

Differences in Participation of Men and Women Farmers:

The Case of Farmer Field School in Kavre District, Nepal

**A Research Project submitted to Van Hall Larenstein University of Applied Sciences in
Partial Fulfilment of the Requirements for the Degree of Master of Development
Specialization in Social Inclusion, Gender and Rural Livelihood**

By

Shova Paudel Regmi

October 2010

Wageningen,

The Netherlands

© Shova Paudel Regmi. All rights reserved

PERMISSION TO USE

In presenting this research in partial fulfilment of the requirements for a Postgraduate degree, I agree that the Library of this University may make it freely available for inspection. I further agree that permission for copying of this research in any manner, in whole or in part, for scholarly purposes may be granted by Larenstein Director of Research. It is understood that any copying or publication or use of this thesis thereof for financial gain shall not be allowed without my written permission. It is also understood that due recognition shall be given to me and to the University in any scholarly use which may be made of any material in my research project.

Requests for permission to copy or to make other use of material in this research project in whole or part should be addressed to:

Director of Research
Larenstein University of Applied Sciences
P.O. Box 9001
6880 GB, Velp
The Netherlands
Fax: 0031 26 3615287

ACKNOWLEDGEMENT

My first gratitude goes to my supervisor Ms. Annemarie Westendorp. The study has been completed only due to her valuable suggestions and constructive comments from the very beginning to the end. Her help and cooperation has definitely improved the quality of this dissertation.

I am thankful to the Government of Netherlands (NUFFIC) and Larenstein University of Applied Sciences for providing me financial assistance to pursue Master's Degree in this reputed institute. I would like to thank GON/MOAC for approving my leave to pursue the study. I am especially thankful to Dr. Suraj Pokharel and Ms. Neeru Dahal Pandey for their support and encouragement. My sincere thanks go to the Plant Protection Directorate, IPM Facilitator Mr. Ram Saran Sapkota and Ms. Laxmi Timilsina for providing valuable time and data.

I would also like to thank all the staff of DADO, Kavre, Nepal. DADO staff specially Mr. Ramesh Humagain and all the farmers in the district for contributing their valuable time and enormous support during data collection.

My special gratitude goes to my friend Ir. Hom N. Gartaula for his unwavering support during the entire period of study. I would also like to thank my colleagues and friends Ms. Indira Ojha, Mr. Chiranjibi Rijal and Mr. Kalash R. Chaudhary for their continuous inspiration during the entire course of study.

I am indebted to my husband Mr. Sagar Regmi, together with my lovely sons Divya and Lakshya for their love, concern and understanding and particularly for taking charge of responsibility in my absence.

Last but not the least, I would like to extend my gratitude to my father Mr. Bijaya Poudel, mother Mrs. Bhawani Poudel for their continuous inspiration and support, and father-in-law Mr. Naresh Regmi and mother-in-law Mrs. Saraswoti Regmi for not only providing me encouragement but also taking care of my children during my absence.

Shova Paudel (Regmi)
07 October 2010

TABLE OF CONTENT

PERMISSION TO USE.....	ii
ACKNOWLEDGEMENT	iii
TABLE OF CONTENT	iv
LIST OF TABLES	vi
LIST OF FIGURES.....	vi
ABBREVIATION AND ACRONYMS	vii
ABSTRACT	viii
CHAPTER ONE	1
INTRODUCTION.....	1
1.1 Background.....	1
1.2 Problem statement.....	2
1.3 Objectives of the study.....	2
1.4 Research questions	2
1.5 Significance of the study	3
1.6 Limitations of the study	3
CHAPTER TWO.....	5
LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK	5
2.1 Farmer Field School.....	5
2.2 Operational mechanism of IPM Farmers Field School.....	6
2.3 IPM in Nepal	7
2.4 Farming system in Nepal	8
2.5 Gender roles and household decision-making	8
2.6 Patriarchy system in Nepal.....	9
2.7 Knowledge transfer	10
2.8 Adoption of agricultural technologies.....	10
2.9 Conceptual framework	11
2.10 Operationalization	11
CHAPTER THREE	13
METHODOLOGY	13
3.1 Introduction.....	13
3.2 Literature review	13
3.3 Selection of the study area.....	13
3.4 Research and sampling design	15
3.5 Data collection and analysis.....	15

3.5.1	Primary data.....	15
3.5.2	Secondary data.....	16
3.5.3	Data analysis	16
CHAPTER FOUR	.....	17
RESULTS	.....	17
4.1	Socioeconomic characteristics of respondents.....	17
4.2	Involvement of men and women	17
4.3	Expectation from the family members	20
4.5	Differences in learning between men and women	21
4.6	Decision-making in agricultural activities.....	21
4.7	Knowledge transfer	24
4.7.1	Learning and application of knowledge and skills.....	24
4.7.2	Attention of trainers' during training.....	27
4.8	Results from the focus group discussion.....	27
CHAPTER FIVE	.....	29
ANALYSIS AND DISCUSSION	.....	29
5.1	Introduction	29
5.2	Decision-making	30
5.3	Learning and application	31
5.4	Knowledge transfer	32
CHAPTER SIX	.....	33
CONCLUSIONS AND RECOMMENDATION	.....	33
6.1	Conclusions	33
6.2	Recommendations	34
REFERENCES	.....	35
ANNEXES	.....	38
Annex A:	Questionnaire for IPM FFS farmers	38
Annex B:	Questions for the Plant Protection Officers	39
Annex C:	Checklist for focus group discussion.....	41
Annex D:	Names of Respondents	42
Annex E:	Respondent Plant Protection Officers.....	43

LIST OF TABLES

Table 1: Operationalization of concepts.....	12
Table 2: Composition of men and women farmers in IPM FFS	18
Table 3: How they were selected for the training	19
Table 4: Reasons for joining the training.....	20
Table 5: Who learns early between men and women?	21
Table 6: Decision-making in the agricultural activities.....	22
Table 7: Knowledge and skills gained in IPM FFS training	24
Table 8: Application of knowledge and skills from IPM FFS training	25
Table 9: Reasons for not applying the knowledge and skills gained in IPM FFS training	25

LIST OF FIGURES

Figure 1: Conceptual framework.....	11
Figure 2: Map of Nepal showing Kavre district.....	14
Figure 3: Map showing Kushadevi and Rayale VDCs.....	15
Figure 4: Reasons behind men and women participation in IPM FFS.....	19
Figure 5: Expectation from the family members.....	20

ABBREVIATION AND ACRONYMS

CBS	Central Bureau of Statistics
CIPM	Community Integrated Pest Management
DADO	District Agriculture Development Office
DDC	District Development Committee
FAO	Food and Agriculture Organization
FFS	Farmer Field School
FGD	Focus Group Discussion
GDP	Gross Domestic Product
IPM	Integrated Pest Management
MOAC	Ministry of Agriculture and Cooperatives
MOD	Management of Development
MOEC	Ministry of Education and Culture
NGO	Non Government Organisation
PPD	Plant Protection Directorate
SIGAL	Social Inclusion Gender and Rural Livelihood
SNIP	Support to National IPM Program
T&V	Training and Visit
UNDP	United Nations Development Program
VDC	Village Development Committee

ABSTRACT

The research assesses how men and women experience the farmer field school in a different way. There is a difference in enrolment, a difference in the application of knowledge and skills gained in the IPM FFS training by the men and women farmers and the factors influencing it. Two villages: Kushadevi and Rayale were selected for the study, based on their perceived success of IPM FFS according to the government records. A total of 40 farmers (20 men and 20 women) were purposively selected for semi-structured interviews and two focus group discussions were conducted. The cases of male and female farmers and plant protection officer were also taken into account in order to grasp their dynamics in more qualitative manner. In addition, semi-structured interviews were quantified to derive some descriptive statistics. The main outcome of this study is that the tedious agricultural tasks are in the hands of women, while main decisions are made by men. Moreover, women have a lesser participation and slower learning behaviour as compared to men farmers. In case of learning and application of skills and knowledge gained from the IPM FFS, women learn slower than men but are found to apply more what they have acquired in their daily life compared with men. The lesser participation rate is due to women's higher involvement in domestic chores, and strict husband or father-in-law who does not allow them to join the training. On the other hand, their low education level also prevents them from understanding technical subject matters. Men are not so interested to apply the knowledge and skills from FFS; they prefer to find work abroad or in service sector. Moreover, women also want their male counterpart to work outside. Knowledge transfer rate from the plant protection officers to the farmers are somewhat equal with both men and women. Trainers utilize participatory approach in selecting farmers for training. Along this line, this study has recommended making the trainers up to date on the recent developments in IPM and FFS. Refresher training related to both technical as well as social aspects of FFS should also be conducted for the plant protection officers by the concerned office. Gender awareness training has to be conducted before the start of the FFS so that the trainers and staffs realise that women and men have different roles in agriculture and different needs and opportunities. The trainer should also be trained in the gender and social aspects before the conduct of training in order to apply gender sensitiveness in prospective trainees' selection. The number of women trainers should be increased to enhance the training efficiency. At farmer's level, input support should be provided so that they could apply the knowledge and skills they gained from IPM FFS, which are indeed essential for the promotion of IPM FFS program.

CHAPTER ONE

INTRODUCTION

1.1 Background

Nepal is a small landlocked country located between the two big nations of India and China. The total area of the country is 147,181 sq. km. The country is situated between 80°04' and 88° 12' east, and 26° 22' and 30° 27' north, along with the southern slopes of the Himalayas (CBS, 2003). Nepal is divided into three distinct agro-ecological zones: mountain, hills and the terai with 35, 42, and 23 percent of the total area respectively. The climate is also diverse according to the altitude and agro-ecological zones from hot tropics to arctic. Hence, the availability of variation in climate offers a wide range of production and variety of agricultural crops. The total population of the country is 23.4 million, with an annual growth rate of 2.25 percent (CBS, 2003). The urban population is increasing rapidly. Socio-culturally, Nepal is a multi-linguistic, multi-ethnic, multi-religious, and multicultural country. Nepali is the official language.

Nepal is one of the poorest countries in the world with the annual GDP growth rate of 3.2 percent (CBS, 2003). The poverty incidence of the country is high as more than 42 percent people live below poverty line (according to the World Bank's indicator of US\$ 1/day). Especially, poverty in Nepal is a rural phenomenon. The rural poverty is 44 percent and 23 percent in the urban areas (CBS, 2003). The economic recession due to political instability for the past decades has further exacerbated the situation. Ten years long Maoist insurgency (1996-2006) has adversely affected every aspect of the economy like trade, industry, tourism, export and development activities. During Maoist insurgency since 1995, about 15 percent of the national budget was spent on the security so it reduced the budget for developmental activities. Although, Nepal has been implementing 5-year periodic plans for the past 60 years, human development indicator is very low.

The gender related human development index is also as low as 119 (UNDP, 2004). Gender discrimination is very high it can be seen in social, economic, and political sectors. Nepal has very low life expectancy rate of women among the South Asian countries. More than 60 percent of the people are engaged in agricultural sector. Economic liberalization and privatization started in Nepal since 1990; however, the problem of unemployment and underemployment is growing rapidly. The development budget is mainly dependent on the foreign aids and loans.

Nepal is an agricultural country where more than 65 people have agriculture as their main source of living (MOAC, 2007b). Farming is practiced under different conditions in the hills, mountain and in the Terai. Out of the total area, 80 percent consists of rain fed upland area and 20 percent is partially irrigated. Out of total land, only 18 percent of the land is suitable for cultivation. Agriculture in Nepal is based on subsistence farming, particularly in the hilly regions where peasants derive their living from fragmented plots of land cultivated in difficult conditions. Formally, the then Ministry of Agriculture initiated group approach in agriculture in 1991 and it has claimed to evolve through ramifications in different spheres of agricultural development. Farmer's group approach, which is the latest approach contrived in Nepalese environment on participatory mode is considered the potential approach of development implemented all over the country (DOA, 2007).

This research assesses the learning and application of knowledge and skills between men and women in the Farmer Field Schools. Farmer Field School (FFS) is a Participatory Extension Approach (Hagmann, et al., 1999) that uses non-formal adult education methods based on experimental/discovery learning techniques and participatory training (Miagostovich et al., 1999 cited in Simpson, 2002). It is a participatory method of technology development and dissemination (FAO, 2001 cited in Madukwe, 2006). Also, it is one of the main extension approaches and participatory learning techniques adopted by the Ministry of Agriculture and Cooperatives, the government body mandated for agricultural development. The approach has been applied in many districts and the levels of participation from the farmers involved are considered high (DOA, 2009). However, the way they learn, the way they perceive the process and the way they apply what they have learnt in the school would differ based on their gender, social and cultural differences. Moreover, the studies on the application of such learning by men and women farmers are scarce. Hence, the study is focused on learning and application of knowledge and skills they have learnt in such FFS.

