Chapter One

INTRODUCTION

1.1 Background of the Study

Nepal is a under developed country in the world with lowest per capita income. It has areas 147181 Sq. Km inhabited by 2,31,51,423 people, the average length from east to west is 885km and the mean width is about 193 km. Out of the total population 86% live in rural area.(CBS, 2001)

Energy is one of the basic needs of people. It is very important for our daily life particularly for the economic and overall development. In general, the energy consumption scenario of the world indicates that people largely depend upon non-renewable source of energy to meet their energy demand. This scenario is intense in most of the developing countries of the world. However, a positive symptom of using renewable source of energy looks to be developing and it is gradually replacing the use of non – renewable source of energy. In this context, the use of alternative technology looks much more relevant for the sustainable use of renewable source of energy for the human betterment. Energy consumption of a nation considered as an indicator of its development. This is because all survival and development activities directly and indirectly depend upon energy. It is an essential of human progress and prosperity. It is clear that the economic development of the country requires access to affordable and sustainable energy. The energy situation in Nepal has characterized by very low energy consumption per capita of 14.06GJ. The developed countries like USA and Canada constitute 5% of the world population but consume one forth of global Energy i.e. 300GJ per person/year. However, developing countries consume energy i.e. less than 1GJ/person/year. This reality shows that the life style and living standard are closely relating to meet their energy needs. Thus, the developing nations have to think about different strategies and method to meet their requirement by utilizing the renewable energy sources available in their geographical area (WECS, 1994).

The total energy demand of Nepal has estimated to be about 248 million GJ in 1990/91 and this has been increasing by an average of 2.4% per annum during the past 10 years. The total energy consumption in the year 1992/93 has estimated to be about 270 million GJ 91%. In other sector amount 91% of the energy demand is meet

from traditional sources (i.e. fuel wood 68%, agriculture residues 15% and animal dug 8%) the share of petroleum fuel, charcoal, and electricity in the total consumption are estimated to be7.21percentage and 0.9% respectively. Only about 12% of the total population have access to the electricity the rural population which comprise about 90% of the total population has very limited access to electricity 3% (WECS, 1994/95)

The amount and type of energy consumption also indicates the level of human development and living standard of the people to certain extent (Goldenberg, 1996) Nepal is one of the five least energy-consuming countries in the world (MoF, 2005). In this context Nepalese are not only economically poor but also their exits a state of energy in sufficiency, since major part of that is traditional resource like fuel wood that is used in most primitive way.

Energy sources of Nepal can be categorized into three main heads like as traditional, commercial, and renewable energy. In fiscal year (FY 2005/06), traditional, commercial, and renewable energies occupied 85.5%, 13.54%, and 0.61% respectively of the total energy consumption. This indicates that the dependency of Nepalese economy on the traditional source of energy has not changed (WECS, 2003).

Traditional energy includes fuel wood agriculture residues and animal waste and share of consumption was 88.68%, 4.85% and 6.47% respectively, on the commercial energy side share of petroleum products was 68.54%, coal 22.74% and electricity consumption was 18.81% of total consumption of energy in FY 2005/06 (WECS,2003)

In Nepal Improved Cooking Stove can be main device to reduce the fuel wood problem as well as energy problem for rural people. It can be more effective method than the traditional cooking stove. It can save 30% to 35% fuel wood than TCS and helps to reduce the fuel wood problem (CRT/N, 2003). It has also save time, which can be use in other earning activities. This technology is simple and not so expensive. It can be installed by using the local available resources so rural people can afford easily. In this way, it can play the vital role to improve the socio-economic condition of rural people.

There are about 50 organizations involved in ICS dissemination in Nepal, such as GON, UNDP, FAO, CFDP, CRT/N, ICIMOD, RECAST,WDD,AEPC/ESAP etc. and others institutions CBOs are also directly and indirectly involving to promote the ICS program in rural areas of Nepal (WECS, 2003)

In our country 85%, people are living in rural area (CBS, 2001) majority of households are using traditional cooking stove for the cooking food. It consumes more time and fuel wood creates more smoke, which mostly affects the health of women and children. Hence, there are limited sources of fuel wood. Majority of households are based on fuel wood energy for cooking food, space heating and other purpose so, it is being challenging for the future. Similarly rapid population growth has been increasing pressure on forest to fulfill their fuel wood problem as well as enlarge the agriculture food production. Because of the rapid rate of deforestation problem is increasing day by day than the previous years. Economically active population is spending about one to six hours/day for fuel wood and fodder collection. That is why, it is hampering for economic activity. The economic condition is also decreasing gradually. In this condition, neither there is better economic condition to consume the commercial fuel nor are other alternative energy sources available. Thus, fuel wood is very crucial to the rural women. In this context, the improved cooking stove (ICS) can play vital role for effective utilization and consumption of fuel wood likewise it is better for the improvement of indoors and out door pollution and also to support health condition and educational activities. The reduction of women's workload and other prominent factor that needs to be focused in the future program interventions. In this way, AEPC/ESAP has implemented "Improved Cooking Stove Program" among the people of poor category and middle class particularly in hilly region. These target people are those who are supposed to be unable to afford the high cost technology. Hence, the study is oriented to analyze the opinion of ICS and purposively the research has conducted in Chirtungdhara VDC of Palpa District. In this VDC at about 6 to 7 years ago, Improved Cooking Stove Program was launched. After the study, it has the necessity to supervise the program other VDC. As well, it has been thought that it will give the comparative study of the effects of ICS program in other program running VDC under the study area. The study has tried to complete the target work, which are presenting the qualitative and quantitative data as per the experience of field study.

1.2 Statement of the Problem

Due to the rapidly growing population, the demand of firewood is increasing in rapid rate. The population growth rate is 2.25% per year (CBS, 2001). The annual extraction from the forest of 2.1% is higher than the regeneration capacity from the forest (Joshee, 1986). On the other hand fossil fuel are too much expensive and the infrastructure to ensure their availability is lacking increasing the supply the bio-mass fuels, and using them more efficiency will be vital task in the coming years.

A rural person in Nepal heavily depends on biomass such as fuel wood, agriculture residues, cattle dung etc. to meet their domestic energy needs. Fuel wood supplies nearly 76% of total energy requirement of the country and agriculture residue and animal wastes contribute 10% of energy. The traditional stoves has been observed over consume these low grade but cheap and readily available biomass fuels resulting into excessive pollution of the indoor environment (air and sanitation) and poor family health especially those of women and children. Incomplete combustion in the traditional cooking stoves results into emissions of green house gas, which has adverse effect on human health too. In this context, ICS can play important role for efficient utilization of fuel wood in terms of saving the quantity of fuels and cooking time's reduction in health hazards and green house gas emission, and lowering the pressure on forest for fuel wood extraction (TRUST, 2006).

This study was focus on these following problems, which problems were in the study area, it has tried to carry out the output, and opinion about the ICS related problem from the respondents. Therefore, it has researched following these problems in Chirtungdhara VDC of Palpa District.

- Nepalese people are largely depend the one of traditional energy source, such as fuel wood 75.79% agriculture residues 3.57% and animal dug 5.74% all used primarily for cooking and space heating (economic survey 2006/07). So this data shows that almost Nepalese people depending energy sources in forest and the population growth rate is 2.25 (CBS, 2001) per year and the forest deforestation rate is 2.1% per year (Joshee, 1986). Hence, if we do not care about of this it would be bringing challenge of like disaster, landslide, deforestation, global warming, and heavy rain etc. therefore Improved

Cooking Stove also one of the best supporting programs for the protection from the above problems.

- Nepal, primarily women carry the cooking activities. Besides rural women often play an important role in collection of biomass, fodder, and water. The supply of biomass is a serious concern in the past few years. It is due to over exploitation of forests for fuel wood and fodder as well as the agricultural food production demand of growing population. These result a serious impact on women's access to source of biomass energy. Further, the use of traditional stoves "*agenu*" and "*chulo*" that consume more fuel increases the drudgery on women to cook. Besides, using biomass energy and low-grade biomass fuels leads to excessive levels of indoor air pollution. Women and children of rural poor families are particularly exposing to smoke emission. This is one of the reasons of higher rates of infant mortality and morbidity. Poor combustion of biomass fuels results greenhouse gas (GHG) effect due to emission of incomplete carbon products in the atmosphere. Furthermore, the firewood used in the traditional "*chulo*" is inefficient and does not exploit the end use efficiency of the firewood.
- The study area was Chirtungdhara VDC of Palpa District. Which lies in hill area so this study area's people are facing so smoky problem due to use of traditional stove for the purpose of cooking food. Because they cannot afford to use other stove such as biogas, LP Gas, kerosene stove etc. there are some health problems due to smoky environment like as respiration problem (cough, asthma, chest pain, ARI in children) and eye redness problem.
- In this study area, around 366 above ICS have been installed and some ICS users are not using ICS. Instate of this stove they are using again traditional stove and some users are using LP Gas stove, bio-gas stove who afford it. Some people have been using traditional stove for a long time. Still they could not try to think about of alternative way.

1.3 Objective of the Study

The general objective of the study has to assess the Livelihood Impact of ICS Program in Chirtungdhara VDC of Palpa District. However, the specific objectives were given below.

I. To explore the socio-economic impact of ICS program on local village people.

II. To identify the prospects and challenges for the users of ICS.

III. To identify the causes of drop out of ICS uses and ICS promoters.

1.4 Important of the Study

During the study, it has felt the necessity of supervision also others different VDC. After that, it has selected the one ward of each VDC from ICS program running VDC, likewise ward no.3 of Kusumkhola VDC, and ward no. 6 of Telgha VDC. These two VDC are programs running VDC of REDA (this local organization (REDA) has affiliated by AEPC/ESAP Biomass support program and it has working in Palpa District as a Regional Renewable Energy Service Centre). In addition, Chirtungdhara VDC is phase out VDC of this program. This study has tried to find out comparative data from the old and new running program VDCs. It has hoped that this study would play the vital role for the dissemination and the development of ICS program in this VDC. Similarly, it would be beneficial for different related organizations, which are working in different part of the country.

The potential for Improved Cooking Stove technology is obvious in the rural areas especially of inaccessible villages, where deforestation is in increasing rate and other commercial fuels are economically not feasible. One of the key characteristics of these cooking stove programs is its ability to utilize the local workers and create a condition of self-sustaining process of diffusion using locally available resources, unaided by external market intervention.

- The researcher had done the live interaction with the different type of users such as ICS users, non-ICS users, dropout ICS users, active and inactive promoters etc. and tried to carry out their experience about use of ICS. Therefore this study shows the real data about ICS program of Chirtundhara VDC.
- It has hoped that this study would play the vital role for dissemination and the development of ICS program in the study area.
- This study helps to know the present situation and condition of ICS and changing socio-economic status of user after ICS installed and environmental aspect of this Chirtungdhara VDC of Palpa District.

- Similarly, it has been getting other information such as socio-cultural, educational activities, gender participation in the kitchen and extra activities, so it will be as a secondary resources and help to develop the policy and program for the District's organizations and chiritungdhara VDC. Likewise, it will be helpful for formulating proper planning.
- This study has helpful to identify the indicators for program implementation, concerning to ICS program area. Thus, the study has played the significant role.

1.5 Limitation of the Study

This study has attempted to assess the impact of Improved Cooking Stove program in Chirtungdhra VDC of Palpa District and each ward of Telgha\Kusumkhola VDC. However, it has following limitations.

- This study was an assessment study about ICS users, non-ICS users, dropout ICS users, active and dropout promoters in Chirtungdhara VDC of Palpa District.
- This study was carry out the Primary data from the Ninety households, where Fifty ICS user, Fifteen ICS non-users and Twenty five ICS dropout users.
- Regular ICS users mean, who has cooking food two times (morning and evening) in ICS. In addition, partial ICS user mean, who has cooking one time (morning or evening) in ICS or irregular cooking food in ICS.
- This study was qualitative and quantitative research, so it was totally base on the answers of respondents and community groups.
- The respondents were selected by purposive and random sampling method from ICS users, drop out ICS users and ICS non-users. Therefore, it is unable to represent the total population of this VDC.
- The research has been conducted the field study within limited time and fund.
- This study has only confined to the users and non-users of the ICS in Chirtungdhara VDC of Palpa District. Therefore, the conclusion might not generalize for the other places.

1.6 Organization of the Study

This study has been in total consists of six chapters

- The first chapter of the study includes introduction, which are includes background of the study, statement of the problem, objectives of the study, importance, and limitation of the study.
- In the second chapter, literature review has presented.
- The third chapter includes research methodology, which are includes research design, rational of the selection of the study area, sampling procedure, types of sources of data, data collection tools and technique, finally data presentation and analysis.
- In the chapter fourth includes the background of the study area. Where are presentation and analysis of the data collected from the households (HHs) survey, summary of activities and case studies.
- Summary, conclusion, and recommendation have given in chapter five.

Chapter Two

LITRETURE REVIEW

For this researcher work, the literature review has done under two categories the conceptual review and review of empirical study.

In this way, literature was reviewed from the different books, journals, previous research, reports, articles, plan, and policy, other published and unpublished documents related to the subject.

2.1 Theoretical Rreview

ICS is the reformed device of traditional cooking stove. Comparatively it consumes less fuel wood; it is easy to cook food, keeps the clean environment in kitchen room, and reduces the indoor pollution than the traditional cooking stove. Technically, it is simple and acceptable than the other stove like as LP gas, biogas, kerosene stove etc. the use of low-grade biomass fuel in traditional stoves leads to excessive levels of indoor air pollution. Women and children of rural and poor families are particularly exposed to the smoke emission. This is one of the reasons of higher rates of infant mortality in rural area. Release of incomplete carbon products in the atmosphere due to poor combustion of biomass fuel results green house gas emission too (AEPC, 2000).

Many researcher and conferences have been done for the promotion, dissemination, and development of Improved Cooking Stove (ICS).

- ✓ According to Joshee 1986, employed person, educated person, large family, rich person were the users of ICS.
- ✓ According to sulpya 1986, the ICS save firewood about 18-42% and efficiency is 25-40%.
- ✓ According to Wood, 1987, ceramic insert type stove has mostly abandoned in favor of stoves built on the site from locally available materials.
- ✓ A health development project estimates about 33% of ICS users in Surkhet District demonstrated changes in work patterns because ICS cooked faster and food is kept warmer for a longer period of time (Health Development Project, 1992)

- ✓ CFDP 1984 reveals that the most common features of ICS are firewood saving it works on the principle of increasing the concentration of heat directly under the first cooking pot and then channels the heat back to the second burner to cook second pot at once. It conserves heat and reduces heat dissipation with minimum waste 30-50% firewood could be saved through the proper use of ICS.
- ✓ The *'Nada chulha'* could reduce fuel wood consumption and improve the women's quality of life has developed between June 1980 and April 1983. It emerged as a response to the women requests for smoke removal from their kitchen. The experience of working with village women has demonstrated the importance of making technology adoptable to unreliable needs (Clarke, 1985).

2.2 The historical development of ICS can be divided on three phase.

The history of the ICS is not new in Nepalese context. The development of ICS can be divided into three phase. The first phase started in the 1950s by introducing *"Magan Chulo"* which originated in India. At that time, the village development services, "*Gramin Vikash Sewa"* started promoting ICS in some areas of Nepal. The program has aimed at uplifting the living conditions of the people and reducing exposure to smoke. However, the program was unsuccessful in terms of wider dissemination because of easy accessibility to the forest nearby as well as the low price of firewood.

The second phase started in the early 1970s and focused on improving fuel efficiency. Technological expertise about large mud stoves with a number of rings, known as the *"Lorena"* stove, came from South America (Guatemala). The Women's Training Centre of Nepal was involved in training women in the construction of Lorena Stoves. The main objective during this period was to find a solution to the fuel wood crisis and accompanying deforestation. In the late seventies, RECAST became involved in the improvement of these stoves and renamed them Nepali *Chulo.*

The third phase, which began in the early 1980s, has taken up by research and development (R&D) and laboratory-based work. This included a detailed assessment of cooking-stove performance, standardized procedures for testing, and design methodologies to obtain higher performance and efficiency. The Lorena Stoves

replaced by ceramic insert and Double Wall Stoves. These cooking stoves were design by RECAST under a contract with the HMG/UNDP/FAO Community Forestry Development Project (CFDP). Large-scale distribution has carried out by the CFDP. After some years, with support from UNICEF the ceramic cooking stoves and the new Nepali *chulo* were also introduced through the Agricultural Development Bank, Nepal (ADB/N), the Small Farmer's Development Project (SFDP) and the Women Development Division (WDD) through their Production Credit for Rural Women (PCRW) Program. Thousands of these stove were distributed some modifications to ceramic Tata Energy Research Institute (TERI) models were made, especially on the second ring and its size. Distribution was limited and confined only to the field trail. As in the first phase, socio-economic issues once again occupied the centre- stage of activities. ICS Production had reviewed and planned for a self-propelling distribution process. (WECS 2004)

Later the Tamang Stove (Improved Village Stove) introduced. It consisted of a mud-brick or mudstone ICS with an iron tripod, which has driven into the combustion chamber to form a better foundation. It is a two-ring stove with a chimney (ceramic or mud-brick). The stove can withstand excessive force, Such as that exerted during cooking maize porridge. The chimney has modified for easy cleaning.

1. The first phase started in 1950s by introducing *Magan Chulo.*
2. The second phase started in the 1970s by introducing Lorena Stoves (Guatemala model)
3. The third phase started in early 1980s has taken by research and development. Laboratory based work, ceramic insert and double wall stoves replaced the Lorena stove. These stoves were design by RECAST under a sponsorship with the GON, UNDP, FAO, and CFDP. The ceramic cooking stoves and the new Nepali *chulo* also introduced through the agriculture development bank. New modification stoves called Tamang completely from cheap readily available local materials stoves dissemination have been underway (CRT/N, 2003).

