

Nick Warren and I are unpacked and have washed the dust and dirt of Haiti off body and clothes...we had a productive trip and progress is being made toward targeted goals we share with our supporting partners.

Summary of our Haiti visit, March 31 - April 7, 2010

Our primary objectives for this trip were fourfold: quantify fish production during the Easter Harvest, evaluate needs to enhance/improve future harvests, explore opportunities to expand sustainable fish rearing in other areas of Haiti, and identify a secure location to store and begin staging distribution of Project Gaia's "CleanCook" stoves along with 100,000 liters of donated Brazilian ethanol.

Firstly, the apparent lack of logic—from our point of view—behind how things operate (or don't) in Haiti is always mind numbing. In the movie *Blood Diamonds*, the phrase "T.I.A" (this is Africa), provides frequent reminder of how differently the third world works from our own expectations. Finding ourselves continually faced with nonsensical events and processes, Nick and I often resorted to saying, "T.I.H.!" (This is Haiti!). Everyone who works in Haiti will at some point be faced with the same obscure, hard-to-define logic of this amazing country. The warmth, kindness, humor and honest caring attitude these people radiate, however, is infectious.



Bill Mebane and friend

Rarely a complaint, always a smile. Some of the fascinating and surprising events we witnessed included an

impromptu parade down the beach of about 300 people singing hymns at 2:00 a.m., complete secrecy surrounding the "who and when" of fish pond harvests, and families amassing a debt equal to a full year's wages to finance a child's graduation from kindergarten (the children are sometimes dressed in wigs with straight hair!) I am sure there are logical cultural explanations for all of these oddities, but for us, they continually to add to the mystique of Haiti.



Nick Warren searching for fish

Post-earthquake rebuilding

Many of the post-earthquake "tent cities" appeared to have more substantial tarps and tents than a month earlier, but there are still acres of tent camps built with bed sheets, scrap wood and tin. I had a chance to meet a new friend, Fritz, who is living with his wife and two children in one of these tent houses—their living conditions are not good. Fritz had found enough discarded cinderblock to make a sleeping platform to keep his family above the dirt and mud, but other than this and a bag of clothes, there was nothing in his "home." Food and water are supplied to this tent camp on an intermittent basis by UN trucks, and many days can elapse between deliveries. Sadly, the village of approximately 300 families had no potable water available when we visited, although they were hoping for a scheduled delivery the next day. Fritz has training as

an engineer and proudly showed us his diploma and certification. Other than the fact that I have been blessed with opportunities to pursue my interests and apply my skills, Fritz and I are not that different. Opportunity is everything—a sobering thought.

Rubble piles in the cities are shrinking slightly, and we were encouraged to see hundreds of newly appointed Haitian government employees with their yellow shirts shoveling debris into big trucks. The labor force in Haiti is huge and it was good to see people being provided needed jobs. In the areas we traveled, there is still little or no electricity but sanitation needs were being addressed with many newly constructed mass latrines provided through the Red Cross. Some of the makeshift hospitals that were not yet operational a month ago are now functioning with limited supplies and on-site generators. Rotary International, Doctors Without Borders, and UN



forces seem to be everywhere, providing support and supplies. We saw many temporary schools set up in huge army-type tents; the Siloe School that many CODEP children attend was destroyed during the earthquake, but rubble has now been cleared away and classes are being held in a tent erected on the remaining concrete slab. The local markets were full of recently harvested mangos, cassava and corn. Numerous necessities remain in short supply however, including



CODEP's Siloe School now in tent classrooms

soap, cooking oil and other imported staples. Charcoal prices have sky-rocketed and consume about 40% of people's income (if they have an income); many Haitians struggle to cook food that has been donated. Sugar cane was being harvested and some of the local sugar processing facilities and distilleries are limping along in patchwork fashion.

The coral reef outside the CODEP compound appears to have risen further out of the ocean during the last month! Visitors to the L'Acul compound no longer are lulled to sleep by the gentle lapping of waves on the beach. The waves on the exposed reef now sound more like those of the Jersey shore. The tremendous topographical movement fascinates geologists who have visited the compound, and we saw research ships off shore collecting ocean floor data—big pieces of the earth have moved.

Easter Fish Harvest

This facet of our trip was *very* frustrating as viewed from a scientist or data collector's point of view, although encouraging from a sociologist's perspective.