1.2 Problem statement

Numerous knowledge and skills are transferred by extension officers to men and women farmers on the farm through Farmers' Field School approach, which is considered as a group based participatory approach of agricultural extension. However, it is unclear how men and women farmers differ in their experiences especially in terms of their different access and opportunities to participate, and learning and applying of what they have acquired from various FFS trainings in everyday practices. Apart from this, the issues of social norms, values, and socio-cultural practices among men and women farmers are still understudied aspects in FFS literature.

1.3 Objectives of the study

In order to address the problems stated in the above sections the study has the following objectives:

- To understand the reasons for differences between men and women farmers in participating in IPM FFS.
- To understand the knowledge and skills gained by participating farmers from IPM FFS training.
- To assess the role of men and women in the decision-making process in agricultural activities among IPM FFS farmers, and factors that determine opportunities for men and women to take part in IPM FFS.

1.4 Research questions

Based on the above objectives the study strives to answer the following research questions:

- What are the reasons for differences of men and women IPM FFS farmers in participating in IPM FFS?
- What are the knowledge and skills they gained from IPM FFS training?
- What are the roles of men and women in decision-making in various agricultural activities among IPM FFS farmers, and What are the factors determining opportunities for men and women to take part in IPM FFS?

1.5 Significance of the study

Since IPM FFS is a problem solving approach in the field of sustainable agriculture development in Nepal, agricultural policies and present extension system of Nepal have adopted IPM FFS approach as an effective extension tool to bring positive changes in the livelihood of rural farmers. IPM FFS is regarded as the best extension approach adopted by government of Nepal, local authorities and extension technicians and also farmers. There have been many studies conducted on IPM FFS in different commodities and skills. However, there is very limited research on the gender aspects. How men and women farmers learn and apply FFS' teachings in the daily practices and what are the factors responsible for learning and application of knowledge and skills gained in IPM FFS are understudied. Thus, I chose this topic for this research, which is expected to be useful in the future in terms of curriculum development, inclusion of gender aspects in such trainings and upgrading of the knowledge and skills of both farmers and the extensionists.

1.6 Limitations of the study

This study was mostly based on the experiences of the IPM FFS farmers and agricultural personnel. It is not unavoidable that professional and farmers biases would influence the results of the study. It was rainy season and the farmers were busy in rice transplanting so to take their time for interview was difficult. The study was only confined in two Village Development Committees of Kushdevi and Rayale, its generalisation is not guaranteed. The study should have presented different scenario with bigger sample size and more number of data collection tools. Given the time frame, the research could not be elaborated much. Moreover, frequent strikes due to political instability hampered the mobility of researcher to the concerned field sites.

Since the study involved single period field work, it was not possible to adequately capture all information. Moreover, virtual non-existence of baseline data considerably constrained the comparison of the impact before and after the intervention.

The questionnaire designed for the Plant Protection Officers on training need assessment was irrelevant as finding for this study and abandoned.

The researcher fell sick during the research and was hospitalized, resulting into the postponement of some activities by one week.

1.7 Outline of the study

This study was conducted as a partial fulfilment of the Master in Management of Development (MOD) with specialisation in Social Inclusion Gender and Livelihood (SIGAL) at Van Hall Larenstein University of Applied Sciences in Wageningen. The study aims to provide insights into the research objectives, questions, and concepts that would play a crucial role in the proposed study area. The research intends to inform the reader on the details of the research topic. The research is based on gender application of knowledge and skill in integrated pest management (IPM) focused FFS in Kavre district, Nepal.

The first Chapter provides an introduction and background of the research within the context of Nepalese agricultural extension system as well as the underlining problems that evokes the research as a whole. Chapter Two gives an overview of conceptual ideas and literature review for the study, while Chapter Three deals with the research methodology describing sampling,

data collection, and data analysis. Chapter Four discussed the results obtained during the fieldwork conducted in July-August 2010. Chapter Five presents the analysis of the data presented in Chapter Four. The last Chapter concludes by presenting summary of the findings with appropriate recommendations for future course of actions.

CHAPTER TWO

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

In this chapter, I describe different aspects of agricultural and social system of Nepal related to FFS. As mentioned earlier, FFS in Nepal is mainly focused on integrated pest management of different crops; sufficient attention has been paid to describe the operational mechanism of FFS and IPM in Nepal, which is linked with farming system in Nepal. Gender roles, patriarchy, knowledge transfer, and adoption of agricultural technologies are other aspects dealt in this chapter. The chapter concludes with the conceptual framework and operationalization of some concepts used in the study.

2.1 Farmer Field School

The Farmers Field School (FFS) was designed in the late 1980s by the Food and Agriculture Organization (FAO) of the United Nations technical assistance team as a training approach for pest management in rice namely Integrated Pest Management (IPM). The FFS grew out of the T&V process in 1988 through improvements needed at the time to address the national threat of a rice insect outbreak in Indonesia that depended on local complex decision-making by farmers in their fields. Initially, the FFS was developed from Indonesia in 1989 that was developed in the field of rice specific area concentrating on IPM (CIP-UPWARD, 2003). FFS aimed to assist the farmer to deal with pesticide-induced problems of rice caused by brown plant hopper in the irrigated rice fields (Braun et al., 2006). Thus, FFS has become the first step as a strategy to promote pest management with the involvement of farmer groups, known as Community IPM to solve the immediate problems in agriculture. The main aim of the program was to stimulate learning, enhance group coherence and encourage collective decision-making and action. In addition, the program expected farmers to know the value of group dynamics practically.

History shows that at the end of eighties, in Indonesia, there was a huge mass of pesticide used by the private sectors haphazardly. The health of farmers and the environment was completely ruined due to the residual effects of pesticides. Similarly, the pest and diseases developed resistance to the particular pesticide and insecticide. Thus, the government of Indonesia launched a decentralized awareness program on IPM education in the fields of farmer. According to Dilts (2001), consequently, they become expert and enable to manage ecology in their field and lessened the risk to their health and to the environment. It also saved money in haphazard use of pesticide and gained profit. Hence, FFS approach was designed to address the problem of ecological heterogeneity and local specificity by placing the control of small-scale agro ecosystems in the hands of the people (Pontius et al., 2002).

Approximately at the end of 1991, the pilot FFS in IPM for rotation crops (mainly soybeans) was initiated. In the mean time, FFS Programme spread out to different countries in Asia (CIP-UPWARD, 2003). When the IPM program was succeeded in rice sector massively, it was spread to other crops including the horticultural crops, banana, cotton and vegetables (Braun et al., 2006). It was also gaining popularity in animal husbandry in many African countries. As the popularity rate and the adoption of IPM increase aggressively; however, it appears to be time consuming as compared to other extension approaches (Braun et al., 2006).

FFS is solely a participatory extension approach based on non-formal adult education methods, experimental learning techniques, and participatory training (Hagmann et al., 1999; Miagostovich et al., 1999 cited in Simpson, 2002). Thus, it is exclusively participatory method of technology development and dissemination (FAO, 2001 cited in Madukwe, 2006). In other words, FFS is people-centred and experimental approach where there is a sharing of knowledge in between subject matter specialists and farmers concentrating on the principle of learning-by-doing in the open field of farmer as a laboratory.

In Nepal, the CIPM-FFS programme started in 1998 with the support of FAO Inter-regional Community IPM Program focusing mainly on training trainers and conducting Farmer Field Schools (Westendorp and Biggs, 2002). Due to the unexpected successes of IPM in Nepal, the FAO continued its support to CIP-FFS programmes. Consequently, different national and international NGOs invested in the CIPM-FFS. The accomplishment of IPM work was funded by the Norwegian Government, FAO, and CARE etc.

IPM program has more successful experiences in Nepal as compared to other South Asian countries (MOAC, 2007a). FFS offers farmers the opportunity to learn by sharing, by being involved in experimentation, discussion and decision-making and ultimately, collectively solving the problems (FAO, 2000).transforming farmers from recipients of information and generation of knowledge at the local level (Madukwe, 2006). Finally, this method enhances the sense of ownership of rural communities in technological packages (FAO, 2000).

In addition, it has provided a positive impact on farmers' experiential learning and farmers' livelihood. The training received and experience gained from field schools are subject to the application of knowledge and skills in the daily life. In the Nepalese context, the existing socio-cultural system does not necessarily affect men and women in the same way. While farmers gain skills to manage pests, FFS has many agro-economic impacts: high yield of crops, environmental protection and management of pests in a better way. They also learn how to take management decisions.

At organizational level, Plant Protection Department under the Ministry of Agriculture and Cooperatives has been coordinating FFS related activities. All the Plant Protection Officers have been provided with the IPM training at the level of training of trainers. At the field level, FFS has been run in the different districts and production of the farmer FFS trainer in the field level.

Under the program, the Plant Protection Officers as extension staff become "facilitators" who assist men and women farmers in merging local indigenous knowledge with modern scientific ecological knowledge. The changed relationship adds value on local farmer's expertise and allows better relationship with their external extension staff while encouraging new ecological science to be incorporated into decision-making. Hence, FFS approach becomes sustainable in Nepalese context as it produces the local level facilitators who know everything in that locality and also they can provide their service to the other farmers in local level easily.

2.2 Operational mechanism of IPM Farmers Field School

Basically, a field school session lasts for about four hours. Depending on the growth duration of the crop under study, a field school might be made up of weekly session up to four months. There is a conduct of wide varieties of activities including farmer experimentation, going beyond pest management issues with the intention of sustainably enhancing the lives and communities of farmers. Throughout the growing season, farmers meet regularly in a group learning field where they manage an IPM plot, make informed decisions based on their thorough observation

of the crop and its environment. IPM is a very ambitious goal requiring both qualitative change relating to farmers' capacities, practices, collective action and support systems. The goal of this strategy is to institutionalize IPM at the local level. The three basic elements of community IPM are learning, experimentation, and organizing groups and activities.

Hence, FFS emphasizes experiential, discovery-based learning. Opportunities for this type of learning are created through a series of field activities and experiments in the FFS curriculum in which farmers observe and prove to themselves, through hands-on activities. In this way, farmers generate knowledge, which helps them make better cultivation decisions.

However, social barrier is one of the main causes in the application and adoption of IPM in Nepal especially for women who have difficulties in joining the FFS groups. In Nepalese society, due gender specific societal roles, division of labour and access and control over the resources the access and application of what they have learnt is challenging. Men and women would have learnt the same issues but their application after training would differ based on their social position within the household as well as in the community; also due to the different social system, caste, religion, norms and values.

2.3 IPM in Nepal

Nepal is predominantly an agricultural country where 65.6 percent of the total population is engaged in agriculture on 1.4 million hectare of the total cultivated land. More than 40 percent people are smallholders with 0.5 ha of land. Agriculture contributes to about 42 percent of the National GDP (CBS, 2003). Nepal has a diversified climate from tropical to temperate depending on the altitude, latitude and dominance of micro climate with variations in temperature and precipitation (high rain fall in eastern and low rain fall in western part of the country). Rice is the main staple crop (accounting for about 50% of the total agricultural land area and production of the country). Because of variations in climate and rainfall, many kinds of vegetables, fruits, spices and cash crops are grown round the year for household consumption as well as for local market.

During the last two decades there were numerous development approaches that supported highly effective and productive development. The approaches in development depended on the motives of the donor agencies. Recent development approaches have been a mixture of such. Some familiar practices in development approaches from different organizations, after 1970's that have been applied in Nepal are the - people-centred development approach, community development approach, integrated rural development approach, participatory development approach, livelihood approach and farmer field school approach.

The agriculture of Nepal is gradually moving towards commercialization. In the quest for higher yield and profits, the 'progressive' farmers started to use various modern agricultural inputs and specially the pesticides in a rather indiscriminate manner. Some of them may have succeeded in achieving some short-term gains, but the majority is losing both financially and in terms of health because of the toxic food they are consuming. In addition, the indiscriminate and excessive use of pesticides has adversely affected on environment and on the whole ecosystem resulting in continuous degradation of biodiversity (PPD, 2009).

In order to combat the dangers of pesticide, IPM based on agro-ecological approach, has been identified as an excellent alternative choice to combat the battle according to support to National IPM program (SNIP, 2005). The Community Integrated Pest Management (CIPM) FFS program started in Nepal in 1998. However, the program set out to do more than just improve crop yields

or reduce pesticide use. IPM FFS do not focus on insects alone, they provide farmers with an opportunity to learn and practice and achieve greater control over the conditions face every day in their fields (Pontius et al., 2002).

