

# Matribhumi Improved Cook Stove for Smoke Free Kitchen

Nepal Environmental Watch Initiative (NEW Initiative)



Empowered lives.  
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**SGP** The GEF  
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Programme



## Mitigation of climate change through installation of Newly Modified Matribhumi Improved Cooking Stove

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### Cover photo caption

1. Community awareness in Lele VDC
2. M-ICS installation training
3. School art competition
4. Woman cooking in M-ICS in Bungmati VDC
5. Mobile Chulo
6. Mr. Madhukar K.C. receiving SANSEA Award 2013
7. Air Supply Disc (Burner)



### Disclaimer:

The opinions expressed in this document are those of the writer and may not necessarily reflect the official view of the United Nations Development Programme, Global Environment Facility Small Grants Programme.

## Foreword

I would like to congratulate NEW Initiatives for successfully completing the project titled “Mitigation of climate change through installation of newly modified Matribhumi Improved Cook Stove (M-ICS)” and publishing this important book.

The project is an exemplary successful project implemented by a woman team leader. The project not only addressed the concerns of GEF focal area of mitigating climate change but also empowered women by reducing their workload and improving their health.

This book captures initiatives undertaken during one and a half years of project tenure and summarizes project approaches, activities, results, learnings and provides recommendations. It also illustrates making of Matribhumi Stoves with brief introduction of its parts.

The book would be helpful to academia as well as development practitioners who wish to take the knowledge forward and promote Matribhumi stoves.

I would like to thank Mr John Narayan Parajuli, Head of Communication and Ms Binda Magar, Gender and Social Inclusion Programme Specialist of UNDP Country office for reviewing this book and providing valuable feedbacks. Last but not the least, I would express my sincere thanks to Mr. Kanchan Mani Dixit and Mr. Vivek Dhar Sharma for critically reviewing the book and providing editorial support.

Once again, I would like to thank entire project team and wish all the very best for continuously installing such an energy efficient stoves in the rural household.



Gopal Raj Sherchan  
National Coordinator  
UNDP GEF-SGP

## Acknowledgement

Implementing innovative projects in local community is challenging. But when convened successfully, all the hardship becomes a sweet memory. The smiling faces of local community members become our reward inducing deep satisfaction within our hearts.

The project successfully installed over 1000 Matribhumi Improved Cook Stove in Lele, Bugmati, Champi, Chapagaun and Lamatar VDCs of Lalitpur District. We plan to install more stoves and benefit local communities in days to come.

Thanks goes to all the project team members- Ms. Sujita Shrestha, Team Leader, Ms. Anu Dangol and Ms. Sharaswoti Nagarkoti, Social mobilizers, Mr. Unnat Rajbhandari, Accountant and Mr. Anil Chudhary, former Team Leader. Without their hardship the success would have not been possible. Thanks also goes to Matribhumi Urja P Ltd and the team including Mr. Madhukar K.C, designer of the M-ICS and Mr. Bijay Raj Ghimire for their constant support. M-ICS technicians did excellent job in constructing all the M-ICS. NEW Initiative members were supportive to the project. I would also like to express gratitude to Mr. Rikesh Chitrakar, Mr. Pramod Lamsal, Mr. Nabin Gopal Baidya, Mr. Anjel Chitrakar and Mr. Rajeev Ranjan Singh for their support during project monitoring visits and workshops.

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Maneesha Rajbhandari  
President  
NEW Initiative

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## Acronyms

<b>AEPC</b>	Alternative Energy Promotion Center
<b>CBO</b>	Community Based Organization
<b>CF</b>	Community Forest
<b>CO<sub>2</sub></b>	Carbon dioxide
<b>GEF</b>	Global Environment Facility
<b>GESI</b>	Gender and Social Inclusion
<b>ha</b>	hectare
<b>Hhs</b>	Households
<b>ICS</b>	Improved Cook Stove
<b>LCDP</b>	Lele Community Development Project
<b>Ltd.</b>	Limited
<b>M-ICS</b>	Matribhumi Improved Cook Stove
<b>MRC</b>	Multi-dimensional Resource Center
<b>NEW Initiative</b>	Nepal Environmental Watch Initiative
<b>NGO</b>	Non Governmental Organization
<b>NRs</b>	Nepalese Rupees
<b>Pvt.</b>	Private
<b>SGP</b>	Small Grants Programme
<b>SSPKS</b>	Shree Sahayogi Prangarik Krishak Samuha
<b>SMSCCL</b>	Sanjaal Mahila Saving and Credit Co-operative Limited
<b>UNDP</b>	United Nation Development Programme
<b>VDC</b>	Village Development Committee
<b>WWF</b>	World Wildlife Fund

# I. Background

## I.1 Biomass Burning and Impacts

Nearly three billion people across the world cook on open fires or rudimentary cook-stoves each day fueled by coal or solid biomass such as wood [1]. About 84% of Nepal's population lives in rural areas where fire wood is the main source of energy. It is estimated that 18 million tones of fuel wood is consumed annually in Nepal [2]. More than 99% of the total fuel wood is consumed only in residential sector in 2008/2009 [3].



A traditional cook stove

Dependence on traditional cook-stoves and fuels leads to a wide variety of environmental problems. Burning solid biomass releases carbon dioxide-the major greenhouse gas that contributes to global warming and causes abnormal changes in global climate. Release of smoke in kitchen also affects human health, particularly women and children. Increasing use of biomass causes forests to deplete leading to mudslides and destruction of agricultural land.

### I.1.1 Climate Impacts

Burning of biomass releases approximately the same amount of carbon dioxide as burning fossil fuels. While burning fossil fuel releases carbon dioxide (CO<sub>2</sub>) captured by photosynthesis millions of

years ago, burning biomass releases CO<sub>2</sub> captured by plants for their growth. Burning of biomass also releases pollutants such as black carbon and methane. Black carbon released due to incomplete combustion is estimated to contribute about 25 -50 percent of CO<sub>2</sub> in the atmosphere. Methane is the second largest contributor to climate change after carbon dioxide [1].

### I.1.2 Health Impacts

Emission from burning biomass in open fires or crude stoves inside household can have serious implication in health of family. The known adverse effects of biomass combustion inside household include respiratory diseases, low birth weight and increased infant mortality.

Chronic exposure to smoke from traditional cooking practices is one of the world's biggest – but least known killer [3]. Smoke from traditional stove penetrates deep into lungs causing chronic and acute health effects such as pneumonia, lung cancer, chronic obstructive pulmonary disease, heart disease [4], as well as low birth-weight in children born to mothers who are exposed to smoke from traditional cookstoves during their pregnancies.

