

Farmer to Farmer Aquaculture Niche Program
Trip Report # 21: Indonesia, July 20-28, 2011
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Aquaculture without Frontiers Volunteers

The focus of this trip was to expand upon the earlier mission led by Dr. Upton Hatch by holding a series of training workshops on how to make edible products from seaweeds grown in shrimp ponds and also how to process the seaweed for commercial sale to a seaweed broker for processing into agar. Drs. Fitzsimmons and Kudrna departed Tucson on July 20 and arrived on July 22, traveling through Kuala Lumpur. We were met by colleagues from the Ujung Batee Aquaculture Center and Sidrotun Naim, a graduate student at Arizona, originally from Indonesia. Next we drove to the town of Sigli about two hours east of the city of Banda Aceh. Sigli was one of the more severely devastated areas struck by the 2004 tsunami. Dr. Hatch conducted much of his work here last summer and managed to meet up with us for the final day of this visit.

Our first day was spent putting together lists for materials for our workshops and checking in at the local police station. The hotel proprietor felt this was important as apparently he was uncomfortable having foreigners staying at his small establishment without the police being fully informed. This further required going to a photography studio and having passport style photos taken for the police files. We also purchased and delivered bamboo and ropes for building the demonstration seaweed drying table and worked with Mr. Muhammed to start construction on the seaweed drying table. The next day was spent purchasing workshop materials (printer cartridges, paper, pencils, aprons, gas canisters, paring knives, aluminum foil, and cooking pots). We visited the construction of the drying table to see the progress. We also took time arranging box lunches for participants and finalizing presentations and translations.

Early on July 25 we began our first day of presentations. The majority of attendees (25) were shrimp pond owners/managers. The other five were local Department of Fisheries officers, attending in order to learn more of the techniques so they could extend the information to other towns and villages. Each of the local shrimp farmers has a less than one acre pond (tambak) that they operate as the main source of income for the family. Most of the farmers have adopted the polyculture of *Gracilaria* seaweed in the ponds as we had recommended last summer. Many of the ponds have luxuriant growth of seaweed and improved survival and growth of the shrimp. However, their initial attempts to sell the seaweed to professional buyers had failed. The farmers had pulled the seaweed from the ponds and were drying it on the pond banks. The seaweed was contaminated with sand and snail shells and the bottoms of the piles was decomposing rather than drying properly.

A major portion of our presentation included the reasons that the seaweed for processing had to be dried properly and kept uncontaminated. We also described how to build sturdy tables of local materials for drying large quantities of seaweed and how the product would be further processed to make pharmaceutical grade agar.



Workshop on seaweed / shrimp polyculture



Naim and Muhammed drying fresh Gracilaria on a new seaweed table

On July 26 we held a second workshop. This workshop was focused on home uses of *Gracilaria* and other seaweeds. We provided several recipes and then we broke the workshop into three groups and had the groups each prepare a different product. The first group took finely chopped fresh *Gracilaria*, mixed it with wheat based flour and seasonings with a little water. A small ball of dough was then flattened through a tortilla type press. The resulting chip was then deep fried in oil to make a seaweed flavored chip. The second group lightly cooked the seaweed (blanched) and then prepared a casserole style meal with onions, carrots, potatoes, tomatoes, and some local vegetables we did not recognize. The third group boiled their seaweed and then strained it through tightly twisted cheesecloth and collected the raw agar. The agar is then frozen and thawed and allowed to separate. This partly processed agar is commonly used for cooking as a thickener or as the main ingredient in several kinds of candy.



Women in cooking class with Fitzsimmons



A confident chef of seaweed dishes

The evening of July 26, Fitzsimmons and Sidrotun Naim traveled to Java at the invitation of the CP-PRIMA group. On July 27 they met with 23 CP-PRIMA managers to discuss options for polyculture of shrimp with fish and seaweeds. The workshop was organized for the full day and then a dinner in the evening.

On July 28 Fitzsimmons returned to Medan, Sumatra, meeting with the team from Ujung Batee, several of the farmers and a seaweed buyer, Mr. Zarkasyi Bin Ismail at a restaurant near the Medan Airport. The negotiation centered on both price and on some additional contributions from the seaweed buyer. The final agreement was that the buyer would loan money to the farmers to build four additional tables, beyond the two tables Farmer to Farmer/AwF had sponsored. The farmers would repay the loan in quarters taken from their first four shipments of dried seaweed. Each shipment would consist of 14 MT of dried seaweed with not more than 20 % moisture. Mr. Ismail would also deliver two bailing machines and bailing ties for the farmers to use to compress and tie the seaweed into the 35 kg bails preferred for transportation. The bailers would remain the property of the seaweed buyers firm, Pt. Kruengoo. The intent is to supply 600 MT per month from the Sigli farmers at a price of 3,500 rupiahs per kg.

Following these negotiations Fitzsimmons also took a short taxi ride to the offices of a large tilapia farm with cages in nearby Lake Toba. We met with Rudi Hertanto and discussed several aspects of the tilapia operations and I provided some recommended contacts for new broodstocks and alternative feed supplier.

Overall the mission was very productive. The farmers are on the verge of having a significant new revenue stream that comes entirely from a by-product of improving pond water quality. The women of the community have a new highly nutritious aquatic vegetable to prepare in several recipes. And they understand how to process the seaweed to generate agar for use as a thickening agent in cooking or as a base for making candies and desserts.

Although not included in our reported numbers, it should be noted that we allowed the students at the elementary school to listen in on the presentations, watch the cooking demonstrations and pose for some of the photos. Our thought was that being exposed to the benefits of growing seaweeds on the farm and to the variety of recipes and preparation methods, they will be more interested in promoting the adoption of seaweed into the family diet and as a profitable side of aquatic farming.



Students edging into workshop during their recess



Students joining the workshop photo

Table 1.

Location / Organization	Male	Female	% M/F	Number of families represented	Number of consumers benefiting	Number of recommendations
Sigli School Day 1	27	3	90/10	30	120	9
Sigli School Day 2	2	43	4/96	42	168	12
CP office	15	6	72/28	21	63	8
Medan Restaurant	8	0	100/0	8	32	4
Fish farm office	3	0	100/0	3	12	2
Total (adjusted for those present at multiple locations)	51	52	50/50	102	395	35