Plant protection strategy has remained as one of the main issues in both short term as well as long term agricultural development plans. IPM has been established as a national plant protection strategy in the Tenth Five Year Plan (2002-2007) and the Agricultural Perspective Plan (1995-2015) particularly emphasizes it as an appropriate strategy or alternative to pesticide application to reduce pesticide use. The Ninth Five-Year-Plan (1997-2001) had also recognised IPM as a strategy for the development of sustainable agriculture. The programs were supported by the Norwegian government.

The ultimate goal of the National IPM Programme is to institutionalize IPM at the farmers' level. IPM trained farmers provide the foundation of sustainable agricultural sector. The core activities of "IPM by farmers" are planned and coordinated efforts by the National IPM Programme. Countrywide IPM farmer training, community IPM organizations are other activities of IPM program that is envisioned to link farmers' groups, research, rural development and educational organizations, and to empower farmers to increase production and productivity for food security, poverty alleviation and sustainable environmental protection this ultimately helps to make better of livelihood of Nepalese farmers (NIPM, 2005).

2.4 Farming system in Nepal

Nepal is a mountainous country where more than 65 percent of the area is covered by mountains. Out of total land, only 18 percent of the land is suitable for cultivation. Agriculture is the main source of livelihood of Nepalese, as more than 65 percent of the people are engaged in this sector (MOAC, 2007b). Farming is practiced under different conditions in the hills, mountain and in the Terai. Out of the total area, 80 percent consists of rain fed upland area and 20 percent is partially irrigated.

Lack of timely availability of inputs and traditional methods of cultivation with cultural prejudices in some cases are some of the problems of Nepalese agriculture. Therefore, the farming system in the hilly region has been in a survival mode, with farmers always in low income status. In the mountainous region marginalised farming is based on only one crop like potato. In high hills, villages have very less irrigated land and more rained terraces. In the mid-hills, the major crops are two times maize, millet, barley and potato. In the plain area there is also production of wheat (Upadhyay, 1993). Hence, the farming system of Nepal varies sharply from the higher altitude in the north to the lower south and from the higher wet east to arid west. For vegetable seed production and for the fruit production, hill is one of the potential areas.

In many instances, farmers are organised in groups through farmer groups, women groups, and cooperatives. The groups are helping them not only for the economic safety nets but also to solve the technical problems appeared in the farm. For example, FFS is playing a crucial role not only to solve their technical problems but also for their organisational development.

2.5 Gender roles and household decision-making

Gender is the cultural construction of masculinity and femininity including social expectations about behaviour regarded as appropriate for the members of each sex (Giddens, 1997) or "the social construction of roles and relationships between women and men" (Ellis, 2000). According

to FAO (1997), it is defined as ‘the relations between men and women, both perceptual and material. Gender is not determined biologically, as a result of sexual characteristics of either women or men, but is constructed socially. It is a central organizing principle of societies, and often governs the processes of production and reproduction, consumption and distribution’ (FAO, 1997).

It is usual to refer the behavioural differences between males and females that are culturally based and socially learned (Appelbaum and Chambliss, 1995). Moser (1989) mentions gender in terms of women’s subordination to men in productive, reproductive and community management roles. Hence, gender roles are the ‘social definition’ of women and men. They vary among different societies and cultures, classes, ages and during different periods in history. Gender-specific roles and responsibilities are often conditioned by household structure, access to resources, specific impacts of the global economy, and other locally relevant factors such as ecological conditions (FAO, 1997). The reproductive role comprises biological reproduction and social reproduction (Hutter, 1998), whereas the productive role entails the contribution to the family income as ‘breadwinner’ and the community management role comprises the leadership and resource allocation at community level. She further highlights the issues of social reproduction i.e. the maintenance of the labour force by giving birth and also in the reproduction of economic capital by themselves.

Men are thought to dominate especially in the intra-household decision-making. Yet, this study shows that there are some differences in gender relations between men and women’s expected roles and responsibilities. Mostly, women seem to be subordinate to men in terms of control over public events, freedom of action, and ownership of resources and they can only take their chance when in the absence of men. But the old idea that women have a community managing role based on the provision of items of collective consumption, while men have a community leadership role, in which they organize at the formal political level, generally within the framework of national politics (Moser, 1989) has been proven misleading. For example, Ellis illustrates how “postmodern cities see women’s subjective construction of themselves as culturally specific, and they therefore deny any universality in the experience of gender inequality” (Ellis, 2000). The increasing dominance of women in agriculture and other productive as well as community roles is now a global trend. This study intends to throw lights on how men and women’s roles and positions in society change in the context of their involvement in IPM FFS.

2.6 Patriarchy system in Nepal

The dictionary meaning of patriarchy is a system of society or government in which the father or eldest male is head of the family and descent is reckoned through the male line. A system of society or government in which men hold the power and women are largely excluded from it (Oxford Dictionary, 2010).

The Nepalese social system is based on patriarchy with an inheritance system on male line. Son inherits the property of father and daughters are entitled to her parental property only before marriage. After marriage, she is entitled to the property of her husband’s family. This is an important factor that gives little property right to women and usually sub-ordination to the male counterpart. Women’s mobility is also restricted as they have to ask for permission with her father before marriage and to husband or her parent-in-law after marriage. This entails her little access to education and control over their own bodies with no or less reproductive rights and also poor reproductive health. Moreover, women have very less access to resources and credit (Martin, 2008).

2.7 Knowledge transfer

Knowledge transfer is the process of communicating knowledge that has been developed by an organisation to other parts of the organisation or to customers (Macmillan English Dictionary). The essential Knowledge transfer is a culture-based process by which adaptive organisational knowledge that lies in people's heads is exchanged with others. Knowledge transfer is literally the transfer of knowledge from one brain to another. Transfer does not mean that the knowledge has to be in exactly in the same manner. People currently measure successful transfer by some sort of test of memory or performance. A better way of thinking about transfer is to use the concept of growing rather than transfer. The use of the word transfer seems to imply that all the knowledge is passed from one person to another like passing a ball. The process requires a certain amount of prerequisite knowledge scaffolding within the transferee before it begins. Knowledge is transferred by means of interpersonal communication, documents, and data etc. (Toolbox.com, 2010).

Knowledge emerges out of a complex process involving social, situational, cultural and institutional factors. The process takes place on the basis of existing conceptual framework and procedures. It is affected by various social, contingencies, such as skills, orientation, experiences, interest, resources and pattern of social interaction characteristics of a particular group or may be in individual level (Long, 2001). However, successful knowledge transfers not always easy to achieve. Research has shown that a firm may greatly improve its innovative capacity by leveraging the skills of others through the transfer of knowledge (Pennings and Harianto, 1992) both within and across firms (Szulanski, 1996). However, research also finds evidence of both incomplete transfer and no transfer at all. The conditions under which transfer occurs have yet to be clearly established.

In the situation of FFS, knowledge can be taken at different levels such as farmers' traditional knowledge, so-called formal knowledge of the extensionists, and the knowledge of policy makers who are situated at higher strata in the government machineries. Other forms of knowledge can be the donor's knowledge that made the concept of FFS as an approach of agricultural extension system. In my research, however, the knowledge dynamics between male and female farmers in relation to how they acquire knowledge and how they apply in their every day practices and the knowledge of extension workers who provides training during the field school sessions. Transfer means how the knowledge goes from one actor to another.

2.8 Adoption of agricultural technologies

According to the world reference dictionary the literal meaning of adoption is acceptance that is the act of accepting with approval (World reference, 2010). Roggers (1983) developed a bell-shaped Gaussian curve. In this curve, four categories of adopters have been developed. Among them, 2.5 percent are innovators, 13.5 percent the early adopters, the next 34 percent are the early majority and the remaining 34 percent are the late majority. The last 16 percent of the adopters are the laggards. Early adopters are more integrated part of the local social system than the innovators. The innovators are generally composites; early adopters are localities. In the society, always the potential adopters look for early adopters for advice and information about innovation. The early adopter is considered by many as individual to check with before using a new idea. The early adopter acts as a role model and they are respected by his or her peers, and is symbol of discrete use of new idea. Early adopters continue to earn this esteem of colleagues and to maintain a central position in the communication structure of the system he or

she must make well judged innovation decisions. Thus the role of the early adopter is not only to adopt for own self he/she also decreased the doubt and convinced others intrinsically.

In IPM FFS, the adoption of technology is also basically by the gender perspective that means according to the gender roles of men and women the adoption of any new innovation of adopted. That means the social role and the gender role both plays vital role to adopt or to reject any new knowledge and skills. Thus the gender roles, access, control over and decision making are the prime parameters to adopt the technologies and the new knowledge and skills from the IPM/FFS. In IPM sectors the early adopters show their potentiality in the different farming sectors.

2.9 Conceptual framework

This study is based on the conceptual framework outlined in Figure 1. The framework follows the process in the farmer field school where men and women farmers participate in the group activities and involve in the trainings related to integrated pest management. The farmer field school has its own curriculum. For imparting or delivery of knowledge there are plant protection officers. The knowledge transfer occurs from plant protection officers to the farmers. The men and women farmers come to school and learn within ability and capacity they possess. In the learning process, some of them adopt the new knowledge early and some would learn late, this can be influenced by their everyday practice.

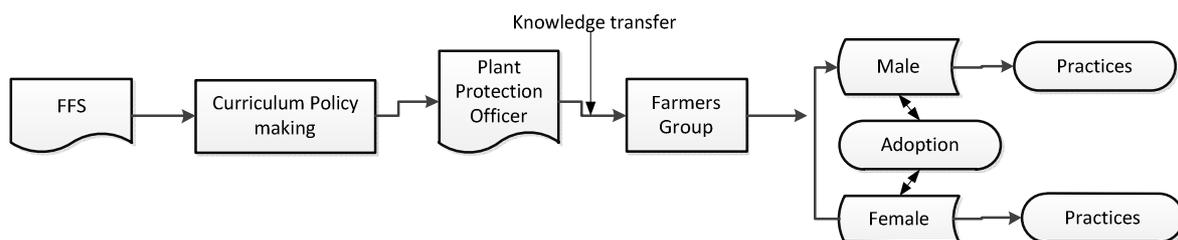


Figure 1: Conceptual framework

2.10 Operationalization

In this research, the concepts of gender roles and decision-making especially in relation to agricultural activities and the transfer of knowledge from one actor to another were of interest. The exchange of knowledge from extension worker to men and women farmers and vice versa has been taken into account. The concepts, their dimension, and indicators were used to assess men and women farmers participating in IPM FFS and the tools applied to measure such indicators as presented in Table 1.

Table 1: Operationalization of concepts

Concepts	Dimension	Indicators	Tools
Gender roles and decision-making	Socially defined roles and responsibilities of men and women	Roles of men and women in agricultural decision-making	Semi-structured interviews, Observation, Focus group discussion, Case study
Knowledge	Knowledge gained in IPM FFS training seasons	Knowledge on agricultural activities	Semi-structured interviews, Focus group discussion
Knowledge transfer	Changes in farmers' knowledge, Changes in farmers' performance, Sharing of knowledge between farmers and trainers	Application of new knowledge and practices in agriculture	Semi-structured interviews, Observation, Focus group discussion

CHAPTER THREE

METHODOLOGY

3.1 Introduction

Research methodology is a systematic way to solve the research problems. It describes the methods and process applied in the overall presentation of the study. This research is both scientific and descriptive in design.

It used case study as a research strategy. According to Yin (1984) case study is a methodology that provides an opportunity to gain a deep insight in complex social phenomena or processes that help researchers gain holistic and/or complete picture of situation or phenomenon. In order to gather the complete data and gain deeper understanding of the cases under the case study approach, different techniques of data collection such as participant observation, interview, focus group discussion and individual case study were used. The ethical considerations and limitations were also spelt out.

3.2 Literature review

Relevant literature pertinent to the subject of this research was reviewed in Chapter Two. The other sources of information gathered were publications and documents of the government, Ministry, Department and non-government organizations, Statistics of NGOs, leaflets, magazines and documents of farmers' groups. Likewise, the internet sources were an extra source of relevant materials.

3.3 Selection of the study area

Kavre district is one of the hilly districts of central development region of Nepal. It lies in between 27° 20' to 27° 45' north latitude and 85° 24' to 85 ° 49' east longitude (Figure 2). The total area of the district is about 1,396 sq km (1, 40,486 ha) and the average elevation ranges from 300 meters to 3018 meters above the sea level. It is bordered by Ramechhap and Dolkha district in the east, Kathmandu, Bhaktapur and Lalitpur district in the West, Sindhupalchok in the north and Sindhuli and Makawanpur districts in the south (DADO, 2009).

