

NEPAL

Research Report on Interrelationship Between Climate Change, Agriculture, Food Security and Sexual and Reproductive Health

SCOPING STUDY

Building New Constituencies for Women's
Sexual and Reproductive Health and Rights (SRHR):
Climate Change and SRHR



A Scoping Study on

A research report on climate change, agriculture, food security and sexual and reproductive health
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Organisation's Full Name

Women's Rehabilitation Centre (WOREC)

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ISBN: 8822-1-7

Published by:**Organisation: Women's Rehabilitation Centre (WOREC)**

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ACKNOWLEDGEMENTS

We would kindly like to acknowledge the ARROW team for their support, constant feedback and constructive comments in producing this research report. This Scoping Study has been produced with the financial support from NORAD.

We wish to express my sincere gratitude to Dr. Renu Rajbhandari, Executive Chair for her guidance, constant encouragement and constructive feedback which helped me to successfully complete the research entitled "**climate change, agriculture, food security and sexual and reproductive health**".

We would also like to thank Ms. Pratima Sharma, Program Director, Ms. Poonam Rishal, Executive board members, Ms Lalita Thapa, Program Coordinator for reviewing the research report internally and providing with the feedbacks. Special thanks go to Ms. Bimala Rai Poodel, member of National Planning Commission for her constructive feedback in the report.

We would like to thank all the district team for their restless support during field visit, data collection, and help during the entire research period.

Our special thanks go to Ms. Shraddha Acharya, Ms. Rajita Dhungana and Ms. Sanju Rajak for their abundant support during data analysis.

We would also like to thank entire WOREC team who has supported me in many respects during the completion of this research report.

Last but not the least I would like to thank all the respondents from household survey who participated in focused group discussion and key informant interview. Without this generous support from households and key informants, I would not have been able to complete this report.

LIST OF ACRONYMS

ARROW:	Asian Pacific Resource and Research Centre for Women
CC:	Climate Change
CSW:	Commission on the Status of Women
DADO:	District Agriculture Development Office
DoSWC:	Department of Water and Soil Conservation
DWIDP:	Department of Water Induced Disaster prevention
FGD:	Focussed Group Discussion
ICIMOD:	International Centre for Integrated Mountain Development
INGO:	International Non-government Organisation
IPCC:	Intergovernmental Panel on Climate Change
KII:	Key Informant Interview
LAPA:	Local Adaptation Plan for Action
MoFSC:	Ministry of Forests and Soil Conservation
NAPA:	National Adaptation Plan of Action
NGO:	Non -Government Organisation
PRA:	Participatory Rural Appraisal
SRHR:	Sexual and Reproductive Health Right
UNFCCC:	United Nations Framework Convention on Climate Change
WHO:	World Health Organisation
WOREC:	Women's Rehabilitation Centre

EXECUTIVE SUMMARY

Climate change is a global challenge, which has daunting effects in the developing countries like Nepal with low adapting capacity. Agriculture is the major source of income for food security, good health and sustainable livelihoods which is completely dependent on climatic factors. This study is conducted in Udayapur, Siraha, Morang, Dang, Salyan and Kailali districts in Nepal representing the Eastern, Mid western and Far western regions of the country which has witnessed extreme climatic events in recent years. The objective of the research is to establish the linkages between climate change, agriculture, food security and sexual and reproductive health and provide recommendations at the local and policy level to reduce the impact of climate change on sexual and reproductive health. The household survey, focus group discussion and key informant interviews were the methodologies employed for data collection. The study is based on the local perceptions, witnesses and experiences on impacts of climate change on agriculture, food security, sexual and reproductive health and adaptations made by the farmers. The farmers opined that due to change in temperature and rainfall pattern the production has been decreasing drastically which has resulted in food insecurity of the farmers completely depending on agriculture for food security and sustainable livelihood. The work burden on women, lack of nutritious food, increased use of pesticides, weak economic condition has direct impact on sexual and reproductive health. The farmers are undertaking different adaptation strategies like early warning system, change in crop varieties, change in cropping calendars, out migration, river bed farming to cope up with the adverse effects of climate change. Based on the study the recommendations are made at the household, level, to the government agencies and UN agencies to protect the food security and sexual and reproductive issues of the women farmers.

Key Words: climate change, agriculture, food security, sexual and reproductive health, adaptation

INTRODUCTION

1.1 Background

The average global temperature of the Earth has risen by about 0.8°C in a period of last 150 years (i.e. from year 1850) which has not been evidenced in the history of Earth. (Hardy, 2003). Globally, the impacts of climate change have already been witnessed in different regions such as rise in sea level, change in precipitation pattern, vegetational shift in higher altitudes, retreat of glaciers etc. It is predicted that climate change will trigger for rise in extreme climatic events and increase number of climate refugees. Due to rise in temperature and climate induced hazards such as drought, flood and soil degradation, there will be decline in agricultural productivity (IPCC, 2007) leading to consequences on food security and health.

Climate change has wide range of socio-economic and political consequences, exacerbating existing issues of poverty, livelihoods, inequities and profound implications on social justice and gender (World Economy and Social Survey, 2013). Climate change is an ongoing phenomenon due to natural and human induced factors that affects human beings directly or indirectly. However, in the least developed countries, it should be noted that women, are affected the most (UNFCC). Nepal is no different especially women who do all the farming activities and household chores because majority of male members are now migrated for foreign employment.

Gender impacts of climate change have been identified as an issue requiring greater attention by the Commission on the Status of Women (CSW). Gender norms, roles and relations are important factors in determining both, vulnerability and adaptive capacity to overcome sexual and reproductive health impacts of climate change (WHO, 2005).

The Intergovernmental Panel on Climate Change (IPCC) states that “climate change is projected to increase threats to human sexual and reproductive health” (WHO, 2005). Climate change can affect human sexual and reproductive health directly (e.g. impacts of thermal stress, death/injury in floods and storms) and indirectly through changes in the ranges of disease vectors (e.g. mosquitoes), water-borne pathogens, water quality, air quality, and food availability as well as quality. It has also stated that social impacts will vary depending on age, socio-economic class, occupations and gender, and the world’s poorest people will be most affected. The risks to sexual and reproductive health from climate change arise from: (1) direct stresses (e.g. heat waves, weather disasters, workplace dehydration); (2) ecological disturbance (e.g. altered infectious disease patterns); (3) disruptions of ecosystems on which humanity depends (e.g. sexual and reproductive health consequences of reduced food yields); and (4) has influenced the human society in social, ecological, economical, political and cultural aspects of. For example Women's vulnerability as an impact of extreme climate events is determined by differences in their social roles and responsibilities. Among women, the expectation that they should fulfill their roles and responsibilities as care taker (e.g. collecting firewood, fetching water from long distances, giving birth to children, etc) of their families often places extra burdens on them during extreme climate events. This further restricts women's access over the natural resources and nutritious food which has direct impact on sexual and reproductive health

Women’s Rehabilitation Centre (WOREC Nepal) established in 1991 is one of the leading national organizations working to prevent violence against women, its causes and consequences, and ensure economic, social and cultural well-being of women as well as other marginalized groups by promoting their access to rights and social justice. The organization focuses on right to food, right to health and right to work to end all forms of violence and discrimination against women. The

organization has been instrumental in addressing the need for sustainable livelihoods by promoting bio-intensive farming systems. The concept of bio-intensive farming system is based on the agro-ecological principles of sustainable organic agriculture system and participatory rural development. It focuses on empowerment of organization, conservation and utilization of plant genetic resources, eco and sexual and reproductive health friendly rural system, equitable access to natural resources and public services and sustainable technology.

1.2 Rationale of the study

In Nepal, women residing in the rural areas have to spend much more time for collecting fire wood and fetching water for domestic use (cooking and drinking) travelling for hours in addition to taking care of their families (Shiwakoti and Federico, 2014). These compounded with lower social status of women in country and society is making women vulnerable to different Sexual and Reproductive Health (RH) problems in which Uterine prolapse is the most common. The impact of climate change has created different layers of vulnerability among women. Women have faced difficulties in enjoying their sexual and reproductive health rights.

