National Climate Change Impact Survey 2016

A Statistical Report

Government of Nepal
National Planning Commission Secretariat
Central Bureau of Statistics

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ACTION ON CLIMATE TODAY

ACT (Action on Climate Today) is a UK Department for International Development (DFID) funded initiative that aims to work in partnership with the governments of Afghanistan, Bangladesh, India, Nepal and Pakistan. Over the next two years, the programme will help these countries to integrate climate change into policies, plans and budgets, and to attract further climate change investment from the public and private sector. Managed by Oxford Policy management, ACT brings together two DFID programmes: the Climate Proofing Growth and Development (CPGD) programme and the Climate Change Innovation programme (CCIP). In Nepal, it is led by Practical Action.

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Message

It is my pleasure to note that first time a publication on the National Climate Change Impact Survey has been published by the Central Bureau of Statistics. Indeed, the Report is a great contribution to the analysis of impact of climate change in Nepal. The climate related data and information play a key role in the preparation and implementation of plans, policies, programmes and projects in the country. Furthermore, this analytical report would also provide a comprehensive picture of the climatic situation of the country and presents an important instrument for policy integration and assist in informed decision making.

As the country is committed to the Sustainable Development Goals (SDGs), this report could be important source of information to develop indicators related to some of the SDGs set.

On behalf of the National Planning Commission, I would like to extend my sincere thanks to Central Bureau of Statistics and all those who have contributed directly and indirectly in the preparation of this report.

April, 2017

Dr. Prabhu Budhathoki
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Ref. No.:

Foreword

Environment is a cross cutting issue and plays a pivotal role in achieving sustainable development goals. As it is widely acknowledged, climate change is one of the major issues of the environment management. The report of the National Climate Change Impact Survey aims to serve as a solid reference material for policy makers and professionals of the fields of environment to increase awareness and knowledge of the climate change situation of the country. The need for improvements in the field of data and statistics to monitor status and progress on the Sustainable Development Goals (SDGs) and the associated need for statistical capacity building in developing countries have been highly recognized.

The environmental problems in Nepal are as diverse as its geography and climate. The Government of Nepal has accorded high priority to environmental issues since they trigger profound and multiplier impact on the livelihood of the millions of people who depend on ecosystem services. Accordingly, the government has formulated policies, strategies and programmes keeping in mind the notion of sustainable development.

I am delighted to know that the Report on National Climate Change Impact Survey conducted by the Central Bureau of Statistics has captured almost all aspects of climate change, their imapcts on the socio-economic and other aspect of human lives and livlihoods in the context of Nepal is committed to the Post 2015 Development Agenda and SDGs and is in the course of their implementation through the 14th Three Year Periodic Plan(2073/74-2075/76). In this backdrop, it is very much expected that of this report findings of this report would be immensely useful for the government and other development stakeholders who are involved in policy arena. Likewise, the findings may be beneficial to researches associated in the relevant domain.

I would like to thank the Central Bureau of Statistics, the members of the Technical Committee and many others who in various ways contributed to the preparation of this report up to this mark.

April, 2017

Chandra Kumar Ghimire
Secretary
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Preface

The Government of Nepal is committed to combating climate change and achieving Sustainable Development Goals (SDGs). Robust indicators are prerequisite to measure the progress on government's efforts towards reducing climate change impacts and progress on development.

The Central Bureau of Statistics (CBS) conducted a National Climate Change Impact Survey (NCCIS) in 2016 to complement the Government of Nepal's initiatives in sustainable development and climate change adaptation.The survey aimed at addressing the data gap as well as providing information on climate change making it available for different users. The data obtained from the survey is expected to be useful for different initiatives in the national development plan and programs. It is also expected that the information provided by this report would be helpful for assessing impact of climate induced events on people's livelihood and their adaptive capacity.

On behalf of CBS, I would like to extend my sincere gratitude to all the respondents who generously spared their time and cooperated with us by supplying their intimate information to make the survey a success. Members of the Technical Committee have provided invaluable inputs in all phases of the survey, I am equally thankful to them.

