

EcoHimal Nepal

An Environment Conservation Pilot Project - Improved Cooking Stove (ICS) 12 month Project Report 1st July 2016 to 30 June, 2017

A. Summary:

The Pilot phase of "An Environment Conservation – Improved Cooking Stove (ICS)" in Chepuwa and Hatiya Village Development Committees (VDCs) of Sankhuwasava district from 1st July, 2016 to 30 June, 2017 in financial support of The Glacier Trust (TGT), UK is in- progress to complete. Due to extreme labor shortage we could not fabricate stove on time and installation has been postponed.

The pilot phase was designed to explore the impact of improved cook stoves (ICS) on fuel consumption, smoke emission, and health of women (cook) in selected 30 rural households of the project area. But, assessment of the impact of ICS is not possible within the project time framework. It has been delayed and will be conducted after summer. The project management will research, test and demonstrate the developed model full metallic ICS in the project area.

On the basis of geo-ecological structure and atmosphere of the project area, 30 model ICSs designed and developed in coordination with National Structures Pvt. Ltd, Patan, after several research and observation of available ICSs in Nepal. The transportation of the fabricated ICSs to the project site has been under plan of transportation.

An inclusive training manual developed and local household have been trained on various issues like forest conservation, climate change and book system of potato cultivation, proper ICS use, Slash and Burn agriculture along with indoor air pollution's health impacts and indoor hygiene practices etc. In total, 460 local households (HHs) have been trained under special package training and awareness program.

Table 1: Detail of Special Training Package

S N	Titles of Trainings	Participation of Local Community			Remarks
		Male	Female	Total	
1	Training on Forest Conservation, Climate Change and Book System of Potato Cultivation	60	16	76	
2	Training on Forest Conservation, Climate Change and ICS use	71	34	105	
3	Training on Slash and Burn Agriculture and Forest Conservation	63	11	74	
4	Training on Forest Conservation and Climate Change	114	29	143	

5	Orientation to CFUGs on Forest Conservation, Slash and Burn Agriculture and Climate Change	50	12	62	
Total		358	102	460	

The ICSs will be installed in selected 30 HHs of project area, will be tested locally along with users' response. After installation of ICSs, feasibility, suitability, efficiency, effectiveness and affordability of ICS will be assessed, monitored and evaluated at local level. Appropriateness of the stove for this environment will be tested, if necessary modifications will be done in future. The criteria for assessment are:- clean, reliable, affordable, efficient, and safe home cooking and heating practices that reduce people's exposure to indoor air pollution. The developed and fabricated ICS may be a sustainable model in the rural areas.

Goal & Objectives Achieved:

Goal

To support environment conservation promoting ration use of natural resources

Out of 1372 HHs (817 HHs in Hatiya and 555 HHs in Chepuwa) , 460 (33.53%) HHs have been trained and oriented on environment conservation issues especially on forest conservation, slash and burn agriculture, book system of potato cultivation linking it with soil erosion and degradation of pasture forest. The installation and use of full metallic ICSs in targeted HHs will reduce firewood consumption and indoor air pollution. Less fuel consumption in ICS than traditional stove surely support in environment conservation promoting rational use of firewood.

Objectives:

Appropriate model of improved cooking stove tested and demonstrated:

30 model ICSs have been developed and transported to the project site. 30 HHs ([Annex 1](#)) have been purposively selected considering the first round (pilot) intervention as well as cook stove adoption decisions. Model ICSs will be distributed to the selected HHs for test and demonstration. The socio-economic profile of selected HHs will be prepared for further assessment. The standards of test and demonstration will be:

- Use of ICS and condition of kitchen
- Influence of ICS to change traditional stove
- Satisfaction level of ICS users
- Overall experience of ICS compared to traditional stoves
- Smoke emission and Indoor air pollution
- Time required in cooking food using ICS compared to traditional stove
- Health condition of the household members in the last 30 days

Reduce Firewood Consumption promoting efficient ICS

After installation of ICSs in selected HHs, monitoring/test will be carried out and will quantify the firewood consumption decreased or increased in comparison with traditional stove. The beneficiaries HHs will be requested to record fuel consumption and time spent in cooking food in ICS increased or decreased compared to the traditional stove.

Local communities are aware on forest conservation, soil erosion and its effects on environment.

398 HHs have been trained on forest conservation, climate change, Book System of potato cultivation and slash and burn agriculture with “an one-day long training, each hamlet”.

76 heads of HHs have been trained on Forest Conservation, Climate Change and Book System of Potato Cultivation ([Annex 2](#)). Likewise, 74 HHs have been educated on Slash and Burn Agriculture, its impacts and forest conservation ([Annex 3](#)).

They have been aware on integration of forestry into conservation planning. They have been able to formulate natural resource management plan linking forest conservation practices and measures. Awareness of local communities on the effects of the natural resources over-utilization and potential need for practice improvement has been improved.

Outputs:

Output 1: Where clay stoves cannot be used, appropriateness of metallic model of ICS is analyzed and recommended for installation in wider range in local area.