2.3 Sources of energy in Nepal

Nepal has a per capita energy consumption of around 15 GJ, which is one of the lowest in the world. Nepal relies heavily on traditional energy sources to meet its energy requirements. According to the economic survey 2003, more than 85% of the total energy demand has met by traditional sources, of which fuel wood is the main

source of energy as shown in (Table no.1). The remaining portion of the energy demand has met by commercial sources and electricity accounts for just over 1%. The 10th five-year plan states that 40% of the Nepali population has access to electricity, however according to the Nepal electricity authority (NEA, 2003) only 22% of households have access to electricity and 7% from alternative source of energy.

The residential sector consumes almost 90% of the total energy consumption of the country. The industrial, transportation, and commercial sectors consume 5.25%, 3.44%, and 1.33% of total energy consumption respectively as shown in the (Table no.2). The agriculture sector consumes less than 1% of total energy consumption. Energy end-uses of the domestic sector in 1992-93 was met mostly 72% by fuel wood, followed by 16.2% agricultural residue. Commercial energy consumption was nominal, with kerosene and LPG making up 2% and 0.1% respectively in that year. About 85% of Nepal's population lives in rural areas where agriculture is the mainstay. The Water and Energy Commission Secretariat (WECS) carried out a detailed study on energy consumption patterns in rural households in Nepal in 1995. As shown in the figure below, fuel wood dominates almost 90% of the total energy consumption in the rural areas of Nepal. Animal dung and agricultural residues provide the second and third energy sources for rural households. The level of electrification was negligible in 1995 as was the use of appliance. Kerosene lamps are the most common lighting appliances in rural energy is heavily dependent upon biomass. According to the same survey conducted by WECS in 1995, residential cooking is the single largest end use, accounting for about 65% of total energy consumption in rural areas, followed by space heating and water boiling as shown in the (Table no.5). Women in rural areas perform most of the household tasks, from collecting firewood and cooking, to looking after children. On average, hills households (without biogas) in rural areas consume about 6 tons of firewood during summer and 7.6 tons during winter. Households in the Terai consume 3.7 tons of firewood during summer and 5.4 tons during winter (Biogas Support Program, 2002). Wood collection for cooking food is getting rougher as forest has depleted and women have to walk for hours to find wood. The time cost alone can be extreme in rural areas. Estimates range from two to twenty hours per week spent in collecting wood. The distance covered could be significant in difficult terrain (warwick, H and Doig A, 2004).This level of work and the drudgery of every day chores leave poor women with little time on other activities such as earning money or even taking rest

and even further contribute to additional threats on health and well beings. Women are vulnerable to back problems from carrying heavy loads, for instance .In rural areas of Nepal, women spend about six hours of their time on hazardous conditions while cooking over traditional stoves that spew highly toxic materials, giving rise to eye infections and other respiratory problems for them, their children and other family member.(Rural Development Program, GTZ Nepal)

Table no. 1. **2.3.1 Energy consumption by fuel types in Nepal 2002.**

SN	FUEL TYPE	IN %
1	Fuel wood	75.79
2	Animal dug	5.74
3	Agriculture residues	3.75
4	Petroleum	9.24
5	Charcoal	3.53
6	Electricity	1.47
7	Renewable	0.48

(WECS, 2002)

Table no. 2 **2.3.2 Energy consumption by sector wise in Nepal 2002**

SN	SECTOR	IN %
1	Residential	89.05
2	Industrial	5.25
3	Transport	3.44
4	Agro-procedure	0.79
5	Others	0.13

(WECS, 2002)

Table no.3 **2.3.3 Energy consumption in residential sector**

SN	FUEL TYPE	IN%
1	Fuel wood	72.4
2	Animal dug	8.90
3	Agriculture residues	16.2
4	LPG	0.10
5	Electricity	0.40
6	Kerosene	0.48

(WECS, 2002)

Table no.4 **2.3.4 Energy consumption in rural household**

SN	FULE TYPE	IN%
1	Fuel wood	87.8
2	Animal dug	6.70
3	Agriculture residues	3.60
4	LPG	0.20
5	Electricity	0.10
6	Kerosene	1.60

(WECS, 2002)

Table no.5 **2.3.5 Energy end-use in rural household**

SN	FUEL TYPE	IN%
1	Cooking	65.00
2	Others	21.00
3	Space heating	8.00
4	Agro-processing	3.00
5	Water boiling	2.00
6	Lighting	1.00

(WECS, 2002)

2.4 Summary Report of ICS in Nepal

The Improved Cooking Stove (ICS) component is one of the five components in GoN-Danida supported Energy Sector Assistance Program (ESAP) in Nepal. The component has executed/monitored at national level by Alternative Energy Promotion Center (AEPC) of GoN and financially supported by ESAP-Danida. According to the approach I & II, AEPC/ESAP was focus on dissemination of ICS in the middle hills of Nepal through the Nepal Forum for Environmental Journalists (NEFEJ), Centre for Rural Technology/ Nepal (CRT/N) and Department of Women Development (DWD). After development of approach III strategy, ICS Promotion has carried out through NGOs by mobilizing CBOs and local institutions such as District and Village Development Committee. After the III approach, AEPC/ESAP has implemented the ICS program through the District levels' local NGOs as a Regional Renewable Energy Service Centre (RRESC). In Nepal Twelve RRESC has been implementing the ICS Program in Forty Eight Districts to cooperative with the AEPC/ESAP. ICS progress report is given below From Jan 2000 to Jan 2010.

2.5 Summary Report of ICS installed in total Program DDC JAN 01, 2000 To JAN 31, 2010

Table No. 6

SN	RRESC	PROGRAM DISTRICTS	ICS INSTALLED	TOTAL	SN	RRESC	PROGRAM DISTRICTS	ICS INSTALLED	TOTAL
1	NCDC	Taplejung	5659	20795	26	DCRDC	Kaski	642	32179
2		Pachthar	5144		27		Myagdi	5998	
3		Ilam	9992		28		Parbat	9420	
4	NCDC, DHARAN	Sankhuwasabha	353	6472	29		Baglung	16119	
5		Bhojpur	305		30		Mustang	0	
6		Dhankuta	5687		31	CRT, Dang	Pyuthan	7879	41432
7		Khotang	127		32		Rukum	4044	
8	REMREC	Okhaldhunga	5847	20973	33		Rolpa	5252	
9		Udaypur	11729		34		Dang	9902	
10		Sindhuli	3397		35		Salyan	14355	
11	REMREC	Ramechhap	9030	37640	36	BNA	Jajarkot	5886	32095
12		Dolkha	7141		37		Surkhet	12154	
13		Sindhupalchok	9508		38		Dailekh	14055	
14		Kavre	11961		39	CRT, Achham	Achham	167	305
15	CRT	Bhaktapur	321	39268	40		Bajhang	0	
16		Lalitpur	367		41		Bajura	138	
17		Kathmandu	363		42	DDC,	Darchula	0	0
18		Rasuwa	970		43	RDSC	Baitadi	3028	14999
19		Nuwakot	10783		44		Dadeldhura	3063	
20		Dhading	13992		45		Doti	8908	
21		Makwanpur	12472		46	REDA	Syangja	15571	71645
22	RESDTN	Gorkha	628	10755	47		Palpa	18225	
23		Lamjung	742		48		Gulmi	19012	
24		Tanahu	8483		49		Argakhachi	18837	
25		Nawalparasi	902			**Total**			**328558**

(Source by AEPC/ESAP, JAN-2010)

2.6 ICS Installed in Palpa District up to Dec. 2010

SN	LPO	VDC	ICS Installed	TOTAL	SN	LPO	VDC	ICS Installed	TOTAL
1	GUPA	Jhadewa	33	751	17	SSAN	Foksingkot	324	1031
2		Khya	109		18		Juthapauwa	182	
3		Koldanda	249		19		Kachal	290	
4		Mujhung	81		20		Satyawati	235	
5		Telgha	170		21	REDA	Gothadi	78	882
6		Thimure	109		22		Heklang	44	
8	JBPTK	Archale	65	337	23		Kaseni	8	
9		Jyamire	10		24		Kusumkhola	553	
10		Sahalkot	215		25		Rahabas	124	
11		Bakabalang	47		26		Rupse	7	
12	RRDC	Gandakot	128	455	27		Khaliban	62	
13		Rampur	327		28		Bahadurpur	6	
14	SASF	Bhuwanpokhari	102	493	29	ISK	Baughagumba	167	627
15		Siddheswor	184		30		Galdha	111	
16		Somadi	207		31		Jhirubas	250	
					32		Mityal	94	
					33		Siliwa	5	
					Total ICS installed				**4576**

ICS Installed in Program VDC = 4576
ICS Installed in Phase out VDC = 10156
ICS Installed in Out of Program VDC = 3493

Total ICS Installed in Palpa District = **18225**

2.7 Present Status of Promoter of Palpa District

Active Promoter	75
Inactive Promoter	60
Dropout Promoter	110
Total Promoters	245

(Source by RRESC, REDA Palpa JAN 2010)

Chapter Three

RESEARCH METHODOLOGY

Methodology is the backbone of the study. Therefore, it needs to be well defined to conduct the study. Therefore, in this study the following methodology were adopted to fulfill the objectives.

3.1 Research Design

For this study, descriptive as well as analytical research design was followed because the study focused in investigation of positive as well as negative impact of ICS in the community. The study finds the trend of firewood consumption, utility study of ICS, health impact of people, save fuel wood in comparison to the Traditional Cooking Stove. This research also was comparative study between the phase out VDC and program running VDC. From these VDC, it has tried to carry out the different impact of ICS program from the program VDC. There were some reasons of selection of others VDC. They are given below:

- During the research, it has found almost ICS users left the use of ICS because some technical defect of ICS.
- This Chirtungdhara VDC, there was no any technical monitoring and dissemination activities have done after the phase out.
- Except one promoter, all promoters were dropout. They had left the install and repair of ICS.
- The study area almost ICS were going to damage, because of there are lack of regular active and skill full promoter.
- There are some technical changes of ICS in the running VDC, like an iron fire gate, raise type of two pot hole stove etc.

Above these reasons, it has thought the necessity add other running program VDC. After that, the study was interesting and analytical. This study carried out based on an investigative and descriptive research design. Similarly, to fulfill the objective information was collect from the field study, interview, questioner survey, field observation, key informant survey, group discussion program, case study of some ICS users and promoter. The descriptive method was used for the qualitative data obtained

during the study. The data that were not quantifiable has explained literally. Analysis of the data has made by generating the tables of average and percentages.

3.2 Rational for the Selection of the Study Area.

The study was conducted in Chirtungdhara VDC of Palpa District; the village community is comprised up of different ethnic and socio-economically disadvantaged groups. The research had done among the ICS users, non-ICS users, dropout ICS users, and promoters of the Chirtungdhara VDC. The main purpose of the study of the researcher is to dig out the impact of ICS technology and its performance in such topographically constraint and socio-culturally diversified area. The reasons to select of this study area were as:

i. This study area is that the researcher being the neighbor inhabitant of the area and familiar with local people therefore by selection of this VDC. It has believed that, more information that is accurate could be collect during this study and study could accomplish easily.

ii. In this Chirtungdhara VDC, there is Improved Cooking Stove Program has implemented eight years ago. Therefore, this study could be carrying out the actual experience of different types of users (like ICS user, non-user, and dropout user.)

iii. In this study area, a local organization Palpa Pasture Development Association (PPDA) had worked as a Local Partner of ICS program. This organization's network is very well in this VDC, so it was easy to take help by this institution for the conducted focus group discussion, household survey etc.

3.3 Sampling Procedure

- This research has been done among the ICS users, non ICS users, dropout ICS users and Promoters in Chirtungdhara VDC and also one ward of each program running VDC (such as Telgha and Kusumkhola) of Palpa District.
- In this study area (Chirtungdhara), around 366 ICS have installed and some ICS users are not continuing use of ICS, so out of total ICS installed Ninety household were selection for the study.

- Out of Ninety households Fifty HHs were ICS users, Fifteen HHs were completely ICS non-users who have never used ICS and Twenty-Five dropout ICS users, those who have dropped out the use of ICS.
- This research household was select by the random sampling method.

3.4 Types of Sources of Data

To fulfill the objectives of the study, primary as well as secondary data were used.

3.4.1 Primary Data

The primary data has collected through structured questionnaire methods. Used sets of questionnaire are in Annex II. questionnaire is the main tool of information of field survey. Primary data also collect from the Focus Group discussion and Key Informant Interview.

3.4.2 Secondary Data

Data collected by the government and non-government offices in their different studies has served as secondary data in the study. The unpublished and published reports of AEPC/ESAP, CRT/N, REDA-Palpa, TRUST, VDC, and former dissertations had been the source of secondary data. Besides different journals, magazines newspapers and different experts of the related field also served as partial secondary source of data were also used.

3.5 Data Collection Tools and Techniques

The structured and unstructured questioners, interview, focus group discussion and Key informant interview methods has been applied to generate the primary data. Which are given below;

3.5.1 Structured Questionnaire

A structured questionnaire schedule had developed with an attempt to bring out the different status of respondents' attitudes, perceptions, and concept upon the utilization of ICS and improvement of their livelihood, socio-economic information and its impact on rural communities. To collect the primary data, household survey was conducted by using both structured and unstructured questionnaire, and were filled up by the researcher himself, asking from the respondents. Almost respondents were the female members of the sampling households.

3.5.2 Field Visit and Observation.

This study had been observed among ICS installed households and some non-ICS users. These households were selected by the randomly. The data had been recorded in observation sheet while observing the households' kitchen room environment, technically condition of ICS (like as baffle, fire gate, pot hole, chimney and smoke outlet.) and kitchen management.

3.5.3 Key Informant Interview

When contradiction and confusing data or information comes in the course of data collection and gathering information from the different respondents, and unstructured interview becomes important of to be clear. Therefore, the unstructured interview had done with local experts, social mobilizer, local ICS promoters, ICS technician and ICS related institutions.

3.5.4 Case Study

During the study, the researcher has presented the three case studies about the experience of ICS users; Dropout promoter and non-ICS user's community (Kumal Gaun).

3.5.5 Focus Group Discussion

This study has been collected qualitative data collected from the focus group discussion through this program. It has been taken out the more appropriate information and for the comparative study of concept and attitude of the respondents of different categories, such as ICS users and non users, social mobilizer, technician, dropout ICS users, LPO members etc. during the study, the researcher has been conducted the FGD program two time in Chirtungdhara VDC of Palpa District.

3.6 Data Presentation Analysis

Data presentation and analysis is the most important step in research. The effectiveness of a study could be measure through the presentation and analysis of data. In this assessment, collected data were processed using both manual and computer tools. Simple statistical tools like coding, classification, and tabulation was done to process the data on table pie chart and bar graphs. For analysis of the processed data, some statistical tools like average and percentage have used.

Chapter Fourth

BACKGROUND OF THE STUDY AREA

This chapter is basically consists of the general introduction of the study area which includes area, population, economic condition, educational status, transportation, climate, communication, energy and water supply facilities of the study area.

4.1 Field Area: Chirtungdhara VDC.

This Chirtungdhara VDC is lies at eastern part of District headquarter of Tansen Palpa. The peripheral VDCs of this VDC is Tansen Municipality in the west, Madan Pokhara VDC in south, Pokharathok VDC is in east and Nayar Namtalesh & Khanichhap VDC are in north. The VDC spreads from east to west. There are Nine hundred Ninety nine households in the VDC. This VDC is near about eleven KM far from the Tansen Headquarter. Farming is the main occupation of this VDC. This VDC has attached with the Siddartha Lokmarg. The VDC has households with the total population 4882. Among them, 2431 are female and 2451are male (VDC profile 2064). Improved Cooking Stove program was launched in the area about eight years ago. The program was financially supported by AEPC/ESAP and technically implementation of ICS program was supported by Centre for Rural Technology in Chirtungdhara VDC of Palpa District. Since the program has been phase out in the area. Therefore, there is no additional monitoring and dissemination activities about the program. A local organization Palpa Pasture Development Association had implemented ICS program in the Chirtungdhara VDC as a Local Partner Organization before 7 years. Now a day a local Promoter Mrs. Jayanti Charti has done the reporting of progress ICS. Among six-trained promoter, only she has been doing work regular for seven years.

4.2 Number of HH, Population by sex, Average HH size of ChirtungdharaVDC

Ward No.	Household	Male	In %	Female	In %	Total	Total %	Average HH Size
1	84	213	4.50	254	5.37	467	9.87	5.56
2	37	79	1.67	112	2.36	191	4.03	5.16
3	134	326	6.89	366	7.74	692	14.63	5.16

4	94	242	5.11	321	6.78	563	11.90	5.99
5	66	154	3.25	199	4.20	353	7.46	5.35
6	75	194	4.10	233	4.92	427	9.03	5.69
7	155	366	7.74	392	8.29	758	16.03	4.89
8	80	233	4.92	266	5.62	499	10.55	6.24
9	159	359	7.59	419	8.86	778	16.45	4.89
Total	884	2166	45.82	2562	54.19	4728	100.00	5.44

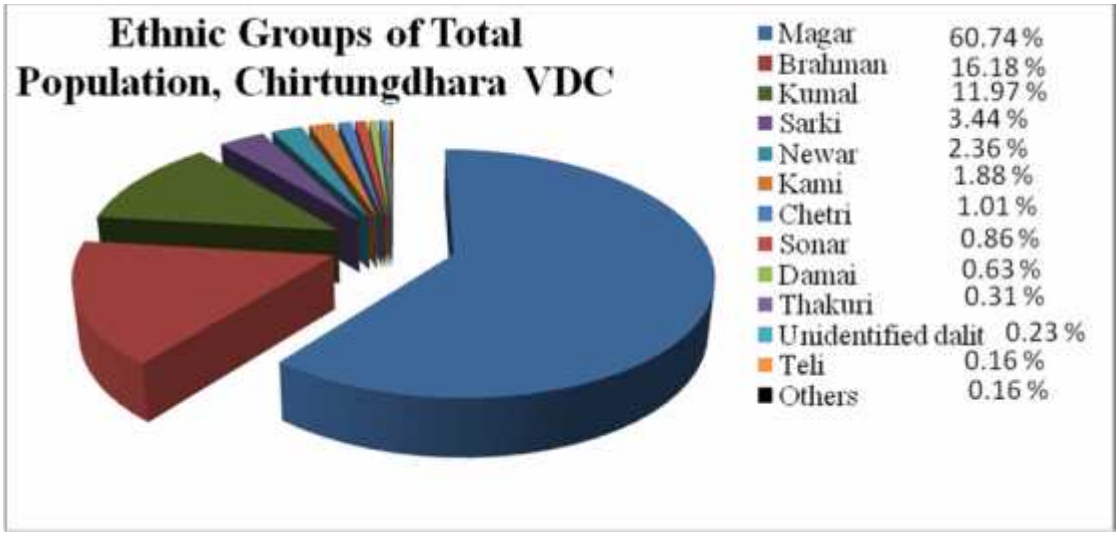
Source: CBS Palpa, 2008

4.3 Age group of Total Population

The table shows that, 4728 population are in Chirtungdhara VDC, female 54.19% and male are 45.81%.

