NAMHOWFO, MANGROVES AND WOODLOTS: A MORE COMPLETE APPROACH TO REDUCING DEFORESTATION IN GHANA

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Country: Ghana

Sector: Renewable Energy

CHALLENGE

Fish processing and preservation is one of the main economic activities for people living in and around the coastal areas and river banks of Ghana. Dominated by women fish smokers, known locally as 'Namhowfo', the sector raises incomes in a large number of households but negatively impacts upon the environment and human health through the use of firewood in inefficient fish-smoking stoves.

In Ghana, it is estimated that smoke from cook stoves causes 16,600 deaths annually. Traditional fish smoking stoves also expose women to high levels of harmful smoke and the 1970's Chorkor stove offers only moderate energy efficiency and emissions gains, resulting in the need to further develop the technology for the local market.

Along the coastal zone, one of the forest areas most seriously affected by deforestation and degradation are the dense, carbon rich mangroves common to the tropical coast of Africa. At the global level, mangrove forests in coastal swamps may contribute up to 10% of total deforestation emissions, despite covering just 0.7% of tropical forest area. In addition to being an important source of fuelwood for fish smoking, bakeries, and metal smelting, mangroves are critical for protection from coastal erosion and storm damage, and provide breeding grounds for many fish stocks and crustaceans.

In 2014, the Renewable Energy Sector received funding from DGIS for a two-year Improved Fish Smoking and Mangrove Restoration project (IFS). The broad developmental objective of the Project was to support sustainable energy value chains in fish smoking markets in Ghana by improving both supply and demand side activities. Specifically, the Project sought to improve the livelihoods of women involved in fish smoking and combat the deforestation associated with their activities by:

- Promoting the use of improved and efficient fish smoking stoves
- Promoting Community Mangrove forest cultivation, conservation and rehabilitation
- Promoting woodlot plantation development to supply sustainable fuelwood for fish smokers.

Figure 1: A Chorkor Fish Smoker (cement block) with fish being smoked on wire racks above a simple enclosed fire.

Figure 2: A lower-cost Chorkor Fish Smoker of mud construction.

CLIENTS

Fish smokers in Ghana have little choice when it comes to the use of improved technologies. SNV's survey on stoves used along the coastal regions and Volta basin discovered that as many as 120,000 traditional and Chorkor stoves were in use by fish processors. The smoke from these stoves affected people's eyesight and also caused lung related diseases. The large amount of fuelwood used in the inefficient stoves also lead to an increased cost of production and the deforestation of mangrove areas. There was the need for improved technologies to better the lives of fish smoking communities - and with the goal of continuous technology improvement, SNV identified the Morrison Improved Fish Smoker and assisted in its development to attain a fuel efficiency of 40% more than the existing Chorkor stove (Fig. 3).

Figure 3: The Morrison Fish Smoking stove gives a 40% fuelwood saving over the existing Chorker stove.

Although District Assemblies in Ghana have the responsibility of supporting businesses within their districts, they are often limited by financial and technical resources. As such, SNV provided the resources to better link assemblies to beneficiaries, enabling them to carry out improved extension support services to fish processors within their districts.

To address the issue of the high upfront cost of the fish-smoking stoves, the project partnered with financial institutions, namely Ada Rural Bank and Mawumenyo Atsu Susu Company. Although already lending to community members in the form of personal loans, these financial groups were unaware of the benefits of supporting women with stoves and through training SNV improved their knowledge on renewable energy technology financing.

On the issue of sustainable fuelwood supply, SNV worked with partners to establish fuelwood plantations, restore degraded mangrove forests and provide alternative livelihoods. With financial support from SNV and technical support from the Wildlife Division of the Forestry Commission, South Tongu District Assembly and FYSSO Ghana, a local NGO, communities in Kwalakpoyom, Sota and Galotse were engaged as part of project activities.

METHOD/SNV INTERVENTION

To combat deforestation while promoting the use of improved fish smoking stoves, SNV adopted an approach that focused on both supply and demand-side.

