



Demonstration



Training Provided to Men



Firing Stoves



Stove Delivery by Moto-Remorque

traditional stove production business into a successful Improved New Lao Stove (NLS) business. Recently CFSP trained 11 female traditional stove builders to produce the portable and efficient Neo Kongrai Stove (NKS). Within one year, 5 switched completely to producing only NKS. The other 6 producers are still making traditional as well as NKS stoves. The stove producers were provided with moulds, templates, and grate punching tools and in some cases a mechanical grate press. The work of these women is monitored and supervised jointly by CFSP and Ms. Sim Pow, the first trainee. Over time, the quality of the stoves has improved and the volume of sales is increasing as a result of regular monitoring and follow-up. CFSP has been providing handholding support in terms of promotion, education and quality control, which has also been instrumental in creating a demand for these stoves.

Gradually, the trained stove producers phased out traditional stoves as they gained more skills in producing Improved Cookstoves (ICS) and became more confident in their entrepreneurship. As the demand is

increasing, Ms. Sim Pow and her elder sister Ms. Sim Sour took a leading role within their family to fulfill the ICS demand, looking after all aspects of production management from planning, resource mobilization, supervision and quality control. The family has set an example for women entrepreneurs in Kompong Chhnang Province.

Mrs. Ung Roun, who produced 150 traditional stoves per month before the training, now produces and sells 250 NKS per month. Similarly, an increase in entrepreneurial skills among other trained NKS women producers who have increased their stove production has been observed. They have also gained confidence in stove building, and are more self-assured in dealing with the ICS middlemen, NGOs and raw materials suppliers. Mrs. Roun also acquired a mechanical grate press to produce standard grates for mass stove production. All these trained women handle cash by themselves and get support from their male partners in communication and transportation. It is also found that the male partners do not interfere in their business or dictate their activities. Decision-making in stove production and acquiring raw materials is done by women themselves.

The men play mainly supportive, rather than leading roles by performing tasks like delivering stoves to middlemen, storing stoves, collecting fodder and fuel for cooking.

It is interesting to note that many of the innovative ideas emerged from the



By Boat

Ms. Sim's family is producing around 400 Neo Lao Stoves (NLS) per month. After four years of work, the family was able to demolish their old house and build a new one. The new house was equipped with a zinc roof, and an expanded working area with more tools. We observed that their life style and living conditions were changing and they seemed comfortable. They also acquired moto-remorque, a trailer pulled by a motorcycle, to deliver stoves.



women stove producers, as they are also the ultimate users of the stove. Based on this, they scaled up or down the improved stove model based on local demand and produced eight different NLS sizes. Around 4000 NLS are being sold per month.

Based on the Methodology for Participatory Assessment (MPA) on ICS Programs and Household Fuel Consumption Test (HFCT), it was reported that women are decision-makers in selecting the stoves for cooking, and accrue other benefits as well. Women benefited from reductions in the amount of fuel needed, in cooking time and in discomfort as the new stoves do not give off excess heat, and emit less smoke compared to traditional stoves. These stoves provide around 23 % fuel savings in real field conditions, based on the 20 household fuel consumption tests carried out in Phnom Penh. Food shop owner Ms. Veal Hour of Phnom Penh reported that she saves 1.5 kg of charcoal per day by using NLS compared to using traditional stoves.

SUSTAINABLE CHARCOAL PRODUCTION

Charcoal production is considered a man's job and the raw materials are

illegally harvested from national or protected forests by the charcoal producers who use traditional kilns. Raw materials are mostly downed tree trunks.

A 200 L oil drum acts as a simple kiln for producing charcoal. But with this method, only small diameter wood or branches and twigs (normally under 8 cm diameter) can be used; full-sized logs do not fit efficiently in the drum and it is not technically viable to operate using them.