There are women saving groups and now FFS group in the VDC. The Brahmin caste is predominantly involved in these groups, more than other caste. Minus the old age population, almost all the people are literate, but in the Dalit and in the Janajati communities this is not applied.



Figure 2: Map of Nepal showing Kavre district
 Source: Digital Himalaya, 2010

This research was conducted in Kushadevi and Rayale VDC of Kavre District of Nepal (Figure 3). As the two VDCs are nearby the capital city, they are easily accessible. IPMFFS were conducted under District Agriculture Offices Kavre. The district Kavre was selected because of the suggestions of the Plant Protection Directorate. The IPM/FFS school trainees' participants were the best in the Kavre District. On the other hand, VDC Kushadevi and Rayale were selected because there were active men and women group and many of them were applying FFS knowledge and skills in their daily life. Another advantage was that Kavre was accessible. The researcher was familiar with different agricultural programmes launched by the farmers of that district, farmers and other service providers. Manpower and logistical support were received from relatives, friends and institutions located in this district in the course of carrying out the field study.

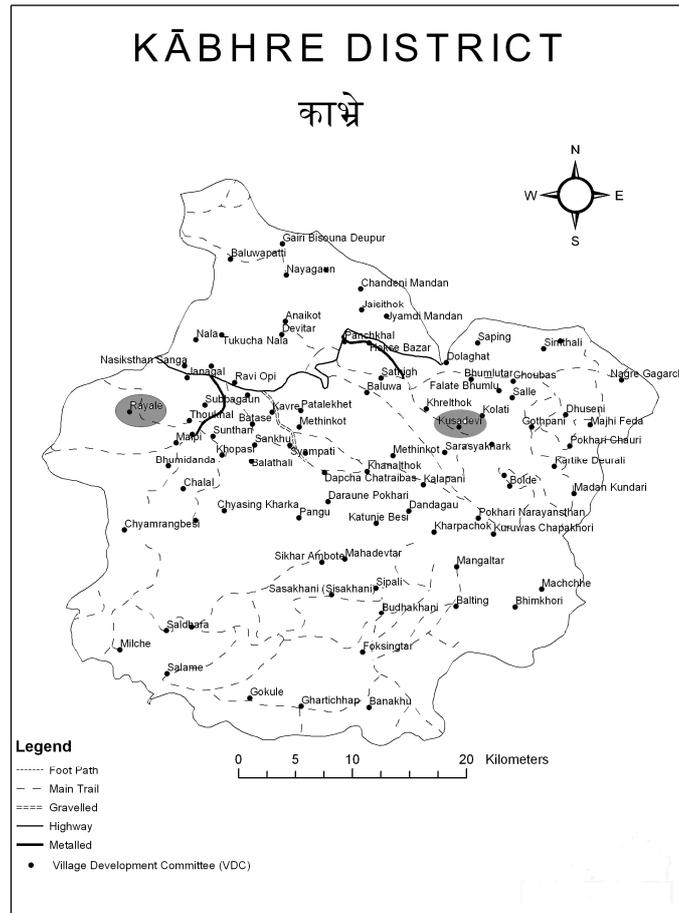


Figure 3: Map showing Kushadevi and Rayale VDCs
Source: Digital Himalaya, 2010

3.4 Research and sampling design

A total of forty farmers were selected purposively. Of the forty farmers, twenty were female and remaining twenty were male farmers. Independent case study of comprising three individuals; one female, one male farmer and five plant protection officers was done. A focussed group discussion with men and women farmers was done separately.

3.5 Data collection and analysis

This study is based on both primary and secondary information. The primary data were obtained from the FFS farmers, while the secondary data were obtained from formal and informal reports from DADO and other governmental and non-governmental organizations involved in farmers field school.

3.5.1 Primary data

The primary data were collected using semi-structured questionnaire through interview and field observation. Similarly, focus group discussion (FGD) was conducted within a group of male

farmers and women farmers separately which helped to triangulate the entire interview. In the same vein, a case study comprising of a woman farmer and one man farmer and one plant protection officer was conducted to find out the root causes of the problem. Focus group discussion and participant observation were also conducted through informal and semi-structured interviews in order to get in-depth information from different respondents. Focus group discussion was required to get different views of the members and leaders of IPM-FFS groups. The responses of respondents were regarded as the major sources of field information.

3.5.2 Secondary data

In addition to primary data, relevant secondary data were also used to meet the objectives of the study. These secondary data were collected from various sources as Central Bureau of Statistics (CBS), District Development Committee (DDC), Library, data from the District agriculture office and data from the local IPM FFS, Plant protection Directorate Nepal, Books, Journals, Articles, Research Reports and website, etc. The information collected from the available published secondary sources were analysed and used in designing the field study.

3.5.3 Data analysis

The data collected from different were tabulated, analysed, and explained. Qualitative data were analyzed manually, while quantitative data were analysed using Excel. Each part of information was classified, analysed using descriptive statistics and described accordingly.

CHAPTER FOUR

RESULTS

This chapter presents the results obtained from the field research. The findings from the focus group discussion and the individual cases of farmers and case study of the Plant Protection Officer is also presented.

4.1 Socioeconomic characteristics of respondents

Out of total 40 respondents, 50 percent were men and 50 percent were women farmers. The average age of respondents was 33.2 years, ranging from 17 to 60 years. Majority of the farmer respondents aged between 26 and 45 years. It indicates that the farmers who had taken the IPM FFS training were younger farmers.

In the research area, Brahmin and Newar were predominant caste groups. Out of 40 respondents, 80 percent were Brahmin castes, 10 percent Newar and the rest of the 10 percent were Dalit and Janajati. Likewise, most respondents were married farmers. In Nepal, after marriage the role of a person especially a woman in decision-making is often changed. In most cases, decision-making process is dominated by husbands or other male figures in the households.

In terms of education, three respondents were illiterate, 15 had education up to School Leaving Certificate (SLC), while two respondents were found to have above SLC level. In comparison to the situation in Kavre the education level in the study area was found to be higher than the district average. In Kavre district, the average literacy rate is 64 percent in which female were 52.8 percent and male 75.7 percent. At the national level, 53.7 percent are literate: 65.1 percent for male, while 42.5 percent for female literacy (MOEC, 2007). The data show that rate of women in education is lower than men. The rate of education influences in learning and application of knowledge and skills in practice.

Obviously, over 90 percent respondents reported agriculture as the only occupation, while only 10 percent had other off-farm sources of income as well. Among the households entirely involved in agriculture, the students in 10 percent households were partially involved in farming. The households that are partially involved in agriculture were found to be involved in off-farm activities such as carpentry, labour ex-country migration. Thus, it is understood that in any case, women had to be involved in both domestic and agricultural activities.

4.2 Involvement of men and women

Among the eight IPM FFS groups under study, seven groups were mixed groups and only one group in Rayale was entirely composed of women farmers. A total of 241 farmers were found to have participated in IPM FFS groups. Among them, 60 percent were men and 40 percent were women farmers. The participation of men and women farmers in two VDCs has a similar pattern (Table 2). In Kushadevi, out of 123 participants, 66.7 percent were men and 33.3 percent were the women farmers. Likewise, in Rayale, among 118 participants, almost 69 percent were men and 31 percent were women farmers.

The average number of participants per group was 21 for men and 12 for women farmers. Men participation does not differ much in two VDCs, while women participation is slightly lower in Kushadevi (10 women per group) as compared to 14 women per group in Rayale. Five groups were led by men, while three groups were led by women farmers. In VDC-wise comparison, two groups were led by women in Rayale, while one group was led by women in Kushadevi VDC. Hence, it is revealed that overall participation of women in FFS IPM groups is less than the men farmers.

Table 2: Composition of men and women farmers in IPM FFS

Description	Kushadevi		Rayale		Total		
	Men	Women	Men	Women	Men	Women	Total
No. of FFS participants per group	82 (66.7)	41 (33.3)	63 (68.9)	55 (31.1)	145 (60.2)	96 (39.8)	241 (100.0)
Average number of participants per group	20.5	10.3	21.0	13.8	20.7	12.0	30.1
Leadership by gender	3	1	2	2	5	3	8
No. of groups	4 (all mixed groups)		3 (all mixed groups) 1 (women group)		8 (7 mixed and 1 women group)		

Note: Figures in parentheses indicate percentages

Source: Field Survey 2010

The reasons behind the participation of men and women farmers in IPM FFS groups are presented in Figure 4. Reported reasons in joining IPM FFS groups were - free from household work, being head of the household, because of women groups, women also got permission from household, and because of females to facilitate the trainings. The results show that men are participating in the training because they are not busy in household activities (26 responses), they are usually the household head (13 responses), and as such they do not need permission from other household members (9 responses). However, none of the women responded such reasons. They rather reported that they participated in the IPM FFS because of women's group (10 responses), and some women also got permission from the household head (10 responses). Three women respondents said that they participated because of women's facilitators in the trainings. As mentioned in Figure 4, none of the women reported those responses. Because of multiple as well as some non responses, the responses do not match with the sample size of 40.

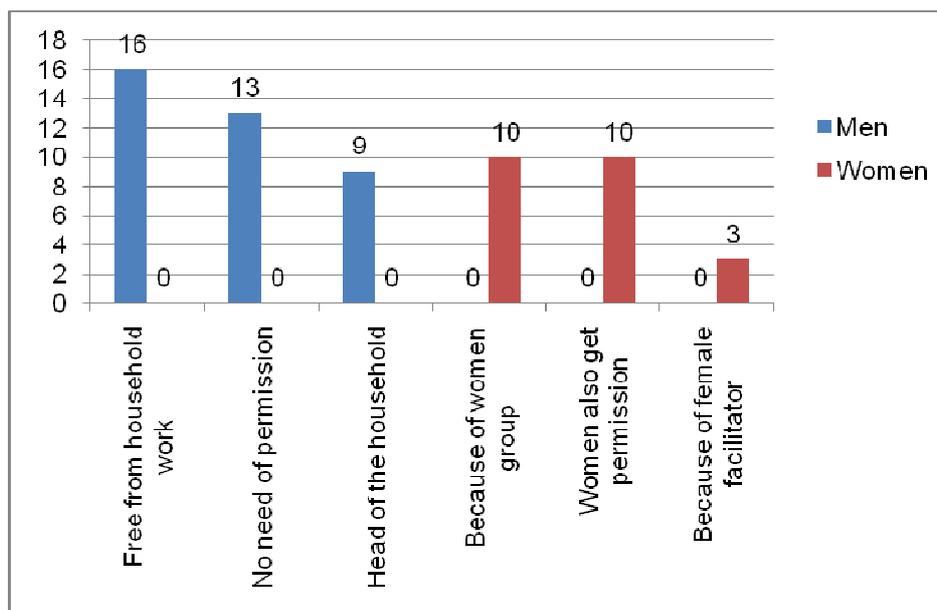


Figure 4: Reasons behind men and women participation in IPM FFS

Source: Field survey, 2010

During the fieldwork, I also inquired how they were selected in the IPM FFS training. A total of 21 responded that they were selected because there was no competition in the participation (Table 3). It means that those who showed the interest could follow the training course. Other 17 reported that they were selected for the training because of group membership. The difference between men and women is not so significant. For being a group member, there are almost same numbers of responses for both men and women, while for no competition 12 for men and 9 for women. Two women did not respond. However, there is no difference between these two reasons because usually non-members do not get opportunity to participate in the training. In fact, no competition means they do not have to go through a standard selection process in the training. Those who show the interest can follow the training.

Table 3: How they were selected for the training

Reasons	Responses from men	Responses from women	Total responses
No competition	12	9	21
Being a group member	8	9	17
Total	20	18	38

Source: Field survey, 2010

Participating in the group does not give a clear picture on whether they will learn some technical matters so I further inquired why they joined the training. A total of 56 responses were recorded as multiple responses were allowed during interviews. The respondents reported three driving forces for them in attending the IPM FFS training sessions: to fulfil family expectation, from their own interest and to gain technical skills on integrated pest management. Table 4 shows that 25 respondents followed the training to gain technical skills on IPM, while 21 due to their self interest and other 10 to fulfil their family expectations. Interestingly, the women's response on to gain skills and due to self interest is higher compared to men farmers, while more number of

men joined the training to fulfil their family expectations. Actually, it led me to inquire about the family expectation, which is presented in the next sub section.