I would like to thank Dr. Rudra Suwal, Deputy Director General of the bureau for his overall guidance and supervision of the NCCIS programme. Mr. Sushil Kumar Sharma, Director, Environment Statistics Section deserves special thanks for working hard to accomplish the tasks of the survey and bringing out this publication on time. I would like to thank Mr. Dhundi Raj Lamichhane, Director of the Environment Statistics Section for his contribution. My sincere thanks go to Mr. Dol Naraya Shrestha, Computer Officer, Statistical Officers Mr. Tulasi Prasad Paudel and Mr. Tej Kumar Darlami and Statistical Assistant Mr. Bhim Bahadur Shakha for their sincere involvement in different phases of the survey operations. Similarly, my appreciation goes to all the members of data collection teams and other personnel from CBS and Statistics Offices who contributed to the survey. I also would like to express my sincere thanks to the thematic experts team led by Mr. Madhu Sudan Gautam for their inputs in various stages of the survey.

I appreciate the funding and technical support provided by ACT—Action on Climate Today - a UK AID funded initiative led by Oxford Policy Management Limited and Practical Action in Nepal.

Finally, I would like to request all users to provide any valuable comments and suggestions for improving our publications in future.

April, 2017

Suman Raj Aryal
Director General
Central Bureau of Statistics

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Abbreviations

CBS	Central Bureau of Statistics
EFLG	Environment-Friendly Local Governance
GDP	Gross Domestic Product
GLOF	Glacial Lake Outburst Flood
GoN	Government of Nepal
Ha	Hectare
HHs	Households
IPCC	Intergovernmental Panel on Climate Change
Km	Kilometre
LAPA	Local Adaptation Plans for Action
MoPE	Ministry of Population and Environment
MW	Mega Watt
NAP	National Adaptation Plan
NAPA	National Adaptation Programme of Action
NCCIS	National Climate Change Impact Survey
NPC	National Planning Commission
NRREP	National Rural Renewable Energy Programme
NTFPs	Non Timber Forest Products
NRM	Natural Resource Management
NRs	Nepalese Rupees
PPS	Probability Proportionate to Size
PSUs	Primary Sampling Units
REDD+	Reducing Emissions from Deforestation and Forest Degradation
SDGs	Sustainable Development Goals
SLC	School Leaving Certificate
SO	Statistics Office
SPSS	Statistical Package for the Social Sciences
UNFCCC	United Nations Framework Convention on Climate Change

EXECUTIVE SUMMARY

Climate change impacts have become highly visible affecting different aspects of human society and ecosystem across the globe. Climate change impact has been experienced in different sectors in Nepal including agriculture, forests and biodiversity, water resources and energy. While several policies have been devised at the central level, effective implementation of such policies and plans at local and community level is a challenge due to limitations including lack of availability of integrated and reliable data and information on different facets of climate change impacts. Aiming to contribute on bridging such gap and making it available while needed for regular planning process, under Central Bureau of Statistics (CBS) of Government of Nepal (GoN) conducted a National Climate Change Impact Survey (NCCIS) from July to December, 2016.

The survey provides data and knowledge on impact and effect of climate change considering multiple dimensions. The data includes broad topics such as demography, household income, level of education, knowledge and perception about climate change, climate induced disasters and socioeconomic impacts, natural resources and bio-diversity (changes in the floristic behavior, water resources, invasion species, etc.), climate change and health (animals and humans), and adaptation practices (farm and off-farm) adopted by households to cope with adverse situation created due to changing climate.

For the survey, 75 districts were grouped into three ecological belts running from north to south – the mountains, the hills and the *Terai*. Each ecological belt was further divided into five development regions – eastern, central, western, mid-western and far-western region. Thus, 15 eco-development regions (or inter-regions) were formed by the cross combination of three ecological belts and five development regions. Kathmandu Valley was treated as separate stratum and as a whole 16 strata was formed. To get reliable information on climate change, households which had respondents aged 45 or above and living in the same locality for at least 25 years were only considered eligible for the survey. The survey enumerated 5,060 sample households from 253 Primary Sampling Units (PSUs) from all 16 strata of the country.

This survey shows that female population (52.40%) is higher than male population (47.60%). The total average household size was 5.05 in which percentage of male (81.65%) as household head is higher than female (18.35%). Illiterate respondents are 45.31 per cent. Similarly, agriculture is found to be the major occupation as well as main source of income of households. Majority of households (87.1%) resides within 5 km of motorable road. 88.9 per cent households reported that nearest health institution is within 5 km from their residence. Similarly, 92.1 per cent households reported that it takes up to 5 km to reach nearest high school and 69.8 per cent reported that it takes up to 5 km to reach nearest market centre. Further, 84.8 per cent households of urban area are within 5 km distance from the nearest agriculture centre whereby this figure diminishes to 59.7 per cent households in rural areas. Further result shows that 63.4 per cent households do not use any kind of machinery in agriculture.

