Photo: Bart van Campen

Woman using an improved cookstove.

Building silos to introduce healthier cookstoves in Honduras

Ian Cherrett

In the late 1980s, the pacific region of Central America was badly hit by the *El Niño* weather pattern. Drought, loss of harvests and starvation haunted many hillside farming communities. The remote Lempira region of Honduras was one of the worst affected and international agencies provided emergency assistance to the area. It was discovered that behind the small farmers' vulnerability to the *El Niño* weather conditions, there was an ongoing process of deforestation, soil depletion and declining water availability and hence even in good rainfall years, the productivity of basic food crops (maize and beans) was declining. Slash-and-burn agriculture and extensive cattle ranching predominated, malnutrition was widespread and the dominant response was migration. In response to these problems, the FAO project *Lempira Sur* started in 1994.

In the design phase of the project, consultants identified the heavy reliance on fuelwood for household energy as a major problem. The introduction of improved stoves for cooking was therefore made a priority. At this time the issue of fuelwood was high on donors' agendas and improved stoves were seen as a way of reducing fuelwood consumption. Health officials in the region were also raising the issue of the damaging health impacts of the traditional open-hearth fires: Over 80 percent of women and a majority of small children in the communities were suffering from respiratory problems and something had to be done about this health hazard.

From the start, the project offered improved stoves – but the uptake was very slow and project targets were definitely not going to be reached. Pressure grew on the project to introduce incentives to promote adoption, but experience elsewhere had shown that this type of approach was not sustainable.

The project was having problems in achieving its objectives and it was identified that the original design had been too supply-driven. It was time to go back to the hillside families and review the project's priorities with them. The project extensionists were retrained as facilitators, emphasizing participatory tools and a demand-driven focus. A priority was to try to understand people's livelihood strategies and in particular, the logic behind the current open-hearth system. After discussing the issue with women and men separately in the communities, project personnel began to understand how the system worked. These open cooking fires were in a low ceiling, enclosed room with a loft above where the family grains were stored. The smoke from the fire rising through the porous ceiling helped preserve the grain against pest infestation.

The project then took a closer look at this grain storage system and found that the smoke did indeed help preserve the grain, but only for an average of six months. However, as few farmers harvested more than six months worth of grain, that was not an issue.

It was clearly necessary to rethink the project's strategy, taking both grain production and post-harvest storage into account. The negative effects of the open hearth system were clear to women but when faced with the choice of new improved stoves or post-harvest losses, the stoves lost out every time. In general, men did

not recognize the health problems and so their opposition to adopting improved cooking stoves was even stronger.

Before the start of the *Lempira Sur* project, another project focusing on the promotion of metal silos for grain storage was already being carried out in the region. However, demand for the silos was low because costs were high and farmer's yields were so low that investing in grain silos did not make economic sense.

The conclusion was reached that if the project could help farmers increase yields and reduce the costs of the silos, it would become a viable option for farmers to buy silos to store their grain. Once they had silos, the need for the open fires in a closed room would disappear and women could install much-wanted improved stoves. Thus a series of steps had to be taken at the same time: increase yields, reduce the price of storage silos and make available new models of cheap cooking stoves, which could be easily built using local materials.

Building on local farming practices, an agroforestry (*Quesungual*) system (see Welches and Cherrett, *LEISA Magazine volume 18 no 3, pp. 10-11*), based on maximizing soil coverage, was developed by the project technicians together with the farmers. Within two years the impact was being noticed and in several communities the farmers were beginning to organize themselves around the agroforestry system. It was decided to test the new approach to introducing stoves in those communities. Meetings were held with the families involved and the project also offered credit via the local savings and loan cooperative, on condition that the women could have new stoves. This was taken up in various groups and evaluated in a participatory way at the end of the year. By the time the evaluation came around, the impact of these changes had already spread by word of mouth and demand for assistance in improving yields, installing silos and constructing stoves had already exceeded the capacity of the project. The time for scaling up had arrived.