Table 4: Reasons for joining the training

Reasons	Responses from men	Responses from women	Total responses
Gain skills	8	17	25
Self interest	8	13	21
Fulfil family expectation	9	1	10
Total	25	31	56

Source: Field survey, 2010

4.3 Expectation from the family members

In joining the IPM FFS group, it was found that there were some expectations from the family (Figure 5). Slightly more than half of the respondents reported their family have expected that they would bring more income to the family from the application of knowledge they gained in IPM FFS, while other 10 did not have expectation but just followed what their neighbours did, eight expected to gain skills, and only one had expectation to get input support. A total of 13 men and eight women reported that their family have expected that they would make money, while five each of men and women reported they were sent to the training as they saw their neighbours were also joining, seven men and one women reported that their family have expected to gain skills from the training, and only one women were sent to the training in the expectation of getting input support from the training organizers or the government.

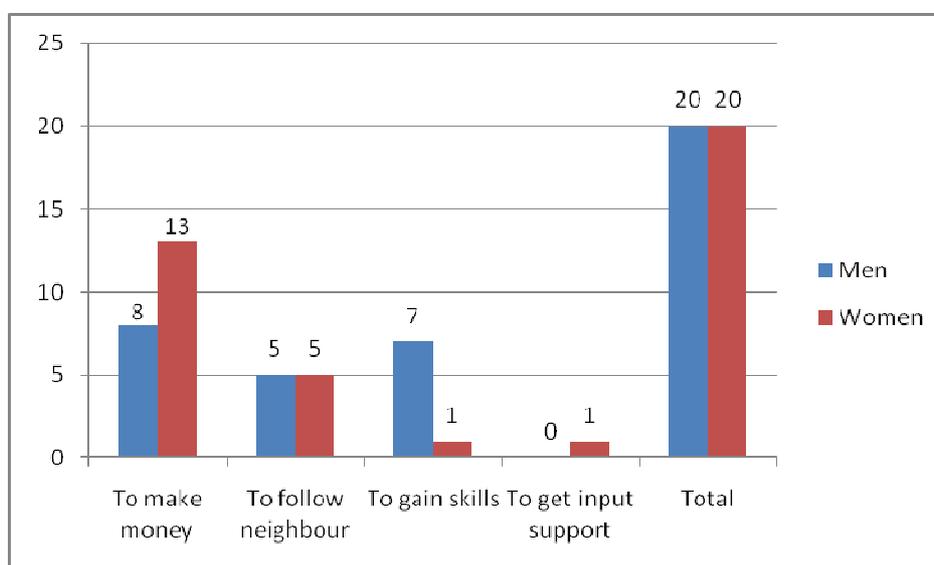


Figure 5: Expectation from the family members

Source: Field survey, 2010

4.5 Differences in learning between men and women

Table 5 shows the perception of men and women on the learning rate of the opposite sex. It is perceived that men learn faster than women. Of the 20 men respondents, 15 reported that men learn faster than women, while only five said women as the fast learners. Likewise, among 19 women who responded on this question, 16 said that men are fast learners, while three reported that there is no difference between men and women in learning, and none of them said women as fast learners.

Table 5: Who learns early between men and women?

Sex	Men are early learners	Women are early learners	No difference in learning	Total
Men	15 (75.0)	5 (25.0)	0 (0.0)	20 (51.3)
Women	16 (84.2)	0 (0.0)	3 (15.8)	19 (48.7)
Total	31 (79.5)	5 (12.8)	3 (7.7)	39 (100.0)

Note: Figures in parentheses indicate percentages

Source: Field survey, 2010

The reasons behind early learners are reported by both men and women respondents as men have higher level of education, they are free from household affairs, and they have free mobility so that they can exchange ideas with outside people and so on.

4.6 Decision-making in agricultural activities

It has been indicated that there are differences in the reasons for participating in IPM FFS, taking part in the training and the learning behaviour between men and women farmers. There must be some reasons in women's access to such things, so I inquired about the decision-making process in some selected agricultural activities at their household level. This helped me understand male and female differences in the above mentioned variables that govern their knowledge and skills in IPM FFS.

In order to take determine their involvement in the decision-making aspect, I selected some most common agricultural activities such as seed variety selection, seed purchase, irrigation, fertilizer application, insecticide and pesticide application, intercultural activities, storage, and selling of products. Table 6, which is split into A and B for men and women respondents respectively, presents 'who decides what' at the respondent's households.

Table 6A (from men responses) shows that men take decisions in majority of activities such as seed variety selection, seed purchase, irrigation, and insecticide/pesticide application and selling of the produce, while women take decision on intercultural operation and storage. In some activities like fertilizer application and irrigation, both men and women are involved in the decision-making.

Table 6: Decision-making in the agricultural activities**(Table 6A: Male respondents)**

Activities	Male	Female	Both	Total
Seed variety selection	19	0	0	19
Seed purchase	19	0	0	19
Irrigation	10	2	7	19
Fertilizer	8	1	10	19
Insecticide and pesticide	14	0	5	19
Intercultural operation	0	17	2	19
Storage	0	17	2	19
Selling of the product	17	0	2	19

Source: Field survey, 2010

Table 6B (from women responses), in principal does not show a different result. It is revealed that men take decisions in majority of activities such as seed variety selection, seed purchase and insecticide/pesticide application and selling of the produce, while women take decision on intercultural operation and storage. In some activities like fertilizer application and irrigation, both men and women are involved in the decision-making. Interestingly, women show more stakes when it comes to the sale of agricultural products.

(Table 6B: Female respondents)

Activities	Male	Female	Both	Total
Seed variety selection	18	1	1	20
Seed purchase	18	0	0	18
Irrigation	9	0	10	19
Fertilizer	4	1	14	19
Insecticide and pesticide	15	1	2	18
Intercultural operation	0	18	0	18
Storage	0	18	0	18
Selling of the product	10	1	7	18

Source: Field survey, 2010

In line with the quantitative information above, the Case 1 below demonstrates that men have a higher share in decision-making not only in agricultural activities but also in household activities. The case of Ram Sharan Sapkota illustrates that he is the head of the family; he had full power and responsibility in decision-making in his family. He has no problem to go outside activities like training, market etc. Thus, he is more empowered and can take any decisions independently. He can sell his farm product even without consulting his wife and keeps the earnings with him. Thus, he can take advantage of the patriarchal social system.

Case 1: Ram Sharan Sapkota, a man farmer



Ram Sharan Sapkota of the Patichour Kushadevi VDC aged 42 is one of the progressive farmers in the area. He is an early adopter and one of the innovative and helpful farmers of that community. He explained about him on his own words:

“My family comprises seven members, mother, wife and four children. I received the training on IPM/FFS three times on vegetable, potato and rice cultivation. I am applying the knowledge and skills I learned from IPM FFS trainings. I earn a good income from vegetables; for example, in the last season, I made about NRs. 50,000 from the sale of tomato and about NRs. 15,000 from the sale of green chillies¹ from 1 *ropani*² of land. I have no barrier to join the training. In fact, I have also encouraged my neighbours to take part in the training to gain new skills on IPM FFS, which would help them to save money by not buying of unnecessary pesticides and fertilizers. I was an exemplary leading farmer in my VDC. At first, when I convinced the neighbours’ wives their husbands considered me as a characterless man, but later on they were also convinced that joining IPM FFS was not a sin. Sometimes, I was threatened by the elderly persons not to poke my nose in other people’s business by disturbing others’ daughter-in-laws and daughter and wives”. (5 August 2010)

Source: Field study, 2010

Case 2 of a woman farmer, Swastika Sapkota shows another picture of the Nepalese society- the daughters-in-law. She is living with her in-laws, as her husband has gone abroad for work. According to her, she does not have a role in the decision-making on which crops to grow or the knowledge she wants to apply what she learnt in FFS. However, she has joined the sessions because of the pressure from her neighbours. Her father-in-law could not oppose at first but he always prevents her to apply the knowledge and skills. She has to ask for the permission of her father-in-law to do any kinds of activities, no matter whether they were related to agriculture or not. She had no control over any decision.

Case 2: Swastika Sapkota, a woman farmer



Swastika Sapkota, 17, of Kushadevi-2 VDC, recently married a year ago. Immediately after her marriage her husband went to Saudi Arabia for work to earn money. She studied up to 10th grade. She wanted to go to school and appear in the School Level Certificate (SLC) exam but her family situation did not allow her. On the question about her experience with FFS, she explained:

“My father-in-law is very strict and restricted me to sit for the examination. He is drunkard and sometimes also beats me, let alone joining the group. However, with the support from neighbours I managed to join the group”. (22 August 2010)

She was found quite frustrated. She feels like a servant in the house. She has no authority to speak what she wishes and keeps doing her daily household chores only. Later, with the support of her neighbour she joined in the IPM FFS training. After joining the training, there has been no

¹ Nepalese Rupees, The exchange rate of NRs. with Euro is about 95.

² 20 *ropani* = 1 hectare

peace for her due to her father-in-law's harassments. He always insists to abandon the training and just do the household chores. Due to her father-in-law, she is irregular in training through she is interested to learn the skills of IPM FFs. When she finished the training she could apply in the field. It was not only the in-law but even the husband was not supportive and dominated her. In fact, she wanted to apply the knowledge gained and be independent by using IPM techniques on vegetable farming. She was not able to fulfil her desire as yet.

Source: Field study, 2010

4.7 Knowledge transfer

The knowledge transfer has been described through a number of parameters such as the application of knowledge and skills they gained during training, learning behaviour among men and women farmers from the plant protection officers' perspective, sharing with farmers to design the trials, imparting knowledge and skills, understanding the subject matter, specific knowledge and practices gained from IPM FFS training and knowledge shared by plant protection officers.

4.7.1 Learning and application of knowledge and skills

It has been revealed that farmers have learnt a number of 'new' knowledge and skills from the trainings they followed in IPM FFS. Table 7 shows the responses on what they learnt from their involvement in IPM FFS. The total number response exceeds the sample size because the question was open and the respondents were given opportunities to give multiple answers. The results show that majority of respondents said they learnt to make bio pesticides using local materials (34.1%), while 30.7 percent learnt to improve quality of compost utilizing cattle urine and other local materials, 19.3 percent could be able to identify harmful and beneficial insects to the crops, some nine percent learnt about the balance use of fertilizers and other eight percent knew how to use chemical pesticides judiciously. Moreover, during informal discussion they also mentioned that they became able to identify label and name of insecticides and pesticides, symptoms of diseases and insect damage in the plants, and identification of different stages of plants that are vulnerable to diseases and pests. There is not much difference in the response between men and women farmers. Apart from balance use of fertilizers and judicial use of pesticides, other proportion of other responses is not so significant.

Table 7: Knowledge and skills gained in IPM FFS training

Knowledge and skills	Men	Women	Total
Making bio pesticides	14 (46.7)	16 (53.3)	30 (34.1)
Improvement of compost quality	13 (48.1)	14 (51.9)	27 (30.7)
Identification of harmful and beneficial insects	8 (47.1)	9 (52.9)	17 (19.3)
Balance use of fertilizers	3 (37.5)	5 (62.5)	8 (9.1)
Judicial use of pesticides	3 (42.9)	4 (57.1)	7 (8.0)
Total	41 (46.6)	47 (53.4)	88 (100.0)

Note: Figures in parentheses indicate percentages

Source: Field survey, 2010

In response to how they are benefiting on the new knowledge and skills they gained from IPM FFS, almost all said that IPM is cheaper option as it seeks for local materials. One of the respondents said, "In rural area, during cultivation the main problem is money to buy fertilizers and pesticides. Making pesticide and improvement the quality of compost also saves money to a great extent". Hence, it is revealed that they can also save money as they can use inputs on exact time of need or manage their resources at the time they have money.

The data show that 37.5 percent have fully applied the knowledge and skills they gained during IPM FFS training sessions, while 55 percent applied partially and 7.5 percent have not applied at all (Table 8). From the above description, it is revealed that men have higher tendency in learning the knowledge and skills from IPM FFS. However, regarding its application, women are found to have a higher tendency in the application of these knowledge and skills. Among the 15 respondents who have applied fully, 80 percent were women, while only three or 20 percent were men. However, among the 22 respondents applied partially, 68 percent were men and 32 percent were female. Of the three respondents who have not applied the knowledge and skills, two were men and one was women.

