

## **The Role of Food Scientists In Non-Profit Companies**

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The following article is written in response to the question, "Is there a role for Food Scientists in Non-Profit Companies that are working internationally?"

I will relate my experience with a non-profit company over the past twenty-three years. Compatible Technology, International (CTI) is a non-profit company with its office at Hamline University in St. Paul, MN. CTI had its origin at General Mills Research. In 1980 some engineers and scientists formed a Food Committee to determine if they could use their knowledge and experience to assist hungry people in developing countries. Under the leadership of George Ewing this group worked after hours and on Saturdays on ideas and concepts for developing countries. The group needed more specific direction as to where their efforts should be placed. Robert Nave, a retired missionary from India joined the group. He was able to relate to problems in India and direct our efforts to them. In May of 1981 Compatible Technology, Inc. was registered as a non-profit company in Minnesota. Robert Nave, George Ewing, and Emory Swanson, a retired scientist from Pillsbury, were the founders.

Through out its existence CTI has sought out areas in the post harvest of crops and food process concerns where technical help is needed. Their objective is to provide jobs and to improve the food supply to benefit persons in need.

The first example of their effort was to reduce the spoilage of potatoes in India. Potatoes are a large crop on the Ganges plain. The harvest starts in February and continues into March. By then the temperature can exceed 100 degrees F. The farm prices for potatoes drop due to the glut on the market. Electric refrigeration is costly and is not very reliable. Given these circumstances CTI developed a rustic storage building and a low technology process for drying the potatoes. The rustic storage building has mud block walls, a thatch roof and a slat floor with a water pool under it. Several tons of potatoes are dumped in these buildings. As the water evaporates the potatoes are kept moist and cool. They can be kept for several months in this storage.

Based on the process used to make dry potato slices in the U. S., a process using no electricity was developed to produce dry potato slices or shreds. Pedal power potato slicers, drums washers, wood heated blanchers, sulfite dipping and sun drying racks make up the plant design. Each plant is designed to process one metric ton of fresh potatoes per day. The drying season starts in February and runs to August with a break during the monsoons. After the potato slices are dry they are moved to a central location where they are packaged or ground into flour which is then packaged. There is a good market for these products in the bazaars. The growers receive a higher price for the potatoes and jobs are added for the processing and packaging. Additional jobs are created for persons that manufacture the processing equipment. CTI established a technical center named SOTEC in Bareilly in northern India that's services projects in that region.

Ground nuts (peanuts) are grown in many countries in Africa. CTI was asked if they could develop a process that could be used in the villages of Zimbabwe to produce a marketable peanut butter. Working with the University of Zimbabwe a process was developed. A burr mill grinder that can be hand cranked, driven with a pedal power or a small diesel engine was tested and worked very well. These grinders have hardened steel burrs that resist wear and produce finely ground material.

Now the women's groups in the villages can produce good quality peanut butter. Additional work has been done to improve roasting using solar power, shelling and skin removal. All the equipment used can be produced in Zimbabwe. The peanut butter quality and quantity is improved. Jobs are created.

About 1000 of these grinders have been produced in Zimbabwe. Currently a shop is being opened in Uganda to produce these grinders. The first run of 250 grinders is being completed. These grinders are also used in processing sorghum, maize and millet. These are common grains in many countries in Africa.

A more recent CTI venture is the development of food products using breadfruit in Haiti. Using a combination of the low technology potato drying process and extrusion cooking a puffed cereal base is produced that can be used for cereals or snacks. Women's groups have been set up in the rural areas to harvest and dry the breadfruit. The dried breadfruit is ground into flour. The flour can be used with ground pinto beans, rice, sugar, oil and salt as a base for a puffed cereal or snack. A coating for the snacks uses molasses, sugar, ground peanuts and peanut butter. Vitamins and nutrients are added to produce a nutritious product that has tested well with school children in Haiti. The production of this product requires food processing and nutrition knowledge. This product is comparable to U. S. cereal products. With the exception of the vitamins added all of the materials are produced in Haiti. The plan is to bring the normally wasted breadfruit into use to expand the supply of food and create jobs.

Several other CTI programs use food processing skills. They are the maize post harvest work in Guatemala, Cassava processing in St. Lucia, and leaf protein and palm fruit processes in Congo. Currently a village scale water purification system is being tested in fifteen villages in Nicaragua. In conjunction with Dr. Pat Wolff from St. Louis, MO, CTI is working on a Therapeutic Toddler Food in Cap Haitien, Haiti. This product will be used to deal with the children's malnutrition in the region. The product can be prepared using solar roasting of peanuts and simple hand grinding of the ingredient blend. The grinder used is one of the CTI grinders. The product can be produced by local persons.

CTI has had project involvement with students at Lehigh University, St. Cloud State University, The University of Minnesota, and Grand Valley State University in Michigan.

The challenge for CTI has been to develop high quality food products using low technology in remote regions. The quality standards for products produced in developing countries are the same as in the U. S. In the U. S. commercial peanut butter has a fineness of three on a Hegman scale. The women in Zimbabwe find this to be a little coarse to their taste.

There are many areas where engineers and food scientists can apply their skills and knowledge. They can work with the local non-profit organization developing solutions to problems in the countries where projects are being done or planned. They can make short term trips to these project areas. They can help with the design and testing of equipment. There are not a lot of full time jobs, but there are opportunities to apply their knowledge and expertise.

**Submitted by: George Ewing, BSChem Engineer, P.E., retired from General Mills, Inc.  
and CTI Volunteer**