The Global Burden of Disease Study (2010) estimates that exposure to cooking smoke is the fourth worst risk factor for disease in developing countries and causes four million premature deaths



A woman carrying headload of firewood

per year—exceeding deaths attributable to malaria or tuberculosis. In addition, millions more fall sick that could be prevented with increased adoption of clean and efficient cooking solutions [3].

Women in developing countries are at risk of head and spinal injuries, pregnancy complications, and maternal mortality from the strenuous task of carrying heavy loads of fire wood [3]. Exposure to indoor smoke can cause cataracts, the leading cause of blindness in developing countries [3]. Since women spend more time in kitchen than men, they are the primary victims of cataract.

## 2. Clean Cooking Options

Subsidies and the foreign exchange requirements make kerosene and Liquid Petroleum Gas (LPG) imports burdensome for countries like Nepal. Clean and renewable energy like electricity and solar battery are yet cost intensive to the rural population. About 77.7% of national energy requirement is fulfilled by forest [2]. For this reason, energy efficient improved cook stoves (ICS) are viable cost-effective options of energy for Nepali people. Use of improved cook stoves reduces indoor smoke improving the quality of life of family and also saves resources like time and money.

Over 700,000 mud improved cook stove (ICS) have been installed in 63 districts of Nepal [5]. Although the technology of ICS making is simple, projects promoting ICS are not seen as successful owing to sustainable operation of such stoves

### 2.1 Matribhumi Improved Cook Stove (M-ICS)

In the quest of sustainable form of ICS, M-ICS brought revolution in its kind. M-ICS saves nearly 65% of fire wood and has efficiency as high as 27% making it superior to other improved mud cook stove with efficiency only upto 18%. M-ICS is affordable, easy to use and durable. It does not alter the taste of food, cooks food in less time and with less fire wood, significantly reduces cost and saves time spent for fire wood collection. The

positive and negative aspect of the M-ICS and mud improved cook stove is presented in Table 1.

Table 1: Features of M-ICS and Mud ICS

Particulars	M-ICS	Mud ICS
Construction time	3-4 hours	At least a week
Construction process	No need of mud bricks	Mud bricks are prepared and left to sun dry for a week
Keys	Made up fibre dye and polythene pipes	Wooden dyes
Efficiency	Upto 27%	Upto 18%
Cooking time	Less	Relatively longer
Durability	Strong	Weak
Accessories	Air supply disk, small fan and adaptor of 3 Watt	None
Electricity required	Yes	No
Additional cost	Cost for air supply disk and its accessories	None

The details of accessories required for M-ICS construction is given in Box 1.

M-ICS has three innovative components- air supply disk or burner, fiber dye for stove and chimney construction.



Matribhumi Improved Cook Stove (with fan)



### Air Supply Disc or Burner:

The air supply disc or burner is circular in shape. It is made up of cast iron with seven perforated conical projections. The air supply disc is placed at the bottom of fire chamber and air is supplied by a low watt (2-3 watt) electric fan to help in efficient combustion of fire wood. Once air supply disc is heated it sucks air by itself and does not require electricity.



Air supply disc

### Fiber Dye an Polythene Pipe Inner Keys

Another technological innovation is the use of modified fiber dye and casting keys made from polyethylene pipes of different shapes and sizes. With the help of fiber dye, an M-ICS can easily be made in a single block (See Box 2). The use of the dye

and keys simplifies construction and standardizes stove sizes. By using proper combination of mud, rice husk, cow dung and small bricks or stones, the stove can easily be made within four hours.



A Fiber dye is used to construct MICS

### Chimney

Mud chimney blocks can also be easily constructed with these keys. Eight to nine blocks are required to construct a chimney.

### Box 1: Technical accessories for M-ICS

#### a) Fan and adaptor

A commonly available 3 Watt fan run by adaptor is used to provide air to burner. The flow of air is controlled using adaptor while keeping it safe.



Fan and adaptor

#### b) Switch box, electrical wire and safety wire

A simple switch box, electrical wire and safety pipes are used to connect fan and adaptor with main grid.



Switch box connected using electrical wire

#### c) Chimney cap

A chimney cap is placed at the outlet of chimney connecting to M-ICS. As the smoke exists from the chimney, the cap provides safety from fire in mud houses. It also blocks air from outside to enter inside the stove and improves stove efficiency.



Chimney cap

#### d) General equipment

Simple general equipment such as screwdriver, hammer, measuring tape, insulation tape, nails and tester are required during M-ICS installation.



General equipments

## Box 2: Fiber Dye an Polythene Pipe Inner Keys

The fiber dye consists of four rectangle plates of three different dimensions. The two large plates are identical in size. The length is 32 inches whereas the breath is 13 inch in one half and 15 inch in the other half. The two small plates have dimension of 13\*16 & 15\*16 inches.

During the construction of M-ICS, six inner keys of polythene pipes are used. These pipes are designed with fix dimension to ensure standard inner parts of the M-ICS. The details of key and its use are explained below:

### a) First fire chamber / place of air supply disc (burner) key

The first fire chamber key is used to construct first fire chamber where the burner is placed. After fixing the fiber dye in a flat surface floor, it is placed at the center of lower left chamber of the fiber dye.



First fire chamber

### b) Fan key

Fan key is used as a key to make a small channel fan hole with first fire chamber. It is placed at left alignment of the fiber dye touching lower part of the first fire chamber. Then it is followed with one inch of a mud and a layer of bricks or stone inside the fiber dye.



Fan key

### c) Fire wood post key

Fire wood post key is used to make an opening at fiber chamber through which fire wood is inserted in M-ICS. The keys are again covered with a layer of mud and bricks or stone.



Firewood post key

### d) Second fire chamber key

Second fire chamber key is used to make a second fire chamber at the right side of the fiber dye. It is placed at the edge near to right side of fiber dye.



Second fire chamber key

### e) Linkage key (between first and second fire chambers)

Two linkage key is used to make a channel that connects first and second fire chambers. Since the right side of the fiber dye is one inch higher, the linkage keys are placed inclined from left to the right side of the fiber dye.



Linkage key

### f) Chimney place key

As the name suggest chimney is use to make a place connection of fire chambers with the chimney outlet. It is place at the right corner of the fiber dye touching the second fire chamber. Then all the keys are covered with mixture of mud and bricks proportionately.



Chimney place key

### g) Chimney block key

The chimney block keys consist of two sets of pipes different diameters. These keys are used to construct chimney blocks. Eight to nine chimney blocks are made and left to dry in the sun, which are compiled at M-ICS on the next day. These blocks are later connected with one another to construct chimney.



