



An aquasilvifarm in the Philippines

By **M Castaños**

Aquasilviculture can be defined as the integration of aquaculture with (mangrove) forestry, otherwise known as silviculture. In a sense, it promotes harmony where there is conflicting interests between the fishery-forestry sector (the need for environmental protection) and the local communities who need to make a living out of the resource. Aquasilviculture exemplifies multiple use management.

An example of aquasilviculture in the Philippines is the 4.4 hectare farm of Melchor and Necitas Sur in Puerto Galera, Mindoro (farm transect on page 20).

The Sur family has three ponds stocked with tilapia and milkfish. Melchor practices modular farming, transferring one stock from one pond to another depending on what he sees when inspecting the partially harvested fish. He harvests when there is demand, figuring that he can get a total of 20-40 kilos of fish per crop. He doesn't have a strict stocking and management protocol.

The Surs started operating their fishpond in the early 1990s. They hope to develop this for leisure fishing -- maybe stock seabass which take the bait rather impressively -- especially for foreigners who have come to enjoy the white beaches of Puerto Galera. "But we're glad Puerto Galera doesn't have that much tourists like Boracay, or we would lose the natural beauty of our island."

The Surs have also built three series of fishponds surrounding nipa shingles. The size of the perimeter ponds is 4 x 44 x 4 m, and water depth is 1 meter. The ponds are stocked with tilapia, although they catch milkfish, mudcrab and shrimp which enter the ponds incidentally.

The fishpond-nipa series is adjacent to 10 ha of mangrove buffer zone which the Sur family maintains for the Department of Environment and Natural Resources (DENR). Melchor says the mangroves can be selectively harvested in another 15 years. In the meantime, reforestation efforts continue, with 3 ha already replanted. DENR has noted that during the first five years of silviculture, the mangroves are still in the seedling or sapling stage. Mangroves may already produce propagules on the third year, which can be sold. The next 5-10 years will have the farmer pruning and thinning the mangroves for firewood or low-cost housing materials.

(An example farmers in the Philippines can follow in utilizing a mangrove forest sustainably is the Matang Mangrove Forest Reserve in Malaysia which is reputedly the

best managed mangrove forest in the world. The reserve is managed for timber production, a 30-year harvest period with two thinnings, on the 15th and 20th year.)

The Sur family also set nets near the open sea, getting 30 kilos at least of siganids, crabs, shrimps, and others every high tide cycle. The 10 kilos is for sale, the other 20 is for his relatives who, Melchor says, provide his family "security" in exchange.

Upland, the farm is planted to practically all types of fruit trees -- indian and carabao mango, jackfruit, orange, durian, to name a few. From the orchard, the family earns an estimated ₱3,000-5,000 per kind of fruit per year. They also have bamboo and coconut trees. Chicken (20 heads) and pigs (24 heads), too.

Melchor Sur is a driver-mechanic working in Saudi Arabia before turning to farming with the encouragement of extensionists-researchers from the University of the Philippines at Los Baños (UPLB). The family first tried rice but it didn't work. A UPLB study convinced them to try nipa from where they can earn ₱5,000 every four months. From then on, their farm expanded to what it is today.

Both Melchor and Necitas are very aware of the importance of sustainably managing Mindoro's resources. Both are active in baranggay activities, and are supportive of the locals who harvest shells and other products they can glean from the mangrove buffer zone. The Surs have four children and a grandson.

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The Sur farm has three series of perimeter ponds -- 4 x 44 x 4 meters -- enclosing nipa shingles. The ponds are stocked with tilapia. On the other side is the mangrove buffer zone. Upland are fruit-bearing trees.

One of the Sur farm's advantages is its location, Puerto Galera in the island of Mindoro which is a reserve under the "Man and the Biosphere" project. The 10,245 km² island has a population of 833,000, and is the tribal land of the semi-nomadic Mangyans. It is also better known as the sanctuary of the Philippine tamaraw, the only one of its kind in the world.

Mindoro's living coral cover is largely intact, 20% is considered good to excellent, 50% is considered fair, and only 30% is poor. (Puerto Galera's living coral cover is even 74%.) The reefs are home to serranids (15 per 1,000 m² at last count) and lethrinids (32 per 1,000 m²).

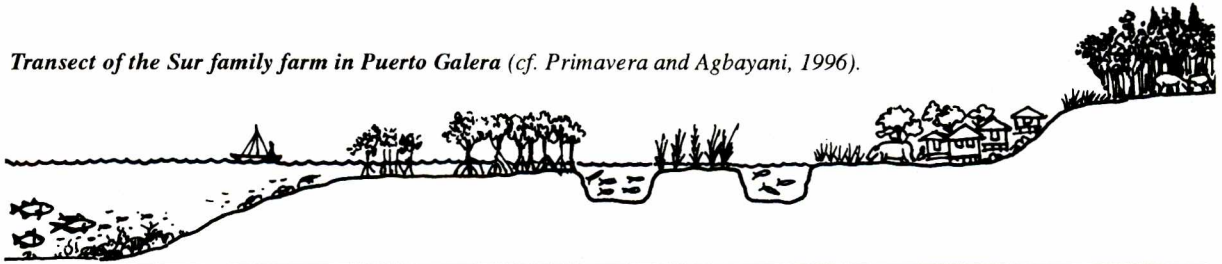
Region IV, where Mindoro belongs, has about 30,000 hectares of mangroves as surveyed by DENR in 1990-1994, representing 24% of the country's total. Region IV's fish production is about 595,000 tons in 1996, with almost half (275,000) contributed by municipal fisheries. This represents 21% of the country's total fish production.



In aquasilviculture, DENR recommends a ratio of 70:30 or 80:20 mangrove plantation to open pond area. Mangroves are usually located at the center, fishponds at the sides. This way, the farmer protects the mangrove stand against illegal firewood cutting and benefits from the sale of propagules produced for contract reforestation of denuded mangrove areas.



Transect of the Sur family farm in Puerto Galera (cf. Primavera and Agbayani, 1996).



	OPEN SEA (CORAL REEF)	SEASHORE (TIDAL FLAT)	MANGROVE AREA	LOWLAND (AQUASILVICULTURE PONDS)	LOWLAND (AGRICULTURE)	UPLAND
Products	Fish	Fish, shells, crustaceans	Fish, shellfish, crustaceans	Nipa shingles, fish	Fruit trees, vegetables, livestock	Fruits, livestock, wood
Activities	Fishing	Small-scale fishing	Mangrove planting Fishing Shellfish gathering	Mangrove / nipa planting Fishfarming	Farming Livestock	Small-scale logging Farming

DENR has established a mangrove nursery to reforest more areas.

Beyond the mangrove buffer zone near the open sea, the Sur family sets a net to trap fish, while a child gleans shellfish under the mangroves.



Photos by RY BUENDIA