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FIELD CASE STUDIES

Case Study 1

In 1985, RECAST installed 50 *Tamang* Stoves in Hokse Village, 25 minutes walk from Palanchock Bhagawati in Kabhre District. Because of the iron quadripod used in the stove construction, people found it suitable for cooking their staple food or *dhindo* (maize porridge). During the construction of the stove, the iron quadripod was driven into the ground to give a firmer foundation so that it could withstand the force exerted while stirring cooking *dhindo*. At the time of installation, a large number of villagers were, however, asking for such stoves. At that time there were 40 stoves in one area of Hokse Village alone, making it easy to study the impact and effectiveness of the distributed stoves. However, after six months the *Pradhan Pancha* came to RECAST with an application for 62 *Brahmin* and *Chettri* households which were willing to pay Rs 60/- per stove and from 200 *Tamang* households which were willing to pay Rs 20/- to Rs 30/- per stove. He also claimed that they had threatened not to vote for him and to smash the chimneys of the stoves already installed if *Tamang* Stoves were not installed in other villages and wards. This application was forwarded to the CFDP and then to MFSC, but no action was taken because it was claimed that Kabhre did not belong to the CFDP site.

The Family Planning and Parasite Control Project, based in Lainchaur, has a project at Panchkhal where they installed 13 *Tamang* Stoves in 1987 with the help of RECAST in an attempt to create demand in that area. After one month, 15 more stoves were installed. Later the demand grew and a policy of charging Rs 40/- per stove for those affiliated with the project and Rs 70/- for those not involved with the project was adopted. More than 200 stoves have been installed and installation continues.

In 1989, it was also observed in Hokse that some of the stoves (around 8) were removed from *Tamang* households and reinstalled in *Brahmin* and *Chettri* households; the installer was paid Rs 60.

Case Study 2

In 1990, with the help of the Centre for Rural Technology (CRT) a training programme on ICS construction was organised by the ADB/N in Western Nepal under the Environmental Project. With grants from UNICEF, SFDP, and WDS, ICS are distributed free of cost. Recently, a policy of charging a certain amount of the cost to the users has been adopted. The charge differs from one place to another. An interesting approach adopted by the SFDP in Western Nepal involves paying the trained ICS installer (farmer) in full for a certain number of stoves; he then takes full responsibility for promoting and constructing *Tamang* Stoves. This approach initiated the privatisation of ICS production and distribution. Users are charged about Rs 40/- per stove. The chimney is constructed out of a mould of mud and brick and these installations have been successfully carried out in Palpa. Where proper construction has been lacking the CRT discontinued the programme for a period of time.

Case Study 3

During the 1988 survey, in three districts covered by the TCFDP, namely, Dhanusha, Chitwan, and Rupandehi, it was observed that 70 per cent of the Insert Stoves installed in 1986 were in use. The lowest use was in Dhanusha (34%) followed by Rupandehi (44%). In Chitwan District, 75 per cent of all the stoves installed in 1987 were in use. In Chitwan there were many complaints about unavailability and the use of 'source and force' in acquiring ICS.

It is learned that, some years ago, in Bharatpur in Chitwan District, Insert Stoves were installed at a cost of from Rs 135/- to Rs 150/- per stove by a private installer, Mr. Kopila, who had previously worked as an installer for the CFDP. More than 350 stoves were installed by him.

Case Study 4

In 1990, the TCFDP started a pilot stove programme in Judibela and Saruwatha villages of Rautahat District. These two villages are quite distinct from each other. Judibela lies to the north of Rautahat and fuelwood is collected freely from the nearby forest, while Saruwatha lies to the south of Rautahat where fuelwood is quite scarce and dung is the principal fuel used for cooking. The main objective in selecting these two villages is to determine the impact and effectiveness of improved local mud-stoves in both freely collected firewood areas and areas where firewood is scare.