WOREC has been attempting these issues from the women's perspective. For instance, we can take the case of Koshi and Mahakali floods in 2008. WOREC, Nepal was engaged in protecting the lives of the victims/survivors and special program was conducted to address the urgent need of pregnant and lactating women who were struggling hard for their survival as an impact of floods. WOREC, Nepal supported pregnant and lactating women with food, shelter, psycho-social counseling, clinical assistance and post natal care during the flooding in 2008. Furthermore, being a part of protection cluster (from civil society) WOREC is also engaged in advocacy and coordination with government line agencies and INGOs.

Many studies conducted by WOREC have shown that women working in different geo-ecological conditions have been facing different types of SRHR problems. However, such studies have not thoroughly investigated the inter-linkages between climate change and SRHR. Therefore this study tries to find out the linkages between climate change, food security and sexual and reproductive health. This study further tries to document the adaptation strategies adopted locally to cope up the adverse effect of climate change and food security to ensure their SRHR.

Therefore, the major focus of the research is to study about the impact of climate change on SRHR of rural women and to document the adaptation strategies they have adopted locally to cope up the adverse effect of climate change on their SRHR.

1.3 Scope and limitations

Climate change is a long-term change in the statistical distribution of weather patterns over periods of time that range from decades to millions of years. It may be a change in the average weather conditions or a change in the distribution of weather events with respect to an average, for example, greater or fewer extreme weather events. Climate change may be limited to a specific region, or may occur across the whole Earth. The major elements of climate change are (i) Temperature, (ii) Precipitation (iii) Ice and snow and (iv) Sea level rise.

The scope and limitations of the study are:

- This study would be helpful for understanding the linkages between climate change, agriculture, food security, sexual and reproductive health and violence against women. However, it does not provide the magnitude of climate change and its effect on SRHR.
- The study does not assess the characteristics of the rainfall and temperature trend to compare with the farmers perception.
- The impact of climate change, agriculture, food security, sexual and reproductive health right and violence against women only for five districts of the country. So, this may not represent for whole region and Nepal.
- The study only looks into the two elements of the climate change i.e., temperature and precipitation.

1.4 Objectives

The objectives of the study include:

- To assess the impact of climate change on agriculture, food security, sexual and reproductive sexual and reproductive health and violence against women.
- To document and analyze the climate change adaptation strategies adopted by the community people for the sustainable livelihoods in regard to sexual and reproductive health rights.
- To provide recommendations in regard to climate change, food security and SRHR at different levels.

1.5 Methodology

Site of Research

In recent years, Nepal had witnessed increase in the frequency of floods, drought and hailstorms in the different regions namely Eastern, Mid-western and Far-western Development regions. Climatic disasters since 2006 to 2014 have been identified as one of key reasons for food shortage in the region which has direct impact on SRHR. There is topographic variation in the area which offers opportunity to study about climatic disaster in both hill and plains. Moreover, Udayapur, Siraha and Kailali was worst hit by flood in year 2006, 2008 2009 and 2014, based upon which following development regions were selected for the study.

- Eastern development region: Udayapur, Morang and Siraha
- Mid western development region: Dang and Salyan
- Far western development region: Kailali

Selection criteria for the districts:

- An area that has experienced floods in recent years.
- Households are dependent on agriculture as major occupation
- The SRHR issues are identified
- Districts where WOREC already has offices so that work can be organised effectively

To meet the objectives of this research various qualitative tools and techniques are employed. Qualitative researchers rely quite extensively on in-depth interviews, focus group discussion (FGD), and key informant interviews (KII). Hence, data has been collected through focus group discussion (FGD), key informant interviews (KII), in depth interviews and household survey (HHs) with the women farmers.

1.5.1 Sample size

Altogether 320 households were included in the surveys, 10 FGDs and 15 KII have been conducted. The samples were taken only from women farmers as this study was biased to take the voices of only women farmers to know about the impact of climate change on SRHR. The SRHR issues are still hidden at the community level because it is regarded as sensitive issue and there is a taboo related to SRHR. During the pre-testing of the questionnaire, men did not talk about SRHR thus, only the women farmers were selected for household survey.

1.5.2 Data Collection

1.5.2.1 Primary Data Collection

Primary data was collected through household questionnaire survey, Key Informant Interviews (KII), observation from the fields, and focus group discussions. The questionnaire and the topic guide consisted of both open ended and closed questions. Prior to the data collection, the questionnaire and topic guide was pretested among 10 percent of the total sample size.

Questionnaire Survey

The purpose of conducting household survey was to collect information about food security profile of households, their perceptions in environmental changes due to changes in temperature and rainfall they have witnessed and its impact on SRHR and adaptation measures they had adopted in response to those climatic changes. Survey was the primary means to collect information required for the study which was based on farmers' perception and experiences. The households were randomly selected, but respondents from all existing ethnic groups and wealth ranks were included.

Key Informant Interviews

Key informant interviews were conducted with village leaders, individuals who have stayed in the area for long time and individuals who were affiliated government officials of Women and Children development Office, District Agriculture Development office, District Forest Office, District Soil and Water Conservation office, etc. They were interviewed about change in rainfall and temperature pattern and changes in resource availability. Open-ended questions were asked for this purpose. The duration of the interview ranged from 45 minutes to 90 minutes.

Focus Group Discussions

Focus group discussions were conducted to gather information on past natural disaster events in the area, observed environment changes in recent years, adaptation measures adopted by local people, including various other socio-economic details of the area. During group discussions, PRA tool like seasonal calendar for understanding cropping calendar of agricultural crops were used. Altogether

10 group discussions were held, which included male as well as female participants of different ethnic groups. The number of participants ranged from 7 to 15 individuals. The time interval for each group discussion was about an hour.

1.5.2.2 Secondary Data Collection

A meticulous global and national literature review was done which included review of journals, websites and thesis of various individuals and various published reports of government offices such as Ministry of Forests and Soil Conservation (MOFSC), Department of Agriculture, Department of Water Induced Disaster Prevention (DWIDP), Department of Soil and Water Conservation (DoSWC) and other concerning NGO's and INGO's such as International Centre for Integrated Mountain Development (ICIMOD), Mercy Corp, Base Nepal and various other concerned agencies.

2. UNDERSTANDING THE INTERLINKAGES

2.1 Literature Review

It has been realized that the negative impact of climate change is increasing. It will continue to rise at astonishing rates in coming days, keeping new records in recent human history (Adger, et al., 2003).

It is evident from the observations such as global average air, ocean temperatures and sea level rise and melting of polar snow and ice that the global warming and the climate change are true. While going through the global surface temperature records since 1850, of the twelve years (1995-2006) history, only a year was found to be relatively cooler than other years. It shows that the temperature is increasing alarmingly all over the world due to the increasing human activities that had contributed to greenhouse gas accumulation (IPCC, 2007a).

Changes in temperature, amount of carbon dioxide (CO₂), and the frequency and intensity of extreme weather could have significant impacts on crop yields. Warmer temperatures may make many crops grow more quickly, but warmer temperatures could also reduce yields. Crops tend to grow faster in warmer conditions. However, for some crops (such as grains), faster growth reduces the amount of time that seeds have to grow and mature. This can reduce yields (i.e., the amount of crop produced from a given amount of land). For any particular crop, the effect of increased temperature will depend on the crop's optimal temperature for growth and reproduction. In some areas, warming may benefit the types of crops that are typically planted there. However, if warming exceeds a crop's optimum temperature, yields can decline.

According to the Intergovernmental Panel on climate change (IPCC) the mean global surface temperature increased 0.74° C during the 20th century. Since 1971 rates of land surface temperature have been increasing at the alarming rate of between 0.23 and 0.28°C per decade. This continuing trend, coupled with changes in rainfall pattern and greater frequency of extreme weather events are likely to have adverse effects on the world's population.

Cohen et al predict that agricultural output could decrease by 10-20 percent by 2080, limited production will in turn cause food price to rise and will further impede the ability of the poor to access sufficient, safe and nutritious food. It is therefore highly probable that limited food availability from decreased production as well as higher food prices will worsen under nutrition.

The United Nations Development Program (UNDP) estimates that approximately 600 million more people could be afflicted by hunger by 2080 as a consequence of climate change. Although least developed countries (LDCs), such as Nepal are culpable for a relatively small proportion of greenhouse emissions, they often are most vulnerable to the negative effects of climate change.

