

Solar Work in Northern Honduras – 2012

By Richard Komp

It has been twelve years since the last time I had been working in Honduras and Honduras has been through a lot since then but when Jean Arnold of the Falls Brook Centre in Canada asked me to help restart a project they have been working on with the Garifonos people in northern Honduras, I said that I would help. The project is to bring solar electricity to this group of people who live in the Cuero y Salado Reserve right on the Caribbean near La Ceiba, that was on land owned by Dole and is still used by them as a coconut plantation. Actually, Dole seems to own just about everything in the area, including the politicians.

Earlier, in 2011 two Falls Brook interns worked at the reserve and built a 65 watt PV module using the techniques I taught them last June at a solar workshop I taught at the Falls Brook Centre in New Brunswick, Canada. They had installed this one module but got no further in the project before they went back to Canada. While I was in Sabana Grande, Nicaragua giving solar seminars to a semester abroad group of college students from the US, I talked with young Mauro Perez about his coming with me to Honduras to continue this work. He was very excited about the possibility so we arranged to go in late February of this year.

Since I was already in Sabana Grande when it came time to start the trip, Mauro arranged a taxi driver friend to take us in his taxi all the way from the big ceiba tree in the middle of the village to the Honduran border at Los Manos, to save time. The taxi driver was going to work in Ocotal anyway so he only charged 300 Cordobas (about \$14 Dollars) for the hour long ride early in the morning. We had no problems at all crossing the border and nobody even asked us what was in our luggage. I had been worried about that since I had a box of 500 Evergreen Solar cells and a gallon bucket of the two part silicone resin, plus lots of other parts and tools but we simply walked across the border, stopping at the immigration windows in Nicaragua and Honduras to fill out simple forms and paying a couple of bucks US for the visa fees.

We had been told that there was an express bus from Los Manos to Tegucigalpa but when we got across to the bus stop we discovered that we had been misinformed. Instead, we took one of the yellow “chicken buses” to a nearby village where we caught an express minibus to Tegucigalpa. We ended up spending all day taking three buses and three taxies to get to La Ceiba, which is a resort town right on the Caribbean beaches. The trip cost \$80.18 total for the two of us. Jean had reserved a room for us at the Grand Hotel Paris, which had 3rd World elegance (a nice fancy restaurant and swimming pool but I had to fix the plumbing in our bathroom and the Wi-Fi didn’t work on our floor).

We spent one day in La Ceiba shopping for the tools and parts we didn’t bring with us, which is my usual way of working when I get to a new 3rd World country. I design the PV modules to use as much local material as possible. The Falls Brook people had already ordered the glass and aluminum frame materials cut to size, but I had the glass dealer cut six of the pieces of glass cut exactly in half to make twelve 32 watt modules instead of the 65 watt ones they thought were needed. I also showed Mauro and the participants how to cut and bend the frame material so we didn’t waste any of that either because of the change. We bought so many batteries that the pickup truck had to go that afternoon to bring a group of them and the heavy glass to the Reserve.

The next day we left early to go in the pickup truck with rest of the batteries and catch the narrow gauge Dole banana train (which now carries coconuts instead). This train is the only way to get to the Reserve but it has become a bit of a tourist attraction. It used o be steam powered but now they use a homemade looking engine car with a little diesel engine and transmission that I suspect is from a small Japanese pickup truck. The train trip takes a bit over half an hour on the wobbly track with stops to pick up school kids heading home for lunch and dropping off compesinos and packages for little stores along the way.



The narrow gauge train with a load of coconuts behind the “passenger cars”.

The Cuero y Salado Reserve is in wetlands with a large lagoon so after unloading our luggage and solar parts, we took a boat ride on the lagoon to see the turtles and crocodiles and the many kinds of birds that live there. The reserve was a Dole plantation in old fashion antebellum style with a Big house surrounded with two story outbuildings and a row of huts for the workers to live in. We got a tour of the grass huts we will be wiring up for solar electricity and the tiny school which we will also furnish with electric power.

The Garifonos natives have lived in this area for generations and are an interesting mixture of Native Americans, descendents of escaped slaves and pirate crews, and others who somehow ended up on that shore over the centuries; but of course none of them “own” the places their families have lived in for hundreds of years. Dole owned it all, having acquired it the old fashioned way – they stole it in the 19th century. Several years ago, Dole turned the land over to the government to be made into the nature preserve but I noticed that Dole still uses the bulk of the land. The Falls Brook Centre has made an arrangement with the NGO that runs the reserve to work with the people and introduce *Analogue Forestry* to the area. They have shown the Garifonos how to plant trees and start gardens so that in just a few short years they will have something analogous to a climax forest. In just a little over one year, the contrast with the dole land is quite remarkable.

Jean Arnold, the head of the Falls Brook Centre (FBC) had promised the compesinos that if they worked hard and fixed up the little patches of land around their grass huts, the work would count towards the payment of their getting solar electricity, as well as give them fresh vegetables from their own gardens, so they have put a lot of labor into these nice gardens.



The start of the Analogue Forest. On the left is the Dole land, on the right is about one year of the new plantings and landscapes.