Chimney block key

## Mitigation of climate change through installation of Newly Modified Matribhumi Improved Cooking Stove

### 3. Project Brief

<b>Project number:</b>	NEP/SGP/OP5/Y1/CORE/12/07
<b>Project location:</b>	Lele; later expanded to Bungmati, Champi, Chapagaun and Lamataar VDCs of Lalitpur District
<b>Project duration</b>	1.5 years (July 2012 to December 2013)
<b>Project cost (USD)</b>	59,805 (GEF-SGP 37,887, other cofunding 10,309 in cash, 11,033 in kind)
<b>Beneficiaries</b>	Total 1016 Hhs Male 2,703; Female 2,583
<b>Capacity building</b>	Total 302 (Male 157; Female 145)
<b>Objectives:</b>	<ul style="list-style-type: none"> <li>● Mitigate climate change through installation of 1000 M-ICS by reducing fire wood consumption.</li> <li>● Aware rural people about the indoor air pollution and its harmful health effects</li> <li>● Reduce drudgery of women and improve their health</li> <li>● Produce locally available M-ICS technicians for sustainable use of the stove.</li> </ul>

### 4. Project area

Lele is the second largest VDC of Lalitpur District, covering 15 square kilometers. It has 1,932 households with 10,094 population (Male 4,941 & Female 5,153) and literacy rate of 39.5% [6]. Situated in 27.22'-28.50' North and 85.14'-85.26' East, the average altitude of Lele is 5500 feet above mean sea-level. Average rainfall is 1232.60 ml. Majority of rain falls during monsoon. The average temperature in summer is 20°C and in winter 10°C indicating cool winter.

About 70-75% of Lele residents depend upon agriculture for their livelihood and the rest 20-30% are involved in business, services and daily-wage work such as stone queries. Major agricultural products are millet, barley, wheat and paddy. The VDC has 18 community forests spread in 1321.16 ha. with 1,622 household members (men 4,527 and women 4,600 members). The forests are The



● Project District, Lalitpur

local ethnic groups are Newar, Nagarkoti, Sijapati, Chhetri, Mahat, Silwal, Tamang, Thapa, Khadka, Damai, Sarki and Sunuwar. Famous temples of Lele are Manakamana, Tika Bhairab, Balkumari, Champeswari, Maneswari, Jay Kumari and Tileshwor Mahadev. There are two *Kundas* (sacred ponds): Ganga-Jamuna and Sarashwoti. Each year in December, a festival is organized in Saraswoti Kunda [6].

Being one of the famous historical places of medieval Lichhavi dynasty and its close proximity to Kathmandu Valley, Lele should have received lots of developmental efforts. But the VDC still lag behind development activities. The annual firewood demand of Lele is 6,617 tons. The community forest can only supply 2,458 tons leaving two third of demand in deficit. (CF range post Lele). As of baseline collected by NEW Initiative in November 2012, about 86% of households in Lele use traditional mud stove for cooking. It is followed by LPG users (8%) and biogas (6%)<sup>2</sup>. The average household uses three cylinder of LPG per year. The deficit of fire wood in Lele makes M-ICS an ideal solution to compensate the demand of fire wood. In addition, use of M-ICS improves women and children health as well as reduces women's drudgery in fire wood collection.

## 5. Working approach

The project undertook following activities to meet its objectives:

- **Inception workshop:** Inception workshop was organized in Lele VDC to inform stakeholders about project and its working modalities.
- **Piloting:** The project was piloted in Lele which was gradually expanded to other VDCs upon request from local people.
- **Data collection:** Two hundred households were selected from Lele and Champi VDCs of Lalitpur District for questionnaire survey. Questionnaires were prepared to collect baseline data on:
  - The type of cooking stove
  - The type of energy used for cooking
  - The quantity of fire wood required for households.
  - Time spent to collect fire wood, cooking and utensil cleaning and
  - Household expenditure spent on energy for cooking
- **Awareness Activities:** Community awareness activities were carried throughout the project period. Meetings were organized at each wards of the VDCs. School awareness programs were carried out in the project area to inform school students about indoor air pollution and environmental stewardship. School students were purposively selected for the awareness programs because they can easily persuade their parents in conservation practices. Drawing competition on effect of indoor air pollution was carried out as part of awareness activities in school.
- **Technical training:** Technical trainings on M-ICS making and installation were organized. Barefoot trainings on M-ICS installation were carried in several occasions to replace the migrated M-ICS technicians. Lele VDC served as a demo site for M-ICS installation training.
- **Partnership:** The project partnered with Matribhumi Urja Pvt Ltd to promote the stoves. Mr Madhukar KC, former Maoist Militia and director of the company designed the Matribhumi Stove.
- **Resource mobilization:** The total cost of a stove was Rs. 2,900, of which project supported the cost of burner and its accessories worth Rs. 2,200. The beneficiary contributed Rs. 700 of which Rs. 500 goes to the technician, Rs. 100 for maintenance and remaining Rs. 100 for the form collector plus other promotional activities. Each beneficiary contributed their time and labor during soil preparation for stove construction. The project purchased the burner and its accessories from Matribhumi Urja Pvt Ltd. and also deployed a full time technician in the project site. The project mobilized resources from different line agencies such as Good Neighbor, VDCs, schools and co-operatives.
- **Gender and social inclusion (GESI):** The project adopted GESI approach throughout the project from design to implementation. Women were the primary beneficiaries as they were responsible for fire wood collection and cooking meal for family. The project had a woman team leader and a woman mobilizer so as to ensure role of women in decision making. In addition, the project also provided trainings to female M-ICS technicians to serve as M-ICS promoters. The project gave special preferences to the marginalized ethnic communities and low income households.
- **Livelihood opportunities:** The project established revolving fund with low interest rate to benefit farmers in organic farming and livestock rearing. The farmers were trained on organic farming and vermi-compost preparation. These support encouraged farmers to install M-ICS in Lele.
- **Media mobilization and demonstration:** Both local and national media were mobilized to disseminate success stories. Radio, Television and national dailies covered the news. Participation was also made in faires and religious festivals to market the new technology of ICS making.

## 6. Major activities

### 6.1 Installation of M-ICS

In project period, a total of 1016 M-ICS were installed in the project area providing benefit to 5,286 people. This includes 2,583 women members (See Annex 1). Likewise, the stove has benefitted 3,174 (60%) indigenous and dalit people. Table 2 lists the number of installation of the stove by VDCs.



