REDUCTION IN FIRE WOOD USE FOR THE FISH CONSERVATION INDUSTRY (FISH SMOKING) IN THE WESTERN AREA PENINSULA, SIERRA LEONE

PROJECT'S AIM: TO PRESERVE LOCAL FORESTS AND THE LIVELIHOODS OF TRADITIONAL FISHING COMMUNITIES THROUGH THE USE OF EFFICIENT FISH SMOKING STOVES

Location:
Western Area Peninsula
Sierra Leone

Technology:
Solid biomass stove

Costs:
Total: € 69,300
WISIONS financial support: € 38,000

Partners Involved:
Welthungerhilfe
(www.welthungerhilfe.de)

EnFO (Energy For Opportunity)
(www.energyforopportunity.org)

Sierra Leonean Artisanal Fisherman's Union (SLAFU)

Duration:
04/2012 – 08/2013

Picture: Welthungerhilfe

The traditional fishing industry in Sierra Leone provides employment to around 30,000 full-time and 200,000 part-time workers and contributes significantly to the national economy. It is also the largest and cheapest source of animal protein for the population: around 80% of the animal protein that is consumed in the country comes from fish.

However, the industry also has significant negative impacts on health and the environment. Given the lack of electricity for refrigeration for small-scale fishing, smoking in ovens, or *bandas*, is the main means of preserving fish. However, the smoking stoves are heavily reliant on fuel wood collected from the nearby mangroves and forests – including the diversity-rich Western Area Peninsula Forest Reserve (WAPFoR). Despite restrictions to harvesting forest wood, the forest cover is decreasing rapidly. This reduced forest cover also results in serious flooding during the rainy season which, in turn, has a negative effect on the livelihoods of the local population.

The objective of this project was to reduce the consumption of forest wood in the fish smoking process by using improved wood stoves.

The project took place against the background of a declining fish catch in 2012-2013 season, due to a particularly severe rainy season which limited the number of days the fishermen went out to sea. This led to lower incomes along the entire local smoked fish supply chain (including temporary migration out of the area) and hindered the project's success. Moreover, in recent years, there has been a steady increase in fishing by medium and large-scale trawlers off the coasts of Sierra Leone, which has further reduced the catch for traditional fishermen. Due to these and other pressures, the rate of repayment for the improved ovens was very low and the various measures taken to counter this (extended deadlines, debt relief, meetings etc.) were not effective.

TECHNOLOGY, OPERATIONS & MAINTENANCE

The project targeted the community of Tombo, which is the busiest fishing port in Sierra Leone with 398 registered fishing boats, an estimated 1,000 fishermen and around 800 women who preserve the fish by smoking it. A questionnaire-based baseline survey was carried out to assess the size of the market for fuel wood and the potential for different coastal communities to pilot the efficient ovens.

The improved stove design, which was selected prior to the project, has been shown to reduce fuelwood consumption by 50% and to require lower maintenance. Smaller stove compartments, greater smoke protection and the use of high-quality bricks instead of local clay served to improve the efficiency.

DELIVERY MODEL & FINANCIAL MANAGEMENT

The project adopted a 'social enterprise' approach. The team formed to facilitate the implementation is composed of staff from the Sierra Leonean Artisanal Fisherman's Union (SLAFU). The core team is made up of a general manager and four officers responsible for the warehouse, payments, construction and community liaison. Construction took place at the SLAFU premises in Tombo by outside contractors.

Following extensive communication through formal and informal means (meetings with stakeholders, flyers, radio discussions and the broadcast of a radio jingle in 150 slots on local radio stations), finance for the ovens was awarded to just under 30 fish smokers out of 120 who expressed interest. A 15% up-front payment was requested, with an initial repayment period of 6 months, as recommended by the baseline survey. This period was later extended in the face of the low rate of repayment.

ENVIRONMENTAL ISSUES

The reduction of fire wood consumption through the use of improved stoves can potentially reduce greenhouse gas emissions, as well as decelerating deforestation and related problems in the Peninsula, such as erosion. However, this particular effort to enhance one aspect of the smoked fish supply chain was greatly affected by the weak fish catch in the 2012-2013 season. Forest cover is believed to have decreased at a lower rate during the project period due to the overall decline in the fish smoking market.

One specific issue that affected the project, both in terms of life-cycle emissions as well as cost, was the unforeseen difficulties in the transport of bricks from the factory to the point of use – a distance of over 120km.

SOCIAL ISSUES

The small-scale fish industry in the Western Area Peninsula provides employment, as well as the only source of animal protein, to a vast population. Over 90% of fish ovens, or *bandas,* are operated by women, also called 'fishermen mothers'. The project witnessed considerable health improvements due to the lower volumes of smoke in the ovens and the users also perceived a reduced risk of fire hazards.

A further interesting outcome is the engagement of local young people who learnt the skills to construct the improved ovens.

RESULTS & IMPACT

The project resulted in the construction of 120 oven compartments. In addition, awareness was raised significantly, leading to high interest from fish smokers. However, as mentioned above, the project faced two considerable challenges: a very weak catch in the 2012/2013 season due to particularly heavy rains and a very low rate of repayment of the pre-financed ovens.

Despite the challenging conditions, when evaluating the project after its completion it was observed that the owners and operators of the improved fish smoking ovens undertook renovations independently, using techniques similar to those used during the project. Considerable improvements in quality have been observed, even when using the less efficient local clay. This indirect effect could be the basis for future initiatives in the area.

REPLICABILITY

Improving fish preservation represents a key priority in terms of the Sierra Leonean economy, diet and environment. There are great opportunities for replicability on a regional and local scale. The delivery model - a business unit which provides the stoves under a set of standard formal conditions - was not entirely successful. The local economy is highly informal and one-time investments are rare, which could be a key factor that contributed to the failure of a formal pre-financing system. Investments are usually undertaken stepwise: for example, materials for household improvements are bought gradually over time, as and when money is available.

LESSONS LEARNED

While the project showed signs of success in certain realms (in particular in terms of awareness-raising), a key lesson was learnt: the effectiveness of such a delivery model is vulnerable to the impact of fluctuating catch volumes and the associated incomes along the whole supply chain. Future project designs must incorporate risks such as inconsistent fishing seasons and emergency situations such as the Ebola epidemic (which further hindered the project's follow up).

In addition, the implementing partner observed that using questionnaires for baseline research resulted in unreliable information. Other methods, such as shadowing fish smokers, could have proven more effective in accurately estimating the market size and household incomes, which would have resulted in a more accurate design of the business model. For example, it is thought that a payment concept requesting a higher up-front payment (70% instead of 15%) could have led to more sustainable success.

Lessons may also be learnt in terms of the implementing agents. Engaging local entrepreneurs experienced in business development, rather than a stakeholder association and an international development NGO for the community liaison activities, may have led to a higher rate of repayment.

Source: Final Report submitted to WISIONS by Welthungerhilfe in August 2013