

EcoHimal Nepal

An Environment Conservation Pilot Project - Improved Cooking Stove (ICS)

Project Progress Report

1st July 2016 to 30 November, 2017

A. Summary:

The Pilot phase of "An Environment Conservation – Improved Cooking Stove (ICS)" in Chepuwa and Hatiya Village Development Committees (VDCs) of Sankhuwasabha district in financial support of The Glacier Trust (TGT), UK has been completed accomplishing the major achievements.

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 has planned to 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 developed ICSs have been transported and installed in selected households of Chepuwa and Hatiya VDCs.

An inclusive training manual developed and local household were 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. At total, 398 local households (HHs) were trained under special package training and awareness program before the installation of ICSs.

The ICSs have been installed in selected 30 HHs of project area and are under tested locally along with users' response. The feasibility, suitability, efficiency, effectiveness and affordability of ICS is planned to be measured, monitored and evaluated at local level. Appropriateness of the stove for this environment is under 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

On the top of 1372 HHs (817 HHs in Hatiya and 555 HHs in Chepuwa) , while conducting ICS installation training program, the selected 30 households have been trained and oriented on

environment conservation issues like forest conservation linking it with soil erosion and degradation of pasture forest. 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, transported and installed. 30 HHs ([Annex 1](#)) were selected considering the first round (pilot) intervention as well as cook stove adoption decisions. Model ICSs installed at selected HHs for test and demonstration. 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

ICS installation orientation and training program was conducted at Karma Bhote's house. The model ICS installation was demonstrated among selected households, where installation procedures, techniques and benefits were shared. (The detail report on model installation program is in [Annex 2](#))

Reduce Firewood Consumption promoting efficient ICS

After installation of ICSs in selected HHs, monitoring/test has been carried out by project staff. During the monitoring at household level, use of ICS, firewood consumption and response from the beneficiaries were analyzed. In the 1st monitoring (after 15 days of installation), the beneficiaries were not regularize hot water facility, they had installed but ICSs were not in proper use. They were requested to quantify the firewood consumption decreased or increased in comparison with traditional stove.

In the second monitoring, the ICS use was better than during 1st monitoring visit. Only default was found in lids opening while cooking (they were using long firewood instead of short). They were requested to use the firewood and fire closing the lids.

The 3rd monitoring visit has been conducted but the findings of 3rd monitoring have not been received yet from field. The findings will be archived in next reporting.

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

398 HHs were trained on forest conservation, climate change, Book System of potato cultivation and slash and burn agriculture with "an one-day training, each hamlet". The refresher orientation has been conducted to those trained households on forest conservation and climate change. Education and awareness on book system of Potato cultivation and slash and burn agriculture's impacts on forest conservation has been increased at local level.

Household level monitoring and oral education on these thematic issues has increased awareness level of local households.

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, an open three-stone 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 was 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 have been regularly tested. The authentic finding and benefit of ICS in comparison to traditional stove will be documented in next report.

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

A video documentary was shared to local community regarding the installation and proper use of ICS. The benefited households have learnt and applied the technical ideas like how to fire inside of ICS, safety measures, cleaning of parts, advantages of ICS, firewood use to reduce quantity, use of ICS ingredients and water heating facility. 30 households were trained and oriented on proper installation.

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

460 HHs in the project area were 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. With the help of prepared holistic manual, orientation and refresher training has been conducted by project staff to disseminate information on forest conservation by promoting ICS use.

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

Before the installation of ICSs, 62 members of 6 Community Forest Users Groups in the project area were oriented on natural resources management and bio-diversity conservation.

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 were educated on impact of indoor air pollution that resulting ambient smoke causes respiratory problems, eye infections and has other seriously deleterious effects.

B. Activities carried out:

1. Capacity building training on installation and use of ICS

One day Model ICS installation training was conducted to the selected households prior to hand over the ICS. Video documentary on installation and use of ICS was presented among the local community. While conducting the training, selected households were oriented on

- 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

Detail report is in [Annex 2](#).