Mrs. Maharjan, M-ICS user, Bungmati-6



Participants in M-ICS making training

support. Altogether, 47 people participated in the trainings organized at different dates. Table 3 provides details on M-ICS making trainings.

The project also organized training to about 20 M-ICS technicians to build their capacity and enhance their efficiency, details of which is provide in Annex 2.

**Table 3: M-ICS making trainings in the project areas**

**Table 2: MICS installation**

SN	Place	No of MICS Installlation
1.	Lele VDC, Lalitpur	538
2.	Champi VDC, Lalitpur	158
3.	Lamatar VDC, Lalitpur	250
4.	Bungmati VDC, Lalitpur	50
6.	Arghakhachi	10
7.	Kapilbastu	10
Total		1016

### 6.2 Installation training

The project organized M-ICS making trainings to interested people of the project area. Matribhumi Urja Pvt. Ltd. provided technical

S. N.	Date	Address	Participants		
			Male	Female	Total
1	2012-08-18	Lele-1	7	14	21
2	2013-02-18	Champi-3	4	5	9
3	2013-03-11	Champi-9	0	4	4
4	2013-06-25	Lamataar-6	5	0	5
5	2013-07-03	Chapagaun-6	0	2	2
6	2013-07-29	Bungmati-6	1	1	2
7	2013-09-23	Champi-7	0	2	2
8	2013-10-25	Lele-7	1	1	2
<b>Total</b>			<b>18</b>	<b>29</b>	<b>47</b>

### 6.3 Barefoot training

Twenty one people from other districts were trained using barefoot approach. Installation of M-ICS in Lele was used as demonstration to promote the stove in other VDCs.



Barefoot trainee learning to construct M-ICS

### 6.5. Awareness campaign

Designing and installing of the M-ICS was easy but persuading the community people for regular use was challenging. As such continuous awareness campaigns were carried out among the local people and school students.



Locals in sensatizing workshop

### 6.4 Workshops

Workshops were organized at three levels to finalize working modality and disseminate project activities. Over 90 local people participated in the workshops (Table 4).



Women participants of awareness program

#### 6.5.1 Local people

Twelve awareness workshops were organized to inform public on the benefit of stoves. The workshop benefitted 288 local people of which 202 were women (Table 5).



Participants of awareness program

Table 4: Workshop details

S.N	Date	Location	Participants		
			Male	Female	Total
1	2012-07-31	Ringapur Credit and Co-operative, Lele-1	7	28	35
2	2013-01-04	Shree Unnat Bali Krishak Samuha, Champi-1	4	22	26
3	2013-06-23	Shree Maharjan Guthi Sansthan, Bungmati-6	2	30	32
		<b>Total</b>	<b>13</b>	<b>80</b>	<b>93</b>

**Table 5: Awareness programs in co-ordination with the local CBOs**

S.N.	Date	Name of CBOs	Participants		
			Male	Female	Total
1	2013-10-25	Shree Shikharpa Star Youth Club,Lele-7	11	9	20
2	2013-07-01	Shree Bageshwori Mahila Credit and Co-operative, Chapagaun-6	2	14	16
3	2013-07-15	Mahila Samuha, Chapagaun-6	2	30	32
4	2013-07-29	Maharjan Guthi Sansthan, Bungmati-6	13	14	27
5	2013-06-20	Sayapatri Mahila Samuha, Champi-8	0	15	15
6	2013-05-30	Ganapati Mahila Samuha, Champi-3	2	14	16
7	2013-04-04	Lele Community Development Project (LCDP),Lele-9	12	44	56
8	2012-12-13	Shree Satya CFUG,Lele-4	15	24	39
9	2012-12-08	Saraswati CFUG,Lele-1	4	3	7
10	2012-11-13	Melmelap Samaj,Lele-1	9	20	29
11	2012-11-21	Yekikrit Mahila Credit and Co-operative,Lele-6	0	10	10
12	2012-11-20	Damsidole CFUG,Lele-8	16	5	21
		Total	86	202	288

### 6.5.2 School student

The project collaborated with Youth Information Center of Lele-2 to conduct awareness classes to grade 8 and 9 of four schools. A total of 195 students including 112 girls participated in the programs (Table 6).

The students also participated in drawing competition. The theme of the completion was “Indoor Air Pollution Control and Forest Protection Measures”. The winner received M-ICS set as a prize. The prize was sponsored by Matribhumi Urja



**School awareness program**

**Table 6: Schools which participated in the awareness programs.**

S.No.	Date	Name of School	Participants	
			Boy	Girl
1	2012-12-26	Saraswati Higher Secondary School, Lele-2	15	23
2	2013-04-22	Ganga Jamuna Secondary School, Lele-1	22	27
3	2013-04-28	Holy Temple Secondary School,Champi-5	21	21
4	2013-04-29	Champi Devi Higher Secondary School,Champi-2	15	41
		<b>Total</b>	<b>73</b>	<b>112</b>

### 6.6 Organic farming and vermi composting

The project provided organic farming and vermi-compost preparation trainings to farmers. Similarly, the project also provided support to create revolving fund for organic farming and other income generating activities and trainings to manage revolving fund



**Revolving fund handover to Sanjal Mahila CBO, Champi-2**

### 6.6.1 Organic farming training

The project facilitated to send four lead farmers from Lele and Champi to Nawalparasi and Makawanpur for training on organic farming. The training has not only helped farmers to acquire knowledge on organic farming but also had the opportunity to interact with other farmers. On their return, they provided orientation training to additional 33 people of Lele VDC.



**Training on organic fertilizer and pesticide making**

**Table 7: Organic farming training**

Name of training	Duration of training	Place	Name of participants	Training organized by
Organic vegetable farming training	3 days	Arun Khola, Nawalparasi	Mr Ram Krishna Shrestha	MRC Nepal
			Ms Renu Silwal	
	5 days	Phaparbari, Makawanpur	Ms Gamala Bista	NEW Initiative
			Ms Kamala Thapa	



### 6.6.2 Vermi-compost training

The project organized an orientation program on vermi-compost and its benefits to 12 CBO of Lele VDC (Table 8). The training highlighted the importance of vermi-compost in organic farming. The participants learned techniques of composting for small vegetable gardening to the large scale farming. Two vermi-compost making beds were constructed in Lele for demonstration. The participants were enthusiastic and showed their eagerness to implement composting in vermi-beds.



Training on vermin compost making at Lele

**Table 8: Orientation Program on Vermicomposting**

Date	Name of CBO	Address	Participants	
			Male	Female
2013-08-25	Shree Sahayogi Prangarik Krishak Samuha	Lele-I	4	5
2013-08-25	Shree Nuhjaa Mahila Sahakari Samuha	Lele-I	1	2

In addition to the training, the project also supported construction of two vermi-compost pits for demonstration in Lele VDC.