The survey reveals that 49.33 per cent households have heard about climate change out of which 42.82 per cent households got information on climate change through radio while 27.63 per cent through television. Majority of the respondents observed that deforestation, natural disaster, and human intervention as major causes for climate change.

Overall, maximum percentage of households (86.1%) reported experiencing drought in past 25 years. Similarly, most of the households have observed change in temperature as well as decrease in monsoon duration and winter rain. Highest percentage of households (84.58%) reported the monsoon is delayed by 1 to 4 weeks while 57.14 per cent households observed delay on winter rain by 1 to four weeks.

Almost all households (99.33%) reported that they have observed increase in drought as climate induced disaster in past 25 years. Similarly, 97.69 per cent households observed increase in disease/ insects and sporadic rain. Additionally, 78.12

per cent households have observed an increase on incidence of landslides in 25 years. All the households in central mountain region reported an increase in cold wave while all of them in central hill observed a decrease in cold wave. Likewise, 56.25 per cent of eastern *Terai* households have observed an increase in hot wave whereas none in eastern hill reported so.

Similarly, 100 per cent of sub-alpine households perceived an increase in drought, landslide, avalanche, and Disease/insect whereby majority (64.05%) in temperate zone observed an increase in fire in settlement in the last 25 years.

The survey reveals that maximum households (60.25%) have observed new Disease emerging on crops. Moreover, maximum households (66.09%) observed appearance of new insects. Similarly, 45.98 per cent households observed appearance of new Disease in livestock. Furthermore, nearly one fifth (18.59%) of the households stated that they frequently suffer from vector borne Disease whereas one fifth (20.67%) of the households are suffering from waterborne Disease.

The survey result shows that 74.29 per cent of total households have observed changes in water sources whereby 84.47 per cent observed decrease in amount of surface water. On the other hand, 79.64 per cent households in urban area and 68.12 per cent in rural area reported decrease in water quality. Likewise, majority of households (74.56%) in mountain region have reported complete drying up of surface water and high percentage (48.81%) in hill area observed complete drying up of the underground water sources. Such changes in water sources have been reported due to insufficient rainfall. Majority of households from all climatic zones perceived that trees, shrubs, medicinal herbs, non-timber products, aquatic animals, aquatic plants, wild animals, and birds are decreasing whereas grass and insects are increasing.

Majority of households have reported an increase in invasive species of shrubs. Highest percentage of households (92.03%) observed invasive creepers in agricultural land among which 92.03 per cent of households perceived that it has contributed to decrease in their income. Highest proportion of households of first quintile (86.3%) and fifth quintile (89.8%) income group reported that creepers on land have decreased household income. Households opined that those invasive species have spread due to natural causes rather than human activities.

Likewise, majority of households across all regions and strata observed early flowering/fruiting of plants. Across all the climatic zones, 50.63 per cent of households observed early flowering/fruiting in fruit species in temperate zone followed by 40.83 per cent in sub-tropical.

Only 20.61 per cent households reported that touristic sites lie in their areas out of which 95 per cent households have reported having touristic sites from sub-alpine zone. Majority of households (62.68%) have observed an increase in the number of tourists in the last 25 years. Households who observed a decrease in length of stay of tourists have opined that lack of proper hotel facilities is the major reason for such decrease.

The survey result demonstrates that households have been adopting various climate change adaptation measures during the past 25 years. Among the 25 farm and 7 off-farm based adaptation measures identified, most of the households reported use of chemical fertilisers, additional investment to protect livestock from Disease, mixed cropping, and trying to cultivate improved crops varieties. Majority of rural households have been using more adaptation practices in comparison to urban households. Whereas more households of urban setting are seen adopting several adaptation techniques. Among the urban households, 13.9 per cent received skill development trainings; only 1 per cent insured agricultural crops and 5 per cent relied only on livestock as adaptation measure. The highest proportion of illiterate (65.46%) and first quintile (69.38%) respondents reported using chemical fertiliser in their farmland as adaptation measure.