Age group Population							
SN	Age group	Sex				Total Population	Total %
		Male	in %	Female	in %		
1	Below 14	902	19.07%	913	19.31%	1815	38.38%
2	15 to 29	554	11.71%	730	15.43%	1284	27.15%
3	30 to 44	274	5.79%	427	9.03%	701	14.82%
4	45 to 59	230	4.86%	291	6.15%	521	11.01%
5	above 60	206	4.35%	201	4.25%	407	8.60%
	Total	2166	45.81%	2562	54.19%	4728	100%

Source: CBS Palpa, 2008



Source: CBS Palpa, 2008

4.4 Caste\Ethnic groups of Total Population

Population by caste\ethnic groups		
SN	Caste\Ethnic	Population
1	Magar	2872
2	Brahman	765
3	Kumal	566
4	Sarki	163
5	Newar	112
6	Kami	89
7	Chetri	48
8	Sonar	41
9	Damai	30
10	Thakuri	15
11	Unidentified dalit	11
12	Teli	8
13	Others	8
	Total	**4728**

Source: CBS Palpa, 2008

Above this table shows that, majority of the population is consist of Magars. Other different groups after magars are Bramans, Chhetries, Newar, Kumal, Kami, Damai etc. in the Chirtungdhara VDC.

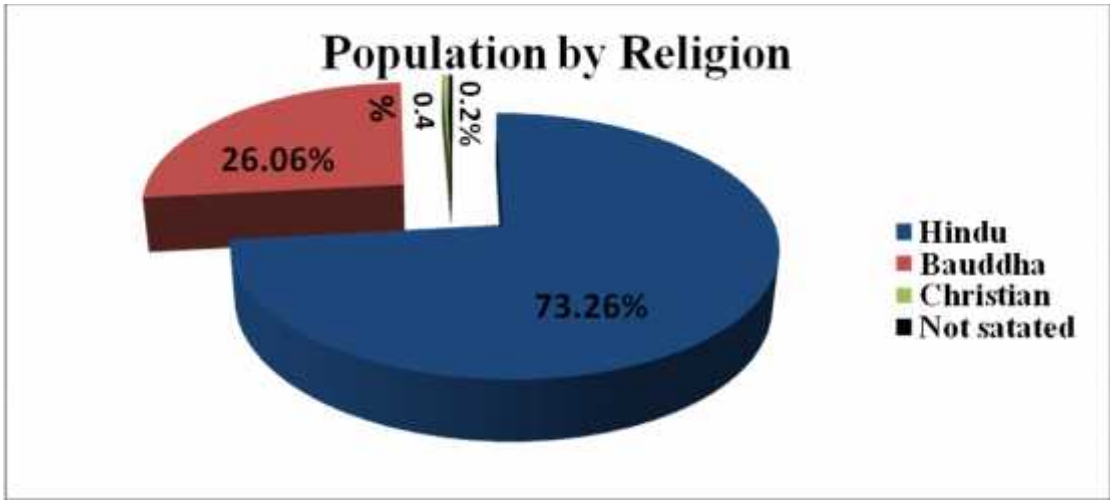
4.5 Population by Religion

In Chirtungdhara VDC, most of populations are Hindu religion, second Buddha and third Christian.

Population by Religion

Population by Religion		
SN	Religion	Population
1	Hindu	3464
2	Bauddha	1232
3	Christian	19
4	Not stated	13
	Total	4728

Source: CBS Palpa, 2008



Source: CBS Palpa, 2008

4.6 Educational Institutions

There is one higher secondary school in ward no one of Chirtungdhara VDC, 2 lower secondary School and primary school in each ward. There are two English Boarding School in this VDC. The following table shows the literacy rate of chirtungdhara VDC.

Population 6 years of age and over by literacy status and sex						
Status	Male		Female		Total	
	No.	In %	No.	In %	No.	In %
Can't read and write	290	15.77	911	40.1	1201	29.21
Can read only	97	5.27	126	5.55	223	5.42
Read and Write	1445	78.58	1235	54.36	2680	65.19
Not stated	6	0.33	0	0	6	0.33
Total	1838	100	2272	100	4110	100

Source: CBS Palpa, 2008

Chapter Five

PRESENTATION AND ANALYSIS OF DATA

In this chapter, the primary data has collected from the field survey. Basically, primary data has taken from the Chirtungdhara VDC but some data takes from others two VDC like a Telga and Kusumkhola VDC. It has taken eight HHs from ward no six of Telgah VDC and nine household from ward no three of Kusumkhola VDC. These VDCs where ICS program is still running program VDC and the program has been phase out in Chirtungdhara VDC. Therefore, as well as it has been thought that it would give the comparative study of the effects of ICS program in three VDC under the study area.

5.1 Social information

All type of respondent's the social information of has been included in the table (ICS users, non ICS users and dropout ICS users) these include, family size, ethnicity composition, age group population roof's structure, educational status, occupational condition. They were the main variables considered in the field study.

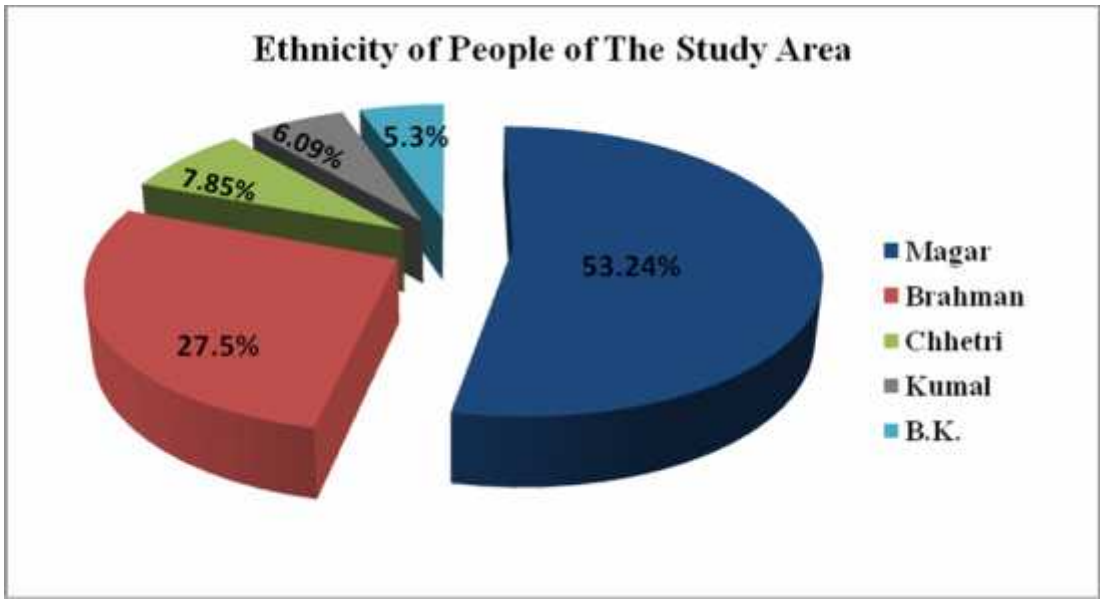
5.1.1 Ethnicity composition

It has been taken ethnicity of the respondents of study area. Which data would be help for the study and it would be effect of program depend on ethnicity types.

Table No. 5.1 Types of ethnicity of respondents.

Ethnicity and caste			
SN	Ethnicity	No of ethnicity	In %
1	Magar	271	53.24
2	Brahaman	140	27.5
3	Chhetri	40	7.85
4	Kumal	31	6.09
5	B.K.	27	5.3
6	Others	0	0
7	Total	509	

Source: Household survey 2010



Source: Household survey 2010

The different ethnicity composition has been tabulated in table 5.1. Ethnicity composition of the respondents shows that (53.24) half over of the respondents are Magar followed by Brahman 27.5% and similarly chhetri 7.85% etc.

Similarly, Magar community was 60.74%, 16.19% Brahaman, 11.27% Kumal community etc. (CBS, Palpa 2008) in Chirtungdhara VDC of Total population. Therefore this table shows that, in Chirtungdhara VDC most of them magar community lives than others cast's community.

5.1.2 Size of Family

The study area, there was different types of family size. It has been categorized in three family sizes, which are presented in below table no. 5.2.

Table No. 5.2 Family size of respondents.

Size of Family			
SN	Family size	No of HHs	in %
1	Below 4 persons	25	27.77
2	5 to 8 persons	58	64.44
3	above 8 persons	7	7.77
4	total	90	

Source: Household survey 2010

This table shows that the maximum family size 64.44% is 5 to 8 persons in one family, second 27.77% is below four people per family and 7.77% is above eight persons in one family. The average family size of the sample households (ninety HHs) is 5.65 persons per family.

The study area, out of Ninety households 64.77% is five to eight people per family. Therefore, this table shows that in rural area, especially hilly region there is lack of awareness of family planning. Still some families were live in joint family.

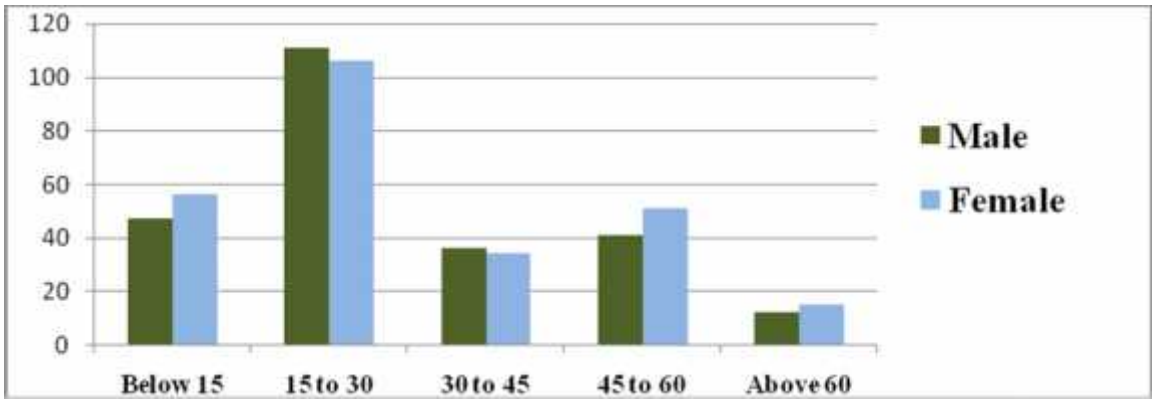
5.1.3 Age Group Population

The different age group population has tabulated in table 5.3 below. This data has been tried to carry out the different types age groups of population in study area.

Table No. 5.3 Age group population of the study area.

Age group Population							
SN	Age group	Sex				Total Respondents	Total %
		Male	in %	Female	in %		
1	Below 15	47	9.23	56	11	103	20.23
2	15 to 30	111	21.8	106	20.82	217	42.62
3	30 to 45	36	7.07	34	6.67	70	13.74
4	45 to 60	41	8.05	51	10.01	92	18.06
5	above 60	12	2.35	15	2.94	27	5.29
	Total	247	48.52	262	51.47	509	99.99

Source: Household survey 2010



Source: Household survey 2010

This table 5.3 shows that the maximum people 42.62% are age of group of 15 to 30 and it has followed by 20.23% from the below 15 age group. The study area minimum dependable groups above 60 years are 5.29%.

The study area, 15 to 30 years is major age group than others. Therefore, this data shows that, majority group is young in the study area.

5.1.4 Educational Status

Education plays vital role in overall development of any community. The following table 5.4 shows the educational status of the surveyed area.

Table No. 5.4 Educational status of respondents

SN	Educational Status	No. of person				Total Population	Total %
		Male	in %	Female	In %		
1	illiterate	35	6.87	27	5.3	62	12.17
2	general	41	8.05	39	7.66	80	15.71
3	up to 5	53	10.41	61	11.98	114	22.39
4	5 to 10	73	14.34	82	16.11	155	30.45
5	above SLC	45	8.84	53	10.41	98	19.25
	Total	247	48.52	262	51.47	509	99.99

Source: Household survey 2010

Above this table shows that, major respondents' educational status (30.45%) were five to ten class. In addition, 19.25% people are above SLC, out of 19.25%, there are 10.41% female and 8.84% male. Out of total population 12.17%, people were illiterate and 15.71% were general education.

According to 5.4 out of 509 people 10.41% females were passed SLC more than 8.84% males. Therefore, this table shows that females were more educated than male because of the poor. Almost young males are goes to foreign job before class ten for earn more money especially in Gulf country, after that they could not get further chance for study.

According to table no. 5.4, 12.17% people were illiterate; they do not have any types of education. Therefore, it should be launch the educational program like old education. It will help for the sustainable of program because education is main part of awareness for people.

5.1.5 Occupation of the Family Members

The people had followed the various occupations to sustain their life in the study area. Fallowing table 5.5 shows the occupational of the family's members.

Table No. 5.5 Occupation of the family's members.

Occupation of the family Members							
SN	Occupation	Male	in %	Female	In %	Total	Total %
1	Farming	60	11.78	131	25.73	191	37.51
2	Student	86	16.89	88	17.28	174	34.17
3	Teaching	15	2.94	9	1.76	24	4.7
4	Business	8	1.57	5	0.98	13	2.55
5	Labor	6	1.17	7	1.37	13	2.54
6	Foreign Job	35	6.87	2	0.39	37	7.26
7	Others Job	6	1.17	2	0.39	8	1.56
8	Pension	25	4.91	9	1.76	34	6.67
9	Non occupation	6	1.17	9	1.76	15	2.93
10	Total	247	48.52	262	51.47	509	99.99

Source: Household survey 2010

The above table 5.5 shows that the maximum Households are farmers 37.51%, second dependable student are 34.17% and minimum are others job 1.56% (Note: Other Job – private job in hospital, peon, journalist etc). There were 7.26% people went to foreign country to search labor job. They did not get opportunity in country.

Major occupation is agriculture of our nation. Therefore, 85% people are depending on the agriculture in Nepal (CBS 2001). However, 37.51% people were depended only in farming occupation in the study area.

5.1.6 Type of Roof

There were different types of roof of house in the study area. In the rural community, roof and house's type also indicated the development of area.

Table No. 5.6 types of roof of house

Types of Roof			
SN	House Type	No. of HHs	in %
1	Zink	75	83.33
2	Thatched	13	14.44
3	Others(Cemented)	2	2.22
	Total	90	

Source: Household survey 2010

According to the table 5.6, most of the respondents have Zink roof. This possessed about 83.33% and remaining 14.44%, 2.22%, Thatched and Cemented roof respectively.

5.1.7 Facilities of Infrastructures

Gaas, baas and kapas are fundamental right of people. Infrastructures' facilities are also indicate the development of human being and their community. Therefore, this data presents the shows development of study area.

Table No. 5.7 facilities of Infrastructures

Facilities in House			
SN	Facilities	HHs	In %
1	Tap	40	44.44
2	Electricity	89	98.88
3	Radio	85	94.44
4	TV	64	71.11
5	Toilet	89	98.88
6	Motor Way	25	27.77
7	Mobile	89	98.88

Source: Household survey 2010

In this study area, according to table no. 5.7 shows that electricity, toilet, and mobile telephone service are satisfy (98.88%). A drinking water facility was 44.44% and motor able road was 27.77 in the study area. There was problem of drinking water and motor able road.

The study program VDC is joints with headquarters of Palpa District. This VDC's almost people were going to modernization and they were using alternative energy source like LP gas, Biogas, electricity etc instance of fuel wood for cooking food. They were using fuel wood to cook feed for animal and jad raksi.

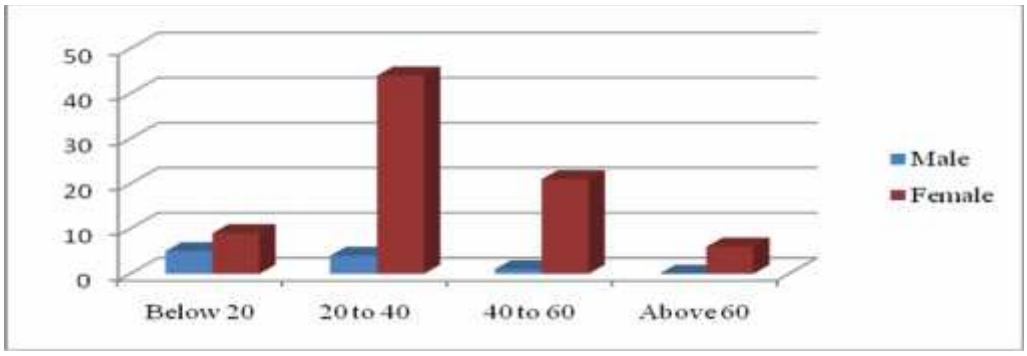
5.1.8 Age and Sex of the Respondents

The study and data totally depended up on the respondents. Therefore, it would be effect of data or answered to depend on the respondent's age, because below 20 and above 60 years respondents have not more experienced of cooking activities than others. The data has taken within limited time and fund; the study had taken data randomly.