Vermi compost pit in Lele-9

### 6.6.3 Revolving fund for organic farming

The project supported revolving fund of Rs. 50,000 each to two CBOs: Shree Sahayogi Prangarik Krishak Samuha (SSPKS) of Lele and Sanjaal Mahila Saving and Credit Co-operative Ltd (SMSCCL) of Champi-2. The CBO members promoted M-ICS in their area.

The revolving fund distribution process and interest rate were discussed and finalized by CBOs themselves. It was also agreed that they would provide financial and progress to NEW Initiative on quarterly basis.

### 6.7 Exhibition and Visits

The project partnered with Matribhumi Urja Pvt. Ltd in different workshops and exhibitions. The details of workshops and exhibitions are presented in the annex 4.

Various stakeholders including government officers, barefoot trainees, SGP officials and media have visited project site to acquire first hand information on effectiveness of M-ICS. (See Annex 5).



Visit to Lele by GEF-SGP officials- Mr Gopal Raj Sherchan, National Coordinator, Nepal (Left); Mr Charles Nyandiga, Climate Change Advisor, SGP HQ and Ms Hyacinth Douglas, National Coordinator, Jamaica (Right)

## 7. Results

The project conducted survey in 200 households who have installed M-ICS. The survey questionnaires focused on information related to fire wood consumption pattern, time spent for fire wood collection, cooking and utensil cleaning and household expenditure to purchase fire wood and LPG for cooking.

### 7.1 Reduced fire wood consumption and CO<sub>2</sub> emission

Prior to using M-ICS, average household consumed about 40kg (1 bhari) of fire wood in three days for cooking. After installation of M-ICS, the same amount of fire wood lasted for 8.5 days thus saving almost 65% of fire wood during meal preparation.

Thus, the installations of 1,016 M-ICS saved 2,960 tons of fire wood in a year. This helped reduce emission of 4,161 tons of CO<sub>2</sub> per year in the atmosphere (Table 9).



Mrs. Nirmala Nagarkoti cooking in an M-ICS, Lele-7

**Table 9: Fire wood consumption and CO<sub>2</sub> emission in households of the project sites**

S.N	Item	Before	After	Saving
1	Firewood consumption (ton/yr)	4932	1972	2960
2	CO <sub>2</sub> emission (ton/yr)	6934	2772	4161

(NEW Initiative survey, 2013)

### 7.2 Reduced drudgery of women

On an average, each household used to visit forests 121 days a year to collect fire wood. M-ICS reduced fire wood collecting days to only 36 days per year. M-ICS has also reduced cooking and utensil cleaning time to 1.5 hours from 5 hours per day. This has significantly reduced drudgery of women. With M-ICS, families, particularly women and children, enjoyed living in clean cooking environment and smoke free rooms.



After M-ICS installatin, Mrs. Sita Nagarkoti of Champi-3 utilizes her free time in vegetable farming.

**Table 10: Reduced drudgery of women in the project sites**

S.N.	Item	Before	After
1	Fire wood collection time	121 days/yr/hh	36days/yr/hh
2	Cooking time	3hrs/day/hh	1hr/day/hh
3	Cleaning utensils	2hr/day/hh	30min/day/hh
4	Fire wood expenses	NRs. 36,300/yr/hh	NRs.10,800/yr/hh
5	LPG expenses	6LPG cylinders/yr/hh (NRs. 9,000)	2 LPG cylinders/yr/hh (NRs. 3,000)

(NEW Initiative survey, 2013)

### 7.3 Increased economic benefits

Households with M-ICS saved energy by reducing fire wood and LPG consumption. Each household with M-ICS saved up to Rs. 25,500 annually. Likewise, households using LP gas also saved 4 gas cylinders worth NRs 6,000 annually after M-ICS installation (Table 10). M-ICS installation has also generated local employment for both men and women.

### 7.4 Increased income generating activities for the women

Women M-ICS technicians showed their interest to promote and install M-ICS in their villages. Though most of the women were not literate, they got an opportunity to learn from skillful training on M-ICS. This enhanced their confidence and increased motivation. They also had steady income through M-ICS installation. It was observed that women M-ICS technicians were comparatively



**Mrs. Kalu Maya Nagarkoti earns steady income through M-ICS installation.**

more enthusiastic in installation of M-ICS than their male counterparts.

Many housewives of the project area were busy with household work prior to using M-ICS. They did not have spare time for other jobs that support their livelihood. However, use of M-ICS provided them leisure time to get engaged in other income generating activities and managing vegetable garden.

### 7.5 Mobilizing revolving fund

CBOs of Lele and Champi VDCs have efficiently mobilized fund of Rs. 100,000 for the income generating activities. With small interest rate (5%), the CBOs have invested in organic farming and animal husbandry. As of March 2014 Rs. 228,500 has been mobilized benefitting eight members.

The revolving fund in Lele was distributed to two members: Mrs. Renu Silwal, Lele-2 and Mr. Ram Hari Ghalan, Lele-5. They paid back principal with 5% interest earned from organic vegetable farming. The revolving fund at present is being used by two members: Mrs. Mira Thapa of Lele-9 and Mrs. Rita Shrestha of Lele-1 for off-seasonal organic vegetable farming.

Similarly, the revolving fund for Champi was used by Mrs. Kamala Thapa, Champi-1 and Mrs. Nisha Bista, Champi-6, who returned principal with interest earned from organic vegetable farming. At present, the fund is being used by Mrs. Gamala Bista of Champi-2. She invested the fund to purchase cows. She makes profit by selling cow milk to dairy in Chapagaun VDC and nearby teashops. She sells two liters of milk per day and makes a monthly income of Rs. 20,000. The detail of the CETF fund revolved among the CBOs of Lele and Champi VDCs is presented in Table 11.



**Organic tomato farming in Champi**

**Table II: CETF fund and its users**

S.N.	Name of CBOs	CETF fund (Rs.)	No. of users	Duration	Purpose	Status	CETF fund updated
1	SSPKS	50,000	2	6 month	Organic tomato farming	Recovered	63,500
2	SSPKS	63,500	3	6 months	Non seasonal vegetable farming	On going	-
3	SSMSCL	50,000	2	6 months	Organic tomato farming	Recovered	65,000
4	SSMSCL	65,000	1	6 months	Animal husbandry	Ongoing	-

Source: Quarterly reports of the CBOs.