On the demand side, SNV initiated a partnership with Morrison Energy, a local stove SME/artisan, and built the capacity of the stove company with theoretical training on combustion, technical drawings, component development and business development skills. Two LCBs from the Keta Municipal and Ada East District Assemblies also worked with the stove company as demand aggregators, customer liaisons and were trained to teach women on food hygiene and improved fish handling practices.

During the project period, the LCBs created demand for over 400 Morrison fish smoking stoves. However, as a result of this increased demand Morrison Energy experienced supply problems and so was assisted to expand operations by training new employees and transfering the stove technology to two existing stove building companies.

In addition, four emerging stove companies and one women's group were trained on the construction and maintenance of the Morrison stove. Through this intervention, employment was created for over 30 youths in the beneficiary communities, the capacity of existing stove building companies was improved, and new entrants to the stove construction sector were supported.

Although fish smoking stoves are used mainly by women, stove construction is mainly done by men who do not usually understand the everyday experience of their use. The Project therefore identified and trained nine women fish smokers on the construction and maintenance of the Morrison fish smoking stove, to then offer services for a fee to other women.

On the supply side, SNV worked with the Forestry Commission to develop a plan for training communities and commercial fuelwood suppliers. A communications firm was contracted to work with the Forestry Commission and SNV to transform both indigenous and technical knowledge on mangrove establishment and management into a manual (Fig. 4).

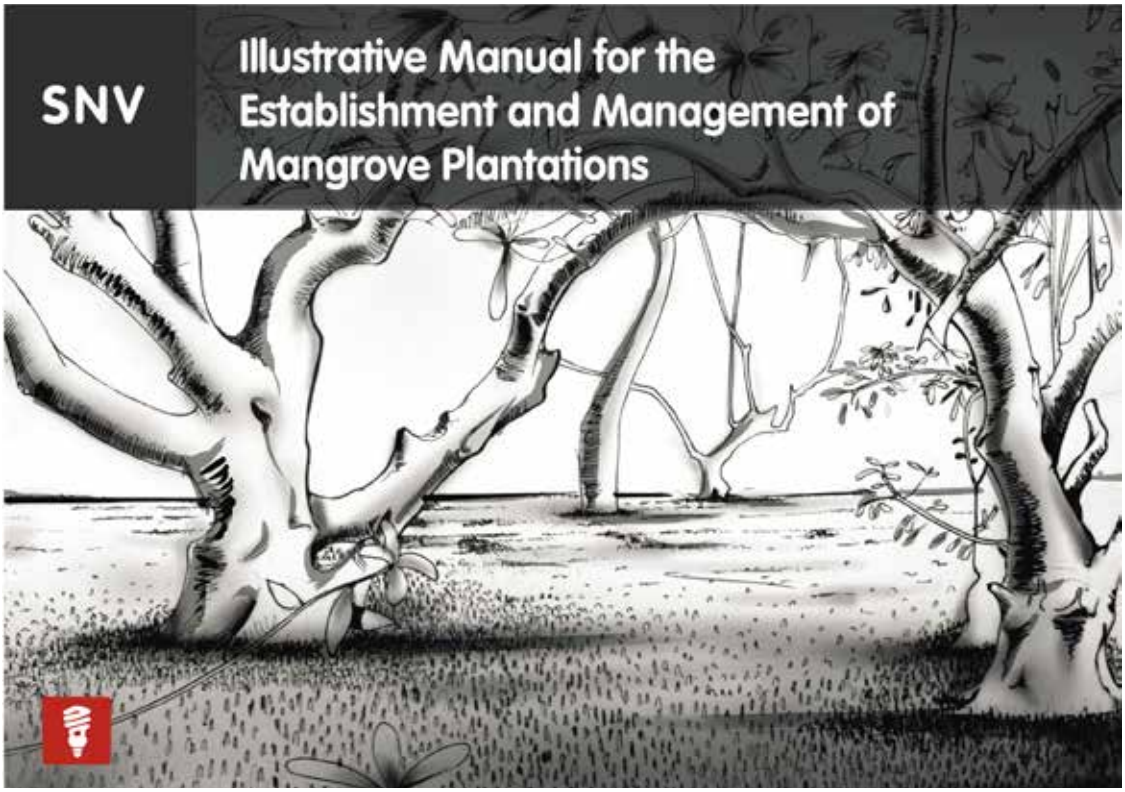

Figure 4: A manual was developed to engage communities on sustainable mangrove plantations.