Nepal, responsible for just 0.025 percent of global greenhouse emissions, is one of the lowest emitters in the world. Yet Nepal ranks fourth among the 170 countries rated for vulnerability to climate change in Maplecroft's Climate Change Vulnerability. Atmospheric temperature in Nepal is rising at a higher rate than the global average, with a 1.8°C increase between 1975 and 2006. Precipitation has become increasingly unpredictable, while biodiversity depletion, deforestation and increased frequency of extreme weather events have all negatively impacted agriculture production. As the majority of Nepalese citizens engage in small holder farming, a sector that is particularly susceptible to weather volatility, a great portion of the population will find itself directly affected by climate change. High-level of poverty will restrict the adaptive capacity of Nepali farmers. Biodiversity loss is also occurring and is expected to continue if the effects of climate change intensify. Since different plant and animal species are suitable to ecosystems, changes in soil, temperature, humidity, sunshine and water availability will alter particular ability to survive in its environment.

Additionally, modern and hybrid seed varieties are increasingly replacing local traditional varieties as they often provide greater drought resistance or higher yields. Cold water fish, herbs, pasture lands; apple trees and livestock are expected to be most at risk in Nepal. The majority of Nepal's population depends on small holder farming for its livelihood. Many households operate on land holding that are inadequate to produce enough annual food for survival. Certain families, particularly those from lower caste groups, manage land holding with the *adhiya* (share cropping) system and are obliged to turn over a significant portion of their harvest to the wealthier or higher caste members holding the land.

Poverty and a lack of purchasing power limit the poor's ability to access food. Even if the poor are able to consume enough calories, diseases and a lack of micronutrients may compromise their bodies' ability to absorb and synthesize nutrients. The development and spread of crop diseases, pests and weeds will also have an adverse impact on agriculture, human health and the environment. Several pathogens, such as rust and foliar blight, have already adapted to the hills and mid-hills. Mosquitoes that once only populated the Terai region are now able to survive in the mid and high hills (*Synnott P. 2012.*)

Climate change and agriculture are interrelated processes, both of which take place on a global scale. Climate change affects agriculture in a number of ways, including through changes in average temperatures, rainfall, and climate extremes (e.g., heat waves); changes in pests and diseases; changes in atmospheric carbon dioxide and ground-level ozone concentrations; with 2 chains changes in the nutritional quality of some foods; and changes in sea level. Climate change is already affecting agriculture, with effects evenly distributed across the world. Future climate change will likely negatively affect crop production in low latitude countries, while effects in northern latitudes may be positive or negative. Climate change will probably increase the risk of food insecurity for some vulnerable groups. There are ranges of policies that can reduce the risk of negative climate change impacts on agriculture, and to reduce GHG emissions from the agriculture sector.

In the long run, the climatic change could affect agriculture in several ways:

- *Productivity*, in terms of quantity and quality of crops.

- *Agricultural practices*, through changes of water use (irrigation) and agricultural inputs such as herbicides, insecticides and fertilizers.
- *Environmental effects*, in particular in relation of frequency and intensity of soil drainage (leading to nitrogen leaching), soil erosion, reduction of crop diversity.
- *Rural space*, through the loss and gain of cultivated lands, land speculation, land renunciation, and hydraulic amenities.
- *Adaptation*, organisms may become more or less competitive, as well as humans may develop urgency to develop more competitive organisms, such as flood resistant or salt resistant varieties of rice.

Women and men respond to climate signals by diversifying their crops, which requires additional human capital investments in the form of time and labor. This may be due to the unfamiliarity of dealing with new types of crops in comparison with crops that had been planted regularly in the past, or that more diversified farms require more labor and time to operate as different types of crops may require different treatment. These tasks contribute to the time demands of women and men, causing greater difficulties for women who have to deal with other household chores at the same time (Bynoe 2009).

It was observed that women in the field continue to work, while pesticides are being sprayed. This exposure to pesticides could cause a variety of reproductive health problems of the reproductive age group. This aspect of women being prone to various ways of exposure to pesticides has been highlighted in the study done among the cotton growers of India (Mancin et al., 2005).

These farmers have been spraying pesticides for more than a decade which implies that a large number of the farmers get exposed to pesticides over long durations. This may cause chronic health impacts to the farmers. Young people seem to be engaged in pesticides spraying more than the older people, which may affect their reproductive organs. Pesticide exposure has been found to be linked with chronic disease like diabetes, hypertension, ophthalmic disorders etc. Asthma, a chronic disease, was noticed to be prevalent among the farmers, who are associated with pesticides exposure (Hoppin et al., 2002) on the health of farmer (Dey K. R., P. Choudhury* and Dutta B. K. 2013).

The main adverse health effects are difficulty in breathing, headaches, neurological or psychological effects, irritation of skin and mucous membranes, skin disorders, effects on the immune system, cancer, and reproductive effects. The authors do not show which pesticides are responsible for which reproductive disorders. They have just claimed the exposure to pesticides without giving their chemical names, and limiting their analyses only to the duration of exposure to pesticides. Only in some cases we were able to show that exposure to certain kinds of pesticides may be dangerous to pregnant woman. There are several pesticides that induce reproduction disorders. Dicamba is related to the risk of spontaneous abortion and prolonged time to pregnancy, and glyphosate to spontaneous abortion, prolonged time to pregnancy, birth defects and preterm delivery. Exposure to phenoxy herbicides may cause spontaneous abortion and have impact on time to pregnancy; triazines increase risk of spontaneous abortion and preterm delivery; organophosphate pesticides are associated with an increased risk of infertility, miscarriage and preterm delivery; perythroids influence time to pregnancy, birth weight and fetal death, might cause birth defects (Hanke W, and Jurewicz J. 2004).

Several studies which examined the links between meteorological conditions and the incidence of eclampsia in pregnancy find increased incidence during climatic conditions characterized by low temperature, high humidity, or high precipitation, with an increased incidence especially during the

first few months of the rainy season (Neela and Raman 1993; Subramaniam 2007; Wacker et al. 1998).

A more severe climate impact on health may occur for women and children due to the indirect effects of malnutrition, which make them additionally susceptible to diseases and this may be especially evident in poor developing countries. The indirect effects of malnutrition place women and children at higher risk from contracting diseases in post disaster situations. The psychological and emotional toll of climate events appears to be heavier for women as they are unable to carry out their tasks and roles, especially to provide care for their children and other family members (Reyes 2000).

Menstrual cycle disturbances

The effects of pesticide exposure were observed on the menstrual cycle. Serum levels of DDT or a metabolite of DDT and short cycles and undefined 'menstrual disturbances'. Women who currently used pesticides experienced longer menstrual cycles and increased odds of missed periods compared with women who never used pesticides. In addition, women who used probably hormonally active pesticides had a 60–100% increased odds of experiencing long cycles, missed periods, and inter menstrual bleeding compared with women who had never used pesticides.

Infertility

In a study in the USA, infertile women were observed to be three times more likely to ever having been exposed to pesticides and nine times more likely to ever having worked in agriculture. Another study found no correlations between infertility and self-reported overall pesticide exposure, working in the agricultural sector, or living on a farm during the two years before the diagnosis of infertility or the last pregnancy.

Time-to-pregnancy

Three studies examined the effects of pesticide exposure on the time it took couples to become pregnant [time-to-pregnancy (TTP)], which is affected by disturbances in the whole chain from gamete to genesis to embryonic survival (Bretveld R. W, Thomas Chris MG, Scheepers, Paul TJ, A Zielhuis and Gerhard RoeleveldNel (2006).

Spontaneous abortion/stillbirth

A number of studies reported that among women occupationally exposed to increased use of the pesticides and/or working in the agricultural sector the risks of spontaneous abortion and still birth seemed to be significantly increased. In addition, two reviews concluded that there are numerous indications that exposure to pesticides may contribute to spontaneous abortion and/or stillbirth (Arbuckle TE, Sever LE, Crit Rev Toxicol 1998) but it is unclear whether this should be considered as an endocrine disrupting effect (Hanke W and Jurewicz J (2004) that exposure to pesticides may be associated with menstrual cycle disturbances, reduced fertility, prolonged time-to-pregnancy, spontaneous abortion, stillbirths, and developmental defects. However, in most of these studies specific information on pesticide exposure and the path physiological mechanisms involved was missing.