Table No. 5.8 Age and Sex of the Respondents

Age and Sex of the Respondent							
SN	Age group	Sex				Total Respondents	Total %
		Male	In %	Female	In %		
1	Below 20	5	5.55	9	10	14	15.55
2	20 to 40	4	4.44	44	48.88	48	53.32
3	40 to 60	1	0.01	21	23.33	22	23.34
4	Above 60	0	0	6	6.66	6	6.66
	Total	10	11.11	80	88.88	90	99.99

Source: Household survey 2010



Source: Household survey 2010

The above table shows that, out of ninety respondents eighty female and ten male were involving as the respondents from different age groups. Among them mainly 20 to 40, (53.32%) years persons were participate in household's survey and it has followed second by 40 to 60 years. There were 15.55% respondents from below 20 years and 6.66% from above 60 years old.

The study's primary data is very effective, because most of them respondents were from 20 to 40 (53.32%) years old. It may be, they have more experience of cooking activities because those group most of time engage in kitchen room.

Group 'A'

5.2 Knowledge of Improve Cooking Stove

The study has focused also knowledge of ICS. It is most necessary to know about detail information of ICS for users, such as repair and maintenance of stove, cleaning chimney pipe etc. the ICS program can play the vital role for reduce deforestation rate of forest and escaped the smoky environment of kitchen room, if it has been used properly way. Therefore, the study tried to carry out different aspect of ICS.

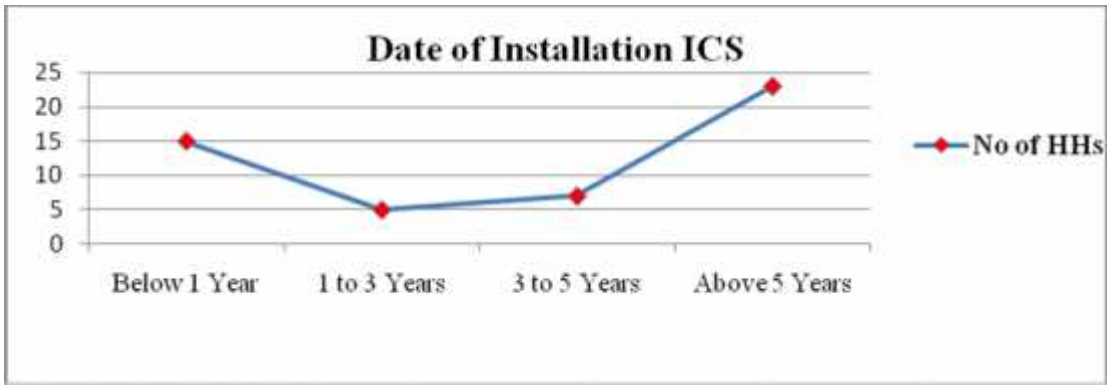
5.2.1 Date of Installation ICS

The study area, before one year installed ICS was performing better than after one year ICS. Therefore, the study had taken date of installation ICS.

Table No. 5.9 Date of Installation ICS

SN	Date of Installation	No of HHs	In %
1	Below one Year	15	30
2	One to Three Years	5	10
3	Three to Five Years	7	14
4	Above Five Years	23	46
	Total	50	100

Source: Household survey 2010



Source: Household survey 2010

According to above this table no. 5.9, 46% ICS had installed before five years and there was only 30% ICS installed before one year. In chirtungdhara VDC, most of them ICS have installed before five years.

This table shows that maximum ICS no. was before 3 to five years. Before 3 to 5 years, almost ICS were technical defect. After the study, ICS related organization has only focus on the quantitative of ICS but they had should be run the program qualitative + quantitative. There is lack of repair and maintenance of ICS. Users have no idea knowledge of repair and maintenance.

According to survey 2010, recently should be do the repair and maintenance training for ICS users in ICS Program area.

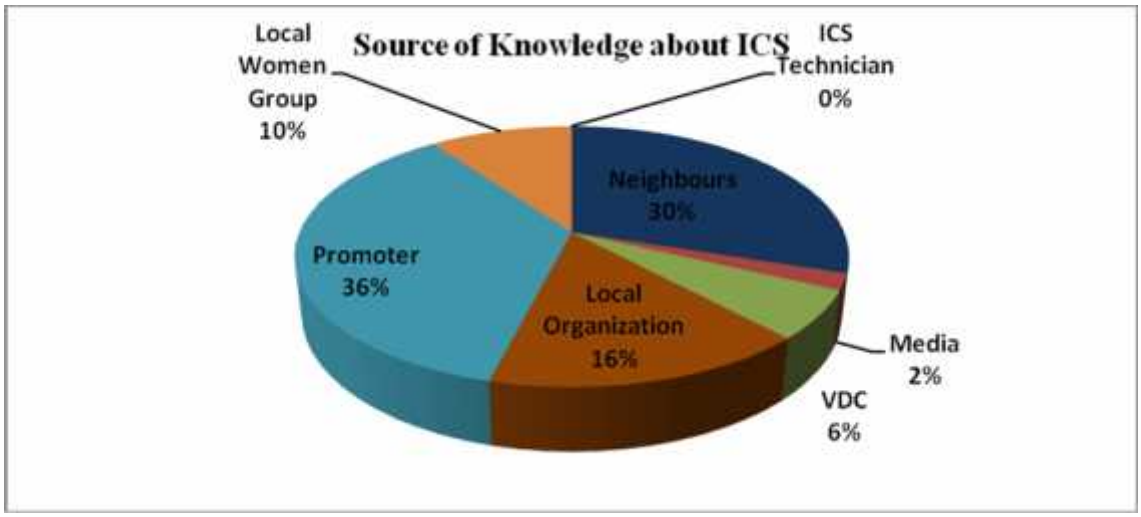
5.2.2 Source of Information about ICS

The initial source of information was the respective ICS promoters of ICS promotion organization.

Table No. 5.10 Source of Information about ICS

SN	Source	HHs	In %
1	Neighbors	15	30
2	Media	1	2
3	VDC	3	6
4	Local Organization	8	16
5	Promoter	18	36
6	ICS Technician	0	0
7	From Women Group	5	10
8	total	50	

Source: Household survey 2010



Source: Household survey 2010

The above table 5.10 shows that Promoter 36% served as the chief source of information about ICS. Then a second neighbor (30%) is role-play for the dissemination of ICS and low effect of media only 2% for the information source. There was 0% role of ICS technician for the dissemination and promotion of ICS program.

This table shows that there was no any support from the ICS related organization and its' staffs for the dissemination and promotion of ICS. According to this table 5.10 media is not effective but the media is very strong mediator for the dissemination activities. Therefore it would be better if broadcast the ICS related program like jingle, *laghu natak*, experience of good promoter and ICS users from the local FM radio, wall paper, TV, posters etc.

5.2.3 Purpose of use ICS

Users were using ICS for different purpose.

Table No. 5.11 Purpose of use ICS

Purpose of use ICS			
SN	Purpose	No of HHs	in %
1	Cooking Food	43	86
2	Preparing feed for Animal and boiling Milk	7	14
	Total	50	

Source: Household survey 2010

In the research area, users have to use ICS for cooking food (86%) and 14% users were using ICS just preparing feed for animal and boiling milk.

This table no. 5.11 shows that, there was less use of ICS for the cooking feed for animal, heat milk and cook Jad Raksi. Almost users were used TCS for the cooking above this item. Out of 86% there was only 30% users cooking food regularly in ICS. Therefore lack of awareness and ownership feel users did not use ICS properly way.

ICS related organization should be promotion of different types of ICS for the different purpose and create the ownership & it is important to the users.

5.2.4 Types of using Stoves for Cooking Food

Users were using different types of stove for cooking food. Most of them users were used other stove along with ICS (others stove mean like LP gas, Biogas, Kerosene stove etc.)

Table No. 5.12 Types of using stove

Types of Using Stoves			
SN	Stoves	No. of HHs	in %
1	Only ICS	12	24
2	ICS + Others	38	76
3	Total	50	

Source: Household survey 2010

Among the Fifty household's of ICS users, Twenty four percent (24%) users are using only ICS for cooking food. Whereas about 76% ICS users are using also another stove for cooking food and others cooking activities (breakfast, heat milk and food). Such as Biogas, LP gas, Kerosene stove, Rice cooker and almost user are also using TCS for cooking activities (like *kudo and jad raksi banauna*).

Above this table, shows that out of fifty households only 24% users were used ICS but others remaining 76% ICS users were used additional stove for the cooking activities. People were not fully depend up on ICS for the cooking like food, feed for animal, jad raksi especially for Magar community and space heating. Therefore they were used another stove to fulfill their additional cooking activities.

It is most necessary for the promotion of different types of stove for different purpose.

5.2.5 Opinion of users about use ICS

Table No. 5.13 Opinion of users about use ICS

SN	Experience	No of HHs	in %
1	Good	17	34
2	Quite Good	9	18
3	Bad	4	8
4	Facing Problems	20	40
	Total	50	

Source: Household survey 2010

The table no. 5.13 shows that, 40% users are using ICS with facing problems. Such as smoky environment, consumption more fuel wood, cooking late etc., 34% users likes this stove and 18% users felt quite good. There was 8% users felt bad experience of ICS.

Above this data shows that maximum ICS user were not satisfy with ICS. They were facing technical problems from the ICS, such as smoke back, more fuel wood consumption, difficult to cook different types of pot etc. some users were not satisfy with ICS but they were using ICS.

In the study area, there was more lack of technical monitoring from ICS related stakeholders. Therefore, it should be do the regular monitoring and technical backup.

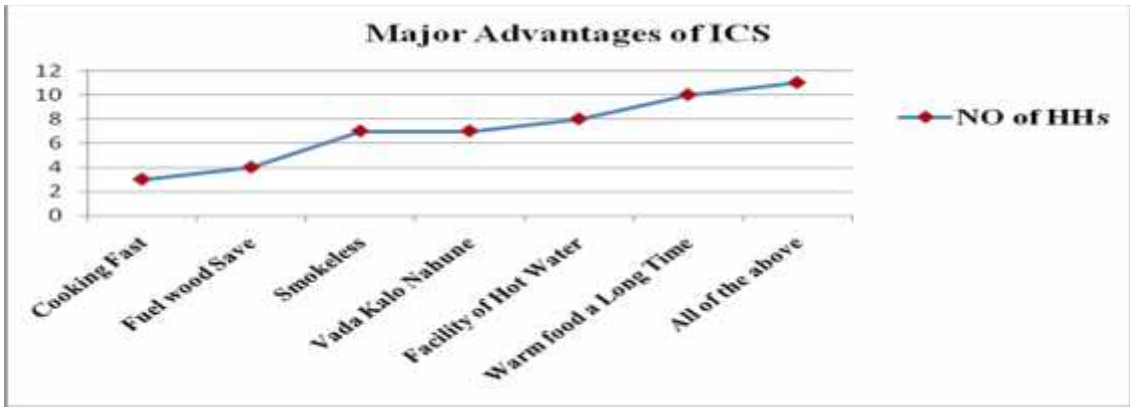
5.2.6 Major Advantages of ICS

The researched has accomplished in fifty household of ICS user for the carry out opinion of major advantages of ICS. This is presented in table.

Table No. 5.14 Major Advantages of ICS

SN	Advantages of ICS	HHs	in %
1	Cooking fast	3	6
2	Fuel wood save	4	8
3	Smokeless in the kitchen	7	14
4	Warm food for a long time	10	20
5	*Vada dherai kalo nahune*	7	14
6	Facility of Hot Water	8	16
7	All of the above	11	22
	Total	50	

Source: Household survey 2010



Source: Household survey 2010

The table no. 5.14 shows that, 22% users are fully satisfied from this ICS. In addition, major advantage is warm food for a long time (20%). When the farmers are come back from the farming work, in that time they get warm food because this stove has absorbed the heat for a long time. According to some user, more consumption of fuel wood in ICS but they like this stove because they have saved from the smoky environment in kitchen room. Therefore, 14% users are focus on the smokeless environment in kitchen room.

Out of fifty ICS users, only 22% users were fully satisfied with ICS, almost users were not more satisfy. Maximum ICS users were facing technical problems from the ICS but they were not very negative, they had little positive experience of ICS. Therefore, Improved Cooking Stove program is technically right but its mechanism and monitoring part was very weak.

5.2.7 Users use of Leisure Time

From the experience of the study and according to the respondents, most of users are passing their leisure time in households' activities. Such as cleaning home, farm work, to care of animal etc.

Table No. 5.15 use of Leisure Time

SN	Activities	HHs	In %
1	Taking rest	15	30
2	Income generating activities	4	8
3	Child care	6	12
4	Household work	22	44
5	Social Service	3	6
6	Total	50	

Source: Household survey 2010

This table 5.15 also shows that 44% people do their household's activities in their leisure time and some (30%) users were taking rest in leisure time. There were just only 8% users engaged in income generating activities like poultry farm, sewing cloths and 12% respondents were passed their leisure time to care of child etc.

Major respondents were passed their leisure time in unproductive activities. They could not manage their leisure time in appropriate work like earning activities. Therefore, it is also necessary to gives others skill trainings such as sewing cloth, to make noodles, micro enterprises etc. for the users.

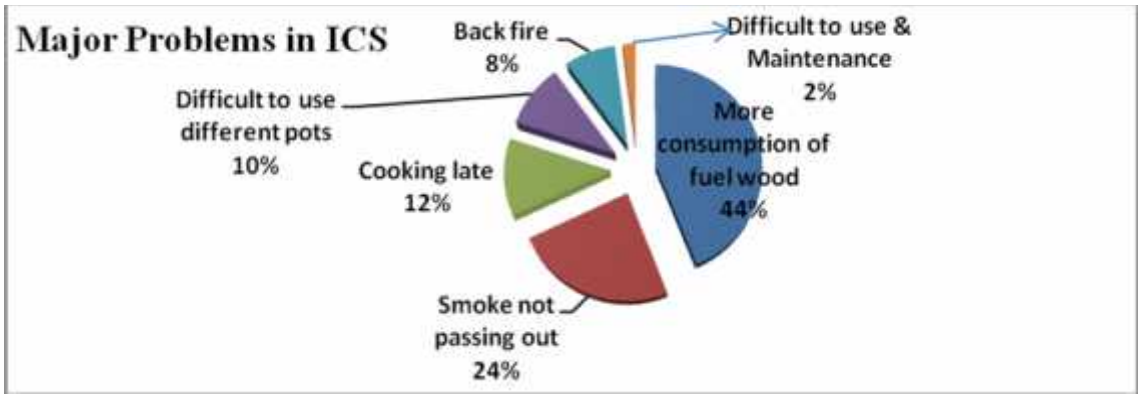
5.2.8 Major Problems in ICS

In the study area, ICS program was launched before eight years. According to the respondents of study area, the major problem was more consumption of fuel wood like TCS. Most of users were leave the use of ICS and some users were using this stove partially because of more consumption of fuel wood.

Table No. 5.16 Major Problems in ICS

Major Problems in ICS			
SN	Major Problem	HHs	in %
1	Equal consumption of fuel wood like in TCS	22	44
2	Smoke not passing out	12	24
3	Cooking Late	6	12
4	Difficult to use different Pots	5	10
5	Back fire	4	8
6	Difficult to use & Maintenance	1	2
	total	50	

Source: Household survey 2010



Source: Household survey 2010

There are 44% users, who view that equal consumption of fuel wood like in TCS. During the observed technical parts of ICS, there were damages of ICS like fire gate was wider, no any regular maintenance of ICS, pot hole size was decrease etc. when it has asked about repair and maintenance of ICS, most of them respondents answered that they have no idea maintenance of ICS.

Improved Cooking Stove program's main one objective also to decrease the more fuel wood consumption and it would be supported the deforestation ratio. However, above the data shows that just negative. Out of fifty households 44% respondents says, major problem was equal consumption of fuel wood like TCS and second 18% people says, smoke not passing out.

5.3 Comparison of Fuel Wood between Regular & Partial Users

These tables show that, there is difference consumption rate of fuel wood. Major 40% over partial respondents are use one bundle of fuel wood up to 4 to 5 days and 46.66% regular users are use one bundle of fuel wood up to 4 to 5 days. However, 62.85 partial users are cooking food two times at one day and 60% over regular users are cooking food three times at one day. According to 42.85% of partial users, 30minutes to one hour taking time for cooking food in one time in the morning or evening shift. However, according to 53.33% regular users, 30minutes to one hour taking time for cooking food in one time in the morning or evening shift. Overall, regular ICS users are satisfy with the Improved Cooking Stove than partial users. Remaining data are presents in the below tables;

5.3.1 (For Partial users)

Table No. 5.17 one bundle of fuel wood takes days.

Consumptions rate of one bundle of fuel wood (30 to 45 KG fuel wood in one bundle)			
SN	Taking days	No of HHs	in %
1	1 to 2	0	0
2	2 to 3	2	5.71
3	3 to 4	12	34.28
4	4 to 5	14	40
5	more than 5	7	20
6	Total	35	

Source: Household survey 2010

5.3.2 (For Regular users)

Table No. 5.18 one bundle of fuel wood takes days.

Consumptions rate of one bundle of fuel wood (30 to 45 KG fuel wood in one bundle)			
SN	Taking days	No of HHs	in %
1	1 to 2	0	0
2	2 to 3	2	13.33
3	3 to 4	2	13.33
4	4 to 5	7	46.66
5	More than 5	4	26.66
6	Total	15	

According to above these tables, there were some differences of fuel wood consumption rate among ICS regular and partial users. Which are presented in given below.

- One bundle of fuel wood consumed 4 to 5 days 40% in partial users and 46.66% in regular users.
- In partial users 34.28%, who view that 3 to 4 days take of one bundle of fuel wood but regular users in only13.33% household.
- One bundle of fuel wood consumed 2 to 3 days 5.71% in regular users and 13.33% in partial users.
- One bundle of fuel wood consumed more than five days 20% in partial users and 26.66% in regular users.