Gathering for the Easter fish harvest

Approximately 45 fishponds are owned and operated by Haitians who work with CODEP. The ponds are spread out over thousands of acres of rough terrain. These ponds are all stocked with fish, and every one that we were able to visit was undamaged by the earthquake. We found it amazing and unexplainable that concrete ponds precariously perched on mountainsides remained unscathed while within 100 feet of them, houses are laying in heaps of rubble.

Before arriving in Haiti we emphasized to Mike and Nicole Carlin, who run the missionary compound for CODEP, that it was imperative for us to visit and witness as many fish harvests as possible. We, as biologists and promoters of periphyton fish farming, desperately sought fish production data to evaluate how well ponds were being managed. This data is essential in order to refine techniques toward increased production. The Carlins are superb hosts, and made every needed resource available to us: transportation, local cell phone contacts, scales, fishnets, etc. Clement—our CODEP “go to guy” who is closely connected to CODEP fish farmers—was instructed to find out what ponds were being harvested and when, and asked to facilitate getting us to the harvest sites. In spite of everyone’s efforts, including 4:00 a.m. false starts and countless hours bouncing in the back of a truck, we attended harvests at only two ponds. We chased up into the hills when we got the word of a harvest, but usually arrived only to find a pond had already been harvested, or was still full of fish with nobody around. The secrecy surrounding the process of fish harvesting was confusing and frustrating for us as data collectors. It was almost like trying to find Big Foot...T.I.H.!

Numerous conversations with Haitians failed to explain why the fish farmers are so secretive; an anthropologist might be better able to explain this phenomenon. Friends, who understand the



A fish farmer's rewards!

Haitian culture far better than I do, attribute the secrecy as a testament to the success of the harvests. People in these rural areas are subsistence farmers, all working equally hard under the same harsh conditions to feed their families. Very few people have access to a fishpond. Those who do have a crop and source of revenue that sets them apart from the status quo. A successful fishpond may be a source of envy, or perceived “unfair” advantage within these agriculturally based communities which for generations shared the same resources. When some individuals are able to earn increased income through access to a unique

commodity, complicated social issues may result within these Haitian villages; hence the

secrecy. Our fish farmer friends will have to work this out amongst themselves. The ultimate result we did see is that money is being earned, people are eating better, and more ponds are being built – so the process is working! We can positively report that the ponds we visited are increasingly productive, that others are being maintained, and that periphyton technology is perpetuating into other villages. No data worthy of publication in any peer review journals was gathered, but this was not our goal.

Of the two ponds where we were able to weigh and measure fish, the harvest was respectable and on par with our colleagues in Israel and Bangladesh who are using the same methods. Madame Ense, who has been tending her pond for about 3 years, stocked 6 pounds of 1” fingerling fish and harvested 30 pounds of healthy marketable fish worth \$2/lb U.S. Considering the minimal investment of time and materials required, this is an impressive result. Madame Bertone harvested slightly more from her pond, probably due to more exposure to sunlight. We weighed 34 pounds from this pond but there was evidence that some fish were sold prior to our arrival, so although we quantified the bulk of her harvest, the true total remains uncertain.



Weighing the harvest

Witnessing the harvest of a pond is a remarkable experience. People arrive early with small buckets and fistfuls of goudes (Haitian currency), and wait as the water slowly drains and fish are caught by hand or in baskets. Young kids hunt for plastic bottles or jugs to capture any baby fish that are mixed in the mud and water from the discharge pipe. It is quite a festive event!



Every fish is harvested!

An observation that reinforces our theory about fishponds and village economic balance is the manner in which money is passed between people while fish are being sold. Transactions are brief and discrete, with wrinkled bills quickly passed between muddy hands.

Improvements to increase harvest yields

Appropriate quality and quantity of substrate used in ponds can certainly be improved. Palm and coconut branches work, but they rot quickly and sink, reducing their ability to support periphyton. These materials also create a mess in the pond and make harvesting difficult. Plans are underway with ECHO to provide bamboo seedlings which will ultimately serve as pond substrate. Bamboo is hard to find in the areas where the ponds are located, but is well-proven as the most effective substrate when culturing fish using the periphyton method. Additionally, Madame Ense has been given some “Cobra Vent” material to experiment with as an alternative substrate. Cobra Vent is an inexpensive, reusable rug-like material used in the U.S. for venting asphalt roofs. It has all the right attributes for replacing palm and coconut branches until the bamboo crop is established. We are hopeful to get some data from this at the Christmas harvest.

We are now also encouraging pond owners to start feeding papaya leaves to their fish. Feeding papaya leaves should improve production dramatically, it costs nothing, does not require much effort, and is wholly sustainable.