- 2. 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 was conducted in coordination with Makalu Barun National Park.
- 3. Indoor air pollution and its impacts on Health:** Awareness-raising of local people on effect of indoor air pollution and on indoor hygiene practices was conducted. Follow-up of impact has been done to individual households. But report is not available yet from field.
- 4. Sensitized and empowerment of CFUGs:** Community Forest Users Groups have been sensitized on forest conservation and natural resources management.

5. **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.
6. **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. Monitoring and Evaluation of the project:

At local level, project staff has been conducting household monitoring to evaluate and measure the ICS use and response of benefited households. Three monitoring visits at benefited households have been carried out and feedbacks have been provided to them. The weakness on ICS installation and use shared to the benefited households and requested to improve. It is found that utilization of hot water is not properly done.

A monitoring visit is planned from Kathmandu with an external consultants in mid-December.

D. Difficulties

- Local people have been disturbed by the elections _local, provincial and parliamentary.
- Transportation of ICSs at project area became challenge due to summer and geographical remoteness.
- Consequent three election delayed the monitoring from Kathmandu.

Annex 1

An Environment Conservation Pilot Project - Improved Cooking Stove (ICS)

Benefited Households model ICSs

| | Head of Households | Address |
|----|---------------------|---------------|
| 1 | Tenin Bhote | Bhotkhola - 2 |
| 2 | Dappu Bhote | Bhotkhola - 2 |
| 3 | Ngajang Bhote | Bhotkhola - 2 |
| 4 | Kasang Bhote | Bhotkhola - 2 |
| 5 | Kamirijek Bhote | Bhotkhola - 2 |
| 6 | Namyang Bhote | Bhotkhola - 2 |
| 7 | Pekma Bhote | Bhotkhola - 2 |
| 8 | Kanchhathilen Bhote | Bhotkhola - 2 |
| 9 | Kijaridar Bhote | Bhotkhola - 2 |
| 10 | Ngijok Bhote | Bhotkhola - 2 |
| 11 | Dema Bhote | Bhotkhola - 2 |
| 12 | Lhakpadhenduk Bhote | Bhotkhola - 2 |
| 13 | Karma Bhote | Bhotkhola - 2 |

| | | |
|----|---------------------|---------------|
| 14 | Mikma temba Bhote | Bhotkhola - 2 |
| 15 | Ngimadorchi Bhote | Bhotkhola - 3 |
| 16 | Karma Bhote | Bhotkhola - 3 |
| 17 | Mikmachhiring Bhote | Bhotkhola - 3 |
| 18 | Jumik Bhote | Bhotkhola - 3 |
| 19 | Chhejik Bhote | Bhotkhola - 3 |
| 20 | Chhedapasang Bhote | Bhotkhola - 3 |
| 21 | Ngimachhedar bhote | Bhotkhola - 4 |
| 22 | kinsang Bhote | Bhotkhola - 4 |
| 23 | Ngimalenduk Bhote | Bhotkhola - 4 |
| 24 | Chhiriphinjo Bhote | Bhotkhola - 4 |
| 25 | Dukpa Bhote | Bhotkhola - 4 |
| 26 | Dharche Bhote | bhotkhola - 4 |
| 27 | Dipendra Rai | Bhotkhola - 4 |
| 28 | Prem Tamang | Bhotkhola - 4 |
| 29 | Ladar Bhote | Bhotkhola - 4 |
| 30 | Tenjik Bhote | Bhotkhola - 4 |

Annex: 2

One Day Training on ICS Installation in relation to Indoor Air Pollution and its effects on Human health

Summary

This initiative has focused on environmental enhancement of 30 household living in Bhotkhola Rural Municipality ward 2, 3 & 4 through installation of metallic improved cooking stoves. Health and social condition of local poor households will now improve better than existing. It is particularly true who spend a lot of time running households for e.g. women and children, pregnant and lactating mothers, old aged people and newborns & infants who indirectly suffers due to miserable health condition of mothers. Improved cooking stoves helps to reduce charcoal consumption, generate savings, and to have healthier food treatment and safe domestic conditions. The village will be smokeless and people have a better chance to get rid of unhealthy environment.