## 7.6 Research and development

### 7.6.1 Modification of air supply disc

Feedbacks received from users in project area were helpful to modify M-ICS to improve its efficiency and meet the local needs. Matribhumi Urja Pvt Ltd continues research to develop more efficient air supply disc. This new version of burner does not require electricity as it has many holes for ample air supply.



**New burner operates without support of fan and adaptor**

### 7.6.2 New prototypes of Matribhumi stoves

With constant modification, following prototype of stoves were developed:

- Portable Matribhumi Cook stove (Mobile Chulo)
- Metallic Matribhumi Improved Cook Stove with a fan
- Metallic Matribhumi Improved cook stove without fan

## 7.7 Replication and upscaling

Bare-foot training and popularity of stove in the project area led to installation of 849 additional stoves in 16 districts (Annex 3). The barefoot trainees served as M-ICS focal persons to replicate the technology.

NEW Initiative is promoting more stoves with the support received from different donors. Federation of Nepalese Chambers of Commerce and Industry has assured funding for 50 M-ICS in Kaski. Similarly, WWF is supporting installation of 1,000 stoves in the bufferzone of Chitwan National Park.

After the successful training on organic farming and mobilization of revolving fund, the members of Shree Sahayogi Prangarik Krishak Samuha (SSPKS) CBOs increased from 13 to 76 who were practising organic farming.



**Shree Sahayogi Prangarik Krishak Samuha Organic farmer's group, Lele**

## 7.8 SNASEA award

Mr. Madhukar K.C, the makers of Matribhumi Improved Cook Stove (M-ICS) was honored with Surya Nepal Asha Social Entrepreneurship Award (SNASEA) 2013, for his contribution to society and environment.



Mr. Madhukar K.C. Director, Matribhumi Urja Pvt. Ltd., receiving SNASEA 2013.

## 7.9 Reduced social discrimination

The installation process of M-ICS helped reduce the caste discrimination in the project sites. So called educated upper caste people permitted dalit M-ICS technicians to come in their kitchen and install M-ICS as they believe in equity and efficiency.

## 7.10 Co-funding

The project is able to generate a total of USD 21,918 (Table 12)

**Table 12: Co-funding achieved during the project period (as of Dec 2013)**

S. N.	Co-funding organizations	Cash (NRs)	Kind (NRs)	Total (NRs)
1	GOs	-	4,500	4,500
2	NEW Initiative	60,600	197,000	424,250
3	CBOs	-	72,500	72,500
4	Local community	666,200	429,000	1,029,600
5	Medias	-	90,000	90,000
6	Matribhumi Urja Pvt. Ltd.	150,000	200,000	300,000
7	Good Neighbour	45,000		
	Total	927,850	993,000	1,972,650
	USD (@90)	10309	11033	21918

## 8. Sustainability and exit strategy

The air supply disc has a full life warranty except its accessories such as adaptor and fan. For the maintenance of these accessories, the project collected Rs. 100 as maintenance fund from each beneficiary. A three-member committee of M-ICS makers has been formed to manage this fund and ensure proper maintenance of the stoves.



M-ICS maintenance fund handover to Shree Sahayogi Prangarik Krishak CBO of Lele VDC

Finding skilled M-ICS makers in the village can be difficult. Therefore, the project prepared relatively larger number of people for M-ICS making. The project also trained married woman members for retention.



Closing ceremony of the project

## 9 Lesson Learned

### 9.1 Habits and attitude

Convincing local people to adopt M-ICS was difficult as people were reluctant to accept new technology. People have habit of cooking in traditional stove with high blazing fire and were not ready to change existing kitchen setting. Likewise, some people were also not willing to invest Rs. 700 for a mud stove as they can easily cook in their traditional stove which is freely available. As such they were waiting for other donors to cover the cost of their M-ICS.

In the beginning, the project could not accelerate as expected and many users stopped using the stove. New requests for stove installation were also cancelled. To regain public trust, the project team made door to door visits to offer post installation service and solve people's problems on stoves. A monitoring system was developed emphasizing free service after installation and replace defective parts within three months of warranty period. The systems also emphasized to address any complains within a week.

In order to promote the stove and change the habits of local people, the project organized awareness meetings in wards and schools. Organizing art competition at the school level also helped to sensitize the young mines. The project team leader and mobilizer participated in the CFUG and cooperatives meeting, which also curtailed time and energy to organize separate meeting for M-ICS installation. Such efforts to sensitize local communities on M-ICS were continued throughout the project period.

### 9.2 Developing local technicians

Many of the trained M-ICS technicians switched to other job leading to shortage of skilled M-ICS technicians. However, barefoot M-ICS making trainings to interested people and married women helped fill the gaps. The installation process were not affected. Refreshment of M-ICS making trainings

were organized to help the M-ICS technicians maintaining quality. Installation of chimney requires a hole in the wall of house. Making holes in a wall, however, is difficult for female M-ICS technicians.

### 9.3 Religion, custom and political situation

Social aspects also need to be considered during promotion and installation of stoves. While constructing the stoves, the local rituals and customs were abided. During Purushottam Mahina (additional pious month in Lunar Calendar) and mourning periods, Brahamins and Chettris of Lele and Champi VDCs would not install new stoves.

Similarly, stove could not be installed during the birth month of household head or when the household head is away from home. In case of death of household head, people dismantle existing stoves and install a new one in another location.

In Bungmati VDC, M-ICS could not be installed during paddy growing season and festivals. Since the stove construction requires mud, it was difficult to dig out the soil from muddy paddy field. The stoves were constructed only after harvesting paddy. During commemoration of different festivals in Newar community and long festivals such as in Dashain and Tihar, the construction of stove were not carried out.

Due to election of Constituent Assembly, construction of M-ICS in the village was affected. The project maintained political neutrality and constructed stove only after the election.

Some places are very cold and needed open fire to keep the room warm. In such cases, M-ICS is not preferred.

### 9.4 Technology

To improve efficiency, stove height was increased by one inch. This provided bigger fire place to maximize the heating. Likewise, air supply disk that

does not require electricity has been developed so as to make it more users' friendly.

## 10. Recommendation

Periodic cleaning of fire place and chimney, proper orientation of air supply disc and cleaning fan holes are important steps to ensure high efficiency. Stove accessories such as adaptor and fan are not durable and need to be handled properly. These information should be clearly communicated to users prior to operation of stoves at households.

Although, barefoot approach of M-ICS installation was effective and less expensive for the beginners from other districts, construction of 1 to 2 stoves under the supervision of trainer was not sufficient. Upon returning to their respective districts as the demand for M-ICS is less, they may forgot the

stopve making process learned during the training. A pictorial manual that illustrates step by step process of stove installation is necessary. This will help beginners to properly install stoves and solve problems during complication.