Efforts to expand Fish Farming efforts to other areas of Haiti

During the World Aquaculture meeting in February 2010, I was introduced to Mr. Patrick Wooley, a Haitian businessman who now resides in California and is interested in establishing fish farms in the rural village where he grew up in Haiti. Patrick owns several acres of land on the shore of Lake Azuei, 18 miles east of Port Au Prince. Several days were spent with Patrick



evaluating the feasibility of beginning a fish farm on/near this huge lake, 65 square miles in size.

Historically the lake had a thriving fishing industry but environmental issues and overfishing have resulted in a lake that barely supports the few fisherman that still fish it. Water quality in the lake and the topography of Patrick’s property are very conducive to establishing a “cage culture” tilapia rearing facility. We met with the local fishermen and adjacent property owners and discussed methods to establish a fish

production/enhancement project and they expressed excitement and a willingness to work with us. Due to the size of the lake, the periphyton technique we currently use would require supplementation with fish feed. Past experiments with developing a fish feed using ingredients found in Haiti worked fairly well but we were limited in the ingredients we could find to make

the fish feed. Patrick has friends who own the “Prestige™” beer factory in Port Au Prince and after visiting with the manager we were able to secure the right of first refusal for all beer fermentation waste products (free)– perfect for fish feed! The project on Lake Azuei, is very exciting and the concepts developed with this project can be put to use in the CODEP ponds, most importantly the development of a supplemental fish food. The next phase of this project is to obtain permits. Local labor will be hired to prepare the site and begin planting specific agricultural crops (with help from ECHO) that can be blended with the brewery waste to produce a fish feed. There is the possibility of installing a water distribution system and tanks for producing fingerlings but a more likely scenerio may be that the CODEP farmers barter fingerlings for fish food – everyone wins!

Introduction of the Gaia “CleanCook” stove

Docks in Port Au Prince are operational and 100,000 liters of denatured ethanol from Brazil along with 500 “CleanCook” stoves from Slovakia are ready to be shipped to Haiti. Part of our mission during this last visit was to locate a secure staging area where the ethanol and stoves could be held for distribution. This has not been an easy task, but thanks to some impressive networking by Project Gaia, great progress has been made. Brady Luceno, the Project Gaia Program Coordinator, has been working with people in four languages on three continents to orchestrate this delivery.

On April 5, through Gaia contacts, I met with project leaders from Hands On Disaster Response (HODR), a U.S. organization which has a team located in Leogane, very close to our base at L’Acul, and one of the most devastated areas in need of stoves. HODR has agreed to provide us with a secure storage area for all our materials and supplies! This is a huge and important logistical achievement, and we hope, one of the final issues to resolve. HODR’s Project Leogane is a well organized operation which has been on the ground in Haiti since immediately after the earthquake. Their staff is involved in all aspects of relief work: medical support, shelters, water and food distribution. They have 5 acres of secure storage and qualified Haitian and American relief workers available to assist us. We are very grateful for their support.

One of HODR’s greatest contributions to the Haitian relief effort has been the distribution and construction of low cost, earthquake and hurricane proof housing structures. These buildings are constructed of steel studs imported from the U.S. which are cut and assembled into modular walls and roofs by local Haitian employees, and then assembled into structures on site where needed. The homes cost \$800 U.S. and are suitable for a family of six. In exchange for the use of their facility HODR has asked us to help them source a small excavator or Bobcat machine that they can use to off-load equipment from incoming trucks and construct latrines. If one can be donated, or if funds are available to buy one, we are working with connections in Brazil who may be able to include this machine in one of the containers with the ethanol.



HODR's modular structures



Introducing a sample Gaia stove

sugarcane, and only extracting a small portion of ethanol. Our strategy is to utilize the expertise from Gaia to introduce more efficient distillation equipment. Distillers will benefit by extracting higher quality and greater quantities of ethanol while using less effort and resources. Furthermore, the quality of ethanol will be suitable for use as fuel, allowing the producers to expand their market beyond the rum industry.

We also wanted to begin to evaluate the quality and quantity of ethanol available from within Haiti. We purchased some ethanol from one of the distilleries in Leogane to test in the CleanCook stove, but the alcohol content was too low to serve as stove fuel. From what we understand, Haitian ethanol distillers sell to rum producers who use it in their blends. The value of the final rum product is contingent on the alcohol content, so poor distillation methods hurt everyone. The Haitian distilleries are highly inefficient, burning copious amounts of wood, grinding tons of



A distillery in Leogane