Women's lower economic autonomy may also be manifest in a weaker bargaining position of women within the family. Differential feeding and care giving practices may favor boys over girls, thus leading to poorer nutritional outcomes for women and girls, and making it more difficult for women to adequately fulfil even their traditional roles in care giving and food systems. The cost of this to society is considerable, both in lost productivity, and worse, in health and nutritional outcomes.

Violence against women is an important contributor to ill-health of women, especially to their sexual and reproductive health. Such violence is a human rights abuse and a consequence (and a cause) of gender inequality. The most common and better documented types of violence (physical, sexual, and emotional), are intimate-partner violence (domestic violence) and sexual violence (rape, sexual coercion, and child sexual abuse). Abuse by an intimate partner is widespread and happens in both developed and developing countries. Prevalence varies widely between countries and between regions within countries. Such abuse is accepted as normal in many parts of the world, with acts of violence often regarded by families as a private matter and as an inevitable fact of life by the victims (*Glasier A. AGülmezoglu M. Schmid G. P Moreno G. Pau and I FA Van Look MD*)

Violence directed at women is defined as any behaviour including those which can cause physical, sexual or psychological harm, or cause pain, as well as the threat of such behaviour and restriction of women's freedom by force. Violence against women is most often experienced within the family.

The diagnosis and treatment of infertility significantly decreases marital quality, by having a negative effect on the couple's sexual life, their communication with family and friends, role distribution in the family, and conflict resolution. These factors that decrease marital quality and satisfaction are also reported to be risk factors that contribute to marital violence (*Wang K. Li J, Zhang JX, Zhang L, Yu J, Jiang P 2007*).

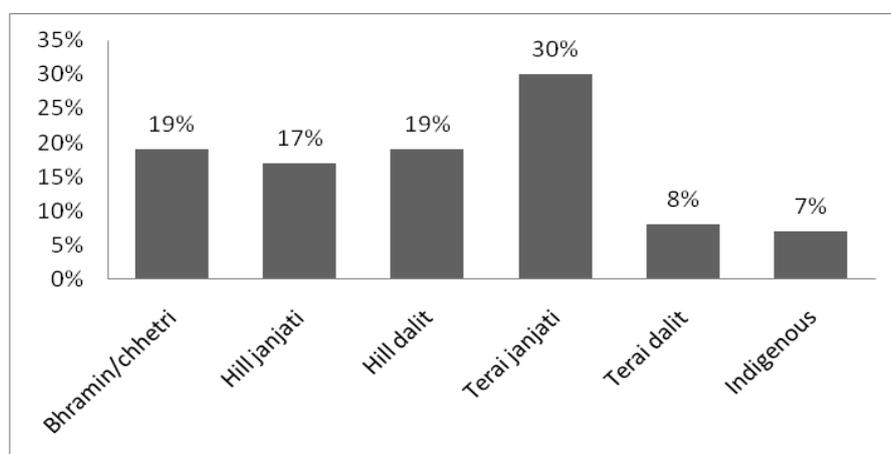
2.2 Results and Discussions

2.2.1 Socio-economic condition

2.2.1.1 Ethnicity of the sampled households

Almost 30% of the sampled households were found to be Terai Janjatis. This was followed by Brahmin/Chhetri and Hill dalit, which comprised 19%. The lowest population was found to be of Teraidalit and Indigenous people which comprised 8%.

Figure 2.1: Ethnicity of the sample households



2.2.1.2 Educational status of the respondents

Figure 2.2 shows number of illiterate and literate members in sampled households. Literate members are classified into 3 groups i.e. primary level (able to read and write to 5 years of formal schooling), secondary level (above 5 years and below 10 years of formal schooling) and higher secondary and above (above 10 years of formal schooling). Of the total sampled households 25% were illiterate, 64% had primary education, 9% secondary education and only 2% completed SLC. This shows the pathetic situation of the women though government has provision of free education till SLC. Interaction with the women farmers showed that low access to education was the main cause of food insecurity and this also devoid them from taking health services.

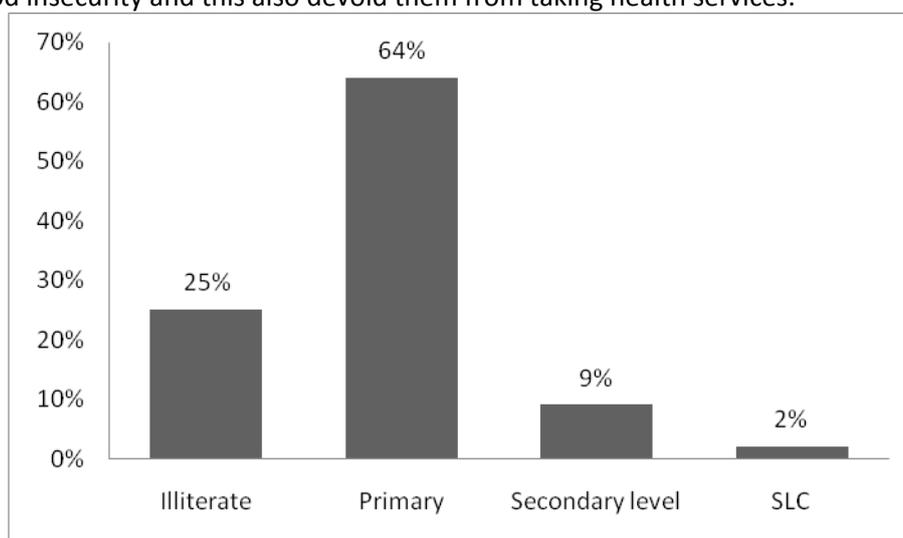


Figure 2.2: Education levels of sampled women farmers

2.2.1.3 Citizenship Card

Citizenship card is important card that gives identity to live with dignity in the country. Without citizenship, no official business can be conducted in Nepal. The Nepali citizens can't own land or house, open a bank account or apply for driving license. A citizenship card legitimises one's legal presence and those without one cannot participate in social welfare program run by the state. Because poor and marginalized groups are deprived of opportunities, they are usually illiterate and have little awareness about the country's laws. Despite this, fact only 53% of the sampled households have citizenship and remaining 47% did not have citizenship.

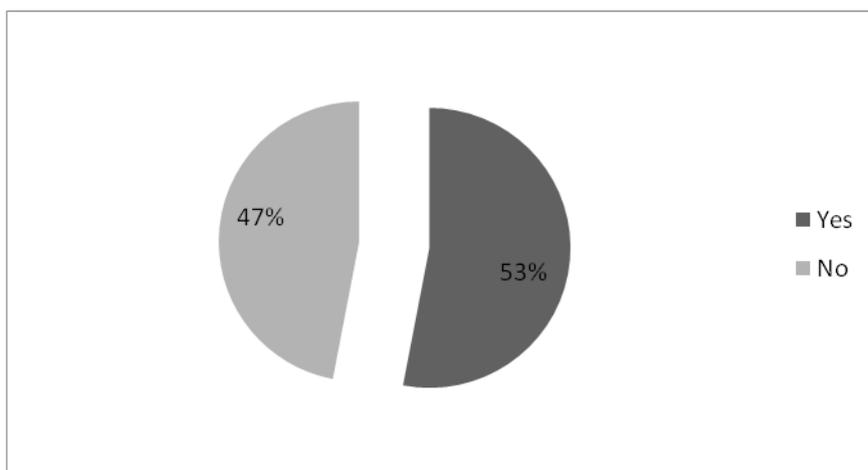


Figure: 2.3 Citizenship status of the sampled households

2.2.1.4 Land area holding inhabitant

The term land area holding describes holding of land for residence and farming purpose. In both study area, proportion of land area allocated by a household for farming was found to be larger than that set aside for residence. Land is not only means of production but also social and financial security and reflects status and identity of a household in the society (Thapa and Niroula, 2008). Lands have been deposited in banks as collateral for loans in the study area.

Of the total sampled households majority (94%) had land against few who did not have (6%). Of the total households possessing land, 66% had agricultural land and remaining 34% had housing land. Though maximum households had agricultural land, of the total households slightly more than half of the household (53%) did not have access to source of irrigation and remaining 47% had the provision of irrigation in their land.