The M-ICS technicians should be oriented on the type of local cooking behavior and consequences of smoke to human health particularly women and children. These information should be shared with the users during the stove construction.

In order to reduce per unit cost of M-ICS, mass scale production of air supply disk should be done.

There is however, limit on what current M-ICS can do, if we go beyond regular cooking such as preparing animal feed and alcohol making, a bigger sized M-ICS is required.

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- [3] <http://www.cleancookstoves.org/our-work/the-issues/health-impacts.html>
- [4] Dixit, K, ( 2006 ). Fundamentals of Air Pollution: Its Local Relevance, Ekta Books, Kathmandu.
- [5] [www.aepc.gov.np](http://www.aepc.gov.np)
- [6] Source CBS, NTC& NEA, 2010 projection

## Peoples' Voice

The cases of respiratory disease from project area have significantly reduced as compared to the past.

– Ms. Sagar Thapa, Community Medical Auxiliary of Leprosy Mission Nepal, Ananda Ban Hospital, Lele-9.

I am a single woman with asthma. It was very hard for me to cook meal with smoke in my kitchen. Sometimes I became helpless. With M-ICS installed, I can now cook my meals in smokeless environment.

–Mrs. Kanchi Maya Tamang, M-ICS user, Chapagaun -6

After knowing the importance of M-ICS during my pregnancy in a CBO meeting, I immediately installed it in my house. Now my new born child and I live in smoke free kitchen. M-ICS also served to keep meals warm for longer time which is very good for my child.

–Mrs. Priti Tamang, Champi-8

Due to my lower abdominal pain, carrying a head-load of firewood was a herculean task for me. I am very thankful to M-ICS as one head-load of firewood lasts for fifteen days. Earlier I used to carry the heavy load every three days.

–Mrs. Bimala Thapa, Lele-6

Developing the air supply disk was tough and came with many sleepless nights. The present form of air supply disk had been modified 33rd times.

–Mr Madhukar KC, Designer of the air supply disk

My hard work got rewarded when a member from Lele-5 woke me up early in the morning and requested me to install M-ICS in her house. Since our project had already phased out, she installed one with her own expenditure.

–Anu Dangol, Social Mobiliser, Lele

I have built 16 different mud stoves in my stove making career and I am very proud of my achievement. When I was sent to Lele for M-ICS training, I thought that I do not need training. But I was wrong, the new fiber dye has eased the stove construction and my job became easier. I wonder why I was not introduced to this technology earlier.

–Mr. Chaudhary, M-ICs technician from Arghakhanchi

I earned NRs.80, 000 from M-ICS installation in Lele and the surrounding villages. We have invested the savings in organic vegetable farming.

–Mr. Gupta and Mrs. Kalu Maya Nagarkoti, M-ICS technicians, Lele-7

I used to spend my time watching TV as I did not have skills to work and earn. After M-ICS making training I became confident to work as an M-ICS technician. I saved about NRs. 15,000 within 3 months. I am satisfied as I am able to financially support my family.

–Mrs. Anju K.C, M-ICS technician, Chapagaun-6

I cannot offer to use LPG to cook meals for my wage laborers. I used traditional cooking stove which generated lots of smoke and consumed huge amount of firewood. Now, I am using M-ICS and my cooking has become effortless and smokeless.

–Mrs. Laxmi Shrestha, Lamataar-2

I run a small tea shop and used to expend both on firewood and LPG. One cylinder of LPG lasted for a month. The use firewood that blackened utensil, cleaning which was very challenging. After installing M-ICS, I save six LPG per year and I no longer have to spend time cleaning the black utensil.

–Mrs. Kamala Duwal, Local tea seller, Lamataar-6

I had not used efficient ICS in my life. It is effortless and I enjoy cooking during festivals and gatherings as well.

– Mrs. Sushma Shrestha, M-ICS user, Chapagaun-7

Going to forest to collect fire wood were usual chores of people in Lele VDC. After M-ICS installation, the frequency of fire wood collection has significantly reduced.

–Mr. Suman Nagarkoti, President of Star Youth Club, Lele-7



# Annexs

**Annex 1: Beneficiaries of M-ICS users in the project areas (as of Dec 2013)**

S.N.	Project Areas	Janajatis		Brahamins/ Chhetris		Dalits		Others		Total		Total
		M	F	M	F	M	F	M	F	M	F	
1	Lele	572	597	498	505	35	40	35	33	1140	1175	2315
2	Lamataar	315	299	239	233	91	91	24	21	669	644	1313
3	Champi	150	195	179	45	56	0	0	0	385	240	625
4	Bungmati	120	154	7	4	0	0	0	0	127	158	285
5	Nallu	116	112	4	1	0	0	0	0	120	113	233
6	Chapagaun	111	112	93	89	0	0	6	7	210	208	418
7	Argakhachi	0	0	0	0	0	0	28	23	28	23	51
8	Kapilvastu	4	4	10	4	0	0	10	14	24	22	46
	<b>Total</b>	<b>1388</b>	<b>1473</b>	<b>1030</b>	<b>881</b>	<b>182</b>	<b>131</b>	<b>103</b>	<b>98</b>	<b>2703</b>	<b>2583</b>	<b>5286</b>

**Annex 2: Beneficiaries of Capacity Building/Training (as of Dec 2013)**

S.N.	Trainings on	GESI								Total		Total
		Janajatis		Brahamin/ Chhetri		Dalit		Other		Total		
		M	F	M	F	M	F	M	F	M	F	
1	M-ICS making	19	15	15	16	1	1	1	0	36	32	68
2	Organic farming	6	17	0	10	0	0	0	0	6	27	33
3	Vermi composting	6	8	0	2	0	0	0	0	6	10	16
4	Awareness in schools	59	37	40	34	10	5	0	0	109	76	185
	<b>Total</b>	<b>90</b>	<b>77</b>	<b>55</b>	<b>62</b>	<b>11</b>	<b>6</b>	<b>1</b>	<b>0</b>	<b>157</b>	<b>145</b>	<b>302</b>

