

Second Trip Report for Rwanda

I came back to Rwanda for a follow-up visit to continue my work with the Radiant Horizon cooperative, which the Rugerero Survivors village people started last April while I was here on the first visit. Last time, I taught them how to build photovoltaic (PV) modules but this time we are concentrating on building solar box cookers, although they are still building the PV modules with a new box of solar cells and other materials I brought in my suitcases. This trip was sponsored separately by the nonprofit Skyheat Associates and private donations since the second half of the IEEE grant won't be available until 2010.

The start of the work was delayed by my getting Swine Flu. I must have contracted it in Maine, but had no symptoms when I entered the country. When it was verified that I had the real H1N1 virus, they put me into isolation in the local hospital here in Gisenyi for three days, then let me stay at the home of John Bosco, the local Red Cross representative, as long as I didn't mix with people. Rwanda has single payer socialized medicine for all its citizens; but as an alien I don't qualify so I had to pay the entire hospitalization bill in cash. It cost me 13,540 Rwandan Francs (\$23.75 US) for the three days and two nights in the hospital and the medicines they gave me. Of course the hospital is missing some 1st World luxuries like hot water, reliable electricity and food (people's relatives bring them meals); but since I had no appetite at all for three days, the latter wasn't a problem for me. Since I was the first H1N1 patient in this part of Rwanda, the Ministry of Health doctors came from Kigali to check me and the situation out. I got to know them and discussed what could be done to bring solar hot water and electricity to the hospital.

The Radiant Horizon group had made ten 60 watt PV modules while I was sick so when I was allowed to work with them, we concentrated on the solar cookers. However, I also taught them how to cut solar cells and we built a 30 watt module and another cell phone charger with the freshly cut PV cells. The group also installed one of the newly made 60 watt PV modules on a duplex in the village, powering two more homes.



Photo 1 Making one of the solar cookers

The project of building three solar cookers took more than a week since I had to teach the participants the details of the precision cabinet making style of carpentry necessary to get solar cookers that are efficient and will reach temperatures high enough to bake bread. Because of the unavailability of what are common materials in most of the world, we used a different design than that for the well tested plans Grupo Fenix uses in Nicaragua. We finished three family sized cooker boxes and used them in a cooking class one Saturday. They worked very well until the rains came (November is the rainy season and it usually pours rain every afternoon).



Photo 2 Testing the first of the solar cookers

John Bosco asked me to check out and repair a solar water heater that had been installed in a nearby orphanage. The solar cooker had been installed by a German NGO and was a perfect design for Germany with a complex heat exchanger system to keep it from freezing and the collector boxes set at the perfect angle for the latitude of Germany (They were very good at blindly following rules). The system hadn't been working for about two years but it took me 15 minutes to fix it and get it working as well as it could with the wrong slope to the absorber plates. The problem was in the heat exchanger, which had simply leaked out the expensive freeze-proof working fluid, which I replaced with plain water since it never gets below 60° F in Rwanda. On a second trip back to the orphanage, I taught the Radiant Horizon group the basics of solar water heater design as we checked out the system. In the next trip, I will teach the group how to build solar water heaters designed for tropical climates, using only parts and materials available in that part of Rwanda. If the money can be raised, maybe the local hospitals and health clinics can get hot water. In any event, this part of Rwanda is becoming a tourist destination with people coming to visit the silverback guerillas; and the local hotels have discovered that people from the 1st World like to have hot showers in their rooms, so the Radian Horizon group should have a good set of customers for the solar water heaters.

I will be going back to Rwanda in April for the IEEE follow-up trip, and will combine this with a trip to Mali to see how the Afriqpower company started there by the orphans is doing. I also will teach them the latest PV module assembly techniques and check on their quality control.