Table 8: Application of knowledge and skills from IPM FFS training

Application	Men	Women	Total
Fully applied	3 (20.0)	12 (80.0)	15 (37.5)
Partially applied	15 (68.2)	7 (31.8)	22 (55.0)
Not applied at all	2 (66.7)	1 (33.3)	3 (7.5)
Total	20 (50.0)	20 (50.0)	40 (100.0)

Note: Figures in parentheses indicate percentages

Source: Field survey, 2010

Table 9 presents the reasons behind the partial and non application of the knowledge and skills they gained during IPM FFS sessions. Among 17 partial and non-applying men farmers, five said that the IPM techniques are time consuming, while five reported it to be tedious and seven reported that they are either involved or interested to work outside agriculture. In case of women farmers, all the eight partial or non-applicants reported that they are not interested in agriculture anymore. In both cases, actually, the tendency of going out for work (especially to the foreign country) is increasing. The responses, hence, do not apply only for them but they are reflecting the overall situation in the village. Among the partial and non-applicant men farmers, three are working in Kathmandu, the nearby town.

Table 9: Reasons for not applying the knowledge and skills gained in IPM FFS training

Reasons for application	Men	Women	Total
Time consuming	5	0	5
Tedious	5	0	5
Involved/interested in outside jobs	7	8	15
Total	17	8	25

Source: Field survey, 2010

According to the views of the plant protection officers (1 woman and 4 men), men are the early learners compared to women as can be read in the following transcript:

“...Men are early learners, women take long time to learn. However, what women learn is better applied and last for a long time”. - Nabin Sharma, Plant Protection Officers, 12 August 2010

The view of the PPO was supported by three other officers whom I interviewed on the same opinion about the learning process of men and women. This finding also corresponds to the views obtained from the farmer respondents described in the above sections.

The view of Ms Sabitri Baral, Pesticide Registrar was, “Women still have a problem to go outside to take training by the men trainer especially in the Terai and some western parts of Nepal”. She is a woman officer as well as an IPM trainer. Likewise, the Case 3 of a Plant Protection Officer reveals that women’s participation in the past was low. They had to look for women farmers in the village to meet their quota but nowadays women themselves go the DADO to ask for training requirement. The women nowadays are more open, which is helping the officers to conduct trainings at ease. He also pointed out that now the selection process is more participatory than before.

Case 3: Plant Protection Officer

Rishi Ram Kuwar aged 50 and with 20 years of working experience in this sector is one of the dedicated staff of the Ministry of Agriculture and Cooperative. During his service period he has conducted a lot of training on the IPM/FFS. He said it was difficult to include women in the early days:

“When I first started the training on IPM/FFS it was difficult to call the women participants. I had hard time to follow the rule of women inclusion as their household situation was difficult for them to come to the training”. (28 August 2010)

He found it difficult to convince their families to take part in the training. But nowadays, women are aware and interested to come to the IPM/FFS training. Before 5 years, women were more illiterate so it was very difficult for the trainer to convince them on the technical matters and the household members for allowing them to attend the trainings. Lately, women make their own group and come to district office requesting the trainings for them at their VDC level. Women are now becoming empowered by cultivating vegetable in the commercial scale making them self-sufficient economically and technologically through IPM/FFS technology. The PP officer feels happy about their programs, which has contributed towards the progress of the women farmers in general.

Source: Field study, 2010

However, their application differs as per their situation. Women show a higher application rate from the knowledge they learnt. A clear distinction was made between the learning and application process of men and women. Men could learn at shorter time, while women took a long time to learn; however, when it came to application, women applied more.

All the plant protection officers reported that they design the trials in collaboration with the participant farmers in participatory way.

4.7.2 Attention of trainers' during training

All the five Plant Protection Officers reported that they do not have biases on the selection and during training between men and women. However, according to Sabitri Baral and Rish Ram Kunwar sometimes they prioritise women in order to motivate them for the training. Moreover, Rishi Ram Kunwar elucidates that it depends upon the attitudes of the facilitators. If the facilitator wants to increase women participation, he/she would emphasize women; if not, they just treat equally.

To further understand how they treat men and women farmers I inquired whether the plant protection officers consider the interests of their participants during the training sessions. All of them said that they consider the interests of both men and women farmers to make equal participation. On response to how they consider their interest, they replied that they would form smaller subgroups during the training sessions so that they could hear all of their participants.

4.8 Results from the focus group discussion

In order to triangulate the above information I also conducted a focus group discussion with two separate groups comprising 10 men and eight women farmers respectively. First, the men farmers were asked about their enrolment in the IPM FFS training. They said that the procedure is simple there is no competition among the group members; just being the member of a group would be eligibility to participate in the training. The group participants said that men do not have problems in deciding to join the groups or following any trainings related to IPM. Ram Sharan Sapkota said that they have no problem regarding the enrolment in IPM FFS training.

In relation to what they learnt from IPM FFS, one of the members of that group Hari Sapkota said, "I did not believe the new practices of the IPM FFS would work, but later when I started the training, now I have applied the knowledge and skills in my everyday life". One of the members of that group said that the technical issues of the IPM FFS is somewhat difficult for the less educated farmers so it should be in simpler and in the local languages so that it will be understandable for them. The group also said that when they attended the training they become more helpful in the household works for their wives. One of the participants of that discussion said that before the training he only has 5 *ropanis* of land. He cultivates only rice and maize and little vegetables but after training he has applied the knowledge what he learnt from the training; now he can be able to pay all the household expenses from the earning of that small piece of land. They also referred that they are applying the learning from IPM FFS training to make bio pesticides, improvement of compost quality, proper and timely spraying of pesticide and insecticide, and so on.

However, getting into IPM FFS groups, women have to face some difficulties as the woman IPM facilitator Laxmi Timilsina said that they have given permission to go to the training but they have to arrange all the household work to go there in advance. According to their view they have little support in doing the household chores. Swastika Sapkota, one of the woman participants said: "At first, my father-in-law did not give me permission; he was objecting of my entry but I did not listen to him and joined the group. It is very difficult for me to attend the training regularly." She further said that she is very curious to the training but her family does not support and she is unable to practice in the field. She seems to have frustrated from what she learnt but could not get opportunity to apply. The women said that they have started to make biopesticide to their home they know about the label of pesticide and insecticide.

In general, the discussion with men and women farmers showed that they found aware of integrated pest management. The most significant change observed in the field that FFS raised women's capability to speak in public. They could easily interact with the researcher of this group discussion. Ms. Ramadevi Sapkota said, "In the beginning, the facilitators had to force me to tell something and I was so nervous to speak but gradually after some classes I gained this competence that now I can even talk to an officer like you and talk about FFS for long even in public". Also, Ms. Ram Kumari Sapkota said: "I have to accomplish all the domestic activities including cooking, cleaning, and child care in the morning and evening and during day. I have to work on the farm doing weeding and other intercultural activities".

Moreover, they gained knowledge on selecting pesticides and knew the differences between chemical and bio-pesticides. Moreover, they were found to be well informed about their problems related to agriculture. For example, one of the respondents said that apart from the training they take at FFS they would also need the input support from the government, otherwise the knowledge they gained would be forgotten if not practiced for long time. It did not only show their increasing awareness about agriculture and improved capacity to identify the problems but also indicated the problems they were facing in relation to agriculture.

I also discussed with them on how FFS intervention would play an important role in their daily life. One of the respondents of the IPM FFS group Bishu Bahadur Shrestha said, "The sustainability of FFS depends on the long term use of the technology and skill we learnt in the FFS sessions so that we can follow the practices in the future days; however, there is no mechanism or any government organization at local level to contact with and the application would also decline after sometime. If there would be a unit at VDC level we would be more benefited from FFS". Hence, according to FGD participants if there is a permanent IPM FFS unit at VDC level it would be more beneficial to the farmers of that particular locality.

CHAPTER FIVE

ANALYSIS AND DISCUSSION

This chapter presents the analysis and discussions based on the results presented in Chapter Four.

5.1 Introduction

The findings showed that majority of FFS farmers were younger farmers with the age ranging from 17 to 60. Similarly, majority of them were married as households formed after marriages. The caste was dominated by the Brahmin followed by Newars and the nominal presence of the Dalit, Janajati. It is apparent that in the hills of Nepal there are patches of settlements usually dominated by a single caste especially in the area where there is less in-migration with lesser chances of a mixed settlement. In many hilly areas of Nepal, it is still possible to find such caste or ethnic dominated settlement such as Majhi settlement or Tamang settlement. With this logic, there was more Brahmin settlement found in this study area.

In a country like Nepal, caste system is the one of the factor which affects on the development processes. Even though Nepal's law does not allow any citizen to discriminate different ethnic communities and castes, the disparity among the communities in opportunity distribution still exists in society. It was very important to cover this all the communities for a thorough understanding and local developments. Brahmins determines the upper caste than Newar. This was the reason Brahmins being superior and dominates the other castes. Brahmins were more economically advance than other castes. They considered superior to other castes. Due to such facts, Brahmins dominated FFS farmer participants.

The education is the crucial factor to enlighten people and trigger development process. Few respondents were illiterate in my research area. The rate of education influences the learning and adopting the knowledge and skills and its utilization in day-to-day life. As compared to the national literacy rate, literacy level farmers in this research site were better. High literacy rate in the research area was due to the fact that there was higher caste Brahmins who often are educated. They maintain a trend of literacy in their families since generations, which is a tradition for them. The other reason could be the respondents cited was the Brahmins caste often performing religious ceremonies, rites and astrology since ages. Also, the modern education has greater influence on Brahmin families since their grandparents and parents were educated who understand the value of education today. This was also reflected in the research area where we higher literacy rate as majority of respondents were from upper caste Brahmin caste.

The overall participation of women was found to be less than the men farmers. Likewise, the average number of women farmers in the groups was also found less. This fact partly attributes to above discussion, while the discussion in the next subsections would also contribute to it. Participating to the groups and training on IPM FFS is not subject to a standard selection procedure because in most cases the group participants get opportunity to follow the training. It is rather influenced by other factors that are discussed in the next sections. Majority of respondents have joined IPM FFS groups or training thereof to gain skills, in their own interest, while some have followed to fulfil their family expectations. It is important to note that the attitude

of women to join the group was to gain skills and to fulfil their interest compared to men. However, their interest much subject to their access to resources and role in household and agricultural decision-making.

5.2 Decision-making

In the decision-making for specific agricultural activities, the result shows that in the variety selection, seed purchase, irrigation management, application and selection of insecticides and pesticides, and sale of agricultural products there is dominance of men farmers, whereas in case of intercultural operations and storage women have more decision making power. For fertilizer application and irrigation management to some extent, however, both men and women decide about equally. As Nepalese society is based on patriarchal system, men always have bigger stake in the decision-making not only at the household level but also at the community level. Women are usually considered as the subordinates of men in each and every aspects of life. This has also been confirmed by other studies. Men and women are both involved in decision-making in agriculture, whereby women decide what to do pre-planting, weeding and during harvesting and beyond.

At household level men dominate decision-making and also at community level men take policy decisions due to patriarchal social system. Gartaula et al., (2010) report that women have little voice in the decision-making for both household as well as agricultural activities, which is slightly higher in case of women-headed households, compared to the women living with in-laws. It reveals the overall subordinate position of women in Nepalese society, which is also revealed in the case of FFS in my study area. However, the indication of empowerment is also revealed from focus group discussion, as mentioned by Rama Devi Shrestha, one of the FGD participant described in the above section, which in fact is also noted by other studies. Van de Fliert et al. (2007) illustrate that the training provides some benefits to women such as a more prominent voice in household or family decision-making, new friendships, improved relations with local officials, and enlarged social networks, which helps empower farmers through enhanced social capital that subsequently became a significant part of the farmers' motives.

The decision-making process also reflects on the roles of men and women in different agricultural activities. Men perform mainly productive roles in agriculture that is masculine in nature. While women took double roles of productive as well as reproductive roles. In fact, women perform tedious works ranging for the field related works to routine household chores. Despite the greater responsibilities of women, major decisions were made by men. It happened mainly due to the fact that patriarchy system of society is still common in Nepal, which expects different roles for men and women to perform domestic as well agricultural activities. According to the study conducted by Boserup (1970) in Sub-Saharan Africa, women have to do most of the agricultural works as well as household chores in case of food crops. However, men are more involved in the cash crops.

In Nepal, at the household level, women are not only engaged in the production of vegetables for home consumption but also at the commercial production level in terms of their labour participation. Moreover, they are busy in the inner household chores and nourishing of the children and other family members, which exacerbate the situation of their overburdened labour. A study conducted by Gartaula et al. (2010) in a situation of male out-migration, women's involved in both household as well as agricultural activities is relatively higher. In that study, it was also found that in the case of women-headed households women's role in agricultural activities is much more than the women staying with their parents-in-law. Rich-Zendel (2006) reports gender inequality in Nepal that comes from a long history of the subjugation of women.

Many aspects of Nepalese society; cultural/religious diversity, political instability and institutional corruption, have all reinforced gender discrimination for generations. Although constitutional and legal reforms are being made, traditional values and inaccessibility of education for girls have prevented these reforms from being effective. Moreover, the current wave of male out-migration forces women to live with their parent-in-law makes further subjugation of daughters-in-law.