It was observed that more than 100 improved single and two-ring mud-stoves without chimneys were constructed in Saruwatha Village, while in Judibela the response to improved mud-stoves was not enthusiastic. There, firewood is freely available but actually the villagers were more interested in different sized Insert Stove with chimneys. Through the local Nepal Red Cross, 50 Insert Stoves were installed. In Saruwatha, the improved mud-stoves were installed at the cost of Rs 5/- to Rs 20/- per stove. The TCFDP pays Rs 15/- for construction of the single-ring mud-stove and Rs 20/- for the two-ring mud-stove. The project also provides a metal grate worth Rs 8/-. The total cost per stove for the TCFDP is from Rs 23/- to Rs 28/-. It was observed that women who have received training are promoting the stoves which are a modified version of the traditional mud-stove. These stoves also helped to improve the suitability of kindling such as dung-sticks and agricultural residue. The stove is also portable and can be installed outside or inside depending upon the season; it also holds different sizes of cooking pots.

In the promotion of these cooking-stoves, two households were chosen for a kitchen performance test. A certain amount of fuel was given to cook a given quantity of food on the traditional stove for one day and on the improved two-ring stove for another day. It was found that in cooking the same amount of food (rice, potatoes, onion soup), the specific daily consumption of dung-sticks and soft wood was 1.16kg per head on the traditional two-ring stove whereas, on the introduced improved two-ring stove, it was 0.623kg. The perceived fuel saving was around 46 per cent; the improved single-ring mud-stove saved around 44 per cent.

Further Field Observations

A case was observed in Jumla in 1984, with a metallic stove having a 6.6m long metallic chimney and which consumed 37kg of fuelwood to cook a meal for 9 persons. The stove had no baffle but had a damper on the chimney; the cook, however, never used the damper to control the fuel. All

the heat was directed into the second ring or into the chimney. The stoves were in the quarters of the Jumla Technical School.

Recently, a technical evaluation survey of the SCF-USA-installed mud-n-brick ICS with a ceramic chimney, at *Ilaka* No. 1 in Gorkha, was conducted. It was observed that the majority of stoves were not well installed and because of this the stoves did not perform well in terms of fuel saving. In most cases, the housewives themselves constructed the stoves according to instructions received, or by observing the installed stoves of their neighbours. In one village, out of 30 stoves distributed, only 10 stoves were installed.

Lessons Learned from the Case Studies

Acceptance of ICS depends upon the economic status of the people. If fuel supplies are predominantly non-commercial and fuel is available free of charge, the incentive for consumers to invest in ICS is minimal. Open fires (three stone/iron tripod), which are highly inefficient, or other simple traditional stoves are still being used by the majority of households. The governmental, non-governmental, and bilateral and multilateral organisations are still hoping for a large-scale introduction of energy efficient ICS in an effort to reduce the rate of deforestation and prevent the impending household energy crisis.

Lessons drawn from the case studies and field observations are highlighted in the following points.

- The priorities of rural women vary a great deal. Saving energy is not their top priority.
- Some stove designs are not based on women users' priorities.
- In many areas, particularly in areas with good agricultural production, agricultural residue and dung-sticks, rather than firewood, are the principal domestic cooking fuels.
- Traditional stoves used for cooking animal feed need to be replaced by ICS.
- Mass adoption of unifocal ICS needs to be replaced by broader-based development projects in which ICS are integrated as a component, e.g., improved kitchen conditions and sanitation, extra-income generation, biogas for lighting as well as cooking, kitchen gardens, and agro-forestry. Good examples can be taken from SFDP and WDD programme activities.
- Until now, the distribution of ICS has been either free or on a subsidy basis in rural areas. The distribution of ICS through commercial channels is more likely to succeed more rapidly in the monetised urban and semi-urban areas where fuelwood is purchased rather than collected.

Organisation and Institutional Back-up Unit

RECAST has been involved in R & D activities on cooking-stoves for several years. It can be considered as a pioneer in current ICS developments. As a result of R & D efforts, various models have been designed for the mid-hills and rural areas of the *Terai* and some of them are

propagated by different distributing organisations. RECAST also acts as a technical back-up unit with involvement in training, refresher training, technical services, evaluation, analysis, field testing, and monitoring. From 1982 to 1984, regular interactions took place between RECAST and other cooking-stove distributing agencies. On request from such agencies, RECAST provides technical support for the effective implementation of the cooking-stove programme.