Majority of households have also taken different off-farm based adaptation techniques. A total of 70.64 per cent households reported that they have changed the food consumption habit to adapt to climate change impacts while 49.86 per cent have involved in road infrastructure improvement whereas 56.72 per cent engaged in community based natural resource management.

CHAPTER 1

INTRODUCTION

Climate change impacts have become highly visible affecting different aspects of human society and ecosystem across the globe. Rapid increase in earth's surface temperature and changing precipitation pattern has resulted in direct implication to multiple sectors and livelihood of communities. The poorest and vulnerable people are being affected the most.

The Intergovernmental Panel on Climate Change (IPCC) has predicted 3.7 to 4.8 °C of warming if the business as usual continues (IPCC, 2014). The continuous increase in greenhouse gas emission due to anthropogenic pressure would further amplify the rate of increase in temperature and intensify the frequency of extreme weather events including floods, droughts, changing rainfall pattern, water resources depletion, and severe heat/cold waves. It has posed the global communities specially the poorest households more vulnerable to climate change.

A number of international intergovernmental policy instruments have been set up to tackle climate risks and hazards. These initiatives include establishment of IPCC, enforcement of United Nations Framework Convention on Climate Change (UNFCCC), and its subsequent decisions including the Paris Agreement in 2015.

Nepal has experienced direct impacts of climate change and is one of the most vulnerable countries to climate change in the world. The data trend from 1975 to 2005 shows that the mean annual temperature has been increasing by 0.06 °C while the mean rainfall has been decreasing by 3.7 mm (-3.2%) per month per decade (MoPE, 2016). Similarly, mean annual temperature is predicted to be increased between 1.3 °C to 3.8 °C by the 2060's and 1.8 °C to 5.8 °C by the 2090's while annual precipitation could reduce by the range of 10 to 20 per cent across the country (MoPE, 2010).

Climate change impact has been experienced in different sectors in Nepal. One of the visible impacts is observed in the glaciers and glacial lakes in the Himalayas which are changing in an unprecedented rate. Studies have shown that Himalayan glaciers are retreating fast with the annual rate of about 10 to 60 m that has caused vanishing of small glaciers of less than 0.2 km^2. Similarly, change in different climatic variables has caused increased frequency of disasters including flash floods posing more than 1.9 million people to high vulnerability and exposing additional 10 million people to the risks of climate induced disasters (MoPE, 2012).

Climate change has also wide range of impacts on other natural resources and biodiversity causing threats to forest conservation, species extinction and occurrence of pests and Disease (IPCC, 2007). It has further amplified impacts on health sector; extended scope and increase in the frequencies of vectorborne Disease such as typhoid, malaria, encephalitis, dengue, and meningitis (IIED, 2008). It has further claimed that different waterborne Disease such as typhoid, cholera and other diarrheal Disease are being more frequent mainly due to extreme drought, flooding, and poor sanitation (IIED, 2008). Moreover, change in rainfall pattern, insufficient water supply for crops, extreme weather incidents, spread of pests and crop Disease have been directly affecting agricultural crops production and hence on food security. The Economic Impact Assessment of Climate Change in Key Sectors (2013) has estimate that the current climate variability and extreme events has costs equivalent to 1.5 to 2 per cent of current GDP (approximately $ 270 to 360 million a year) and much higher in extreme years[1].

Nepal government has devised a number of policy instruments to enhance community resiliency along with contribution to reduce greenhouse gas emission. The government, with the leadership of Ministry of Population and Environment (MoPE) as the focal ministry for climate change, has developed National Adaptation Programme of Action (NAPA) to Climate Change (2010) to address the most urgent and immediate needs for adaptation followed by National Framework on

[1] See: https://cdkn.org/wp-content/uploads/2013/01/Inception-Report-vs-8-summaryfinall.pdf

Local Adaptation Plans for Action (LAPA) (2011) to ensure integration of adaptation and resilience into local to national planning processes, and Climate Change Policy (2011). Moreover, Climate Change Budget Code has been introduced in 2012 aiming to promote integration of climate change issues in budget and expenditure management (NPC, 2012)[2]. Meanwhile, different sectors strategies and policy documents including National Rural Renewable Energy Programme (NRREP) (2011), Forestry Sector Strategy (2016-2025), Nepal Biodiversity Strategy and Action Plan (2014-2020), Environment-Friendly Local Governance (EFLG) Framework (2013), and Environment-Friendly Vehicle and Transport Policy (2014) have been developed to contribute to climate change mitigation, adaptation and integration. Whilst, additional sectoral policy instruments such as National Reducing Emissions from Deforestation and Forest Degradation (REDD+) Strategy and Low Carbon Economic Development Strategy (LCEDS) are on the finalisation process. Nepal has launched a process to formulate and implement National Adaptation Plan (NAP) to address medium and long-term adaptation options.