Nepalese society is governed by patriarchal system of norms and values. This yields a differential access to and control over especially the land resources, which also governs the decision-making at household level. "In Nepal, inheritance of land property passes through the male line. The existing social system of equal inheritance of land amongst all sons has created fragmentation and increased sub-division of household plots to the extent that land sizes are progressively decreased and become insufficient to provide subsistence" (Regmi, 1994). Hence, the property rights belong to the men. Men's access to resources (physical, natural, financial) is higher compared to women's one. Moreover, more than 92 percent of land holdings are owned by men and about 87 percent of formal credit is granted against the strong collateral like land (UNDP, 2004). This situation not only limits women's access to credit especially from the formal sources such as commercial banks and other financial institutions but also make decisions on major household and agricultural decisions. Hence, men are always in the front position in the decision-making process and get access to the service providers.

Nevertheless, the Government of Nepal wants to create an environment for equal participation of men and women in agricultural decision-making process and give equal access to agricultural inputs such as credit, extension service, training programmes.

5.3 Learning and application

As mentioned in the result section above, farmers learnt wide range of knowledge and skills from their involvement in IPM FFS such as making biopesticides with the use of local materials, improving quality of compost utilizing cattle urine and other local materials, to identify harmful and beneficial insects to the crops, balance use of fertilizers, judicious use of chemical pesticides to identify label and name of insecticides and pesticides, symptoms of diseases and insect damage in the plants, and identification of different stages of plants that are vulnerable to diseases and pests, and so on. This has helped them improve their agricultural techniques and ultimately helped improve their livelihood. For example, they used to just spray pesticides by seeing others spraying or if they see some insects in the farm. However, after they followed the IPM FFS training they became able to identify beneficial and harmful insects and decide whether they really need to spray. With the use of local materials to make compost and biopesticides their cost of production has been reduced and hence increased the income from agriculture.

There is a high gap in the learning and application of knowledge gained from IPM FFS between men and women farmers. Men learn faster, while women apply more of what they learnt in the school especially in the most important activities such as variety selection, seed purchase, and fertilizer application. The basic reason behind it could be women's much focus on household affairs and food management. As they confine to household affairs, they tend to apply more. On contrary, men have outside access and they would prefer to do something else rather than doing agriculture. For example, since men have access to outside activities, they can easily go to Kathmandu to work on off-farm sectors.

Traditionally, men and women have different learning styles, where men can learn faster than women (Philbin et al., 1995). On contrary, the application of knowledge and skills in women is higher than men. Women were found to learn late but they apply more in their daily life. Women

are mostly involved in household activities; hence, even if they are in the training session they tend to think of their household activities whether their children was crying at home or thinking of what to cook in the evening that actually distracts their attention in the training and retards learning. On contrary, coming to the application, they are actually the practitioners as they have to work on the farm even more than their male counterparts so tend to apply more. This, however, contradicts with another study carried out in the same district by Atreya (2007). He reports that men farmers apply the knowledge of IPM more, compared to women farmers. He looked at only pesticide application; however, this study included almost all of the agricultural activities. In case of spraying and making and application of bio-pesticides this study corresponds to the above study of Atreya (2007).

5.4 Knowledge transfer

The result showed that the majority of farmers realized that they learn new knowledge and skills in the IPM FFS. Less percentage said that IPM is old practice with new version. Many farmers learnt to make bio-pesticides, improvement of compost quality, make manure from urine, identification of harmful and beneficial insects, balance use of fertilizers, and judicious use of pesticides, and so on. The result also shows that majority of early learners were men farmers. Women seem to be the late learners. It could be because of women's lower educational status. Even if they would be educated it would be hard for them to understand the technical matters. Mostly, the young and educated people can learn in a short time but after learning they would not apply as they would be busy in the off-farm jobs like services or they would more like to go to the foreign country for work. In many instances, such cases are men than women. I found that the late learner who has mostly the low educational status they follow or applied the knowledge and skills of IPM FFS in the daily life.

While imparting knowledge and skills in the IPM FFS, the trainers give more priority to both the men and women farmers. It is important because knowledge emerges out of a complex process involving social, situational, cultural and institutional factors. The process takes place on the basis of existing conceptual framework and procedures. It is affected by various social, contingencies, such as skills, orientation, experiences, interest, resources and pattern of social interaction characteristics of a particular group or may be in individual level (Long, 2001). On the one hand, the trainer may also be from the same social community. He has the same perception and beliefs same as the other people, which some contradicts with the learning outcome of the training participants. On the other hand, most of the trainers are not updated and the curriculum is not only old but includes only the technical matters, which does not consider the gendered specific learning outcomes.

The result shows that the trainers not only collaborate with farmers to design the trials but also they consider the interests of both men and women farmers during the training sessions. It shows an interaction between 'formal' knowledge of the extensionists and the indigenous or local knowledge of the farmers. Moreover, the extensionists do not only represent government or donor knowledge but also have their own discretion to apply knowledge in practice. Hence, it can be anticipated that emergence of knowledge from this interaction would help to improve FFS practice in the future.

The Government of Nepal has a policy to involve at least 33 percent women for both trainers as well as the participants but in the actual field situation is quite different because women usually want to stay at the central offices and do not want to work at field level.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATION

Based on the results described in chapter four and discussion thereof in chapter five, this chapter provides some conclusive remarks on the learning and application of knowledge and skills in IPM FFS by men and women farmer. This will help to know the actual situation of learning practices and factors influencing the learning processes; and the influence of Plant Protection Officer to the farmers during the IPM FFS training. This chapter also includes some recommendations.

6.1 Conclusions

As the general socioeconomic situation of the research area, the majority of farmers are from the Brahmin community lesser from other caste groups such as Chhetris, Janajatis and Dalits. The literacy rate was found to be low in Dalit, Janajati and women farmers as compared to upper caste and men farmers. Most of the farmers who took the IPM FFS training are married and the farmers involved in the trainings were mostly younger. The main occupation in the research area is agriculture, while few people have a service and other off-farm activities or working in the Arabian countries. Apparently, most of the women are engaged only in agriculture.

In case of involvement of men and women farmers in FFS training, the men farmers' proportion is high. The involvement of men is higher than women farmers because men are usually the heads of the households and they need not to take permission to join the training. Similarly, they are also free from the household chores. In case of women, they have dual responsibility of domestic works as well as farming. The women farmers participate if there is women group and women facilitator and got permission from the household. To participate in the IPM FFS training there is no much competition. If men or women farmers are members of a group can easily participate in the training because there is no standard selection procedure. Thus, those who keep interest can easily take part in the training.

The driving forces for men and women farmers to attend the IPM FFS training sessions: to fulfil family expectation, from their own interest and to gain technical skills on integrated pest management. The farmers go to the training to gain skills, to fulfil family expectations, with their own interest. Interestingly, the women's response on to gain skills and due to self interest is higher compared to men farmers, while more number of men joined the training to fulfil their family expectation. The family expectation on sending their members to the training was to earn money, while others follow the neighbour style and few sent their members to gain skills.

It was found that in majority of agricultural activities such as seed variety selection, seed purchase, irrigation management and application, selection of pesticides men take the decisions, and selling agricultural products, except for some activities such as intercultural operations and storage where women have more decision-making power. For fertilizer application and irrigation management to some extent, however, both men and women decide about equally. The responses from men and women do not differ much.

This study found that men can learn faster than women, while women have higher application behaviour. In other words, women learn slowly but they apply in the long run but men farmers

learn fast but do not bother to apply in practice. However, the application of knowledge and skills by women farmers does not only the matter of their individual behaviour but also their social circumstances. As we have seen from above discussion that women have little stake on decision-making, it is difficult to realize full application of what they have learnt in the training. With their involvement in IPM FFS the farmers have learnt some knowledge and skills, which they consider as new to their practice. They have learnt to make bio-pesticides, improvement of compost quality, make manure from urine, identification of harmful and beneficial insects, balance use of fertilizers, and judicious use of pesticides, and so on. The plant protection officers not only found to treat men and women equally in order to accommodate their interests in the training but they also pay equal attention to them.

6.2 Recommendations

Based on the above conclusion, I made the following recommendations:

- It is suggested to provide the timely refreshers new technology related training to the IPM trainers so that he/she could update knowledge in the field of IPM and FFS in order to better impart knowledge and skills in IPM FFS training. This has been indicated by the farmers while conducting focus group discussion.
- Involvement of women trainer in IPM FFS will make the training more effective as the women trainee will feel more comfortable with women trainer during teaching learning process.
- IPM/FFS training is a combined approach of technical and social aspects for farming community. It is highly recommended to include the gender sensitization part in the curriculum. Gender sensitization part in the training will help to reduce gender biasness and encourage women participation.
- Participation from different ethnic groups, regions, religion and disadvantaged women groups should be encouraged. The household survey showed dominance of higher caste in FFS training.
- Effective mechanism of monitoring and follow up program should be developed by the service providers to update the farmers' knowledge on IPM/FFS.

REFERENCES

- Applebaum, R. and Chambliss, W., 1995. *Sociology*. HarperCollins, New York.
- Atreya, K., 2007. Pesticide Use Knowledge and Practices: A Gender Differences in Nepal. *Environmental Research*, 104: 305–311.
- Boserup, E., 1970. *Women's Role in Economic Development*. London.
- Braun, A. & Duveskog, D., 2008. *The Farmer Field School Approach: History, Global Assessment and Success Stories*. Paper Commissioned by The International Fund for Agricultural Development, October 2008, FAO Community IPM Programme, Jakarta, Indonesia.
- Braun, A., Jiggins, J., Rollings, N., Berg, H and Snijders, H., 2006. *A Global Survey and Review of Farmer Field School Experiences*. Wageningen, the Netherlands.
- Business Dictionary, 2010. Available at: <http://www.businessdictionary.com/definition/social-value.html> (Accessed 2 July 2010).
- CBS, 2003. *Statistical Year Book*. Central Bureau of Statistics, Kathmandu, Nepal.
- CIP-UPWARD, 2003. *Farmer Field School: From IPM to Platform of Learning and Empowerment*. International Potato Centre –Users' Perspectives with Agricultural Research and Development, Los Banos, Philippines. Rockefeller foundation.
- DADO, 2009. *Annual Progress Report*. District Agriculture Development Office, Kavre, Nepal.
- Devkota, D., 2006. Access to and Control over Household Resources: A Consistency Check Using Gender Analysis and Household Survey Data". *Nepal Agric. Res. J.*, Vol. 7, www.narc.org.np/publicaton/pdf/journal/Vol7/access_to_and_control_over_hHousehold_re_sources_a_consisten.pdf (Accessed 26 September 2008).
- Digital Himalaya, 2010. Kavre District. Available at: www.digitalhimalaya.com (Accessed 9 September 2010).
- Dilts, R., 2001. From Farmer Field Schools to Community IPM: Scaling up the IPM movement. *LEISA magazine*, 17/3.
- DOA, 2007. *The impact study on farmer's group approach adopted in agricultural extension system of Nepal*. Department of Agriculture. Report submitted by Agri. Business and Trade Promotion Multi-Purpose Co-operative Ltd (ABTRACO), Kathmandu, Nepal
- DOA, 2008. *Participation of Farmers in IPM in Nepal*. Department of Agriculture, Hariharbhawan, Lalitpur.
- Ellis, F., 2000. *Rural Livelihoods and Diversity in Developing Countries*. Oxford University Press, New York.
- FAO, 1997. *FAO Corporate Document Repository - What is Gender?* Available online: <http://www.fao.org/docrep/007/y5608e/y5608e01.htm#TopOfPage> (Accessed 5 September 2010).
- FAO, 2000. *Gender and IPM in Nepal*. Available at: <http://www.communityipm.org/docs/Gender-and-IPM-in-Nepal.pdf> (Accessed 26 September, 2010).