**Annex 3: Details on MICS distribution in different districts of the country (as of Dec 2013)**

<b>S.N.</b>	<b>Name of Distributor</b>	<b>Name of MICS technician</b>	<b>District</b>	<b>No. of MICS sets distributed</b>
1	Kashi Baral	Jagadish K.C.	Kalikot	50
2	Dipak Babu Ghimire	Dipak Babu Ghimire, Matrika Ghimire, Kul Prasad Shrestha and Maya Nath Wagle	Lamjung	225
3	Narayan Dahal, , Hridaya Khadka	Ram Prasad Dahal	Ramechhap	157
4	Kumar Dahal	Kumar, Dahal and Ran Chandra	Dolakha	21
5	Lokendra K. C.	Lokendra K.C	Pyuthan	13
6	Padam Giri	Padam Giri	Kailali	7
7	Madan Pyakurel	Madan Pyakurel	Udaypur	2
8	Bikram Thapaliya	Bikram Thapaliya	Kavre	60
9	Umesh Tamang	Umesh Tamang	Makawanpur	5
10	Wangcho Sherpa	Wangcho Sherpa	Okhaldhunga	200
11	Bishnu Thapa	Bishnu Thapa	Sindhuli	10
12	Yam Prakash Gharti Magar	Yam Prakash Gharti Magar	Baglung	6
13	Philman Tamang	Philman Tamang	Nuwakot	10
14	Ram Prasad Parihar	Ram Prasad Parihar	Kavre, Bhakundebesi	25
15	Bhagat Khadka	Bhagat Khadka	Dhading	3
16	Arjun K.C.	Arjun K.C.	Khotang	55
<b>Total</b>				<b>849</b>

#### Annex 4: Workshops and exhibitions

S.N.	Date	Participation	Organized by
1	2013-05-18	Exhibition on Clean Cooking Stove	Small Scale Industry, Pokhara
2	2012-07-20	Exhibition on Clean Cooking Stove	AEPC, Kathmandu
3	2013-07-15	Exhibition on Clean Cooking Stove	AEPC, Kathmandu
4	2013-01-21	Workshop on learning cum review	UNDP/GEF-SGP and IRDC, Pokhara
5	2013-09-21	Workshop on Learning Cum Review	UNDP/GEF-SGP and IRDC, Pokhara
6	2013-09-26	Workshop on GEF National Stakeholder's Review	MOF and IECCD, Kathmandu
7	2014-02-17	Renewable Energy Week	Organised by AEPC, Kathmandu

#### Annex 5: Visitors from different organizations in the project areas

S.N	Name	Organization/District	Purpose
1	Jagdish K.C.	Kalikot	Barefoot MICS training
2	Dipak Babu Ghimire	Lamjung	Barefoot MICS training
3	Matrika Ghimire	Lamjung	Barefoot MICS training
4	Kul Prasad Shrestha	Lamjung	Barefoot MICS training
5	Maya Nath Wagle	Lumjung	Barefoot MICS training
6	Ram Prasad Dahal	Ramechhap	Barefoot MICS training
7	Kumar Dahal	Dolakha	Barefoot MICS training
8	Ran Chandra		Barefoot MICS training
9	Lokendra K.C	Pyuthan	Barefoot MICS training
10	Padam Giri	Kailali	Barefoot MICS training
11	Madan Pyakurel	Udaypur	Barefoot MICS training
12	Bikram Thapaliya	Kavre	Barefoot MICS training
13	Umesh Tamang	Makawanpur	Barefoot MICS training
14	Wangcho Sherpa	Okhaldhunga	Barefoot MICS training
15	Bishnu Thapa	Sindhuli	Barefoot MICS training

16	Yam Prakash Gharti Magar	Baglung	Barefoot MICS training
17	Philman Tamang	Nuwakot	Barefoot MICS training
18	Ram Prasad Parihar	Kavre, Bhakundebesi	Barefoot MICS training
19	Bhagat Khadka	Dhading	Barefoot MICS training
20	Arjun K.C.	Khotang	Barefoot MICS training
21	Mr. Gopal Raj Sherchan	UNDP/GEF-SGP, Kathamandu	Monitoring visit in Lele-7
22	Mr. Vivek Dhar Sharma	UNDP/GEF-SGP, Kathamandu	Monitoring visit in Lele-7 and Bugmati-6
23	Mr. Bharat Mani Gyawali	NEWS 24, Kathmandu	News coverage in Lele-7
24	Mr. Sunil Shrestha	NEWS 24, Kathmandu	News coverage in Lele-7
25	Mr. Nabin Aryal	Arthik Dainik, Kathmandu	News coverage in Lele-1&7
26	Ms. Niru Aryal	Karobar Dainik, Kathmandu	News coverage in Lele-1&7
27	Mr. Roshan Adhikari	CRT, Kathmandu	Monitoring with engineering view in Lele-6,7,and 9
28	Dr Dhruva Gautam	Pragati Nepal	Monitoring visit
29	Tara Bhandari	Sagun	Observation and learning visit in Lele
30	Mr. Sanjay Kumar Mandal	Executive Director, Jeevan Bikash Samaj, Morang	Monitoring visit in Chapagaun-6
31	Mr. Damodar Regmi	Senior Officer, Jeevan Bikash Samaj, Morang	Monitoring visit in Chapagaun -6
32	Mr. Nawa Raj Dhakal	Assistant Director, AEPC, Kathamandu	Monitoring visit in Lele-7
33	Ms. Karuna Bajracharya	AEPC, Kathmandu	Monitoring visit in Lele-7
34	Ms Sharmila Katuwal	AEPC, Kathmandu	Monitoring Visit in Lele-7
35	Mr Shashwat Sharma	Change Fusion Nepal	Visit Lele-7 for documentary in SNASEA 2013
36	Prahlad Khatiwada	Camera crew, Media+ pvt Ltd	Visit Lele-7 for documentary in SNASEA 2013
37	Ms Hyacinth Douglas	NC, Jamaica	Monitoring visit in Lele-7
38	Aakhi Jhyal	Nepal Television	Documentry
39	Mr Charles Nyandiga	Climate Change Advisor, SGP HQ, New York, USA	Monitoring visit in Lele-7
40	Mr Recardo Monteiro	NC, Côte d'Ivoire	Monitoring visit in Lele-7

## Annex 6: Raw Material and Making of M-ICS





Nepal Environmental Watch Initiative (NEW Initiative) was established in 2005 as a non-profit and non-governmental organization by a group of graduate students of environmental management and science who aimed to serve marginalized rural community. The organization integrates Climate Change and Agriculture as an approach to look at marginality and poverty. It promotes new technology on Renewable Energy, Organic Farming and Sustainable Integrated Farming System (SFIS). It provides technical skill training to rural communities and build their capacity, organizes awareness campaigns, and conducts surveys and research. The organization provides trainings on income generation and promotes options for sustainable livelihood to retain human resources within the country. NEW Initiative also prioritizes Gender and Social Inclusion projects at field level.



**Nepal Environmental Watch Initiative (NEW Initiative)**

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