Major respondents answered that one bundle of fuel wood takes four to five days. It would be decrease the deforestation rate of forest. But 5.71% of partial users and 13.33% regular users were still totally depended on the forest for the energy source of fuel wood.

Table No. 5.19 Times of cooked/day

Times of cooked food in ICS/day			
SN	Times	HHs	in %
1	One	8	22.85
2	Two	22	62.85
3	Three	5	14.28
4	Four	0	0
5	more than four	0	0
6	Total	35	

Source: Household survey 2010

Table No. 5.20 Times of cooked/day

Times of cooked food in ICS/day			
SN	Times	HHs	in %
1	One	0	0
2	Two	5	33.33
3	Three	9	60
4	Four	1	6.66
5	more than four	0	0
6	Total	15	

According to above these tables, there were some differences times of cook food per day among ICS regular and partial users. Which are presented in given below

- In partial users, 62.85% were cooked food two times per day and 33.33% regular users were cooked food three times per day in ICS.
- There was 60% regular users cooked food three times per day but 14.28 only partial users cooked food three times per day in ICS.

The data shows that, regular user were cooked food more times in ICS than partial users. Therefore, it could be some consumption of fuel wood for regular users' stove than partial's users.

Table No. 5.21 Taking time for cook

Cooking time at once in ICS			
SN	Times	HHs	In %
1	up to 30 min.	0	
2	30 to 1 hrs.	15	42.85
3	1 to 1:30 hrs.	12	34.28
4	1:30 to 2 hrs.	8	22.85
5	above 2 hrs.	0	
	Total	35	

Source: Household survey 2010

Table No. 5.22 Taking time for cook

Cooking time at once in ICS			
SN	Times	HHs	In %
1	up to 30 min.	0	0
2	30 to 1 hrs.	8	53.33
3	1 to 1:30 hrs.	6	40
4	1:30 to 2 hrs.	0	0
5	above 2 hrs.	1	6.66
6	Total	15	

According to above these tables, there were some differences times of cook food per day among ICS regular and partial users. Which are presented in given below

- In partial users, 42.85% respondents view that, were take time 30 minute to one hour for cooking food at once and 53.33% of regular users.
- In partial users, 34.28% respondents view that, were take time one to one, half hour for cooking food at once, and 40% of regular users.
- In partial users, 22.85% respondents view that, were take time one and half-hour to two hours for cooking food at once and 6.66% of regular users view that above two hours takes time for cooked food.
- Majority users said that, it has taken time 30 minute to one hour for cooked food at once. However, it would be depend up on family size.

5.3.3 Previous Consumptions one bundle of fuel wood in TCS

When ICS user used TCS before installation of ICS, there was take more fuel wood in TCS than ICS. here are presented of opinion of ICS user's before experienced.

Table No. 5.23 fuel wood consumption in TCS

SN	Taken days	HHs	in %
1	Up to 2 days	2	4
2	2 to 3	20	40
3	3 to 4	23	46
4	4 to 5	5	10
5	above 5	0	0
6	Total	50	

Source: Household survey 2010

According to ICS users, previous days when they (ICS users) were using Traditional Cooking Stove, 46% respondents were using one bundle of fuel wood maximum for three to four days and similarly 40% users were used one bundle of fuel wood up to 2 to 3 days.

These table no. 5.23 and 5.20 show that the use of Improved Cooking Stove is saving fuel wood more than Traditional Cooking Stove if users are using the properly way. However, almost users said, ICS is consuming more fuel wood like a TCS because

they have not used ICS right way. The researcher found there is lack of awareness and regular monitoring of ICS.

5.4 Source of Energy and its access

Traditional energy includes fuel wood agriculture residues and animal waste and share of consumption was 88.68%, 4.85%, and 6.47% respectively (WECS 2001). The study area almost users were depended on source of energy of fuel wood in forest. Some users were using LP gas, Biogas stove but they were also used fuel wood for the purpose of preparing of feed for animal, boiling milk and making jad & raksi.

5.4.1 Source of Energy

According to fifty households of ICS user, almost of them are using fuel wood for the source of energy.

Table No. 5.24 Source of Energy

Source of Energy			
SN	Source	No of HHs	in %
1	Fuel Wood	50	100
2	Bio Gas	14	28
3	Agro Residues	9	18
4	Electricity	8	16
5	LP Gas	8	16
6	Kerosene	2	4

Source: Household survey 2010

Above the table shows that 28%, users are using the Biogas along with fuel wood. Almost users (who have alternative source of energy like biogas, LP gas, electricity etc.) are cooking food from biogas or LP gas; they generally use fuel wood in-case LP gas and Biogas become insufficient for cooking food, 18% used also agriculture residues similarly, 16% electricity, 16% LP gas and 4% kerosene stove.

Above the data shows that almost households were depends on fuel wood for energy. Therefore, it should be care to implementation of ICS program in all rural area with effectively and install the qualitative ICS.

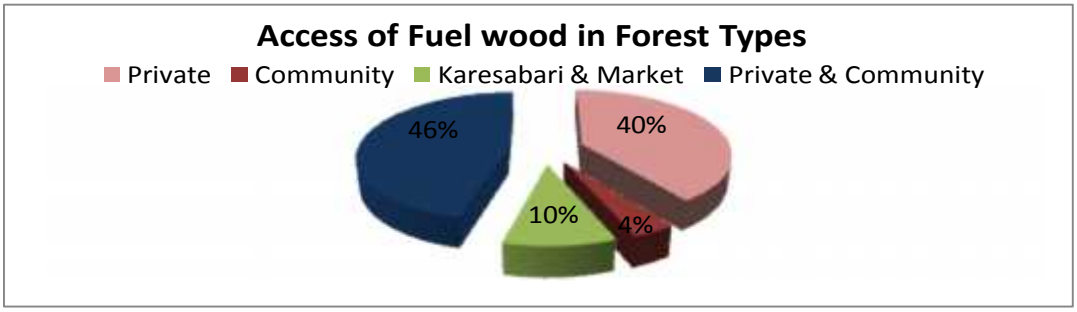
5.4.2 Sources and Access to Fuel wood

Almost users were depended on forest for the fuel wood. Some respondents have private forest; therefore, they have sufficient of fuel wood. Hence, they could not care for using fuel wood.

Table No. 5.25 Access of Fuel Wood in Forest Types

SN	Forest Types	HHs	In %
1	Private	20	40
2	Community	2	4
3	Government	0	0
4	Karesabari + Market	5	10
5	Pvt. + Community	23	46
6		50	

Source: Household survey 2010



Source: Household survey 2010

The table no 5.25 is shows that, almost 46% user depended up on the private and community forest for the fuel wood. According the respondents, they are using the fuel wood from their own private forest. In addition, to it they have use fuel wood from the community forest generally one or two times in a year. Therefore, 40% people are using fuel wood from only private forest.

There were about 40% over people depends on private forest for the fuel wood. There were sufficient of fuel wood so they could not try to understand the major meaning of ICS. Therefore, it is most necessary to extent qualitative ICS program in every rural area where as almost people are depends on fuel wood for energy source.

5.4.3 Gender Participation

Table No. 5.26

Cooking Food in Family			
SN	Persons	no of HHs	in %
1	Male	5	10
2	Female	45	90
3	Child	0	0
4	Total	50	

Source: Household survey 2010

The table no 5.26 shows that, among fifty households only 10% male is supporting in cooking activities and 90% female are busy in cooking activities.

Above The table shows that, there was less participated of male in cooking activities. Therefore, it is also necessary to give gender participation training for the users.

5.5 Health, Technical, and Dissemination Aspect

The ICS program's main objectives are to improvement health of people, and reduce the deforestation rate. Therefore, the study also focused up on the health improvement of ICS's users, technical defects, and problems for dissemination activities.

5.5.1 Improvement of Health

In traditional stove, almost users are facing with smoke during the cooking activities in kitchen room. Therefore, the study try to find out the health problem by smoke and improvement after the installed ICS.

Table No. 5.27 Health Problems by Smoke

SN	Problems	No of HHs	In %	Progress	In%	not	In%
1	Headache	4	8	4	8		
2	Eye disease	1	2	1	2		
3	Lungs disease	0	0	0	0	0	0
4	Respiratory	1	2			1	2
5	Don't know	6	12				
6	No	38	76				
7	Total	50					

Source: Household survey 2010

In the study area, most of them (76%) respondents have no any health problem of smoke related, 12% people are unknown of this problem, and 10% people feel improvement of health after installed the ICS. During the field study, some ICS users

felt more consumption fuel wood in ICS but they were satisfy with this ICS because, they were saved from the smoky environment of kitchen room.

ICS is not a direct medicine of smoke's health problems but it would be reduce the smoke from kitchen room. After that, users have to feel some relief. Hence, 10% people have to feel some little improvement of health like headache and eye disease. Therefore, it is most necessary to improvement of technical quality of ICS because it is related with human's health.

5.5.2 Knowledge about Repair and Maintenance of ICS

ICS repair and maintenance knowledge is very important for the users. It would be done properly work, if do the ICS's technical part is regular repair and maintenance.

Table No. 5.28 Knowledge of clean Chimney

Knowledge of clean Chimney and Times			
SN	Knowledge/	HHs	in %
1	Yes	48	96
2	No idea	2	4
	Total	50	100

Source: Household survey 2010

Above the table no 5.28 shows that, 96% respondents were to knowledge of only clean chimney pipe and 4% respondents were unknown about knowledge of clean chimney pipe.

It is most necessary to give technical knowledge, repair, and maintenance training for every ICS users. It would be help to durability of ICS.

Table No. 5.29 Times of cleaning chimney

SN	Times	HHs	in %
1	Weekly	3	6
2	Quarterly	11	22
3	Monthly	26	52
4	Bi-Monthly	10	20
	Total	50	

Source: Household survey 2010

According to above tables no 5.29, most of them 52% respondents were clean chimney in monthly, 22% quarterly, 20% bi-monthly and only 6% respondents were clean chimney pipe weekly.

The above data has shows most of users were very careless for clean and maintenance of ICS. only 6% HHs were regular clean chimney pipe. It should be increase the awareness program and importance of every technical part of ICS for ICS users.

5.5.3 Knowledge of Institution

The study had to try to know the relationship between ICS users and ICS related organization. Therefore, this question was asked to respondents.

Table No. 5.30 Knowledge of Institution

Knowledge of Institution of ICS Program			
SN	Knowledge	no of HHs	In %
1	Yes	8	16
2	No	42	84
3	Total	50	

Source: Household survey 2010

Out of fifty households, only 16% HHs know about the ICS related Institution and 84% users did not know about of service center of ICS program.

Above this table, shows that there was not seen present of ICS related organization in the program area. There was lack of regular relationship between users and organization.

5.5.4 Dissemination Aspect

A dissemination activity is big importance for the promotion of program. Therefore, ICS user manual book, calendar, wallpaper are mediator things for the information of Program.

Table No. 5.31Dissemination Activities

Users got the ICS user's book & calendar			
SN	Types	HHs	in %
1	ICS user's book	4	8
2	Calendar	21	42
3	Both not	25	50
4	Total	50	4

Source: Household survey 2010

According to table no. 5.29, there is 50% people do not have the any dissemination-supported documents, such as user manual book, ICS related calendar, poster etc. 42% users have got ICS related calendar. Therefore, the table shows that there is weak of dissemination activities.

Out of fifty households, 50% people did not have the user manual book and any type of dissemination materials. Therefore, it should be do the dissemination activities with effectively and promotion the program from the media.

5.5.5 Use of Outlet

The study area, there was less use of smoke out let. Some user were used T shape out let.

Table No. 5.32 Use of Outlet

SN	Outlet types	No of HHs	In %
1	T	5	10
2	Pipe	32	64
3	No outlet	13	26
4	Total	50	

Source: Household survey 2010

There is out of fifty households only 10% users are use of properly outlet ‘T’ shape, 64% user used outlet pipe shape but it is less effective than ‘T’ shape outlet, and 26% users did not use any type of out let.

It would be better if give the priority of ‘T’ shape outlet during the install ICS, it may be reduces the smoke back problem.

5.5.6 Expectation of Training

Most of ICS users have no knowledge of simply repair and maintenance ICS. Therefore, some users were interested for trainings. Which data is presetting in table no. 5.33.

Table No. 5.33 Need of ICS related Trainings

SN	Need	No of HHs	In %
1	Yes	36	72
2	No	5	10
3	Don't know	9	18
4	Total	50	

Source: Household survey 2010

When it has asked the view of respondents regarding the additional training 72% of them respondent that they need additional training for ICS where as 10% of them showed no interested any type of training because they almost engage their time in their regular farming work and 18% users did not give constant answer.

Most of them respondents (72%) were interested to take training. It is most necessary to give some general training for ICS users, after that, they can use and run ICS with properly way.

5.5.6.1 Need of Training

Training is a most important thing for respondents. It makes practical and give some knowledge of new technology and its function. After that, users can maintain or management of ICS and kitchen room.

Table No. 5.34 Expectation of additional Trainings

SN	Name of Trainings	HHs	in %
1	Kitchen Management	5	10
2	ICS Repair and Maintenance	28	56
3	Gender Participate	0	
4	Income generating skill	3	6
	Total	36	

Source: Household survey 2010

According to above table 5.33, out of 72% respondents demanded to the additional training, which as 56% users were interest of Repair and Maintenance of ICS and similarly, 10% users were interest of Kitchen Management and 6% users were interest of Income generating skill. The table shows that ICS repair and maintenance training is most important for the ICS user, after that it might help reduce the drop out cases.

Out of fifty households, 56% respondents were demand of ICS repair and maintenance training, it is also necessary for the users. The field study, there was lack of repair and maintenance training therefore almost ICS condition was worst.

Group 'B'

5.6 Information of non-ICS Users

It has been taken data fifteen respondents of non-ICS user. The study tried to carry out their opinion about the ICS program.

5.6.1 Type of Stove for Cooking Food

Users were using different types of stove for cooking food. Most of them users were used other stove along with TCS (others stove mean like LP gas, Biogas, Kerosene stove etc.)

Table No. 35 Type of Stove for Cooking Food

Types of Using Stoves			
SN	Stoves	No. of HHs	in %
1	Only TCS	4	26.66
2	TCS + Others	11	73.33
	Total	15	

Source: Household survey 2010

The table shows that, 26.66% people are using only Traditional Stove for cooking food. In addition, 73.33% non-ICS users are using another stove along with TCS, such as LP gas, Biogas, Kerosene stove etc.

Out of fifteen households, 73.33% people were using another stove with TCS. Therefore, this data shows usually fuel wood was using in TCS especially cooking feed for animal (Kundo) and Jad Raksi. They were using another modern stove for cooking food such as LP gas, Biogas etc. according to above data ICS related organization could not promote the different types of ICS especially for cooking above items.

5.6.2 Comparison of fuel wood consumption ratio between ICS & TCS

Improved Cooking Stove program's is also another one major objective is less fuel wood consumption. In Traditional Stove like tripod stove, there is consume more fuel wood and loss of heat. Therefore, the study tried to find the difference fuel wood consumption rate between TCS and ICS. Below these tables no 5.36 and 5.20, there is same no of households but it may be difference family size of between TCS's respondents and ICS's respondents. Although, the study tried to show difference fuel wood consumption rate between TCS and ICS. if we assume the following below primary data of TCS and ICS users.

Respondents of TCS users

Table No. 5.36 one bundle of fuel wood takes days.

Consumptions rate of one bundle of fuel wood (30 to 45 KG fuel wood in one bundle)			
SN	Days	HHs	in %
1	below 2	0	0
2	2 to 3	9	60
3	3 to 4	4	26.66
4	4 to 5	2	13.33
5	above 5	0	0
6	Total	15	

Source: Household survey 2010

Table No. 5.20 one bundle of fuel wood takes days.

Consumptions rate of one bundle of fuel wood (30 to 45 KG fuel wood in one bundle)			
SN	Taking days	No of HHs	in %
1	Below 2	0	0
2	2 to 3	2	13.33
3	3 to 4	2	13.33
4	4 to 5	7	46.66
5	Above 5	4	26.66
6	Total	15	

Respondents of Regular ICS users

According to above these tables, there were some differences of fuel wood consumption rate among TCS and ICS users. Which are presented in given below.

- One bundle of fuel wood consumed 4 to 5 days 13.33% in TCS users and 46.66% in regular ICS users.
- In TCS users 26.66%, who view that 3 to 4 days take of one bundle of fuel wood but regular ICS users in 13.33% household.
- One bundle of fuel wood consumed 2 to 3 days 60% in TCS users and 13.33% in regular ICS users.

Table No. 5.37 Times of cooked/day

Times of Cooking Food in TCS/Day			
SN	Times	No of HHs	In %
1	One	4	26.66
2	Two	7	46.66
3	Three	4	26.66
4	Four	0	0
5	above four	0	0
6	Total	15	

Table No. 5.21 Times of cooked/day

Times of cooked food in ICS/day			
SN	Times	HHs	in %
1	One	0	0
2	Two	5	33.33
3	Three	9	60
4	Four	1	6.66
5	more than four	0	0
6	Total	15	

Source: Household survey 2010

According to above these tables, there were some differences times of cook food per day among TCS and regular ICS users. Which are presented in given below.

- In TCS users, 46.66% were cooked food two times per day and 33.33% regular ICS users were cooked food two times per day in ICS.
- There was 26.66% TCS users cooked food three times per day but 60% regular ICS cooked food three times per day in ICS.