The Improved Cooking Stoves project has been implemented by **EcoHimal Nepal** with the support of **The Glacier Trust** Fund. The entire project has generated lasting, cost-effective and sustainable solutions with measurable impacts to indoor air pollution and offers an inspiring example to addresses the urgent needs to mitigate greenhouse gas emissions and help to adapt to the impacts of climate change.

Background and Context

Solid biomass fuel is a principal source of energy used for domestic purposes. Household air pollution mainly indoor air pollution is a major risk factor associated with causing chronic obstructive lung disease and acute respiratory tract infection among children. In rural area, many people still cook and heat their homes using solid fuels (i.e. wood, crop wastes, charcoal, coal and dung) in open fires and leaky stoves. Such inefficient cooking fuels and technologies produce high levels of household air pollution with a range of health-damaging pollutants, including small soot particles that penetrate deep into the lungs. In poorly ventilated dwellings, indoor smoke can be 100 times higher than acceptable levels for fine particles. Exposure is particularly high among women and young children, who spend the most time near the domestic hearth.

Objectives:

The orientation program was targeted to 30 household beneficiary members of Bhotkhola Rural Municipality ward 2, 3 & 4. The objectives of orientation are:

1. To address trioka purpose of cooking, water heating and space heating need of people living in remote areas
2. To aware the above defined population regarding metallic improved cooking stoves installation and proper use.
3. To reduce impact of indoor air pollution

Content:

The contents of orientation are listed below:

1. Introduction to Improved Cooking Stoves
2. Types of Improved Cooking Stoves
3. Improved Cooking Stoves in context of Nepal
4. Benefits of Installing Improved Cooking Stoves : Health, environmental and economic benefits
5. Proper use of Improved Cooking Stoves
6. Methods of cleaning and maintaining Improved Cooking Stoves
7. Differences in Traditional cooking stoves and Improved cooking stoves
8. Indoor air Pollution
9. Ways to keep clean and hygienic indoor environment
10. Unhealthy environment and its effects
11. How to ignite fire
12. How to use firewood and different air vent
13. How to flare up fire
14. Safety measures especially for kids and senior citizens
15. Water heating system installation and use
16. Smoke stack cleaning
17. Maintenance of stove
18. Kitchen hygiene,
19. Effect of indoor air pollution
20. Health hazard due to smoke
21. Hand washing technique and personal hygiene
22. Proper care of cooked food and cooking procedure
23. Food handling after and before cooked.

Training and Discussion

There were 30 participants from each benefited household. Detail of Participants is in [Annex 1](#). The cooking stoves installation training was facilitated by Mr Dawa Sangbu Bhote. A sample of metallic Improved Cooking Stoves was used to demonstrate its application. The pros and cons,

function and specialty of every designed section of metallic improved cooking stoves was discussed in the training. Participants also observed the water flow system practically and they were very excited to see such advantages in their cooking stoves. The Improved Cooking Stoves is designed with advanced technology (3 pot holes, adjustable air vent, separate ash space, drying space, hot and cold water pipes, less firewood consumption and time saving) so it was well accepted by local people.

The installation program was followed by orientation in indoor air pollution control. Educating participants about the harm caused by traditional stoves with respect to the health of household especially children was emphasized in orientation. The health, economic, environmental and gender benefits of adopting Improved Cooking Stoves and reducing risk of hazardous disease was explained to participants.

The next part of the training was followed by kitchen hygiene, effect of indoor air pollution, health hazard due to smoke, hand washing technique, proper care of food, food handling after and before cooked etc. The training participants shared the health effect they were realizing from the smoky kitchen. We have explained the content of carbon dioxide and carbon mono oxide content and its effect in the human health such as eye and skin irritation, acute respiratory tract infection etc.

It was concluded that improved cooking stoves are very effective device in reducing fuel consumption, saving cooking time and improving the kitchen environment. Still a lot effort needs to be done to ensure that every rural household is practice smokeless behavior.