- FAO, 2000. Gender and IPM in Nepal: The FAO program for community IPM in Asia. Available at: <http://www.communityipm.org/docs/Gender-and-IPM-in-Nepal.pdf> (Accessed 24 July 2008).
- Gartaula, H.N., Niehof, A. and Visser, L., 2010. Feminisation of Agriculture as an Effect of Male Out-migration: Unexpected Outcomes from Jhapa District, Eastern Nepal. *International Journal of Interdisciplinary Social Sciences*, 5(2): 565-578.
- Giddens, A., 1997. *Sociology*. Polity Press, Cambridge, UK.
- Hagmann, J., Chuma, E., Murwira, K., and Connolly, M., 1999. Putting Process into Practice: Operationalizing Participatory Extension. Agricultural Research & Extension Network, Network Paper No. 94. International Institute of Environment and Development (IIED), UK.
- Hutter, I., 1998. Research Program on Reproductive Health HERA (Healthy Reproduction: Research for Action), CDS Research Strategy Paper No. 3. Centre for Development Studies, University of Groningen, Netherlands.
- Long, N., 2001. *Development Sociology: Actor Perspective*. Routledge, London, UK.
- MacMillan Dictionary, 2010. Available at: <http://www.macmillandictionary.com/>. (Accessed 20 July, 2010).
- Madukwe, M.C., 2006. Delivery of Agricultural Extension Services to Farmers in Developing Countries: Issues for Consideration. Available at: <http://knowledge.cta.int/en/content/view/-full/3009> (Accessed 22 July 2010).
- Martin, J., 2008. Women and Patriarchy in Nepal: The Legal System and Patriarchal Structure Continues to Discriminate. Available at: http://activism.suite101.com/article.cfm/patriarchy_in_nepal (Accessed 3 September 2010).
- MOAC, 2007a. Comparative Study of IPM in South Asia. Ministry of Agriculture and Cooperatives, Kathmandu, Nepal.
- MOAC, 2007b. Farming Systems of Nepal. Ministry of Agriculture and Cooperatives, Kathmandu, Nepal.
- MOAC, 2007c. Assessment of Working Hours of Men and Women in Agricultural Works. Ministry of Agriculture and Cooperatives, Kathmandu, Nepal.
- MOEC, 2007. Educational Status of People of Nepal. Ministry of Education and Culture. Kathmandu, Nepal.
- Moser, C., 1989. Gender Planning in the Third World: Meeting Practical and Strategic Gender Needs, *World Development*. 17(2): 1799-1828.
- NIPM, 2005. National Integrated Pest Management Programme, Country Report. Plant Protection Directorate, Kathmandu, Nepal.
- Ounjian, M. L., and Bryan, C. E., 1987. A Study of the Factors Which Affect Technology Transfer in a Multi-location Multi-business Unit Corporation. *IEEE Transactions on Engineering Management*, 34: 194–201.
- Oxford Dictionary, 2010. Available at: <http://www.oxforddictionaries.com/definition/patriarchy?-view=uk> (Accessed 3 August 2010).
- Pennings, J. H., and Harianto, F., 1992. Technology Networking and Innovation Implementation. *Organization Science*. 3: 356–382.

- Philbin, M., Meier, E., Huffman, S., and Boverie, P., 1995. A survey of gender and learning styles. *Sex Roles*. 32(7/8): 485-495
- Pontius, J.C., Dilts, R. and Bartlett A., 2002. Empowerment of Farmers. In: From farmer field school to community IPM: Ten years of IPM training in Asia. RAP/2002/15, FAO Regional Office for Asia and the Pacific, Bangkok, Available at: <http://www.fao.org/docrep/006> (Accessed 29 June 2010)
- PPD, 2008. Introduction, Achievement and Proceeding of Plant Protection Program, Plant Protection Directorate, Kathmandu, Nepal.
- PPD, 2009. Introduction, Achievement and Proceeding of Plant Protection Program, Plant Protection Directorate, Kathmandu, Nepal.
- Regmi, R. R., 1994. Deforestation and Rural Society in the Nepalese Terai. *Occasional Papers in Sociology and Anthropology*. 4: 72-89.
- Rich-Zendel, S., 2006. Behind the bars of justice: gender inequality in the Nepalese legal and penal systems. Available at: <http://www.ucalgary.ca/md/PARHAD/documents/2006-SarahRich-Zendel.pdf> (Accessed 6 October 2010)
- Rogers, E. M., 1986. Early Adopters of Technological Innovations. Available at: <http://www.zonalatina.com/Zldata99.htm> (Accessed 5 September 2010)
- Simpson, B., 2002. Farmer Field Schools and the Future of Agricultural Extension in Africa. Proceedings of the 18th Annual Conference, Durban, South Africa.
- SNIP, 2005. Country Report Prepared for 15 days Observation Tour to Vietnam and Bangladesh during 15-30 September 2005, Support to National IPM Program Nepal.
- Szulanski, G., 1996. Exploring Internal Stickiness: Impediments to the Transfer of Best Practice within the Firm. *Strategic Management Journal*, 17: 27-43.
- Toolbox.com, 2010. Available at: http://it.toolbox.com/wiki/index.php/Knowledge_Transfer (Accessed 9 July 2010).
- UNDP, 2004. Nepal Human Development Report: Empowerment and Poverty Reduction Report. United Nations Development Programme, Kathmandu, Nepal.
- Upadhyay, K.D., 1993. Forestry and Farming System in the Mid-hills of Nepal, *Occasional Papers in Sociology and Anthropology*. 3: 1-14.
- Van der Fliert, E., Dung, N.T., Henriksen, O. And Dalsgaard, J.P.T. D., 2007. From collectives to collective decision-making and action: farmer field schools in Vietnam. *The Journal of Agricultural Education and Extension*, 13(3): 245-256.
- Westendorp, A. and Biggs, S., 2002. Strengthening Social Capital in Agricultural and Natural Resources Innovation Systems: Community IPM Farmer Field Schools (FFSs) in Nepal. Available at: <http://www.infobridge.org/asp/documents/3233.pdf> (Accessed 3 June 2010).
- Worldreference, 2010. Available at: <http://www.wordreference.com/definition/adoption> (Accessed 4 September 2010).
- Yin, R.K., 1984. Case Study Research: Design and Method. Sage Publication: New York, London.

ANNEXES

Annex A: Questionnaire for IPM FFS farmers

1. How do you know about the IPM (FFS)?
2. When do you take the training of IPM (FFS) in the first time?
3. What is the composition of male and female in training? If more men why? If more women why?
4. Who are the trainer men or women?
5. Which trainer you preferred men or women and why?
6. How do you select to take the training of IPM (FFS)?
7. What is your family's expectation on FFs training?
8. Why do they send you in training?
9. What are the points that you remember till today in FFS training? Ask in brief to find out all the points.
10. Who is the early and fast learner in your group and why?
11. Why that person is early learner than you? What are the reasons behind this?
12. Which aspects of the IPM (FFS) do you feel useful and which aspect you feel not so useful? Why?

Questions related to application;

1. What is the learning's that you are applying in daily life? And why? If you are partially applying why? If you dropped out why?
Activities: Who decides: Why?
 - Seed selection
 - Seed purchase
 - Irrigation
 - Fertilizer
 - Insecticide and pesticide
 - Intercultural operation
 - Storage
 - Selling of products
2. Why does your neighbour not apply the FFS practices?
3. Do early learner apply the learning of FFS? If apply why and if not why?

Annex B: Questions for the Plant Protection Officers

1. Name of staff:

Sex:

Age:

Work Experience:

1) Do you carry a preliminary assessment? Yes..... No.....

If yes, what information is available on training needs?

.....
.....

2) Who is involved in the process?

a) Trainer oneself b) only female farmer c) only male farmer d) Participatory

3) List the roles of each of those involved in the process? Do you think that each has quite right role?

.....
.....

4) What types of trainings are delivered in the FFS? Are those trainings really useful for the men and women farmers in their daily life? And how?

.....
.....

5) What is the attendance of men and women in these trainings?

a) More men b) More women c) Equal

6) Why the attendance rate of women is less than men?

a) Busy in house hold work b) No responsiveness c) careless in learning

7) Who decides on the training topics?

a) Trainer b) Male farmer c) Female farmer d) All

8) Do you give equal opportunity to the male and female farmers in deciding topics? If yes how and why? If no why?

9) Who decides on trials?

a) Trainer b) Male farmer c) Female farmer d) All

10) Can you convince the male and female farmer equally in imparting knowledge and skills in IPM/FFS?

a) Yes b) No c) somewhat equal

11) Who are the early learner men or women why?

12) Do you sometimes feel difficulty in convincing women farmer and why?

13) Do you biased in imparting knowledge to women farmer sometimes in the technical issues and why?

14) Do you give more attention to the male or female farmer and why?

17) In your own view, do you think the interests of women and men are taken care of in the whole training programme? a) Yes.....b) No.....

If Yes how and why.....

If No why...

18) What do you think that you can clarify all the aspect in training to the trainers? If yes how and why? If no why?

19) 19) How this can be improved in coming future days?

Annex C: Checklist for focus group discussion

Men farmerwomen farmer
Braminschettri.....Janajati.....Dalits

A. General Information

1. How do you know about the IPM (FFS)?
2. When do you take the training of IPM (FFS) in the first time?
3. What is the composition of male and female in training? If more men why? If more women why?
4. Who are the trainer men or women?
5. Which trainer you preferred men or women and why?
6. How do you select to take the training of IPM (FFS)?
7. What is your family's expectation on FFs training?
8. Why do they send you in training?
9. What are the points that you remember till today in FFS training? Ask in brief to find out all the points.
10. Who is the early and fast learner in your group and why?
11. Why that person is early learner than you? What are the reasons behind this?
12. Which aspects of the IPM (FFS) do you feel useful and which aspect you feel not so useful? Why?

B. Questions related to application

What is the learning's that you are applying in daily life? And why? If you are partially applying why? If you dropped out why?

Activities: Who decides: Why?

- Seed selection
- Seed purchase
- Irrigation
- Fertilizer
- Insecticide and pesticide
- Intercultural operation
- Storage
- Selling of products

C. Why does your neighbour not apply the FFS practices?

B. Do early learner apply the learning of FFS? If apply why and if not why?

Annex D: Names of Respondents

S.N.	Name of Respondent	Age	Sex	Address
1.	Dinesh Sapkota	22	Male	Kushadevi-1
2.	Ram Humagain	45	Male	Kushadevi-1
3.	Kedar nath Sapkota	55	Male	Kushadevi-2
4.	Bhim Bahadur Shrestha	55	Male	Kushadevi-1
5.	Harka Bahadur Shrestha	55	Male	Kushadevi-1
6.	Bishnu Bahadur Shrestha	30	Male	Kushadevi-2
7.	Arjun Sapkota	30	Male	Kushadevi-1
8.	Ramesh sapkota	28	Male	Kushadevi-1
9.	Sanjaya sapkota	25	Male	Kushadevi-2
10.	Rajendra Sapkota	17	Male	Kushadevi-1
11.	Amrita Sapkota	28	Female	Rayale-1
12.	Ram sharan Sapkota	40	Male	Kushadevi-1
13.	Sujan Shrestha	22	Male	Rayale-1
15.	Bhola nath Sapkota	35	Male	Kushadevi-2
16.	Gyanu Sapkota	27	Female	Kushadevi-1
17.	Amrita Sapkota	32	Female	Rayale-2
18.	Tulsi Sapkota	30	Female	Kushadevi-1
19.	Kanchi maya Tamang	27	Female	Kushadevi-2
20.	Pavitra Timilsina	24	Female	Rayale-1
21.	Santu Lama	27	Female	Rayale-2
22.	Sukumaya Tamang	41	Female	Rayale-1
23.	Apshara Sapkota	24	Female	Rayale-1
24.	Maiya sapkoya	35	Female	Rayale-1
25.	Srijana Sapkota	17	Female	Rayale-2
26.	Yashoda sapkota	26	Female	Rayale-2
27.	Meena sapkota	29	Female	Rayale-2
28.	Shova sapkota	30	Female	Rayale-1
29.	Nirmala Sapkota	35	Female	Rayale-2
30.	Maya Tamang	32	Female	Rayale-1
31.	Bhagwati Sapkota	43	Female	Rayale-2
32.	Sangita Sapkota	28	Female	Rayale-1
33.	Bhawani Sapkota	28	Female	Rayale -2
34.	Swastika sapkota	17	Female	Kushadevi-1
35.	Hariar Humagain	60	Male	Kushadevi-2
36.	Shiva Ram Humagain	35	Male	Kushadevi-1
37.	Shankar sapkota	42	Male	Rayale-2
38.	Sita Ram Sapkota	36	Male	Rayale-1
39.	Laxman Humagain	50	Male	Kushadevi-1
40.	Ganesh Humagain	35	Male	Rayale-1

Annex E: Respondent Plant Protection Officers

Name	work experience	Sex	Age
1. Sabitri Baral	14	Female	40
2. Rishi ram Kuwar	20	Male	50
3. Nabin Sharma	11	Male	37
4. Sahadev Humagain	18	Male	42
5. Raju Das Rajbhandari	17	Male	44

Annex F: Selected field photographs



Information collection with women farmer and FGD



Identification of harmful and beneficial insects



Farmers graduating from FFS