Table No. 5.38 Taking time for cook

Cooking time at once in TCS			
SN	Times	HHs	in %
1	up to 30 min.	2	13.33
2	30 to 1 hrs	3	20
3	1 to 1:30 hrs	5	33.33
4	1:30 to 2 hrs	4	26.66
5	above 2 hrs	1	6.66
6	Total	15	

Table No. 5.22 Taking time for cook

Cooking time at once in ICS			
SN	Times	HHs	In %
1	up to 30 min.	0	0
2	30 to 1 hrs	8	53.33
3	1 to 1:30 hrs	6	40
4	1:30 to 2 hrs	0	0
5	above 2 hrs	1	6.66
6	Total	15	

Source: Household survey 2010

According to above these tables, there were some differences times of cook food per day among ICS regular and partial users. Which are presented in given below

In TCS users, 20% respondents view that, were take time 30 minute to one hour for cooking food at once and 53.33% of regular ICS users.

- In TCS users, 33.33% respondents view that, were take time one to one, half hour for cooking food at once, and 40% of regular ICS users.
- In TCS users, 26.66% respondents view that, were take time one and half-hour to two hours for cooking food at once and 6.66% of regular ICS users view that above two hours takes time for cooked food.

Above these table shows that, there are difference of fuel wood consumption ratio between TCS and ICS. According to table no 5.33 and table no 5.20, there are major respondents of TCS users (60%) says that one bundle of fuel wood consume up to two

to three days, similarly 46.66% of ICS users says that one bundle of fuel wood consume up to four to five days. This data shows four bundles (In percent 16.67% to 18%) of fuel wood saves per month in ICS than TCS.

Simply calculation and analysis of fuel wood consumption ratio.

Given,

If we takes major respondents from (Tables 5.20 & 5.33) the primary data,

According to table 5.33, major respondents (60%) are says, one bundle fuel wood consume max. 3 days.

According to table 5.20, major respondents (46.66%) are says, one bundle fuel wood consume max. 5 days.

Solution,

Three days = one bundle of fuel wood (for TCS user)

30 days = 30/3

= 10 bundles

It means that, 10 bundles of fuel wood consume one month in TCS (30 days).

Similarly,

Five days = one bundle of fuel wood (for ICS user)

30 days = 30/5

= 6 bundles

It means that, six bundles of fuel wood consume one month in ICS (30 days).

Therefore,

Ten bundles of fuel wood consume in TCS per Month.

Six bundles of fuel wood consume in ICS per Month.

Four bundles of fuel wood saves in ICS than TCS.

5.6.3 Knowledge of ICS

Most of non-ICS users were using another alternative stove for cooking food and some users were using TCS. The study tried to know opinion of non-ICS user about the ICS program.

Table No. 5.39 Knowledge of ICS

SN	Knowledge	HHs	in %
1	Yes, just heard	7	46.66
2	No	3	20
3	Yes, but negative	5	33.33
4	Total	15	

Source: Household survey 2010

According to table no. 5.39 (46.66%) of non-ICS users, they have just heard about ICS but they have no any idea of contact person and ICS related institutions. In addition, 33.33% users heard negative impact about of ICS and seen such as more consumption and smoky environment in kitchen. Therefore, some respondents have known about the ICS but they were not interest to install ICS.

Non-ICS users have heard about ICS but negative impact. Therefore, they were not ready to install ICS. If when any problems are create, it should be the solved in time otherwise it would be take negative impact and would be also negative effect to the whole program.

5.6.4 Why people are not interesting to install ICS?

This question was concern on the causes of uninstall ICS. According to above table no. 5.39, there was 33.33% respondents heard negative impact of ICS. Therefore, it has researched on the why non-ICS users were not install ICS.

Table No. 5.40 Causes of uninstalled ICS

SN	RESONS OF UNINSTALL	HHs	In %
1	Expensive for Poor People	1	6.66
2	No idea who made?	3	20
3	Easily access of fuel wood so TCS *bat kam chaliraheko chha*	6	40
4	No place for install ICS		0
5	Heard negative effect of ICS so	5	33.33
	Total	15	

Source: Household survey 2010

There is out of fifteen households of non-ICS users, 40% respondents answered that they are not interested to install ICS because, they have easily access of fuel wood form forest. Some (20%) non-users were interest to install but they have no idea of contact person and 33.33% of them replied that they had heard negative impact of ICS so they did not want to install. When it has studied in Chirtungdhara VDC of Palpa District, there were some problems in study area. Such as;

- There was major problem of regular monitoring after the program has been phase out.
- There was lack of awareness about importance of ICS in their community.
- In study area, there are (ward no 7 & 9 of Chirtungdhara VDC) almost peoples are from Brahaman Community. Therefore, almost Brahmans'

users have cattle (like Buffalo, Cow) for the purpose of milk and dung and therefore, they prefer to install biogas rather than ICS. Therefore, ICS is not getting due to importance; slowly the ICS is going damage.

- A local promoter Mrs. (Bishnu Kumari Kunwar) has got married and she has migrated from this VDC to other VDC.

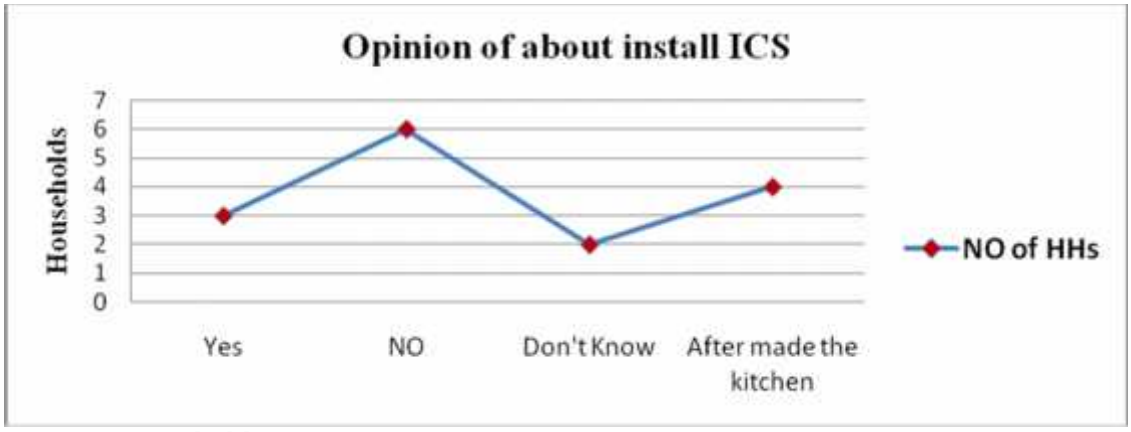
5.6.5 Thought of about installs ICS

The study also supporting for the promotion of ICS program therefore, the study tried to take out opinion of about install ICS.

Table No. 5.41 Opinion of about install ICS

SN	Install ICS	No of HHs	in %
1	Yes	3	20
2	No	6	40
3	Don't know	2	13.33
4	After made the kitchen room	4	26.66
	Total	15	

Source: Household survey 2010



Source: Household survey 2010

The table 5.38 shows that, 40% people are not interesting to install ICS but 20% people are interesting to install ICS and 26.66% people want to be installing after made the separate kitchen room.

The table shows that, 20% respondents were interested to install ICS. Therefore, it should be mobilize the promoter and Technician in that potential area.

Group 'C'

5.7 Information of Drop out ICS Users

Drop out users mean, who was use ICS before day and due to problems, they were leave to use of Improve Cooking Stove. Now a day, they were using traditional and modern stoves. Such as tripod, mud, LP gas, Biogas etc.

5.7.1 Type of Stove for Cooking Food

Users were using different types of stove for cooking food. Most of them users were used other stove along with TCS (others stove mean like LP gas, Biogas, Kerosene stove etc.)

Table No.5.42 Types of Using Stoves

SN	Stoves	No. of HHs	in %
1	Only TCS	11	44
2	TCS + Others	14	56
	Total	25	

Source: Household survey 2010

The table shows that, 44% respondents were using only Traditional Stove for cooking food. And 56% drop out ICS users are using another stove along with TCS, such as LP gas, Biogas, Kerosene stove etc.

The table shows that drop out ICS users were again used TCS instate of ICS. According to this data, it has generated a question mark on overall ICS program's policy. Therefore, it should be reduce the drop out cases and give the emphasis on the qualitative ICS.

5.7.2 Major Reason of Drop out ICS

There are many reasons of drop out ICS but among them problems related to more consumed fuel wood is major reason.

Table No. 5.43 Major Reason of Drop out ICS

SN	Major Reason	HHs	In %
1	Lack of Skillful Promoter	3	12
2	Difficult for use & maintain	2	8
3	Back fire	0	0
4	Consume more fuel wood	12	48
5	Smoke not Pass out	5	20
6	3/ eTsfpbf eTsLof] k5L cfjZos ePg	3	12
	Total	25	

Source: Household survey 2010

There is 48% respondents had answered, more consume fuel wood like in TCS. Twenty percent (20%) respondents had answered smoke not passing out is the other major reason, 12% respondents focused on non-qualitative stove and 8% respondents were answered difficult to use and maintain.

Most of them respondents 48% were faced more consume fuel wood. Therefore, it should be care technical part of ICS and give the more practical skills for promoters in trainings period.

5.7.3 Knowledge of Use & Maintenance

Most of respondents answered they have no idea use and maintenance of ICS. The table shows that, 64% users have no knowledge about the proper use and maintenance of ICS. During the study, it has found one householder had not used ICS for a long time but he had not removed stove from the kitchen. The householder has been using that kitchen as a TV room instated of kitchen. The householder is using kitchen out of room in small cottage. The householder says, he had no idea of properly use and maintenance. The householder felt odd use of ICS.

(The ICS user used kitchen room as a TV room. There was useless of ICS.)
Ward no. 5, Chirtungdhara VDC.

Table No. 5.44 Knowledge of Use & Maintenance

Knowledge of Use & Maintenance			
SN	Knowledge	HHs	in %
1	Yes	9	36
2	No idea	16	64
	Total	25	

Source: Household survey 2010

The table shows that, 64% respondents have no idea of use and maintenance of ICS and 36% respondents have knowledge of use and maintenance. Therefore, there is need of users repair and maintenance of ICS.

5.7.4 Drop out User's opinion about re-installs ICS

In the study area, some ICS user has been drop out to use ICS. There is a lack of awareness and technical defect of ICS; after that, more consumed fuel wood and smoky environment in kitchen. Therefore, the study tried to take out their opinion about re-install ICS.

Table No. 5.45 opinion about re-installs ICS

Thought of about Re-install ICS			
SN	Re-install	HHs	in %
1	बनाउछु	4	16
2	बनाउदिन	11	44
3	घर सल्लाह गर्नु पर्छ।	6	24
4	भान्छाकोठा बनाएपछी	4	16
	Total	25	

Source: Household survey 2010

According to table no 5.46, 44% respondent do not want to reinstall ICS. Because of 44% user are using TCS again and others users are using alternative source of energy like LP gas, Biogas etc. but the interesting fact is that still about 16% of them were willing to re-install ICS therefore, there are mobilize the promoter as soon as possible.

5.7.5 Dissemination Aspect

Dissemination activities are a main part of program for promotion. There are many types of mediator for the dissemination and promotion of program. Such as FM radio, wallpaper, user's manual book, posters etc.

Table No. 5.46 Dissemination Activities

Users got the ICS user's book & calendar			
SN	Types	HHs	in %
1	ICS user's book	2	8
2	Calendar	7	28
3	Both not	16	64
4	Total	25	

Source: Household survey 2010

According to table no. 5.43, there is 64% people do not have the any dissemination-supported documents, such as user manual book, ICS related calendar, poster etc. 28% users have got ICS related calendar. Therefore, the table shows that there is weak of dissemination activities

Group 'D'

5.8 Information of Regular and Drop out Promoters

According to RRESC Palpa, there are 245 people have got promoter training. However, up to now most of promoter were leave the install ICS. The research has tried to find out the reason of drop out promoter, which as following.

5.8.1 Types of using Stoves for Cooking Food

Promoters were using different types of stove for cooking food. Most of them promoters were used other stove along with ICS (others stove mean like LP gas, Biogas, Kerosene stove etc

Table No. 5.47 Types of Using Stoves

SN	Stoves	No. of HHs	in %
1	Only ICS	3	25
2	ICS + Others	9	75
	Total	12	

Source: Household survey 2010

Among the Twelve ICS Promoters, Twenty five percent (25%) promoters were using only ICS for cooking food. Moreover, remain ICS Promoters (75%) were using another stove along with ICS for cooking food and others cooking activities (breakfast, heat milk and food). Such as Biogas, LP gas, Kerosene stove, Rice cooker and most of them user were also using TCS for cooking activities (*kudo and jad raksi banauna*).

Out of 12 promoters, 75% promoters were using another stove with ICS. The data shows promoters were not fully depends on ICS.

5.8.2 Promoter's opinion for their Profession

Promoter is a main backbone of the program. Therefore, the study tried to find out the opinion about their profession. Most of them promoters were satisfying their profession but some promoters were not satisfying their profession.

Table No. 5.48 Satisfied with the profession

SN	Opinion	No of Res.	in %
1	Yes	5	41.66
2	No	4	33.33
3	*Thikai*	3	25
4	Total	12	

Source: Household survey 2010

The table no 5.48 shows that, 41.66% promoters was satisfying with their profession, 33.33% promoters were not satisfying this profession. They do not have another opportunity for easy life sustain and 25% were quite satisfied.

According to table no 5.48, there is 33.33% promoters not satisfy with their profession. It would be harmful for the program's sustainability. Therefore, it should be care first promoter selection, qualitative training and support them for the demand creation.

5.8.3 Promoters spent money following matters,

During the study, some promoters informed that, they are earning more money from their profession. Some technically fitted promoters are almost time busy in install ICS.

Table No. 5.49 Promoters spent money

SN	Purpose	No of Res.	in %
1	For education of children	3	25
2	Household Expenditure	2	16.66
3	To made ornaments	1	8.33
4	To maintained of house	2	16.66
5	खासै कमाइ भएन पकेट खर्च भयो	4	33.33
5	Total	12	

Source: Household survey 2010

According to the table no 5.49, most of them 33.33% promoter were not more earned. After that they felt, it would be difficult to survive of life to depend on their profession. However, 25% were expenditure their earned for the education of children, 16.66% were household expenditure and 16.66% were maintained of house like as to change roof, cemented plaster of wall etc. similarly 8.33% were to made ornaments for their earned.

Above the table shows that, some promoters were improved their life, through this profession. It is most necessary to encourage the regular active promoter and make them busy in their profession.

5.8.4 Support to promoter for the demand creation.

Promoter themselves could not create the demand creation and promotion of ICS Program. Therefore, ICS related organization and its staff helps for their work and supports them for the technical correction. Promoter, organization, and technician are main component of this program. Hence, it is most necessary to interlink among them.

Table No. 5.50 Support to promoter for the demand creation

SN	Support	No of Res.	in %
1	Household Themselves	5	41.66
2	Self	5	41.66
3	Field Technician	0	0
4	VDC	2	16.66
5	Others	12	

Source: Household survey 2010

The table no 5.50 shows that, 41.66% are approach the households themselves for the install ICS and 41.66% promoters self-created the demand of ICS similarly 16.66% role-play for demand created by VDC. According to table, 5.50 there are no any support of approach to install ICS by Field Technician.

Above this data shows, there was no any main role of ICS related organization and Field Technician for dissemination and support to the demand creation of ICS. May be, it will better if the ICS technician play the role as a facilitator between users and promoter.

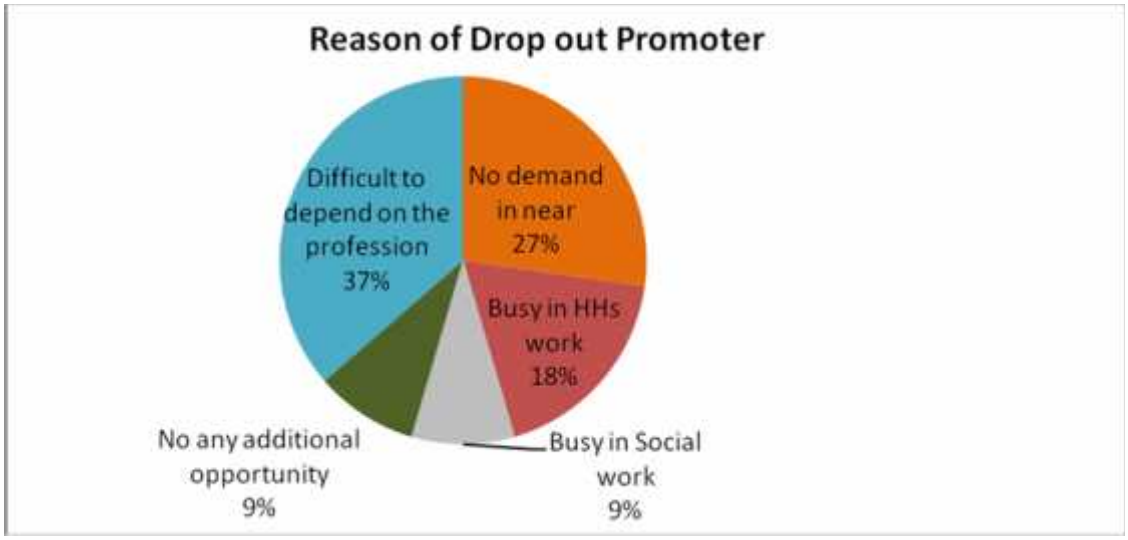
5.8.5 Reason of Drop out Promoters

Promoter is a main backbone of the program. Without promoter, ICS program could not do any performance. However, drop out promoter rate is higher than regular active promoter. Therefore, the study tried to find out the reason of drop out promoters for their profession.

Table No. 5.51 Reason of Drop out Promoters

SN	Causes	No of Res.
1	No demand in near	3
2	Busy in HHs work	2
3	Busy in Social work	1
4	No any additional opportunity	1
5	Difficult to depend on the profession	4

Source: Household survey 2010



Source: Household survey 2010

In the palpa District, about 245 people were received the ICS promoter training but among them only 75 promoters were doing work regular. Out of 245 promoters, 110 promoters dropped the work and 60 promoters were doing some times (irregularly) (REDA Palpa, 2010). According to data 44.89%, promoters have dropped at their work. It has been took the information the reason of drop out with the four drop out promoters; they answered that, the major problem of difficult to survive of their life to depend on their profession.