Raw Materials for Charcoal



Horizontal Drum Kiln

CFSP incorporated this simple technology in the national sustainable charcoal training programme and integrated this with the existing Community Forest programme under the managerial role of the local community and the Community Forest Development Association of Ang Tasom, Takeo Province. Both men and women were involved in this training, but out of 16 participants, only two were women. During silviculture practices, enough fuelwood was collected from pruning, thinning and singling, and converted into charcoal. These pruned twigs and branches do not get a good price if sold directly as fuelwood. People prefer hard wood and special sized fuelwood if they have to buy it.

THE IMPACTS OF SUSTAINABLE CHARCOAL TECHNOLOGY

Mrs. Dara, who was a stone crusher, changed her profession to charcoal kiln operator and her husband supports her by taking care of the raw material collection. Now Mrs. Dara operates 8 oil drum kilns, producing more than 320kg of charcoal and earning a minimum of 56,000 riel per day. If they worked as stone crushers,



Charcoal Produced from Drum Kiln

Ms. Hounng Sokha, a participant of the training, is a community worker involved in tree plantation and forest management for Kompong Chhnang Province, and also is conducting trainings for local men and women to produce charcoal using oil drums.

Mr. Tin Dara, by profession a stone crusher from Poipet Province, learned the technology for charcoal making under the training programme. He was provided a 200 L drum that cost US \$5 by ZOA, an INGO working for refugees. Mr. Dara started a charcoal production business by collecting raw materials from cleared lands. His business expanded with support from his wife, who he trained in horizontal drum kiln operation. Once Mr. Dara could buy his own oil drum, ZOA took the drum supplied to him and gave it to another entrepreneur. Mr. Dara trained his fellow friend and now ZOA's oil drum is moving from one household to another as they are able to buy their own supplies from the profit made from charcoal production and sales. This is how the technology is being transferred from household to household with the encouragement of an NGO and the Project.

they could earn only 16,000 riel per day each. If someone asks her how her business is, she looks at her hands and tells how she suffered during the time she worked as a stone crusher. She is happy to see her hands are not as dry and cracked as they used to be.

Small-scale charcoal making benefits not only local women as an income generating activity, but also is environmentally benign, as by design, the unit does not allow for the use of big trees and logs. The charcoal produced from this technology is smaller in diameter and better quality as a result of higher carbon content due to a higher temperature inside the kiln. The users who buy this charcoal report that they save time and fuel using the smaller charcoal. They do not have to spend time breaking big lumps of charcoal into smaller pieces making it ready to use.

This shows how two laborers changed their roles from stone crushers to successful charcoal entrepreneurs. They can also claim the title "sustainable charcoal producers" as they do not *cut* trees illegally from national forests as traditional charcoal

producers do and they use traditional kilns.

B I O - D I G E S T E R C O N S T R U C T I O N A N D B I O G A S U T I L I Z A T I O N

Construction work in Cambodia is mostly confined to men, and women act in supportive roles as unskilled labor. CFSP organized a national training programme on bio-digester construction, and out of 17 trainees, only one woman attended. In bio-digester construction, both skilled and unskilled laborers are required.

In many cases, women are the primary care-takers of pigs and men are mostly involved in services. It is quite a burden for women to take care of pigs' manure that normally spills into nearby canals and ponds. Pig breeders realize that a bad smell around their home is a nuisance to neighbors and are afraid that if pig breeding is practiced without good sanitation, maybe one day there will be a pig flu similar to the current bird flu. Thus, they are very concerned about hygiene and cleanliness around the pigsty. Women learned how to mix properly the droppings and

water, operate, and maintain the biogas stove and valves.

T H E I M P A C T S O F B I O - D I G E S T E R T E C H N O L O G Y

Unlike South Asian countries, where reducing the workload is counted mostly by time spent collecting fuel wood, in Cambodia the biogas sector is now focusing on pig breeders with the primary objective of keeping the pigsty clean and reducing a public nuisance. The secondary objectives are producing energy for cooking and replacing chemical fertilizers with biogas slurry.