OUTCOME

The technical and business capacities of Morrison Energy and six other stove building SMEs were strengthened. One of the new entrants, Ahiatsi Enterprise, has become a sustainable, profit-making enterprise. The capacities of all companies were strengthened in customer relationship management and after-sales support, enabling them to provide improved services to fish processors.

The District Assemblies, with the intervention of SNV, have improved their extension services to fish processors, who have received training in improved fish handling and business management.

Through the intervention of SNV, the Forestry Commission, District Assemblies and FYSSO have designed a pilot model of community mangrove conservation through effective stakeholder engagement and sustainable alternative businesses.

With the results achieved by the Project, SNV was able to access additional funding for a next phase with more impact, the Ghana/USAID Sustainable Fisheries Management Project (SFMP), implemented by a consortium under the leadership of the University of Rhode Island together with a network of local NGOs and CSOs.

IMPACT

On the demand side, the Project promoted and installed 285 improved Morrison fish smoking stoves, with a fuelwood efficiency of 40% greater than that of the traditional Chorkor stove, in the Volta, Brong Ahafo and Greater Accra Regions of Ghana. The technical expertise of the then sector leader (Enno Heijndermans) was useful in developing the combustion chamber of the Morrison fish smoker. With this improved technology, fish processors experienced improved health and increased income levels as a result of the reduction in fuelwood use and expenditure.

As part of technology transfer activities, the Project constructed four demonstration stoves and trained local artisans in Cameroon. The FAO Thiaroye Technology (FTT) stove was also transferred to Ghana under the project in partnership with FAO Fisheries Industry Sector. Further scientific research by the Project also highlighted the chemical contamination of smoked fish, specifically Polycyclic Aromatic Hydrocarbons (PAH), as a critical issue to address during the next phase of fish smoking technology development in Ghana.

SNV identified the capacity gaps of both the fish processors and the District Assemblies. Through the trainer of trainers approach, the Assemblies were able to support women in improving their businesses. This approach was important in ensuring local content and the sustainability of such support. Internal research findings on fish smoking in Ghana led to the training of 2,700 processors on hygienic fish handling and business management, with some expanding their businesses and accessing loans from MFIs as a result.

On the supply side, the Project restored 7 hectares of community managed degraded mangrove plantation. It also supported 9 private fuelwood suppliers to establish 9.5 hectares of sustainably managed woodlots of Acacia Mangeum, Acacia Siamia, Albizia and Eucalyptus. 20 hectares of mangrove landscapes were conserved through effective stakeholder collaboration and sustainable alternative businesses in the form of livestock for rearing, mango plantations, aqua-culture and woodlot plantations, with the potential for upscaling in the future.

SNV also worked with communities through a peer learning approach where success stories of sustainable mangrove management in neighbouring areas were shared with the target community. Through concrete evidence, people were more motivated to establish their own sustainable supply of mangroves on what were once degraded mangrove lands.

Figure 4: SNV and the Forestry Commission collaborated to help 9 private fuelwood suppliers establish 9.5 hectares of alternative woodlots

Figure 5: FYSSO Ghana, a local NGO, was supported by SNV to assist the Sota and Galotse communities in conserving 20 hectares of mangrove plantations.

LESSONS LEARNED

One barrier to the introduction and deployment of renewable energy technologies is their high capital cost. To overcome this, the Project sensitised financial institutions on the benefits of extending their services to support improved fish smoking. However, as this was a new line of business for them, they were not initially willing to lend from their own resources and so an on-lending approach was adopted with two of the MFIs, Mawumenyo Atsu Susu Company and Ada Rural Bank. The former had a well-structured collection system and was able to on-lend for the construction of 130 stoves, to re-lend from recovered loans for a further 20 stoves and, once confident of the market opportunity, to lend from their own resources for an additional 30 stoves. Ada Rural Bank, however, did not have a good loan recovery structure and was therefore only able to on-lend for the construction of 50 units. For similar engagements in the future, one critical criteria in selecting financial institutions should be the assessment of the institution’s loan recovery systems and capacity.