Full metallic ICS was designed and developed considering the stove requirements for mountain areas. The thermal issues like indoor air pollution control, ventilation and illumination were the prime focus while developing ICSs for the project area. EcoHimal Nepal coordinated with various organizations and companies working on ICS fabrication in Nepal.

To replace traditional stove with ICS convincing local communities was a challenge. In order to meet the requirements of ICS and influence the local people, we have conducted deep research and coordination with organizations working in ICS sector. In the project area, in the traditional houses, a three-stone open hearth is commonly used for both heating and cooking purposes, with the accompanying smoke filling the room. Smoke and soot emitted by an open fire is positively perceived by the local communities with the belief that it strengthens the life of wood used inside of house.

In such context, appropriate full metallic model of ICS has been developed in coordination with National Structures Pvt. Ltd, considering both cooking and heating need and transported to the project area. The developed ICS with 3 mouths is suitable for mountain area to heat/warm the kitchen and for speedy cooking. Most of the hamlets/villages of project area, it becomes so cold in the winter that people do not venture outside for several months.

After installation, the efficiency and effectiveness of ICS in meeting the project’s objectives will be tested. And with the proofs and case studies, the model ICS will be replicated and recommended other HHs in and out of the project area.

Output 2: Techniques of proper installation and use of ICS transfer to model households.

A video documentary has been prepared in coordination with National Structure Pvt. Ltd. The human resources involved in fabrication of model ICS are explaining the installation steps with several informative techniques. They have visibly illuminated the ICS parts and function /position in the video. They have clarified, in the video, the issues like:

- How to fire inside of ICS
- Safety measures
- Cleaning of parts
- Advantages of ICS
- Firewood use to reduce quantity
- Use of ICS ingredients
- Water heating facility

30 households will be trained and oriented on proper installation. One day training and orientation with installation practice is planned before installation of ICS in targeted HHs.

Output 3: Selected community members are educated on forest conservation.

460 HHs in the project area have been educated on forest conservation linking it with climate change and its relation to people's daily lives and long term effect to the upcoming generation. A holistic manual¹ ([Annex 4](#)) has been developed and dissemination of information on forest conservation by promoting ICS use has been done at local level. Solely, 143 HHs have been made aware on forest conservation and climate change. ([Annex 5](#)). Relating Forest Conservation and Climate Change with ICS use, 105 local HHs have been educated organizing trainings at 7 venues in the project area. ([Annex 6](#))

Output 4: Local CFUGs are sensitized and empowered for natural resources management and bio-diversity conservation

Members of 6 Community Forest Users Groups in the project area have been oriented on natural resources management and bio-diversity conservation. At total, 62 members ([Annex 7](#)) including 12 female members have been sensitized on forest management and conservation. They were oriented on:

- skills and knowledge related to forest management, protection, active utilization, group dynamics and management and awareness to the rules and regulations
- Current problems and sustainable solutions
- Group institutionalization

Output 5: Community members are sensitized on health issues relating to air pollution in the home

Local community people have been oriented on health hazards due to indoor air pollution. The participants were benefitted with a higher level of awareness on social, health and environmental issues associated with ICS. They have been educated on impact of indoor air

¹ The manual is in Nepali Language

pollution that resulting ambient smoke causes respiratory problems, eye infections and has other seriously deleterious effects.

B. Activities carried out:

1. Coordination with various organizations/companies :

Coordination with several organizations, fabrication factories/companies and observation of various improved cooking stoves (ICS) modalities and items have been conducted to develop a feasible ICS for Chepuwa and Hatiya Villages. The project management has visited and conducted research on its feasibility in rural mountain areas. The coordinated organizations/companies are:

1. Center for Rural Technology
2. Ajummery Bikas Foundation Pvt. Ltd
3. National Structures Pvt. Ltd
4. Swostha Chulo Nepal
5. Evan Energy Solution Pvt.Ltd
6. Environmental Camps for Conservation Awareness (ECCA)
7. Future Now Pvt. Ltd. Nepal
8. Nepal Energy Development Company Pvt. Ltd

2. Design appropriate model of ICS

In coordination with National Structures Pvt. Ltd after several meeting, physical observation, practical tests at various organizations, a model full metallic box type three pot holes improved cooking stove with chimney has been developed. Sharing of technical ideas about improved cooking stoves (smokeless/not smokeless) from the organizations and companies have been incorporated in the design.

This is similar to mud-stoves but made from metal to provide clean cooking and to allow space heating as well. There are three potholes and a slot for baking bread with water heating facilities. Adjustable air vent in the main door allows regulation of air flow and damper in flue pipe allows transfer of heat efficiency towards cooking pots. We are sure that this model will be good for cooking, water heating and space heating and saves fuel wood consumption. The features of the stove are:

- 17" x 28" three holes stove
- Round ring in the combustion chamber with revolving mechanism (a connected rod to move the ring)
- Fire wood input hole in about 45 degree (bend instead of straight) to encourage users to use small firewood and to close the doors (firewood input)
- Four side 16g sheet for protection while transportation
- Damper box 3mm.
- 12 feet (3 pcs) chimney pipe 18g to outlet the smoke outside the kitchen.
- 6" Legs seated for easy cooking (standing)
- Water heating pipe (cold water input and hot water output)

3. Selection of HHs for Piloting ICSs (30 HHs)

30 Households have been selected for model ICS installation. While selecting households, committed for proper utilization and test as well as medium sized families were prioritized. The selected HHs have contributed NPR 2,000.00 as matching fund (with the purpose of transportation).