2.2.2 Perception on climate change

2.2.2.1 Types of extreme climatic event

All the respondents were asked about the type of extreme climatic event they have been facing in the recent 5-10 years time farmers. About 55.6% responded that they experienced floods and remaining 44.4% responded that they experienced drought.

2.2.2.2 Perception on change in temperature

During the study, respondents were asked whether they perceive change in temperature or not. Their perception had been rated on scale of 3 on Likert scale, viz. no change, increase or decrease.

Table: 1 Perception on trend of temperature change

Change in temperature		
No change	Increase	Decrease
9.4%	64.2%	26.4%

As shown in table 1 above, large majority (64.2%) of respondents agreed over increase in temperature. During key informant surveys and group discussion, participants reported about increased in temperature. People related the case of increase in temperature with appearance of mosquitoes in month of November and December. Key informants told that few years back they could bask in sun for hours in month of November and December, but in recent years one cannot tolerate heat for same period of time. Moreover, in earlier years they did not use fan after October until January, but the case was different in recent years.

2.2.2.3 Perception on change in precipitation

For understanding perception on change in precipitation, they were asked whether they perceived any change in rainfall amount for recent ten years or not. Their responses were categorized as no change, high and low. As shown in table 2, number of people agreeing that rainfall amount had decreased in recent years.

Table2: Perception on Change in rainfall amount

Change in rainfall amount		
Increased	No change	Decreased
27%	7%	66%

During group discussions, participants were unanimous about change in rainfall pattern. According to them, in recent years rainfall pattern had become more erratic and rainfall intensity had increased. The increase in rainfall intensity, along with deforestation in hilly areas was blamed for consecutive floods in year 2008 and 2009. They described that earlier rainy days used to lasts for longer period of time and were less intense compared to recent ones. However, respondents mentioned that there was no rainfall at times needed for crops.

One of the key informants told that there had always been annual variation in monsoon. He related this with an old saying that says “if horns of bullock are dry in mid July, then there will not be enough grain for family to feed.” Even in past there had been events of late monsoon or pre-monsoon that resulted decrease in production. The gradual decline in winter rain was considered as major indicators of changing climate that affected production of cereals.

Though the farmers have perceived climate change, they are unaware about the science behind it. But they are strong witness to the changing climate and increasing climatic variability in Nepal.

2.2.3 Impact of climate change on agriculture

In the study areas, households completely depended on agriculture and were involved in wide range of agricultural activities. The major crops cultivated include cereals, pulses and vegetables and livestock as an on-farm sustainable livelihood options. Paddy and wheat are the staple food crops cultivated while other important agricultural crops cultivated includes maize, mustard, lentil and black gram, including chick pea in drought affected area. The rice was cultivated twice a year except in Salyan. The main source of water for rice cultivation includes rainfed conditions and stream irrigation. The farmers cultivated only the seasonal vegetables to fulfil their nutritional requirements. In Terai region viz., Udayapur and Kailali affected area, 33% households started river bed cultivation where the major crops included cucumber, bitter gourd, bottle gourd, pumpkin, water melon and squash as an alternative source of income.

The study revealed that most of the farmers perceived changes in rainfall pattern and temperature which directly affected rice production. They have experienced increased droughts, which resulted in increasing weed, insect, pest and disease incidences along with the increasing drought. The farmers have increased the use of fertilizers to increase the production. Along with this, the frequency of irrigation has also increased. Water requirement for rice is high during as the initial seedling period covering about 10 days to panicle initiation and flowering stage. The farmers also reported that water supply during this critical stage increases the yields. The farmers have experienced continuous droughts where farmers were unable to afford any alternatives to supplement rain which reduced the production drastically. The continuous drought has negative social impacts such as increasing unemployment and loss of savings.

The farmers opined that the traditional rice varieties have been lost from the study areas. The farmer's revealed that they have adopted new varieties to increase their yields and adapt to the changing environment, which caused lost of the old varieties. The changes in climatic patterns have affected the flowering season of different fruit trees like pear, plum, peach, citrus and coffee. The, early flowering has been observed in these species, which directly affected their yields.

The erratic rain has also resulted in the drying up of water bodies such as streams, lakes, ponds, rivers and wells. Late and insufficient rain has affected the rice plantation in the area and farmers have adjusted the planting time to escape the problem of water scarcity (Regmi, et al., 2008).

Membership to social institutions is essential for community based disaster management, natural resources management etc. Moreover, studies in developing countries have shown that farmers' affiliation to social groups increase their income level, adult literacy rate, diversity of crops grown, increase in crop yields etc. (Pretty and Ward, 2001). This all contributes in lowering vulnerability of households to climate change. Only 25% of the respondents were engaged in at least a single local institution which was only women's groups. The respondents reported that this was possible by the intervention of external agencies.

2.2.4 Climate change and food security

The farmers opined that due to change in temperature and rainfall pattern the production has been decreasing drastically which has resulted in food insecurity of the farmers depending on agriculture for food security and sustainable livelihood. The number of households with food sufficiency for more than 6 months from their agricultural land was found to be only 55 percent. The farmers reported that lower agricultural inputs and recurring drought and flood are other factors aggravating food sufficiency in the study area. In the given circumstances of rain-fed irrigation system and trend of decrease in total amount of rainfall continues, along with decline in winter rainfall ensures worsening of food security.

The FGD and KII revealed that due to decrease in crop productivity, the family which was food secured for one year were secured now for only 6 months. The farmers who had less land had become landless as the flood took away their land. Decreased crop productivity has increased the food prices, which are beyond the capacity of the vulnerable and marginalized groups to purchase so they become insecure which directly affects their health, particularly sexual and reproductive health.

2.2.5 Impact of climate change on sexual and reproductive health

The study revealed that women and girls are the on mostly affected by adverse impact of climate change. The major reason behind this is that after the natural disaster the work burden on women are increased. During this condition the women and girls generally take care of the sick people in their homes, particularly in times of disaster and environmental stress, they ignore their own health

condition. The respondents opined that after destruction of their land, the women went out of their house to work as a labor to make the income and ensure food security, health and sustainable livelihood of their family members. This increased stresses on the women which directly impacted their health. This increased work load has occupied the woman such that they do not have enough time for sanitation which in turn deteriorated their health. The changed climatic condition has also changed the behaviour of the woman turning them irritated, which affected them especially during their pregnancy. The FGD and KII revealed that food insecurity created due to natural disasters the women members in particular suffered from hunger and malnutrition. This is because they feed all the family members and eat only the left overs in their home.

It is also reported that increasing workloads has resulted withdrawing daughters from schools to help out at home, limiting their future opportunities. The withdrawal and drop out of the girls from the school hinders their process of empowerment on sexual and reproductive health. Dropped out girls are not able to learn about SRHR that included in the course curriculum to take care of them and maintain their SRHR. The study revealed that the recent flood that occurred in Dang in 2014 has caused trauma in the females which has affected their SRHR causing irregular menstrual cycle, white discharge and abdominal pain. The FGD and KII revealed that large numbers of women were displaced during the flood in Dang. They had to sleep in a common place which led to unsafe sex, sex in unhygienic condition which led to stress and led to white discharge. They were not able to seek the services as well since they could not walk to the far off distance as they could not manage their time due to unlimited household chores.

The study also revealed that the low productivity of the crops due to climate change have forced the farmers to use hybrid crop varieties which requires intensive chemical fertilizers and pesticides. Since women are the one involved in all the agricultural activity besides ploughing they are exposed to chemical fertilizers and pesticides. Almost all the respondents opined that they did not use any precaution while using fertilizers and pesticides in the field. Therefore they have been facing an adverse impact of it in the health related problems like disturbance in menstrual cycles, white discharge, and cancer in uterus, miscarriage and infertility. The respondents also reported that 10-15 years ago women even after giving birth to even 7-8 children were found to be healthy but now when the women give birth just to 2-3 children, her health deteriorates and her body becomes weak.

Most of the women reported they have to walk go off far places like 1.5 hours to 2 hours to fetch firewood and drinking water. About 37% of the women farmers who had to walk a long distance to collect the water and firewood reported to suffer from uterine prolapse. The respondents also reported that walking longer distance to fetch water and firewood increased insecurity and make them vulnerable. During these times they experience particularly sexual harassment and violence. Of the total population 67% of the women farmers had to walk whole day to collect the firewood. About 65% of the women farmers reported that they visited nearby health post to treat their sexual and reproductive health right problems such as uterine prolapsed and stillbirth. Due to poor health condition, women and girls have limited the time they have available for income generation, which, when coupled with the rising medical costs associated with family illness, heightens levels of poverty.

