solomon Islands was invited to attend the meeting to share his experience of facilitating tilapia farm clusters in Malaita. In return, he gained a close look at farming of Nile tilapia *Oreochromis niloticus*, which is present in Vanuatu but not in the Solomon

Islands where the tilapia species being farmed is the smaller and slower growing, but more invasive and salt-tolerant, Mozambique tilapia *Oreochromis mossambicus*.

The top priority issues and constraints that farmers identified as needing attention in Santo are:

- ✓ pond construction issues (what is the best pond design?);
- ✓ water supply issues;
- ✓ feed (which gives best results?);
- ✓ pond management issues (stock density and harvest strategies); and
- ✓ market and pricing issues to improve farm income and recoup pond construction costs.

Although farmers began growing tilapia just to supply their own households with fresh fish, which is very scarce anywhere further inland than 3 km from the coast on Santo Island, some identified a commercial opportunity and built as many as 10 ponds each. Farming of tilapia fish is perceived as easier than cattle farming or copra, and a good way to continue generating income in

old age after retirement from other, more physically demanding agricultural livelihoods. Currently, most sales of fish take place in the village or the surrounding district; however, there is also a demand for the fish in the urban market of Luganville. At the end of the workshop, VFD and SPC organised live tilapia sales in Luganville with fish from three South Santo farms as a promotion of tilapia to crowds who were attending the 2015 Independence Week celebrations. Even when priced at VUV 500 per kg¹ (reef fish were selling at VUV 400), the live tilapia soon sold out.

When addressing the issue of what should constitute a 'lead farm', the farmers group deliberated and decided upon the following as target specifications for a 'standard tilapia farm':

1. pond area to be a minimum of 200 m² or 20 m x 10 m, capable of producing 200 kg of fish per cycle, worth VUV 80,000;
2. number of ponds: 4 (e.g. convert 10 smaller ponds into 4 larger ponds, to utilise the farm area and water supply more efficiently by reducing the amount of bund);
3. water depth: 60–80 cm (most Santo ponds have been built too shallow);
4. water supply: separate flow to individual ponds, rather than the same water flowing from pond-to-pond;
5. pond water colour to be maintained at a Secchi value of 30 cm (equivalent to a hand disappearing when arm is immersed up to the elbow);
6. stocking density: limited to 5–10 fish per square metre of pond (all farms are currently over stocked);
7. supplementary feeding to be tested, using Pacific tilapia pellets in addition to local ingredients;
8. stock management to adopt five-month batch cycle strategy with total-harvest followed by re-stocking, rather than continuous cycle with partial harvests; and
9. farmers to coordinate their stocking and harvesting, to jointly maintain a near continuous flow of tilapia into Luganville and thus build up the market for tilapia.

We visited farms of four of the lead farmers: Koilo Lutu, Maliu Tapea, Maliu Ato and Tavui Sosomele, who hail from Marua Village in southwest Santo. All four had farms dug by hand to achieve a respectably large total area for the ponds, but were made up of several small ponds of different

shapes, sizes and depths. They had been designed without any outside guidance and at each farmer's own initiative. Water flows through the ponds in series (not in parallel) from pond-to-pond to save on piping, which is a mixture of bamboo and PVC pipe. This means that all ponds get the same flow irrespective of volume, so have differing water turnover times. The result is that large ponds are overly green, but the water in smaller ponds is clear from too much flushing. It also means that lower ponds receive the fish waste of higher ponds.

Apart from the above variations from best practice, all of the farms visited were well built, nicely landscaped and well managed. A variety of ideas and innovations could be seen for feeding and greening the ponds. The farmers are doing an excellent job in feeding and managing their ponds within the scope of the on-farm resources available to them. Some of the fish were up to 2 kg in size. Breeding occurs in-pond and is



Tavui Sosomele, tilapia farmer of Marua Village, with farm-fresh tilapia netted from one of his ponds.



continuous, which is well adapted to basic tilapia farming. However, batch culture and complete harvest are innovations that should be adopted next. Growing fish to such a large size and keeping them for so long (up to two years), however, is wasteful of pond space, water and food supply. The turnover of fish biomass through the ponds can be greatly increased by more regular harvesting and selling of fish. In summary, the assessment that was made of the lead farms is that their pond management is very good, but their pond design and fish stock management has room for improvement through further project work.

The VFD and SPC project team will next work with these lead farmers on further improvements in tilapia

farm design and practice, based on the lead farm criteria established during the meeting. These lead farms will become a focus for the dissemination of information to other tilapia farmers; for example, via Farm Open Day visits and illustrated knowledge products. In this way, over time, the tilapia fish production capacity in Santo will be built up.

For more information:

Tim Pickering
SPC Inland Aquaculture Specialist
TimP@spc.int

All pictures in this article by Tim Pickering.