Factors Affecting the Adoption of ICS

The ceramic ICS faced serious problems regarding its durability during transportation and also the availability of good clay deposits. The cooking-stove body was upgraded by conducting some tests for clay and by adding ceramic powder, fine sand, and talc. But these improvements were confined only within the laboratory, as the potters did not accept these mixtures for working on their traditional pottery wheels. As it is, the ceramic ICS tends to crack and break during thermal expansion and to contract during cooking. Some of the factors that affect the adoption of ICS are given below.

- o breakage of stove parts
- o blocked chimney
- o installed in wrong place and back draught
- o more time required to heat the second pot
- o not large enough for the family
- o need for space-heating during winter (cold season)

Current Issues

Various organisations have distributed and installed ICS in selected rural areas of Nepal. However, these are not suitable for all ethnic and geographical regions or for development regions. Economic stoves for cooking commercially in restaurants, army and police barracks, student hostels, and cottage industries (e.g., hand-made paper) are yet to be developed but thorough field investigations are necessary to optimise the designs. R & D work into further improvements is needed if wider acceptance of ICS is to be accomplished. For example, the ICS distributed by various organisations at present may comply with the appearance of improved models but not all of them have the same efficiency. The present models of ICS with ceramic chimneys, no doubt, are economical but in the high mid-hills and mountains, where space heating is achieved by burning wood during the cold season, these stoves are not as successful as open fires (*agenu* or iron tripod). In Nepalese society, long logs of fuelwood are widely used for cooking and short logs are hardly used at all. ICS has a smaller wood-feeding outlet in comparison to traditional stoves. Because of this it does not hold logs that are crooked in shape. Use of short sticks and logs will probably improve energy management during cooking and will help in the design of efficient cooking-stoves.

Because of non-uniformity in the distribution approach and the strategies of various distribution, expectations of free gifts of ICS, free installations, and free maintenance and repair (chimney pipe cleaning) have been raised. This has a negative impact even on those who are potential buyers.

There is, as yet, no institution with overall responsibility for ICS R & D and field implementation. Presently, ICS programmes are implemented through various organisations under the Ministry of Forest and Soil Conservation, the Ministry of Health, and the Ministry of Local

Development. The need to strengthen such institutions, with support and policy guidelines, has been felt. In terms of stove promotion, the current level of publicity has not attracted wide attention among potential users.

Constraints and Opportunities for the Development of ICS Projects

On the basis of the discussions presented above, the major constraints for the development of ICS programmes in Nepal can be listed as follows.

- ICS technology is a very complex one, especially in the context of Nepal. A single cooking-stove has to perform so many tasks; for example, fuel saving, space-heating, lighting, smoking for insect control, use of different sizes of pots, and preparation of different kinds of food, including maize and bread (*roti* - which has to be baked first on glowing charcoal). In addition to performing all these tasks the cooking-stove should be cost-effective.

- There is a lack of extensive and continuous research and this holds back the stove programme in terms of fulfilling users' needs.

- Interactions between researchers and extension agencies are negligible and hence, also, the subsequent transfer of technology.

- There is a lack of quality control on production sites, resulting in the production of low quality stoves. Stoves are also too heavy and fragile for transportation over rugged terrain. Distribution is also hampered by the lack of skilled installers.

- There is a lack of interaction between researchers and policy planners. This is one of the reasons why the necessary funds are not made available.

- Little effort is made to popularise the ICS at the village level. Except for a few villages, the promoters do not conduct promotional or maintenance visits and repairs are not carried out. The promoters felt they should be provided with transportation and a field allowance in order to work in the field.

Energy and environmental concerns are being given high priority attention in developing as well as in developed countries. Rapid deforestation has resulted in a significant loss of biomass productivity. Patterns of energy use are changing rapidly in urban, semi-urban, and even in rural areas in Nepal. As fuelwood prices rise, there is a growing tendency to use kerosene and even electric heaters. The problem for the rural poor is that they are unable to switch from biomass fuels because of the prohibitive costs of other forms of fuel. Thus, fuel conservation is the only option for the rural poor.