While several policies have been devised at the central level, effective implementation of such policies and plans at local and community level is a challenge due to various limitations including lack of availability of integrated and reliable data and information on different facets of climate change impacts. Aiming to contribute on bridging such gap and avail reliable data and information for regular planning process, CBS of Nepal has conducted a National Climate Change Impact Survey (NCCIS) from July to December, 2016. The data is expected to be the milestone to integrate climate change initiatives in the national development program, evidence based adaptation plan formulation, and financing adaptation programmes.

This survey report is organised in ten chapters. Followed by this introductory chapter, chapter two offers brief thematic review and associated indicators that are part of survey questionnaire. Chapter three encompasses a detail methodological explanation. Chapter four offers demographic and socioeconomic characteristics. This chapter captures the information related to age, sex, occupation, household services, landholding information, and access to socioeconomic services of the households. Chapter five presents perception on climate change. It presents the survey results whether respondents have heard about climate change and the source of such information. It also presents respondents' observation on change on different climatic variables. Similarly, chapter six presents survey result on climate induced disasters and impact. Moreover, chapter seven, eight and nine depicts climate change impacts on health, natural resources, and tourism sectors respectively. Lastly, chapter 10 offers different farm and off-farm adaptation measures being adopted by the households.

[2] http://www.npc.gov.np/images/category/Climate-change-budget-code.pdf

CHAPTER 2

THEMATIC SECTORS

Climate change impacts different socioeconomic activities and services. The NCCIS considered eight thematic sectors based on their importance in Nepal as climate sensitive sectors. The thematic sectors includes: Water Resources and Energy, Health, Forest, Agriculture, Disaster, Tourism, Gender and Urban sectors. The indicators for all these thematic sectors were reviewed and integrated in the survey questionnaire. This chapter presents brief overview of impact of climate change in the thematic sectors which is followed by discussion of broad indicators included in the survey relevant to impact of climate change.

Water Resources and Energy

IPCC (2007) stated, "Water and its availability and quality will be the main pressures on, and issues for, societies and the environment under climate change." Extreme climatic events like droughts, flooding, and erratic rainfall have a severe impact on availability and usability of water resources. In Nepal, water resources are depleting and the quality of available water is deteriorating. Over 5,500 glaciers and glacier lakes of Nepal Himalayas (WECS, 2011) are under threat of a total meltdown within this century if the present situation of climate change persists (Chaulagain, 2009).

With climate change, more precipitation rather than snow is expected and more droughts will be observed. According to the precipitation trend analysis in Nepal, there is no definite trend in the annual precipitation amount, but the national annual average precipitation is decreasing at the rate of 9.8 mm per decade[3]. Overall 80 per cent of annual precipitation occurs during monsoon season (June to September) whilst winter season (December to February) is the driest of all with 3.5 per cent annual precipitation (WECS, 2011). This results in frequent water shortages. Likewise, as rain flows faster than melting snow, higher levels of soil moisture and groundwater recharge are less likely to occur augmenting the water scarcity. This will severely impact every other economic sector from agriculture to industry to daily sustenance.

Climate change impact on water resources is directly linked to the energy sector, particularly hydropower development in context of Nepal. As most of the hydropower plants in Nepal are designed based on 65 per cent dependability on flow of rivers, impact of climate change will have adverse effects on the energy sector.

In this survey, changes in the different water sources and water quality as observed by the respondents are captured. In addition to the changes observed by the respondents, this survey includes the lived experiences of reasons of change. Results on change in water sources are produced for various analytical domains that provide comparison across the domains.

Health

Climate change affects the social and environmental determinants of health such as clean air, safe drinking water, sufficient food, and secure shelter. Nepal is vulnerable to health impacts of climate change as the country has low adaptive capacity due to weak health infrastructure and services. Researches show that deaths and morbidity associated with extreme and erratic weather are increasing in Nepal.