4. Capacity building training on installation and use of ICS

Training manual and a video documentary on installation and use of ICS has been prepared.

The manual and video have covered:

- Proper installation of Stoves
- Use of improved stoves,
- Firewood saving and efficient cooking technology
- Improved lighting, air circulation and smoke extraction
- Storage of firewood
- Prescription for safe use and management of ICS
- Kitchen hygiene management
- Health and climate impacts of traditional stoves and improvement through ICS

5. Training on Forest Conservation and Climate Change: Training to educate local community on forest conservation, degradation of high pasture forest, climate change and its relation of forest and people's daily lives and long term effect to the coming generation has been conducted in coordination with Makalu Barun National Park.

6. Indoor air pollution and its impacts on Health: Awareness-raising of local people on effect of indoor air pollution and on indoor hygiene practices has been conducted.

7. Sensitized and empowerment of CFUGs: Community Forest Users Groups have been sensitized on forest conservation and natural resources management.

8. Training on Slash and Burn Agriculture and Forest Conservation: Special training and awareness program on Slash and Burn agriculture practices has been delivered to the local communities.

9. Training on Forest Conservation, Climate Change and Book System of Potato Cultivation: Awareness-raising on soil erosion, water penetration, 'bookie' system of potato cultivation etc. has been done in-coordination with Makalu Barun National Park.

C. Significant Changes:

Timeframe Deviation: As per the project document and plan, the project was framed to complete within 30 June, 2017. But, research for appropriate ICS model design, finalization and fabrication took more time than expected. The early summer and local election (in 1st phase, labor in fabricating factory disturbed and in 2nd phase, local community disturbed – nearly 3

months hamper in project implementation) also delayed the transportation and installation of ICS in the project area.

Target Beneficiaries Deviation: In the project document, it was planned to do piloting of 76 ICS (6 households 1st phase and then 75 HHs 2nd phase). In the course of project budget formulation and implementation, 30 HHs were fixed for piloting of ICSs. As per the budget estimation, 30 HHs have been selected and planned for installation of ICS.

D. Monitoring and Evaluation of the project:

The project management has conducted several research and observation of ICSs available in Kathmandu. Project implementation guidelines and orientation on conduction of activities (especially trainings and orientation in field) was delivered to the responsible staff by the project manager. The monitoring format and guidelines were provided to staff and he used to share the progress by phone and feed backs on the implementation were given to him for effectiveness and tracking.

E. Difficulties

- High labor shortage during stove fabrication due to local election of different phase.
- Local people were disturbed by the local election during peak hours of project implementation.
- Due to lofty engage of local communities in farming (before election), the training conduction became so difficult. Our staff made home visit and conducted small hamlet focused training.
- Due to business of factories in manufacturing of houses and schools' hardware structures for post-earthquake reconstruction, it was hard to convince and engage them in model ICS fabrication. We have done lots of efforts - day to day conversations with factory management and labors as well, weekly visit and motivation for labors for speedy work completion.
- Due to early summer began; transportation of ICSs became challenge and delayed in transportation.

F. Lessons Learnt

- ICS Programme should be demand driven and need based.
- An in-depth feasibility study which looks carefully into the various interrelated aspects (poverty-alleviation, gender, cost-benefit calculations, lifestyle improvement, technical efficiency, environmental impact, policy) which affect the implementation process will be instrumental in assuring adequate monitoring. While assessing, baseline data are missing.
- There should be thorough networking and collaboration among key stakeholders at central, district and local level.
- User's education, training, awareness and information are crucial for creating demand for ICS. Users' Training on ICS use and maintenance is very important
- To make a cooking stove acceptable to the end-users, it has to have high quality standards, i.e. be available, affordable, reliable, and bring measurable advantages in terms of money or time savings, reduction of indoor air pollution or ease of practical use.

- Appropriate stove model to cater diverse needs and preferences of the Users based on cooking practices, socio-economic, cultural and geographical conditions are paramount.
- The lifetime of a stove depends on the quality of the basic materials and on how well it is maintained. This should be monitored carefully and continuously until a high quality product can be assured.
- A fully commercial approach is the most important step in achieving long-term sustainability. It should be practiced from the very beginning wherever possible, unless special circumstances (rainy season or socio-political hindrances) prevent this option.
- ICS Programme should not be implemented on isolation rather it should be integrated with other community development activities having strong social mobilization part. ICS promotion activities coupled with kitchen improvement, fuel wood management, as well as household sanitation would add its value and increases demand