5.9 Summary Work Accomplished of Study Area.

The study has accomplished among the Chirtungdhara VDC, ward no 6 of Telgha VDC and ward no 3 of Kusumkhola VDC. During the study, it has been done some activities to supported for the study, which are given below.

5.9.1 SUPERVISED OF VDC

1. Chirtungdhara VDC, ward no 1,3,5,6,7,9 (Phase out VDC)
2. Kusumkhola VDC, ward no. 3 (Running VDC)
3. Telgah VDC, ward no. 6 (Running VDC)

5.9.2 Total no of Household Survey – 90 HHs

- ICS users – 50 HHs
- Non ICS users – 15 HHs
- Dropout ICS users – 25 HHs

5.9.3 Total Visited Promoters – 12 (Individual)

- Regular Active Promoter – 5
- Partial Active Promoter – 3
- Dropout Promoter – 4

5.9.4 Focus Group Discussion – (two times)

1) Venue – Ghorbanda – 6
Chirtungdhara
Date – 2066/09/20
Participants – 20 no

- ICS users – 5
- Non ICS users – 10
- Dropout ICS users – 3
- ICS Technician – 1
- Researcher - 1

2) Venue – Kumal Gaun – 7
Chirtungdhara
Date – 2066/09/24
Participants – 18 no

- ICS users – 3
- Non ICS users - 14
- Researcher - 1

5.9.5 Monthly Promoters Association Meeting

Venue – RRESC, REDA
Palpa
Date – 2066/09/19
Participants – 28

- Promoters – 26
- ICS Technician – 1
- Researcher – 1

5.9.6 Coordination Meeting with LPOs of ICS Program

Venue – RRESC, REDA
Palpa
Date – 2066/09/27 Participants No – 9

SN	NAME	ORGANIZATION	POST
1	Rudra Masrami Magar	Indreni Samaj Kendra	Exc. Coordinator
2	Devilal Lamichhane	Jan Bikas and Parichalan Kendra	Chairperson
3	Durga Paudel	Energy and Environment unit DDC	Program Officer
4	Sumitra Nepal	Rural ICS Promoter Association	Chairperson
5	Chameli Devi Shrestha	WDS, PALPA	WD Officer
6	Lila Bahadur Karki	REDA, PALPA	Executive Director
7	Krishna Kunwar	REDA, PALPA	Snr. Field Technician
8	Bikram Acharya	REDA, PALPA	Field Technician
9	Manoj Kumar Thapa	T U, KTM	Researcher

5.9.7 Summary Report of Study Areas

(Chirtungdhara VDC)

During the study, an interaction program was organized among the ICS users, non ICS users and dropout ICS users to discusses about the ICS program of and an attempt was made to understand their opinion regarding the usefulness of ICS technology. A little bit difficult was realized to collect data and all the participants were not much participated for the interaction program. It is because the time was peak hour for the farming work. Peoples were engaged in the harvesting seasonal crop, collecting fuel wood, daily household activities. Despite these obstacles, the participants have excited to involve in the interaction program. During the study, it was found some positive reaction and some problems from the study area were found. They are given below;

- In this VDC, a local organization Palpa Pasture Development Association had been working before 5 years as a Local Partner Organization.
- In this VDC, 999 HHs and ICS Coverage Households are 366 (36.63%) up to Dec 2010. (source by RRESS, Palpa)
- Chirtungdhara ward no. 9, Piple. Most of them ICS were removing from the kitchen room due to more consumption of fuel wood (main problem) and now some users are using the TCS and some users are using Bio Gas, who can afford it.

- There was lack of skill full promoter.
- After the problem, users could not do the contact to the promoter because of promoter have got married before 5 years of ward no 7, Chirtungdhara VDC.
- They have no any idea to contact others promoter.
- Some users are interested to re-install the re-Improved Stove but they have no idea about where to contact for the installation of ICS.
- From last 4/5 years, no any ICS dissemination and promotion activities have done in that VDC.
- In this VDC, almost ICS are useless because of technical problems. These problems are given below:

    1. Fire gate is wider day by day and more consumption fuel wood. Some users have no idea of repair and maintenance.
    2. Decreasing pot hole size day by day due to the regular *lippot.*
    3. Less use of chimney outlet 'T' shape so back smoke problem.
    4. Some users did not understood the meaning of second pot hole so they were using only first pot hole and blocked the second pot hole.
    5. Almost ICS's height was above 11 inch so some users were not satisfied with this over height stove.

(ICS user was cooking in TCS, instate of ICS.)

(Ward no five, Chirtungdhara VDC)

Telgah VDC

The researcher has supervised in also ward no. 6 of Telgah VDC. During the study, eight household were supervise. In that ward a local promoter, Mr. Chun Bahadur Chidi had installed ICS. He has received the Promoter Training before one & half year. The training was organized by the RRESS, REDA Palpa. In this ward, almost users had installed ICS from the old Promoter Mr. Dolakh Bahadur Rana (now dropout Promoter) before six to seven years. But now a day almost ICS are useless (out of use) due to the technical problems, like smoke not passing out, more consumption of fuel wood, cooking late, unreasonable height of ICS (almost ICS height was above 11 inch so it may be fire heat could not reach properly under the pot). After that, some users have re-installed the new ICS from the new promoter Mr. Chun Bdr. Chidi. But also among them eight HHs, two HHs were only quite satisfied and still others HHs are facing some problems which are given below.

Positives

- Almost users have re-installed the ICS by new promoter
- Iron fire gate was used in most of them new ICS. So that, it may help to reduces the fire gate wider problem.
- Almost households had kept the outlet pipe shape instant of 'T' shape.

Problems

- According to users there is difficult to use more fire wood at once when the users remain in rush time usually in the morning and they felt this stove takes the long time for cooking food therefore they are using others stove.
- Almost users were partially using the ICS. They were use the other stove like a mud stove out of the room, Bio gas, LP gas etc. instant of ICS, causes of problems.
- One user was very negative from this ICS use because she has been facing smoky problem. So she had thought to destroy this stove after one to two days. (Laxmi Khatri, ward no. 6, Telgah)
- The technical problems of ICS are smoke not passing out, cooking late and fuel wood consumption equally like a TCS.

Kusumkhola VDC

During the field study, it was found that the most of them new ICS were technically fine and users satisfied too. Nine households have supervised in the ward no. 6 of Kusumkhola VDC. Among them (Nine HHs), one user was not satisfy because he had installed this stove 6 years ago. Due to lack of repair and maintenance, the stove was not running properly. Despite of problems, user has been cooking food in that ICS. Some users said that, fuel wood consumed equally like in TCS but also they are satisfied with ICS, due to saved from the smoky environment. Some users were fully satisfied with this new stove. It was found some positive condition of ICS. They are given below:

- Iron fire gates were use in all new ICS. most of them ICS were installed raise type. Therefore stove's appearance is looking nice so the user were attractive this new design too.
- Almost stove height is 9.5 inch to 10 inch so easily access heat under the cooking pot.
- New promoter's technical skill was fine. They have received new refreshment promoter training by RRESS, REDA Palpa.
- Darlam Community Forest Users Group had supported to the promotion of ICS program. It had provided materials' cost of ICS like iron rods, iron fire gate especially for the Darlam CFUG's members.

5.9.8 CASE STUDIES

Case Study One

I have installed ICS before one year. I have heard positive advantages after the installation of ICS but I do not know whether lack of knowledge use and maintain of ICS or lack of skill full promoter is the main reason for the failure of ICS in my home. I am facing problems by this new stove. Main problem is smoke not passing out therefore due to smoky environment in kitchen; my headache problem is growing up. Sometime in the rainy season, we cooked in kitchen room. During that time, we could not easily cook due to the smoky environment. Therefore almost time we cooked out of the kitchen room and my children not satisfied too with this new stove. After the installed 2/3 month were running very well, but now it is not good. I have called the promoter but due to his busy, he has not come yet. I have self-tried to clean the chimney pipe but there is no any progress. Moreover, no one come for supervision in our ward except you. I have paid 600 Rs. For two ICS, one pot hole and two pot hole.

- Ram Kumari Khatri

User, Sundanda – 6 Telgah, Palpa

Case Study Two, (Dropout Promoter).

My name is Motiraj Khanal. I have received promoter training on 2058/06/28. I have installed 40 ICS up to now. Now according to my experience abuot 40% to 50% ICS are not being used among forty ICS, which had installed from me. Some user informed that, fuel wood more consumption like in TCS. Especially Brahman community, they have done the regular *lippot*, due to regular repair pot hole size is going to decrease day by day. After that the stove is not work properly way. Now a day I am busy in the social service and self-business. I have dropped the install of ICS since last 5 years. Now I am busy in the following worked.

- A Member of Palpa Pasture Development Association
- A Secretary/Manager of Jan Sahara Krishi Bahuudesya Sahakari Santha
- An Advisor of Local Club and A Secretary of Forest and Pasture Group

Causes of dropout

- Users do not want to pay money for ICS repair and maintenance.
- We could not fully depend on this profession and there is no any other facility or additional skill training except ICS install.
- Now I am involved in different social and farming work so.

Motiraj Khanal, Ex. ICS Promoter

Gaptung – 1, Chirtungdhara, Palpa

Findings and learning of FGD (Kumal Gaun) Case study Three

Kumal Gaun is near about 11 K.M. from the Tansen Head Quarter of Palpa District. The Kumal Gaun has attached from the main highway of Sidhartha Lokmarg. That Kumal Gaun is lies in the ward no seven of Chirtungdhara VDC. In that ward, around 150 HHs are settlement of Kumal Community. Despite of near from the Tansen Head Quarter, only few people are educated and job holder from that community. Most of them people do the labor work, there are a few skill workers, no more farmland; there are scarcity of irrigation and drinking water. They have no also own private forest so there is scarcity of fuel wood. Some people buy fuel wood who can afford it, but those who cannot buy they are try to thief fuel wood from the other's community forest. According to one user, he had bought fuel wood of around 35 Thousand Rupees last year. There are 150 HHs in Kumal Gaun. Out of 150 HHs only five HHs have installed ICS up to the research period. During the study, the researcher found that, there are some reasons for ineffective ICS program. The reasons are given below:

- There is lack of awareness and information about the ICS program.
- In that ward, almost people are marginalized group so they could not pay for the installation charge of ICS.
- Some people are interested to install ICS but they had no knowledge about installation charge of ICS, who made it, where they contact etc.
- After that discussion, they have gained some knowledge about ICS so they wanted to involve one person in the promoter training from that community.
- There is dissemination or promotion activities have not done yet about the ICS program etc.

After the Focus Group Discussion program, it has come back from the field study. However, the researcher had focused the importance and advantages of ICS during the FGD program. In that program, all participants were listening very carefully. They asked the researcher about installation charge of ICS and person to whom contact. The researcher has informed them in details about the installation charge, contact person, ICS related organization and ICS program. The researcher had put those problems in the District level Coordination meeting. In that meeting ICS related stakeholders, Local Partner Organizations, Women Development Officer, Line agency were participated. After the one month, the researcher had visited again in the Palpa District. In that time, the researcher has found there was some positive change in the Kumal Community of Chirtungdhara VDC. After the FGD program, almost people are exciting to install ICS. According a local promoter Mrs. Jayanti Charti, Fifty over household's name was who are interested to install ICS are listed. She said that, now a day she was very busy to install ICS and many others households also calling her for installs ICS. That was very interesting case and lesson learning for the researcher. After that advised to raise people awareness and dissemination of program are main formula of sustain the development program. Moreover, regular monitoring and evaluation part is backbone of the program.

Chapter VI

MAJOR FINDINGS, CONCLUSIONS, AND RECOMENDATIONS

6.1 Major Findings

During the study, an interaction program was organized among the ICS users, non ICS users and dropout ICS users to discusses about the ICS program of and an attempt was made to understand their opinion regain the usefulness of ICS technology. A little bit difficult was realized to collect data and also all the participants for the interaction program. It is because the time was peak hour for the farming work. Peoples were engaged in the harvesting seasonal crop, collecting fuel wood, daily household activities. Despite these obstacles, the participants had exited to involve in the interaction program. During the study, there has found some positive reaction and some problems from the study area. They are given below;

Followings are some of the highlights of key findings

- While Magars, Brahmans, Chhetries and other minorities were the local inhabitants in the researched VDCs. Magars 53.24% were head in installing the system. Brahmans 27.5% were second and Chetries 7.85% were installing the ICS.
- The major households (37.51%) had involved in farming and second (34.17%) are students. The average family size of the sampled households (Ninety households) has 5.25% persons per family and maximum family members are five to eight (64.44%).
- Out of total ninety respondents (19.25%) were above SLC and remaining respondents were under ten class.
- Maximum households (42.62%) were age group of 15 to 30 years.
- Most of the respondents had house with Zink roof they possessed about 83.33% and second Thatched roof and remaining 2.22% were cemented roof.
- In the study area, there are 98.88% facilities of electricity, toilet, and communication service.
- Survey shows that, out of ninety households, 88.88% were female respondents and remaining 11.11% were male respondents. Major respondents (53.32%) were from 20 to 40 years age group.

- Survey shows that the major of the households (46%) had installed ICS before five years.
- There is major promoter (36%) and after that, neighbors (30%) were chief source of information about ICS.
- In the research area, users have to use ICS for cooking food (86%) and 40% users are using for cooking feed and milk.
- Out of fifty households' of ICS users, 24% users are only use ICS and remaining 76% user are use others stove except ICS.
- Out of fifty households,40% ICS user are facing technical problem like more consumption fuel wood, smoke back, late cooking etc. likewise 18% user are quit satisfy and 34% users are satisfying of this ICS.
- Among the fifty respondents of ICS users, only 34% users are satisfy with this stove. And most of them were accepted about the major advantages of ICS such as warm cooking food after a long time, smokeless environment, clean environment in kitchen, fast cooking if use the both pot hole fuel wood save etc.
- In the research area, users are passing the leisure time in household's activities, to childcare, business etc.
- Among the fifty households, 44% users are facing major problem by more consumption of fuel wood. Similarly, 18% users are facing smoky environment and 12% user say cooking late etc.
- There are out of fifty respondents 53.33% regular ICS users said that, ICS takes time 30min to one hour for cooking food in average five members of family. Similarly, 46.66% users said that, one bundle of fuel wood consumes up to 4 to 5 days and they are cooking three times in one day.
- Out of fifty households, 46% users said one bundle of fuel wood consumed up to 3 to 4 days, when they were use TCS before installed ICS.
- According to fifty households of ICS user, there is 100% users are using fuel wood for the source of energy, after that 28% users are using the Biogas along with fuel wood. There are fuel wood is chief source of energy.

- Among the fifty households, 46% user depends upon private and community forest for the resource of fuel wood. Similarly, 10% users are depend upon like *karesabari* and market.
- In the study area, most of them (76%) people have not any health problem of smoke related, 12% people are unknown of this problem, and 10% people feel improvement of health after installed the ICS.
- Among fifty households, (96%) only knows cleaning of chimney pipe. But also 22% users are only cleaning chimney pipe by quarterly and 52% users are cleaning by monthly.
- There are 84% people don't know about institution of ICS program and 8% users only got the user's manual book.
- There is out of fifty households only 10% users are use of properly outlet 'T' shape, 64% user used outlet pipe shape but it is less effective than 'T' shape outlet, and 26% users did not use any type of out let.
- 72% users have to feel need of additional training for ICS users, 10% respondents were not interested any type of training
- Out of 72% ICS user, as a 56% users are interest of Repair and Maintenance training of ICS.
- According to table no 5.33 and table no 5.20, there are major respondents of TCS users (60%) says that one bundle of fuel wood consume up to two to three days, similarly 46.66% of ICS users says that one bundle of fuel wood consume up to four to five days. This data shows four bundles (In percent 16.67% to 18%) of fuel wood saves per month in ICS than TCS.
- There is out of fifteen households of non-ICS users, 40% users give the answered reason of uninterested to install ICS there are easily access of fuel wood. Some (20%) non-users were interest to install but they have no idea of skill man (Promoter) and 33.33% are heard negative impact of ICS so they did not want to install.
- Out of fifteen households of non-ICS users, 20% people are interesting to install ICS and 26.66% people to be installing after made the separate kitchen room.
- There are many reasons of drop out ICS but among them problems more consume fuel wood is major reason.

- 41.66% promoters are satisfying with their profession and 33.33% promoters are not satisfying this profession
- According to data 44.89% promoters are drop out.

6.2 Conclusions

The development and dissemination of Improved Cooking Stove is reasonable favorable in many parts of the country. ICS technology is often the only possible source of energy in the remote areas of Nepal like Chirtungdhara VDC of Palpa District. It has been able to make substantial social impact in this VDC. Improved Cooking Stove (ICS) installation has improved households activities and environment. It will be very useful especially for women, who has pass most of time in kitchen room for cooking activities.

Improved Cooking Stove has the vital role for short run energy conservation in Nepal. It has directly address the urgent problems of deforestation and rescuing domestic firewood scarcity as well as other health related problems due to excess smoke inhalation. They do not require complex technology and high investment. A major difficulty is the adoption and dissemination, which meet local traditions. If ICS are develop considering user characteristics and regional differences, they help to reduce pressure on the forest & fuel crisis.

In the researched area, some respondents has been very positive attitude towards ICS installation, however they have little technical knowledge of the technology. For the promotion of development of ICS technology, the baseline information of Chirtungdhara VDC of Palpa District has been great helped. Therefore, related institutions need to provide awareness of subsidy for poor people to install ICS. In the experience of researched in Palpa District, there was eight years ago ICS program has launched. There was no any additional program or activities in phase out VDC. Therefore, most of them old ICS was going damage technical part of ICS. There was lack of repair and maintenance of ICS and knowledge. After that, it has supervised in program running VDC like Telgah and Kusumkhola. There are better progresses of ICS quality than Chirtungdhara. In Kusumkhola, there are almost ICS users are satisfy with this new technology such as iron fire gate, raise type of two-pot stove and almost stoves are nine half to ten inch height. However, there was some technical problem in Telgah VDC, because there was no accessible of technician for the regular monitoring of quality check.