There have been outbreaks of malaria, Kala-azar, and Japanese encephalitis in the country side of Nepal and all seem to be associated with changes in temperature (Regmi et. al., 2008). Respiratory allergies such as asthma and reactive airway Disease have become more prevalent because of increased human exposure to pollen due to altered growing seasons, molds from extreme or more frequent precipitation and air pollutant dusts by droughts. A study conducted at the Patan Hospital at Lalitpur, Nepal showed that typhoid fever has strong relation with increased temperature and is in proliferating trend. This shows alarming trend of climate change impact on human health and wellbeing.

[3] See: http://www.wecs.gov.np/uploaded/water-recource-climate-change.pdf

The survey included impact of climate change on human health, crops and livestock. The incidences of climate induced Disease are recorded for the past 25 years' period. In case of human health, incidence of vector borne and waterborne Disease and their names are recorded. While in crops and livestock, survey captured the emergence of new Disease, pests or insects and their names. The data so obtained is used to estimate the percentage response across the analytical domains.

Forest

Nepal is already observing visible consequences of climate change in its forest and ecosystem. Climate change has impacted both plant and animal biodiversity. Forest ecosystem has been impacted much due to increased dryness in temperature. It has resulted in increasing forest fire incidents destroying forest products such as timber, fuel wood, Non Timber Forest Products (NTFPs), wildlife and plants. Likewise, physical disturbance in forests and biodiversity occurring from erratic rain, landslides and erosion has further altered natural life cycles of plants as well as animal biodiversity.

It is also observed that wild life which normally comes down in low altitude grass land in winter is retained in high altitude due to rise in temperature in such areas which favors growth of grasses even in winter. Similarly, rangeland ecosystem is also impacted from reduced availability of NTFPs due to drought and rise in temperature, in high altitude grasslands. Local communities have experienced availability of less herbs and NTFPs in grasslands. As a result, livestock, wild lives and local communities depending on those resources are affected.

In this survey, impact of climate change on forest based biodiversity is included. This comprises of information on declining and increasing plant and animal species. In addition to this, information on appearance of new species and those which have extinct are also incorporated. Changes in the fruiting or flowering pattern of various plant species are also part of this study. Furthermore, incidences of infestation of invasive plant species are also included.

Agriculture

The impact of climate change in agriculture has directly affected economy and lives of people in Nepal. Research studies have shown mixed immediate effect of climate change in agricultural production in Nepal. For instance, while increase in temperature leads to damage on agricultural production in low land (*Terai* region), rising temperature has resulted in high yield in high land (hills and mountains). Experiments have shown that enriched CO_2 level has positive impact in major crops production like rice and wheat in all geographical regions of Nepal. On the other hand, studies reveal that increase in temperature and CO_2 levels can lead to hunger problems in future by lowering essential nutrient contents in crops (Malla, 2008). Similarly, climate change particularly rising temperature would affect health of livestock which is an integral part of agriculture sector. Smallholder farmers in agriculture sector are likely to be worse impacted due to projected climate change in future. Smallholders tend to have poor livelihood assets, generate low income, have less education/ awareness and limited access to agro-services. They are mostly rely on rain-fed agriculture and hold land prone to climatic hazards like floods, landslides, and drought.

There is no separate section of agriculture included in this survey. However, the impact of climate induced disasters in crops and livestock is addressed. The loss in agriculture due to climate induced disasters during past five years is covered in the survey. Respondents stated valuation of loss in Nepalese currency is captured in this study. Survey also includes information on 'farm and off-farm based adaptation measures' adapted by the households.

Disaster

The incidence of climate induced disaster such as (floods, landslides, drought, Disease, etc.) are increasing and becoming unpredictable. Data show that climate induced disasters claimed more than 4,000 lives during last 10 years which added economic loss of up to nearly USD 5.34 billion (MoPE 2010)[4]. The impact is differential across

[4] http://www.mope.gov.np/download/Newsletter%20NAPA.pdf.fb8f3b6cd4017fc4c302e535eb4e8bff , Accessed February 10, 2017

gender and different socioeconomic groups. The key sectors that are affected or have potential to be affected by climate induced disasters in Nepal include agriculture, health, water and energy use, infrastructures, biodiversity, ecosystem services, and tourism.