The focus group discussion with the farmers and government line agencies revealed that low economic condition lead to the misuse of the natural resources which deprived the local farmers to meet their basic needs of food and health which in turn worsened SRHR. Since women are the main collector of water they are exposed to water borne diseases due to climatic changes which affects their reproductive health leading to high infant mortality rate. Due to the change in climatic, young girls is one of the first to be affected by economic hardships as they are compelled to drop out of

school. It in turn affects their SRHR due to work burden and lack of knowledge on SRHR. The study also illustrated that most of the women did not get nutritious food which resulted in anaemia, pregnancy and delivery problems, increased rates of intrauterine growth retardation, low birth weight and perinatal mortality. There is increased need of food and water during pregnancy and lactating period but lack of food impacts highly on SRHR of women and girls. They further added that the pre-existing gender inequalities further limit women's economic recovery after a disaster. The FGD and KII publicized that the floods has led to displacement which has resulted in unsafe sexual relation, sexual violence, limited the use of family planning devices which has resulted in unwanted pregnancy, unsafe abortion and uterine prolapsed. Therefore, sexual and reproductive health services must therefore be an integral part of short- and long-term government planning processes. Such policies will help ensure that public service provision, such as education and health care, is adequate, and will also ensure efficient government stewardship and regulation of housing, job markets, agriculture, natural resources and public goods.

2.2.6 Climate change and violence against women

The undesirable impact of climate change on women is that women experience more violence against them. Climate change dries up the natural resources as a result of this, the women farmers have to walk long distance to fetch water which increase their work load. Moreover, this adds extra burden which limits their ability to challenge the social structure and patriarchy, further increasing their roles and responsibilities. They cannot participate in any of the empowerment related activities conducted by government and non-government organisations due to the over burden of work load. Moreover, the study also showed that women do not even get time to listen the news in radio for the information. Due to food insecurity and work broaden arise due to climate change, all the respondents reported that it stress them. As stressed women couldn't household chores nicely they become more vulnerable to domestic violence.

Research revealed that, about 80% of the male members of the sampled households went to India as a seasonal migrant and remaining 20% went to gulf countries to escape the food insecurity, an impact of climate change. Wives of migrated men suffer the stigmatization and other physical and psychological violence at home and in society. Whereas, domestic violence in particular is most prevalent form of VAW as men couldn't make enough money through seasonal migration. Seventy seven percent of the sampled population shared that they were tortured by the society and family members or from other male members of the community or relatives itself. This show how detrimental is the situation of women in the community whose husbands are migrated due to climate change.

The violence had different types of impacts on women. The household surveys, KII and FGD revealed that the first and foremost impact of violence is on women's health especially on their sexual and reproductive health. There are various impacts of domestic violence to the women at individual,, societal and community levels. Prevalent domestic violence and its impact on sexual and reproductive health depends on the willingness of the respondents to talk openly as this is sensitive issue and they have to face additional torture if their family members and society knows that they share it with other people. The fact that women are emotionally involved with and emotionally dependent on those who victimize them has major implications on the dynamics of abuse and approaches dealing with it (WHO, Geneva)

The FGD and KII revealed that the farmers and the concerned stakeholders did not know about LAPA and NAPA. This makes it clear that the strategies developed by the government have not been successfully implemented at the local level.

2.2.7 Adaptation strategies

a. Early Warning system

In flood affected areas of the Kailali and Udayapur districts, Local Disaster Risk Management Committees were formed which were responsible for reading gauging posts. Readings were taken only during monsoons and events of torrential rainfall. In each district, the committee had to inform and alert communities, including disaster management line organizations in district headquarter. The committee was provided with a CDMA phone by the INGO for the purpose. Similar, setup had been established in upstream and they were informed about prevailing conditions in upstream through headquarter. The communities were alarmed after water level rose above a red mark on the posts.

A manually operating siren had been donated by INGO (Mercy crop and Luthern Nepal) as an early warning system. During group discussion, participants told that this was crucial for informing and gathering people. This was effective in alarming other nearby communities as well. Moreover, people were trained to escape along with their important documents such as citizenship card, land ownership documents etc. During flood events, people lost their lives because they did not have any access to early warning system. Early warning system allowed communities to prepare well in advance. During group discussion, people told that flood level in 2008 had rise so fast that they did not have enough time for preparation. However, there were no human casualties since everyone had practiced evacuation process during pre-monsoon. This showed that disasters are unexpected and cannot be overwhelmingly relied on single approach. Such preparation practices are necessary for raising awareness to strengthen disaster risk management.

b. Change in Varieties of Crops

The major cereal crops like rice are grown in the study area. The change in temperature and rainfall has decreased the yield. Therefore, the farmers have been motivated towards the adoption of the improved and hybrid varieties. Altogether 92 percent farmers in the study area reported to have changed the varieties of crops against 8 percent farmers not changing the varieties of crops at all. The improved rice varieties like Barkhe- 1785, Chaite-350, Masuli, Makawanpur-1 and Hardinath-1 have been cultivated in the study area. Similarly, maize varieties like Rampur Composite, Deuti, Sitala and Manakamana are in use. However, it was reported during the FGD and key informant surveys that climate change solely is not accountable for the change in varieties of the crops. Change in climatic patterns along with other factors like increased productivity and early maturing of the crops made farmers to make changes in the varieties of crops.

One of the important conclusions of the field survey, FGD and key informant interviews was that the majority of the farmers preferred vegetable crop production rather than cereal production. This was because profit gained from vegetable crops was thrice as much as that from the cereal crops. The other reason was that vegetables could be harvested in short time and the growers could get income easily at high rate of return. The vegetable farming was done in plastic tunnels by mulching to conserve the soil moisture. The farmers made usage of organic manures and insecticides to enhance the fertility of soil and to control the insects, pests and diseases.

c. Changes in Cropping Calendar

The farmers in the study site reported that they had implemented modifications in the cropping calendar owing to the variations of temperature, rainfall and relative humidity. The changes in the cropping calendar varied from 15 days to one month. But the change in climatic pattern alone

cannot be considered for the shift in planting time as there was modification in the varieties of the crops as well. Almost all the respondents mentioned changes in the planting time of major cereal crops like paddy, maize, wheat and finger millet. This in turn led to the shifting pattern of other major crops like potatoes and mustard.

d. Out migration

Majority of the respondents reported that out migration helped them to gain the food security situation. They reported that agricultural production has been declining rapidly therefore they are forced to take into other alternatives to sustain their livelihood.

e. River bed farming

The organizations working in the study areas have trained the farmers for riverbed farming in the flood affected areas. This has helped the farmers to cope with the adverse effect of climate change and make some income to sustain their livelihood.

f. Construction of plastic ponds/mulching

The farmers reported that during water scarcity situation, they have been collecting the water in the plastic pond which can be used for irrigating their crops in the dry season of the year. Mulching has been practiced to conserve the soil moisture.

3. CONCLUSION

The study on interrelationship between climate change, food security and sexual and reproductive health has been conducted in six districts of Nepal covering Eastern, Mid western and Far western regions of the country. The method of selection of the respondents is random but the study is biased on women farmers as this study tends to look on the impact of climate change on sexual and reproductive health. Since the research on climate change and SRHR is new in the country, the focus is made completely on qualitative data based on people's perception.

Nepal has witnessed rise in temperature of about 0.06°C per year. Though the temperature is raised the impact of such rise in temperature and climate change has not been same throughout the country. The western part of the country is identified to be more vulnerable to impact of climate change. The rise in temperature is lower in the low land areas of Nepal in comparison to the higher altitudes. Similarly, distribution of precipitation varies with increasing trend in lowland while with decreasing trend in higher altitude. There is high inter-annual variation.

The respondents perceived that there was increasing trend of temperature in the study areas. The respondents compared recent year's events with earlier year's events for the respective months. The respondents reported that in recent year's rainfall pattern had become more erratic and rainfall intensity had increased.