A typical grass hut, with everything tied together. No nails used

The first evening we got there I started the course with an introductory PowerPoint on the 3rd World solar work in different countries and how we make and install the PV modules as a cottage industry. At 8 the next morning we started the workshop in earnest. I showed the participants how to sort and cut the PV cells; and how to string them together in series with solder joints to make modules for their cottages.



Soldering together the full size Evergreen Solar cells to make a 65 watt PV module

The women, especially, have learned how to cut the PV cells in half for the cottage modules so that in the first day we assembled two big 65 watt modules and a smaller half size 32 watt one. After they had cured overnight, we tested them in the sun and framed them with the aluminum extrusions. I showed Mauro and them the new technique of framing where we make a cut in the E channel and bend it instead of having to hand-cut 45° miter joints. We reinforce the corners with little aluminum angles we get by cutting the E channel a special way.

We were taking roll every day to keep a record of who was working to decide who among the group would get the first 16 modules installed on their homes, since the area has about 30 homes and FBC had only enough money to buy batteries and install PV systems on 16 homes. Between the two boxes of PV cells brought down from Canada and the one I brought, we had over 1500 Evergreen Solar cells, more than enough to do every home; but the batteries are expensive and limit the scope of the project until Jean Arnold finds more private donors to generate more funds.

The large building we have for the workshop already has its own PV system but the batteries are old and in bad shape, since nobody knew how to maintain them properly. Jason Juurlink, FBC's renewable energy intern who came down to work with us, took careful measurements of the PV system and batteries and we disconnected three shorted batteries to improve the system.

The next day we installed the first PV system on a cottage using a small 32 watt PV module. Most of the men are fishermen so they are very good with knots and tied the PV module onto the tin roof of the house. We used a roll of rusty bailing wire to fasten the aluminum frame so it wouldn't cut the rope and used twine for everything else.



Installing the first PV system on a cottage.

One 12 year old boy named Edwin became Mauro's assistant and has decided that this is what he wants to do in life. I gave him a solar T shirt I had to start him off right. During the five days I was there at the Reserve, we made three 65 watt PV modules, seven 32 watt ones and 6 small solar cell phone chargers. We also installed a second PV system on a cottage and Edwin became a valued member of the installation team, not only climbing on the roof to tie the modules down but also able to wire up the switches and the compact fluorescent lamps. We also taught other members of our course to install, maintain and repair these systems so the project can be self sustaining when the FBC people are not around. I showed them how to collect rain water to use as the distilled water for the batteries and how to clean and maintain the batteries. The women went through two boxes of the PV cells and sorted them out, cutting the marked or damaged PV cells into pieces to make the smaller home PV systems and use the small pieces of cells to make solar cell phone chargers, which turned out to be very popular.

Although I had to leave to come back to Nicaragua to teach a solar course at the National engineering University here in Managua, we arranged for Mauro to stay on for a total of three weeks and the group, under his instruction have installed PV systems on 16 cottages, the tiny local school and the bigger building used as a dormitory for the unmarried men.

Honduras currently has a military dictatorship for a government and the military presence is pretty much everywhere. There is a small group of soldiers living at the Reserve “to protect us” presumably from the Garifonos who are our students. However, the young soldiers got very interested in what we were doing and joined the workshop. On the train trip back from the Reserve, one soldier asked me how he could get to buy one of the solar cell phone chargers.



Two young soldiers helping to measure strings of PV cells as part of the workshop.

I went back to Nicaragua by myself. I took 7 buses, 5 taxies, a pickup truck and the narrow gauge train to get here. This took two days, not counting the time I spent in La Ceiba shopping for more tools and materials to be sent back to the Reserve. The trip back cost me more, \$55, not only because I had to come all the way back to Managua, but because I took an Executive class bus from La Ceiba to Tegucigalpa. It had the luxury touch of reclining seats with more leg room but more importantly: a bathroom. Going to La Ceiba, the 7 ½ hour bus trip with no bathroom and only one stop (because the bus broke down and we had to get something fixed in the engine) is a bit hard on me now that I am 73.

The plan for the future is for Mauro to go back to the Reserve to continue the program and for Nimia (or some other of the Grupo Fenix Solar Women) to go there to teach the workshop on building and using solar ovens. That way, they can switch from the expensive (\$340 per gallon) silicone encapsulant to the ethylene-vinyl acetate (EVA) encapsulant that costs only 1/10 as much. The solar ovens will also help protect the ecosystem of the Reserve since the campesinos won't have to use as much firewood to cook. There are also possible workshops on solar food and herbal medicine drying, and helping to set up a company to make solar devices for sale to both the local people and the tourists who are starting to take that train to the Reserve.

I wouldn't mind getting back to the Cuero y Salado Reserve again. I felt a real affinity with the people I worked with and would like to meet them again. Swimming in the morning in the bathwater warm Caribbean surf is a nice way to start the day. I also enjoyed the Garifonos food. They make a chicken dish in coconut sauce that is gourmet good and just about every meal I ate was better than the food at the Grand Hotel Paris in La Ceiba. It was a very busy but enjoyable way to spend a week.



Talking with the fisherman getting to launch his dugout sailboat at dawn.