Demand for experimenting with the new agroforestry system was high and the project devised a plan to respond to that demand. At the same time, discussions were held to identify who wanted silos and what the demand would be at different prices. That year's (1996) harvest had been good and many farmers wanted silos – but at the right price, of course.

The project met with the artisans and discussed with them how to reduce the price of the silos. The key was identified as the raw materials: metal sheets and bars of tin. These were very expensive, even before adding the transport costs. The project discovered that there was only one place in the country where the artisans could buy these materials, and as this place had a monopoly, it charged very high prices. To break the monopoly, the project took a risk and negotiated to buy the raw materials from a factory in a neighbouring country, which it then sold to the tinsmiths. The project saw this as the only way of bringing prices down to a level that would interest a large number of farmers. And it worked; many silos were made and sold.

At the same time, a campaign was launched to promote the adoption of stoves in the same villages where a demand for silos had been identified. Women in these communities were organized, leaders trained and savings clubs set up. Those interested were trained to make the stoves using local materials and the savings clubs were assisted to acquire metal plates for the stoves at a reduced price. The adoption of stoves, purchase of silos and changes in the production system expanded rapidly. The next step was to make this sustainable.

Large-scale adoption of the agroforestry system took off as a result of the 1997 drought caused by the *El Niño*. Those with the agroforestry system suffered only a 15 percent drop in production. Their harvest was big enough to cover their family's annual consumption and they continued to demand new silos. Those still practicing traditional slash-and-burn agriculture lost an average of 65 percent of their yield! The next year, change to the agroforestry system was massive. Today, it is so widespread that agricultural burning is a thing of the past and the Mocal watershed in Lempira remains green even throughout the six-month dry season.

Today, what was once an area of grain deficit is now a grain surplus region. The possession of a silo is a symbol of domestic food security and a majority of women are proud owners of improved stoves. Interestingly, the impact of improved stoves on fuelwood consumption was found to be less than researchers and experts had predicted. Cultural practices tend not be taken into account in experiments that are not field-based, and it was found that older women do not like to put their fires out; "You never know when you will have a visit" and a visit means at least a hot cup of coffee. Younger women are more ready to put their stoves out when they are not in use. In any case, the fuelwood problem had by then become marginal. Because of the agroforestry system, there is now plenty of fuelwood to go around.

The silo programme has also evolved. The artisans are organized and now negotiate directly with the sheet metal manufacturer in neighbouring Guatemala. They also discuss and negotiate regarding demand, prices and possible credit for the agricultural communities (together with the local cooperative) on an annual basis, allowing raw material needs to be estimated fairly accurately. By the year 2001, over 8000 silos had been built and sold, and the silo market was completely independent of the project. The Association of Silo Makers of South Lempira won an award for having built more silos than anywhere else in Central America. At the same time, they faced a problem of success, as most families now had silos and demand was dropping. The response was the diversification into other products such as watering cans, buckets and containers and the identification of new markets, especially for silos. A new source of demand was identified in El Salvador, where the quality and price of their silos is very competitive; and a training programme to improve the quality and diversify their products was set up, including training in small business management.

Conclusions

What at first sight seem like simple problems with simple solutions are not always so. Being supply-driven and understanding people's livelihood strategies is fundamental to the success of any project. Neither the rural family nor the external experts hold all the knowledge and wisdom, and partnerships should build on mutual respect and learning, through responding to concrete issues.

Blueprints do not help when reality does not follow expectations, and it almost never does. Projects therefore need to have the capacity for adaptation as the changing context demands. There is always a need for a certain amount of luck and opportunism when promoting change.

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Ian Cherrett. Senior Officer Rural Development. Food and Agriculture Organization of the United Nations (FAO), Regional Office for Latin America and the Caribbean, P.O. Box 10095, Santiago, Chile. Email: Ian.Cherrett@fao.org

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