The study illustrated that the climate and climatic variability have negative effect on crop production and the livelihood of subsistence farmers. Problems of weed, insect, pest and disease have increased along with the increasing drought and flood in the study areas. From the field survey, it was found that most farmers agreed that changes in rainfall pattern and temperature have affected rice production. They have experienced increasing weed, insect, pest and disease incidences along with the increasing drought. The application of fertilizer and frequency of irrigation have also increased. The timely supply of water has strong impact on rice yield. When there was a continuous drought and farmers were unable to afford any alternatives to supplement rain, they planted rice very late. Due to the delayed planting, there was poor rice production and farmers confronted a big economic loss.

The major work burden for the women after disaster and natural calamities are increased due to which women do not have enough time for sanitation and personal hygiene which directly affects them especially during their pregnancy. Due to the natural disasters the women members in particular suffer from hunger and malnutrition. The increased workloads results in withdrawing daughters from schools to help out at home, reducing their future opportunities. The low productivity of crops due to climate change have forced the farmers to use hybrid varieties of crops which requires intensive chemical fertilizers and pesticides which has direct impact on sexual and reproductive health. They have been facing problems like disturbance in menstrual cycles, white discharge, and cancer in uterus, miscarriage and infertility. A decade or 15 years ago, women who gave birth to 7-8 children were found to be healthy but now women who gives birth just to 2-3 children has a weak health condition. Travelling long distances to fetch water and firewood has resulted in prolapsed uterus among women. The poor health condition of women limits income generation and restricts their utilization of health posts for their sexual and reproductive health. The pre-existing gender inequalities further limit women's economic recovery after a disaster. The impact of climate change on agriculture, food security and sexual and reproductive health has limited the opportunities of the women in every aspects of life which has resulted in violence on women.

To cope the adverse impact of climate change they have been adapting different strategies like early warning system, changing cropping calendar, construction of plastic pond/mulching, change in crop varieties and out migration.

4. RECOMMENDATIONS &IMPLICATIONS

4.1 Recommendations at the community levels

- Increase awareness about risks of climate change in overall livelihoods and sexual and reproductive health of women and girls; short and long term preparedness and mechanisms at household levels to reduce the risks.
- Organize and equip farm households, especially women with knowledge, skills and technologies for addressing sexual and reproductive health issues during the disaster and diversifying options at household levels for better adaptation.
- An example for adaptation that is often related to food security of girls and women is increasing biodiversity in the farm and home garden to cope with crop failure. Examples of adaptation to reduce work burden is introducing water harvesting technologies that reduces the scarcity needs to be practiced.
- Help local communities to create stronger local institutions by providing external support (mainly technical and financial) to effectively improve food production, access and utilisation and adapt to climate change and ensure SRHR.
- Membership to local institutions, participation in local development activities and withdrawing from traditional inequity practices will bring positive outcome for whole community and improve the coping capacity against climatic disasters.
- Equip local communities, especially women groups and cooperatives with knowledge, skills and resources for disaster risk reduction and management (including the ways of reducing vulnerability, SHRH issues, relief and rescue)
- Diversifying livelihood strategies instead of over-relying on single income source is necessary to build adaptive capacity to climate change.

4.2 Recommendations to the government

- **Include the issue of climate change and SRHR in NAPA and LAPA:** The LAPA and NAPA do not include the policies in regard to climate change and SRHR. Therefore, the government should reformulate policies showing the linkages between climate change and SRHR and plan activities accordingly so that the women farmers can adapt to climate change and utilize health care and ensure their SRHR.
- Manual Siren System should be replaced with mechanical system.
- **Ensure universal access to SRHR information and services:** A safe, accessible and quality reproductive health service sufficient to meet the needs of women throughout their life-cycle is needed. There should be comprehensive, non discriminatory reproductive and sexual health care services within favourable

environment for the youth. The State must ensure that the reproductive and sexual health information and services reach women of all ages and groups.

- **Criminalise gender-based violence and provide emergency services for the survivor**
Survivors of gender-based violence such as rape and domestic abuse must be given immediate health and psychological care. There must be a justice system that criminalises sexual violence and delivers justice swiftly.
- **End harmful practices against girls:** Respect SRHR within the workplace: Employers must respect women workers' SRHR and provide leave and health care for pregnant workers and nursing mothers. The law must guarantee such rights; and strictly applied, especially in migrants' workplaces where violations are high.
- **Ensure coordination at all levels:** Government should create effective coordination mechanism to deliver appropriate sexual and reproductive health care to all women and adolescents. Coordination structure needs to include civil society members; specially women right organizations and prioritize activities to address structural inequalities which marginalize women.
- **Ensure measures to end impunity against VAW:** VAW is the cause and consequences of denial of reproductive and sexual health rights of women. To address the increasing number of rape among women, it is essential to focus on programs like large scale media campaign for behavioural change and mass sensitization. The practice of commodification of women bodies and negative stereotyping must end. Likewise, the current law against rape and the investigation procedure needs immediate revision. Furthermore, the current law on domestic violence needs to be revised due to its ineffectiveness of addressing the intensity of the problems of women. Another urgent need is to create the fast track court to ensure speedy justice to women. Hence, it must be addressed through integrated approach while providing women and girls with effective protection, access to justice and at the same time creating favorable environment for women to move away from any forms of violence.
- **SRHR needs to be dealt with through multi-sectoral approach:** Gender analysis of poverty is needed to address the economic, structural and root causes that deprive women in the first place. Similarly, women's right to natural resources, land and employment needs to be ensured. Further, to address practical needs such as food security, food sovereignty and poverty in line with SRHR, proper linkage and comprehensive planning needs to be established with different ministries such as agriculture, health, women's ministries etc.
- The government should take into consideration the holistic approach that considers every aspect of food security livelihood including institutional arrangement and infrastructure development of the community.
- Empowerment of the communities is essential for improving food security and sustainable livelihood of people. Vocational trainings coupled with disaster risk management trainings can be means for helping to cope up with the adverse effect of climate change.

4.3 Recommendations to UN and other development partners

- Establish more partnership with women rights organisations to effectively address SRHR. Women's empowerment (Social, Economic, and Political) should move parallel to SRHR initiatives. Unless SRHR is assured all other human rights (civil and political, economic and social) have limited power to advance the well-being of women and vice-versa.
- UN and development partners usually work in partnership with local NGOs and civil society actors. They can be mobilized for massive awareness on the topic of climate change and reproductive health impacts, ways of mitigating them or address them. These awareness campaigns can complement to government efforts as well.
- The funding partners should emphasise much more on awareness and sensitization program so that the information on impact of climate change and SRHR can be disseminated to large mass of people and people get sensitized on the issues.
- Emphasise sexual and reproductive health and rights related issues through right-based policy frameworks and support civil society organisations to make communities aware of the rights and government central bodies (parliamentary committees, central level ministries) and to civil society groups to work as watchdogs representing people voice.

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APPENDICES

Questionnaire for Household Survey

VDC: _____

General Information

1. Name: _____
2. Caste: _____
3. Age: _____
4. Sex: Male () Female ()
5. Size of Family: _____
6. Occupation: _____
7. Details of the family members

Name of the family members	Sex	Age	Educational	Marital status	occupation	Migration	Citizenship Yes/No

Livelihood Characteristics

8. Do you own land? Yes () No ()
 If yes, what is the type of land you own? Agricultural land () Housing land ()
 If no, any other forms of land tenure?

If yes, specify type: _____

9. What is the area of land you own? Does the agricultural land have irrigation facility?

Land type	Land tenure type	Area	Irrigated or non-irrigated	Number of months with irrigation facility

10. If agricultural land, do you own any agricultural tools? Yes () No ()
 If yes, what are they? _____

11. What are the crops grown in your field?

Seasonal crop calendar:

Crops/Months	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Crop I												
Crop II												
Crop III												

12. Have you make any changes in crop calendar in recent 5 years? Yes () No ()

If yes, please specify why and what? _____

If No, do you plan or see any requirement to change crop calendar? Please explain. _____

13. What is the average annual yield of crops grown in your land?

Crops	Yield

14. Has there been annual change in yield in recent years?

Decrease () Increase () Stable ()

Please specify amount of change and what factor do you think causing change?