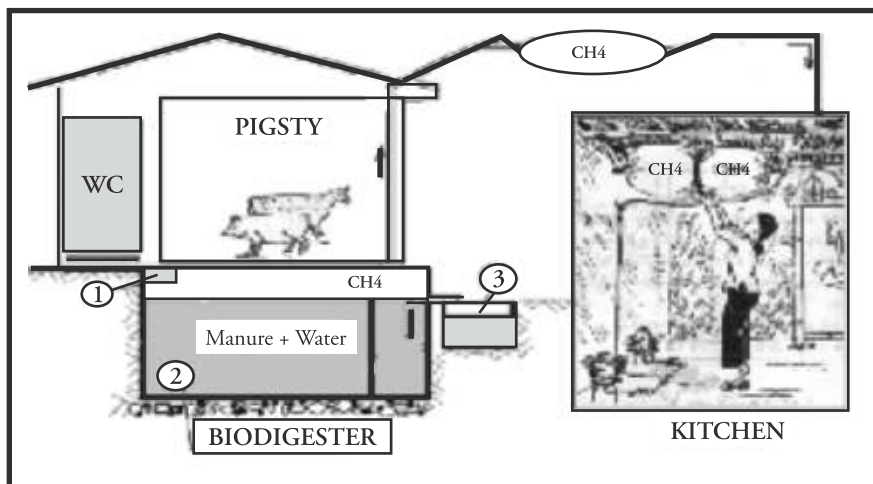
It was found that almost all pig farmers with bio-digesters installed with toilets (around 14, a box type with concrete slab) have clean pigsties and improved kitchens. The cooking is done while standing and all the necessary ingredients and utensils are stored near the stove. They have reported significant reductions in cooking time, charcoal and fuelwood use, and the saved time is used to take care of the pigs, and mix water with the pig manure. They have reported that their kitchens are smokeless. Some households also installed a



Gas Reservoir



A Complete Set of Bio-Digester



refrigerator by converting a kerosene-fired refrigerator into a biogas-fired one and reduced electricity costs by \$12.50 US per month.

CONCLUSIONS

Women of Cambodia are recognized not only as primary biomass energy

users but also producers, and the experience of CFSP demonstrates that biomass energy can be used as a tool for empowering women. With support from their male partners, they could acquire awareness, self-development, access to better, cleaner and cheaper energy, and could control household savings and make

decisions. In this gender issue, civil society also plays a constructive role in the involvement of women and men in development work towards a sustainable livelihood and entrepreneurship, which is well demonstrated in Cambodia. *glow*

GENDER IN KITCHEN IMPROVEMENT

The Case of Aanpghari, Baluwa Kavre Nepal



H. B. Khoju Shrestha

Rural Community Development Society (RUCODES)

Jorpati, Khatmandu, Nepal

Tel: 977 - 1 - 4481166

E-Mail: rucodes@ntc.net.np

INTRODUCTION

Kitchen improvement program is a holistic approach for overall development of women, children and other family members. It can directly address issues related to acute respiratory infections (ARI) amongst children and other diseases caused by exposure to smoke among adults, especially women; food and nutrition; domestic energy use; and environmental health and sanitation. The issues of indoor air pollution, biomass crisis, gender discrimination and environmental degradation are closely related. Kitchen improvement addresses all the above issues and by utilizing locally available resources, can bring about sustainable improvement in quality of life. This article highlights the findings of a project on Kitchen Improvement implemented by RUCODES (Rural Community Development Society), an NGO working with the rural communities of Nepal.