According to research, in three different type of program VDC, Improved Cooking Stove program's theoretical and technical part is right. Almost users are also satisfied with new ICS in program running VDC. Therefore, it is also depend on skill full promoter and users, users most have knowledge about use and repair of ICS. However, it has felt, there was little bit lack of mechanism of the program like technical monitoring and responsibility feel to LPOs. Overall, there are quantitatively progressive of ICS in Palpa regional office than other RRESC. Most of non-ICS users said that, there are easily accesses of fuel wood and they had not felt the problem of fuel wood. Therefore, they were not ready to install ICS. There are most necessary of awareness program for those groups.

6.3 Recommendation

Overall, the research has completed of the study around 90% over and it has gain more knowledge from those communities. Most of them respondents were fully support for the researched work but some respondents were frustrate and not interested in any type of program, because they thought that nobody do the work just they are take data and never come back in our community. Therefore, they did not want waste own time. The researcher has also attended in the promoter's monthly meeting and coordination meeting with LPOs of ICS Program. According to field study's experience, it is most necessary to do some activities for the sustainability of ICS Program with effectively. They are following as:

It has divided into two parts short term and long-term solution.

Recent activities

- There was no any additional monitoring in phase out VDC, due to the lack of technical monitoring most of ICS were drop out (out of use for cooking food). Therefore, it is most necessary to do the re-participatory monitoring in phase out program VDC.
- We should be give priority for the installation of qualitative ICS not quantitative of ICS.
- Few users are only using the outlet, so it should be priority for outlet after the installed ICS. It might reduce the smoke back problem.
- Monthly promoter meeting was not so effectiveness and they were gathering in District office of RRESC, Palpa. In the meeting, they have done just to collect monthly saving money and ICS data. They do not interaction about the further planning or any activities. Moreover, it is not possible to coverage

whole District's promoters. Therefore, it will be better if the promoter's meeting in sector wise held regularly. It may help time and save the money.

- LPOs member has only participated as a witness in any types of activities. Therefore, it should be made responsible to LPOs and give them opportunity such as organize the training, sector wise promoter meeting, orientation and demonstration activities, collect the monthly progress report etc.

  Appropriate design of ICS is necessary for large family, cooking livestock feed and cooking *Jaad raksi*. Moreover, its dimensions such as ICS height, fire gate size, chimney height and also for

  ICS users have no knowledge of repair and maintenance of ICS. Hence, it is most necessary to be trained for ICS users of repair and maintenance.

  According to the research 2010, the ICS program has mainly focused on the two-pot hole ICS for the cooking food. There was less use of one and institutional three pot hole ICS for the purpose of like cooking feed for animal, cooking *jad & raksi* and hotel. Therefore it is most necessary of promote the one and three pot hole ICS.

Long term Solution

- There is need of awareness program about ICS for promotion of the program. Therefore, it should be launched awareness program, because some users could not understand the meaning second pot-hole of stove. After that, they blocked second pot hole.
- According to LPOs, supporting cost is low so they could not manage of full time staff for the only ICS program. Partial staff could not give more time. Therefore, they could not mobilize with effectively in dissemination activities and monitoring of ICS. It is most necessary to manage of full time staff for the ICS program in each partner organization.
- Some poor users are interested to install ICS but they could not afford and manage of materials like iron fire gate, iron rod and charge of installation ICS. Therefore, it will be better if the organization can manage at least 50% cost especially for the target group.
- To be gathering all active promoters in one place and allowing developing ICS individually in different design. Therefore, they learn new technology and get the opportunity to share their technical skill to each other etc.

- Most of the people heard about ICS program, but they are still using traditional cooking stove. Therefore, there are should launch awareness and dissemination program in all program VDC.
- Most of the regular ICS users were accepted that, ICS saved the time but saving time was not properly used in earning activities. Therefore, it will be better if, income-generating skill should be give to utilize their leisure time.
- Some promoters are installing the qualitative ICS and some are not, but they have received training from the same person and same organization. Therefore, first we should be more care for them in training period.

ANNEX - II **(Photos of research program VDC of Palpa District)**

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ANNEX – I

A Questionnaire for an Assessment of Livelihood Impact of Improved Cooking Stove Program in Chirtungdhara VDC of Palpa District

(A)General information about study area.

Name of the head of the household……..

Name of the Respondent……..

Relation with the head of the household……..

Ward no. ……Village/Tole ……Religion……

(B)Social Information

S.N.	Name	Age	Sex		Education	Occupation	Type of roof	Facilities
			M	F				
							Black Slate	Tap
								Electricity
							Zink	Radio/TV
							Thatched	Bio gas
							Others….	Toilet
								Motor Way
								Mobile
								Telephone

(C)Specific Information from ICS users.

1. Which type of stove are you using for cooking food?

a) Traditional Stove b) Improved Cooking Stove c) Kerosene Stove

d) Bio gas e) L P gas f) others……..

2. If you are using ICS, how long have you been using the Improved Cooking Stove?

a) six month b) one year c) two year

d) three year e) four year f) ……year.

2.1 How often do you use the Improved Cooking Stove?

a) Regular b) Partial

2(b) If you use ICS partially, for what purpose do you use other stoves?

a)b'w ttfpg / s'8f] ksfpg b) cfuf] tfKg c) hf8 /S;L agfpg d) cGo

2(b)1. What are the problems to cook above this item in ICS?

a) Time consuming b) difficult to feed more fuel wood c) if others…….

2(b)1.1 Don't you know, there are more consumption of fuel wood in TCS. What do you say about this?

……

……

3. From where have you heard about of ICS for the 1st time?

a) Radio/TV b) Local Organization c) Neighbors

d) Social mobilizer e) If any others……

4. Why are you motivated to install of ICS?

a) To see more benefits b) अनिवार्य बनाउनु पर्छ भनेकोले

c) सबैले बनायको देखेर d) If others…….

5. What are the benefits you saw in ICS?

a) Smokeless environment b) Save fuel wood c) Time saving

d) If any others…… e) All of the above.

6. What types of ICS do you have know?

a) One pot hole b) Two pot hole c) Three pot hole

d) Institutional ICS e) without chimney.

7. Which type of ICS do you are using?

a) One pot hole b) Two pot hole c) Three pot hole

d) Institutional ICS e) without chimney.

8. What types of cooking stove was used before installation of ICS?

a) Mud stove b) Tripod stove c) Bio gas

d) Kerosene stove e) If others…..

9. What type of experience have you gained by the use of ICS?

A) Good B) Not bad C) Facing some problems

D) If any others……

9(A) if good explains some merits of ICS.

a) Smokeless environment b) Save fuel wood c) Time saving

d) If any others…… e) All of the above

9(A)d. If you think the use of ICS have saved time, how do you use the saved time?

a) Taking rest. b) Income generating activities c) Child care

d) If any others……

9(A)d.1 If income generating activities please specify…….

9(A)b. If you think ICS save fuel wood, how many days do you use one bundle of fuel wood?

a) 2 - 3 days b) 3 - 4 days c) 4 – 5 days d) More than five days

9(A)b.1 If one bundle of fuel wood takes…….days, generally how many times do you cook food/day?

a) 2 times b) 3 times c) 4 times d)……..days

10. Generally how many hours do you spend for cooking per day in Improved Cooking Stove?

a)……hours.

11. Previously, how many days do you use one bundle of fuel wood in TCS?

a) 2 - 3 days b) 3 - 4 days c) 4 – 5 days d) More than five days

9(C) if you are facing some problems explains some problems.

a) More consumption of fuel wood b) not passes out of smoke

d) मर्मत सम्भार गर्न झन्झटीलो e) आगो राम्रोसित नबोल्नु f) If others…….

12. Is there any difficulty to cook any items in ICS?

a) Yes b) No

12(a) If yes please specify……

13. Which sources of energy are you using for cooking food?

A) Fuel wood B) Animal dung C) Agriculture residues

D) All of the above.

13(A) If fuel wood, from where are you getting of fire them?

a) Market b) Forest

13(A) b. If forest, which types of forest are you depending on?

a) Private forest b) Community forest c) Government forest

d) If others…….

13(A) a. If market, How much have you paid for a bundle of fuel wood?

a) 40 – 50Rs. b) 60 – 80Rs. c) 80 – 100Rs.

14. How much time does it take to fetch (bring) firewood from forest per day?

a)……..hours.

15. Generally how many bundle of fuel wood have you stored in your home/year? (Tentatively)

a) ……bundle of fuel wood/year.

16. Generally who has to go forest for collecting firewood?

a) Male b) Female c) children

d) a & b e) all

17. Generally who cooks food in your family? (For both)

a) Male b) Female c) children

d) a & b e) all

17(a). If male, did he support in the kitchen before installing the ICS?

a) Yes b) Never c) Seldom

18. Did you have any health problems caused by the released smoke of traditional cooking stove?

a) Yes b) No

If yes please specify the problems……

19. Have you felt any of the improvement in the health problems after the installation of ICS?

a) Yes b) No

If yes please specify the improvements……

20. What improvements are seen in the kitchen after the installation of ICS?

a) Reduction in smoke emission b) Clean utensils c) Clean kitchen

d) भान्छामा बसेर पढ्न सक्छन e) If others……

21. Do you have knowledge of cleaning & maintaining chimney and ICS?

A) Yes B) No, I have no idea.

21(A). If yes, how often do you clean the chimney?

a) Weekly b) monthly c) Bi-monthly

d) Seldom e) If others…….

21(B). If no, how do you do repair and maintain ICS?

a) To call the promoter b) If others…….

21(B) a. If you call the promoter, how much do you pay for repair and maintenance charge of ICS?

a) …….Rs.

22. How much you have paid money for installing charge ICS?

a) ……..Rs.

23. Is it affordable cost? Do you want to say something about installation cost of ICS?

a) Yes b) No, it is very high c) Government should share 50% of total cost d) ……..Rs. is reasonable cost.

24. How often ICS Technician have been visited for monitoring of ICS?

a) Once b) Twice c) Seldom

d) Never seen up to now e)……. f) Don’t know

25. Do you know, all your neighbors using ICS?

a) Yes b) No c) Don't know

26. Do you know about the Institutions of Improved Cooking Stove Program?

a) Yes b) No

27. Have you got any ICS user's manual book, calendar or ICS related books?

a) Yes b) No

27.(a). If yes, from where have you got? Please specify…….

28. Have you taken training of ICS user's repair and maintain?

a) Yes b) No

28.(a). If yes, was it effectives in your practical life? Please specify…

29. Do you expect any additional training related to ICS program?

a) Yes b) No need c) Don't know

29.(a). If yes, what types of training is need?

a) Kitchen management b) ICS repair & maintenance

c) Gender participate.

30. At last, would you want to say something about the ICS program?

(D)Specific information from the ICS non users.

1. Which type of stove are you using for cooking food?

a) Traditional Stove b) Kerosene Stove c) Bio gas

d) L P gas e) others……..

2. If Traditional Stove, which sources of energy is using for cooking food?

A) Fuel wood B) Animal dung C) Agriculture residues

D) All of the above

2(A). If fuel wood, from where are you getting them?

a) Market b) Forest

2(A) b. If from forest, which type of forest are you depending on for fuel wood collection?

a) Private forest b) Community forest c) Government forest

d) If others…….

2(A) a. If from market, how much have you pay for a bundle of fuel wood?

a) 40 – 50Rs. b) 60 – 80Rs. c) 80 – 100Rs.

3. How many days do you use one bundle of fuel wood in TCS?

a) 2 - 3 days b) 3 - 4 days c) 4 – 5 days d) More than five days

3.1. If one bundle of fuel wood takes……..days, generally how many times do you cook food/day?

a) 2 times b) 3 times c) 4 times d)……..days

4. Generally how many hours do you spend for cooking per day? (For both)

a)……hours.

5. How much time does it take to fetch (bring) fire wood from forest per day?

a)……..hours.

6. Generally how many bundle of fuel wood have you stored in your home/year?

a)……bundle of fuel wood/year.

7. Generally who has to go forest for collect of fire wood?

a) Male b) Female c) children

d) a & b e) all

8. Generally who cooks food in your family? (For both)

a) Male b) Female c) children

d) a & b e) all

9. If you are using Traditional Stove. Are you satisfied with the stove for cooking food?

A) Yes B) No

9(A). If no, what are the demerits of TCS?

a) Smoky environment b) More consumption of fuel wood

c) Untidy cloths/kitchen wall d) Take long time for cooking

e) If others……

10. Have you ever heard about ICS?

a) Yes b) No

10.1 If yes, from which sources have you heard about ICS?

a) Radio/TV b) Local Organization c) Neighbors

d) Social mobilizer e) If any others……

11. What do you think, ICS is better or TCS? (ICS).....(TCS).

11.1 If TCS, why?

a) Easy to use b) easily access of fuel wood.

c) Expensive to use of ICS d) If others…….

11.2 If ICS, why?

a) Smokeless environment b) Save fuel wood c) Time save

d) If any others…… e) All of the above

12. What are the problems to install ICS?

a) Expensive for poor people b) No idea, who made? c) No space for ICS installation

d) त्म्रुक बाट काम चलीरहेको छ e) If others……

(E)For ICS promoters;

Name of the Promoter:-

Address:-

1. When have you taken training of ICS promoter?

a) Before…….year…….month.

2. Are you satisfied with your profession?

a) Yes b) No c) Not bad

2.(a). If yes, how much you have earned money up to now for installing the ICS?

a) Around……..Rs.

2(a)1. In which purpose have you spent your money?

a) For education of children b) Household expenditure

c) To maintenance for house d) If others……..

2(b) If no, what do you want to say about ICS program/ Institution?

a) …….

b)……..

3. How often ICS users have called you for re-installation or maintenance of ICS?

a) Seldom b) Not yet. c) Yes, when they need d) If others

4. What do you do for those who can't pay money for the installation of ICS but they need?

……

……

5. Have you faced any problems during the ICS installation? (Social, religious, political etc.)

If yes, specify…

6. How do you motivate the households to install ICS?

a)……

7. Who approach you to installation ICS?

a) Household themselves b) you c) FTC d) Others

(E.1) For Dropped Out ICS Promoters

Name of the Promoter:-

Address:-

1. When have you taken training of ICS promoter?

a) Before…….year…….month.

2. Still do you installing the ICS?

a) Some time b) No c) Partially d) माग आए मात्र बनाउन जान्छु

3. Why did you dropp out for the installation of ICS?

a) नजिक माग छैन टाढा जान सक्दीन b) घरायसी काममा ब्यास्त भएकोले c) social service

d) If others

4. Do you want to say some merits and demerits about ICS program?

a) Merit. …….

……

b) Demerits. ……..

……

5. What do you suggest to make the ICS program more support in the area?

(F) For Dropped Out ICS users.

1. Which type of stove are you using for cooking food?

a) Traditional Stove b) Improved Cooking Stove

c) Kerosene Stove d) Bio gas

e) L P gas f) others……..

2. Did you use ICS previously?

a) Yes but now others stove is using b) No

2.1. Why you are not using ICS despite it has a benefit?

a) To faced problems. b) Difficult for use & maintenance c) Lack of skill full promoter d) If others please specify……..

2.1.(a) If you faced problems, please specify the problems.

a) Back fire b) Consume more fuel wood

c) Smoke not pass out d) Take more time for cooking food

e) All of the above

2.1(c). यदि दक्ष्य चुलो प्रवधकले बनाउन आएको खण्डमा फेरि चुलो बनाउनु हुन्छ।

a) बनाउछु b) बनाउदिन c) घर सल्लाह गर्नु पर्छ।

d) अन्य

2.1.2 Don't you know about, how to use and maintain of ICS?

a) Please specify…..

2.1.3 Did you get the user's manual book or repair & maintenance training of ICS?

a) Yes b) No

3. What do you want to say about of ICS program?

a)……

……

(G)For LPO members/ Key Informant.

1. What do you think; ICS program is sufficient to back up for deforestation?
2. How can we implement with ICS program in all VDC of Palpa District effectively?
3. What is the reason of drop out of promoters and users, what are you planning/program about stop it?
4. Do you expect any further need of training for promotion of ICS program?

4.1 If yes, what types of training do you recommend?

5. What has the arrangement made for those who are poor? (For LPO of ICS program)
6. Still, some users have been using a TCS for a long time, how are you trying to motivate them for the installation of ICS?

ANNEX III

TIMEFRAME

Period of the Study

SN	Months and Week / Particulars	Duration of the Study															
		December,09				January,10				February				March			
1	Preparation of the Proposal			■	■												
2	Field Visit				■	■											
3	Data Collection					■	■	■									
4	Observation							■	■								
5	Focus Group Discussion								■	■							
6	Key Informant Interview								■	■							
7	Meeting with LPOs of ICS Program									■							
8	Promoters meeting										■						
9	Data Analysis											■	■				
10	First Report													■	■		
11	Second Report														■	■	■
12	Final Report Printing and Binding															■	■

ANNEX IV

Budget Estimate

SN	Heading	Amount	Total Amount	Remarks
1	**Pre-Field Visit**			
1.1	Travel (400*2)	800		KTM to
1.2	Food and Accommodation (1person*2days@250)	500	1300	Palpa
2	**Field Survey**			
2.1	Snacks (100person@30)		3000	
2.2	Stationary			
2.2.1	Report Printing & Binding	2500		
2.2.2	Photo	1000		
2.2.3	Photo Copy	1300	4800	
2.3	Travel + Local Travel		1800	
2.4	Food and) Accommodation(2person*60days@300		18000	
2.5	Logistics Expenditure		1000	
	Grand Total -		**29900**	