Crop	Change in amount of yield	Factor responsible

15. Have you shifted to growing new crops? Yes () No (). If yes, please fill this box.

Old crop	New crop	Reason

16. Have you shifted growing season of any crops? Yes () No (). If yes, Please fill the box.

Crop	Old growing season	New growing season	Reason

17. For how many months, food produced from your land enough for your family?

18. Do face food shortage (i) Every year (ii) Sometimes (iii) Never

19. If yes, how have you managed to cope with food shortage problem? _____

20. Is there anyone suffering from malnutrition in the family? Yes() No ()

21. Can you please say about your fooding habit?

- (A) how often do you consume vegetables?
- (B) How often do you consume fruits?
- (C) How often fo you consume milk?
- (D) How often do you consume meat?
- (E) What are the types of cereal in your regular diet?

22. Due to food insecurity have you faced the following problems?

- (A) Low weights births
- (B) increase in miscarriage
- (C) perinatal mortality

23. How much do you spend under following headings in a month/year?

	Expenses	Changes in amount in recent years
Food		
Clothes		
Crops/agricultural		
Tools/fertilizers		
Health		
Others (please specify)		

24. Has amount of chemical fertilizers used change? Increase () Stable () Decrease ()

25. Has there been increase in incidence of pests and diseases in agricultural crops?

Agricultural crop	Pests/Diseases	Period of year/Frequency	Any measures adopted

26. Have you observed any impacts on your health due to the use of chemical fertilizers and pesticides? Yes() No()

If yes then what?.....

27. Do you have access to sources of water? Yes () No ()

28. What is the source of water for (i) domestic purpose _____

(ii) Irrigation purpose _____

29. Has there been any change since 5 years in availability of water supply for

Domestic purpose Yes () No () If yes, Increase () Decrease ()

Irrigation purpose Yes () No () If yes, Increase () Decrease ()

How long do you have to walk to fetch water?.....

30. Have you changed your consumption pattern in response to such changes? Yes ()

No () If yes, please specify the changes you have made. _____

31. Livestock holdings:

Livestock	Number

32. Are livestock (i) stall fed () (ii) grazed () (iii) both ()

33. Have there been any new diseases or changes in livestock in recent 5 years? Yes ()

No (). If yes, please specify changes and any identified cause _____

34. Your source of energy is (please tick) (i) bio-gas (ii) solar power (iii) hydro-power

(iv) fuel wood (v) others specify _____

35. How do you get fuelwood?.....

36. How long do you need to walk to fetch firewood?.....

37. What are the sources of income? Do you have any seasonal occupation?

On farm	Share of total Income	Month (season)	Off-farm	Share of total income	Month (Season)

38. What is your yearly income? _____

39. If sources of income other than agriculture, did you practice agriculture earlier?
Yes () No (). If yes, why did you abandon agriculture? _____

40. Is the income sufficient to meet the basic needs of the family? Yes() No()

41. Do you have loan and credit facilities? Yes () No ()

42. If yes, have you got loan? Yes () No () Increase () Decrease () Please specify reason for taking loan, percent of interest and source. _____

43. Do you have bank deposits or savings? Yes () No ()

44. Has the problem of food insecurity led to migration of your family members? Yes() No()

45. Has this led to conflict situation in your home? Yes() No ()

46. If yes then what type of conflict?

47. Has the migrated individual faced Trafficking and exploitation? Yes() No()

48. What has been the result of trafficking and exploitation?.....

49. If yes, then has he/she been rescued and how?

50. Are there any local organizations for

- (i) Water management _____
- (ii) Forest management _____
- (iii) Agricultural credits _____
- (iv) Disaster relief and rescue _____
- (v) Other organizations (please specify) _____

51. Are you member of any organizations?

Organization type	Membership type	Level of participation

Level of attendance: - regular, sometimes, never

52. Are you benefitting from the membership? Yes () No () If yes, what are benefits? _____

If no, why? _____

53. How do you rate performance of organization committee and why?

Organization type	Performance	Reason

Performance: Very good, good, fair, poor, very poor

54. How do you rate social welfare in your society? Very good () good () fair () poor () very poor ()

55. Do you know about any form of external support that you or community receives?

External agent	Type of support	Level of satisfaction

Level of satisfaction: High, Medium, Low

56. Have you incurred any losses to extreme climatic events? Yes () No ()

If yes, please fill in the table?

Type of Extreme climatic event	Type of loss	Year of loss	Frequency	Trend	Season/month in which it occurred

Frequency: frequently, sometimes, rarely

Trend: Increasing, stable, decreasing

57. If yes, have you recovered from the losses incurred due to disaster? Yes () No ()

If yes how long did it take you to recover? _____

If no, please explain the causes. _____

58. Are there any social practices observed during times of disasters? Yes () No ()
 If yes, please explain? _____

59. In the event , have you received any external support? Yes () No ()

60. If yes, please explain? _____

61. Were you involved in decision making process while receiving external support? Yes ()
 No ()

62. Do you have warning information on extreme climatic events? Yes () No ()
 of _____

63. Do you have insurance for your property? Yes () No ()
 If yes, for what and are you satisfied with compensation? _____
 If yes, please fill up this box:

Nature of conflict	Social practice affected	Adverse effects

64. Have there been any health problems in your family in recent years?

Family member		Health problem	Year/Duration/Frequency
Age	Sex		

65. Have any of your family members been affected by heat waves or cold waves in recent years? Yes () No (). If yes, please specify. _____

66. Have you perceived changes following changes in
 (i) Temperature Yes () No () Increase () Decrease ()
 (ii) Rainfall Yes () No () Increase () Decrease ()
 (iii) Cold waves Yes () No () Increase () Decrease ()
 (iv) Heat waves Yes () No () Increase () Decrease ()

67. Are these measures (please tick) (i) locally developed () (ii) Introduced by external organization (). If introduced and supported by external organization, please specify about organization and form of support.

68. What are the impacts of climate change on your health?

(A) Limited access to health services

(B) Increase in infectious, water borne/vector-borne diseases

(C) Maternal mortality

(D) Abortion

(E) Premature delivery

(F) Stillbirth and

(G) Low birth weight.

Checklists for FGD and KII

FGD

- Total no. of people in FGD
- Their perception about increased temperature
- Perception amount change in rainfall pattern
- Education on CC and SRHR
- Perception about impact of climate change on agriculture production
- Impact of climate change on drinking water
- Impact of climate change on water sources
- Perception about impact of climate change on food availability, food access and food utilization
- Increased work burden on women
- Impact on women health
- Types of women health problem
- Gender equality and women's empowerment
- Do they know about climate change policies like NAPA and LAPA?

KII

- Impact of climate change in the district
- Impact of climate change on agriculture production
- Impact of climate change on food security
- Impact of climate change on drinking water and water sources
- Impact of climate change on women's work burden
- How they have been implementing LAPA?

This research is an initiative of a regional partnership that are working together on building the interlinkages of climate change and SRHR. The 8 partners are from Bangladesh, Indonesia, Lao PDR, Malaysia, Maldives, Nepal, Pakistan, and the Philippines. The regional partnership generates evidence on the linkages of the issues and advocates for the integration of SRHR in climate change frameworks to advance sustainable development.

Women's Rehabilitation Centre (WOREC Nepal) is a non-governmental organization working for the protection and promotion of human rights. Established in 1991, WOREC is one of the leading national organizations that works to prevent violence against women, its causes and consequences, and to ensure economic, social and cultural well-being of women as well as other marginalized groups by promoting their access to rights and social justice. WOREC started her work with an objective to prevent trafficking of women and children and advocate for the rights of survivors, whereas in course of work, with the realization that trafficking is one among various other outcomes of women rights violations, WOREC started to work from broader perspective for women's right without losing the focus against trafficking. WOREC is the first organization in the country to introduce concept on safe migration as a tool for prevention of trafficking, and now with learnings and experiences from ground has been broadened within organization's work frame including labor rights and right to mobility as key to prevent trafficking and slavery-like practices. The strategies WOREC uses for its campaigns are orientations, sensitization, capacity building, research and evidence based advocacy.

ARROW is a regional non-profit women's NGO based in Kuala Lumpur, Malaysia, and has consultative status with the Economic and Social Council of the United Nations. Since it was established in 1993, it has been working to advance women's health, affirmative sexuality and rights, and to empower women through information and knowledge, evidence generation, advocacy, capacity building, partnership building and organisational development.

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