BACKGROUND

With the advent of freedom in India in 1947 and in Nepal in 1950, the concept and practice of Gramin Vikas (Rural Development) started taking root in India. Its influence has also extended to Nepal, culminating in programmes like Ghandhi Charkha Maha Guthi and others. The Nepal improved cookstove program (ICSP), which was based on the Indian model, was launched in the 1950s. However, due to various reasons including lack of appropriate technology, wide variations in topography, socio-cultural and economic settings, many of the programmes including the ICSP, non-formal education, adult

literacy, skill promotion trainings, and tree planting, did not perform satisfactorily up to the 1980s. Many of these activities were in the nature of trial and error exercises. However various organizations, government, non-government and private sectors continued to make efforts to promote them over the years. During 1980s, the HMG/N (His Majesty's Government of Nepal) spelt out ICSP as a development strategy for fuelwood conservation, and with FAO support, the Community Forestry Development Project (CFDP) was launched in 1981. Similarly, other organizations like RECAST TU (Research Center for Science and Technology Tribhuvan

University, Nepal); Agriculture Development Bank, Nepal; government forestry offices; NGOs; INGOs; GTZ; CARE/Nepal; have also been involved in ICS promotion to conserve the environment.

In its historical development of ICS starting from the 1950s, the HMG/N affected a national policy to install 250,000 ICS in the mid hills of Nepal by 2007, with the support of ESAP-DANIDA (Energy Sector Assistance Programme) and other donors. Up to December 2003, 150,000 ICS have been installed through various agencies and partnerships like CRT/N, RUCODES, CSD, NCDC, DCRDC etc. ICSPs for the high

mountains of the Himalayas and the plain areas of Terai are still in the pipeline. In all of these programmes, comprehensive kitchen management has not yet been integrated with ICS.

ENERGY SCENARIO IN NEPAL

In Nepal, the household sector is the major consumer of energy, *Table 1. Energy Consumption Pattern*

Energy Consumption by Fuel Type	%
Fuel wood	75.78
Animal waste	5.74
Agricultural Residue	3.75
Petroleum Products	9.24
Coal	3.53
Electricity	1.47
Renewables/others	0.48

Source: Prof. J.N. Shrestha, 2003

accounting for 89.05% of the total energy consumed by all sectors. 84% of the population of Nepal lives in rural areas, where fuel wood, agricultural wastes, cow dung, leaf litter, and dried forage are the main sources of energy for cooking. Among rural households, cooking accounts for as much as 65% of the energy consumed, followed by space heating (8%), agro-processing (3%), water heating (2%) and lighting (1%).

The kitchen in rural areas of Nepal is a multi-functional open area, mostly in the ground floor of the house, shared by kittens, livestock and fowl. Tasks like agro-processing, food preparation, cooking, socializing, dining, and cleaning are carried out in the same area. Hence, the ground floor is actually the kitchen plus an open area.

A TRADITIONAL RURAL KITCHEN IN NEPAL

As evident in *Diagram 1*, the traditional kitchen is damp, full of smoke, and serves as a storage space for agro-inputs and outputs. Almost all household activities are carried out in this area. The open cookstove is at one dark corner of the room, which has small windows providing some ventilation but hardly any light. The windows are intentionally made small, for safety against thieves and wild animals. Other kitchen wares like utensils, water jars, fuelwood, dishes, plates, grinding stone, and kitchen knives are dumped in the same room here and there without fixed placement. Food preparation, washing and cleaning are also done in the same room. Children, puppies, lambs, kittens, chickens all roam around the kitchen wares and food in the same room. Even livestock like

goats, small buffalos, cows, and fowl are accommodated in other corners of the room openly. This is the general kitchen situation in the rural areas of Nepal.

THE ARECOP KITCHEN IMPROVEMENT PROGRAM

The ARECOP Kitchen Improvement Program focuses on the above problems related to the design of traditional rural kitchens, and is aimed at improving the kitchen environment through appropriate, low-cost interventions. To achieve kitchen improvement objectives, in 1996, ARECOP organized an international workshop on Indoor Air Pollution and Health for ICSP, at Dhulikhel in Nepal, with the cooperation of CRT/N and RUCODES as field-based NGOs. The two NGOs carried out an in-depth study on traditional kitchen

Diagram 1. Kitchen Management Before Intervention