Another lesson learned was that the end-user response to microfinance was not always positive, with women in the Pru District having previously had negative experiences with MFIs and were therefore unwilling to take loans. They instead preferred a savings scheme but the project duration did not make this option feasible.

The price of the Morrison stove also changed during the project, from an initial Chorkor-equivalent GHs 600 to GHs 1,200 by the end of the project in December 2015, due mainly to increases in construction materials but also to a better understanding of the costs of doing business by the stove building company. These price changes impacted on the percentage of subsidy offered by the Project to each stove, with 50% (GHs 300) at the start being increased to 67%, in order not to overburden end-users with the higher price, but after beneficiaries were more aware of the stove this was reduced to 50% (GHs 600). Due to the high price it took more time than initially planned to achieve the target for demand and in some areas women opted out and reverted to the Chorkor stove. While material price changes are difficult to plan against, a more realistic price model for the stove could have been adopted to include a better assessment of SME operating costs.

For the scaled deployment of improved technologies, it is important to work with multiple providers. At the start of the project, Morrison Energy was the sole constructing company and although the SME improved with time it continued to experience capacity problems in terms of liquidity and the inability to pre-finance work, with resulting delays and failure to respond to demand. Additional companies were therefore trained in 2015 to build stoves but they needed more time and capacity building to enable them to meet demand. SNV also designed and built a second improved fish smoking stove but this was late in the project cycle and so was not deployed.

The project supported communities and private woodlot developers in establishing sustainable woodlot plantations for the fuelwood market and to conserve mangrove plantations. Proof of land ownership was essential but intended beneficiaries did not have registered land documents and so the Project had to assist them with this before implementing activities, reducing the number of beneficiaries that the project could support.

TESTIMONIALS

"Initially, I was using the traditional Chorkor stove. Over a year now, I have been using the Morrison stove which was introduced to my fish cooperative. Now the level of smoke and heat around the stove has reduced significantly. I have made a lot of savings from the firewood used". Grace Lumor, a fish processor at Keta.

"With the help of Mawumenyo Savings and loans, I have been able to pay for the Morrison stove conveniently and have even taken a loan to expand my business. Thank you SNV for helping our business". Philomena, fish smoker at Keta.

"I started as a carpenter, helping Morrison Energy to complete the trays of his stoves. SNV trained me to become a trainer for the construction of Morrison stove. I have trained 6 building companies comprising of over 43 artisans. I can boldly say SNV has made significant impact on my life. Through the help of SNV, I have established my own company with 7 employees. I have since constructed 55 stoves under the IFS project," Emmanuel Ahiatsi (MD, Ahiatsi Enterprise Services)

"Because of the interventions from SNV and their engagement with the micro finance, most of the women are independent. Initially, they will rent stoves to smoke their fish but now they all have their fish smoking stoves and can smoke at their convenience. Some have even expanded their businesses with additional loans" Edwin Atsu Apetorgbor (Managing Director, Mawumenyo Susu Atsu)

"We started the woodlot plantation in 2014 on marginal lands. We didn't know they will do this well because crops were not surviving but now the trees have matured to a certain stage where we are seeing the benefits. This is why we believe we need to sustain our efforts to get greater results. We now have the experience so even without external support, we can go ahead and establish our own plantation. Thanks to SNV and the wood development committee. Working together has been very beneficial," Dubatey Kpakpo (Private woodlot cultivator, Tepekope, Ada East district)

STANDARD DATA

The following is to be included with all case studies:

- Contract duration: January 2014 to December 2015
- Team composition: Number of SNV-staff 4, LCBs 4 and external consultants 3
- Number of PP-days invested per category: Staff 400 days, LCB 180 days, external consultant 60 days.
- Relevant partnerships: Keta Municipal Assembly, Ada East District Assembly, Pru District Assembly, Forestry Commission, Fisheries Commission, Ada Rural Bank, Mawumenyo Atsu Susu Company, FYSSO Ghana.
- Financial resources invested: EUR 444,800
- Client satisfaction and enhanced capacity scores: 70%