In this survey climate induced disasters or events and their impacts are considered. These include flood, landslide, inundation, inferno, drought, cold waves, hot waves, storm, and Disease, among others. Information on changes in these climate induced events over the period of 25 years is covered. The impact of any of these events over the period of 5 years is captured. The stated loss in agriculture and business is then valuated in Nepalese currency.

Tourism

Climate change poses more risks in global tourism. Tourism has intrinsic relation with climate particularly the nature based tourism. Most of the nature based tourism activities in the Himalayas are weather sensitive. For example, rain and foggy conditions significantly decrease the quality of the trekking experience in the Himalaya (Neupane and Chhetri, 2009). Frequent changes on climatic variables has adverse impact on tourism as tourists might change the travel pattern or destination in future if weather continues affecting their travel plans. Likewise, climate change is expected to increase the risk of illness while travelling and consequently discourage tourism.

The household level information on tourism was difficult to capture in this survey. However, based on information from the respondents, changes in flow of tourist and length of stay are affected which is also included in this survey. Further, factors affecting change in length of stay are also covered.

Gender

It is widely accepted that climate change affects women and men differently because of socially driven roles and responsibilities. Accelerated climate change impact has intense impact on women's health, livelihoods and gender roles. NAPA 2010 states that womens' access to water resources would decrease, leading to an increase in their workload with detrimental effects on their reproductive health. It also states that climate induced resource conflicts increase social violence, anxiety and depression in women. The effect of climate change on agriculture and migration of men in search of better income result in women taking on additional burdens.

Gender related data in this survey has been assessed at the respondent level. Gender is one of the analytical domains. The impact of climate change on various sectors, such as, health, water sources, forest, and agriculture, among other is analysed based on gender of the respondent. This provides the gender differentiated information of climate change and its impact.

Urban

Nepal is one of the fastest urbanising countries in South Asia. Urban centres are the places of most economic activity. In the face of extreme weather, cities and towns are most vulnerable places.

In this survey, urban areas are considered as one of the analytical domains. The data on climate change and its impact is assessed across the rural and urban areas. The differentiated data on climate change across rural and urban area is analysed in each of the chapters.

CHAPTER 3

METHODOLOGY

3.1. Introduction

The CBS, for the first time, conducted NCCIS whose specific aim is to understand impacts and effects of climate change on social, economic and environmental dynamics at national level. The survey is a milestone towards addressing data gaps, strengthening information on climate change and making it available for use of information for regular plan and programme development. It allows possibilities to integrate climate change data in national socioeconomic statistics being undertaken by CBS like decennial population census, agriculture census, residing standard surveys, labor force surveys, among others. The survey also tries to establish linkages with indicators related to climate change and environment in Sustainable Development goals (SDGs).

3.2. Objectives of the Survey

The major objectives of the NCCIS include:

1. Understanding and acquiring knowledge on effects and impact of climate change from socioeconomic and environmental perspective
2. Exploring how the respondents are developing or making adoptive capacity to confront the impact of climate change and
3. Establishing linkage of climate change and environment related indicators with the SDG (Goal 13) for taking urgent action to combat climate change and its impact

3.3. Survey Framework

Climate change is leading to an increase in frequency and severity of hazards and stresses, with detrimental effects on livelihoods, and an increasing frequency of disasters. In addition, climate change impacts bring gradual changes to seasonal patterns and intensify pests and Disease that directly affect livelihood, especially farming, and which are perhaps too complex for those who are most vulnerable to understand. Facing this uncertainty about what the future might bring, people struggle to adapt to the changes in their environment.

With the uncertainty brought about by climate change for its impact on national development efforts, academic and development practitioners are using different approaches to assess climate impacts and understand vulnerability to livelihoods building on earlier work on disaster risk reduction, food security, poverty analysis, sustainable livelihoods and related fields. The relevance of livelihoods, disaster and climate risk management approaches to understand and address the impacts of climate change is therefore becoming increasingly clear. With the IPCC third assessment report in 2001, the definition of vulnerability and understanding impact of climate change have gained rapid attention in number of evolving assessment methods framed at being consistent with the determinants proposed.

The IPCC defines, “vulnerability as the degree to which a system is susceptible to or unable to cope with, adverse effects of climate change, including climate variability and extremes. It is a function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity’” (IPCC, 2001). In simpler term, vulnerability is the function of exposure, sensitivity and adaptive capacity in which

Exposure refers to the nature and degree to which a system is exposed to significant climatic variations. The climate variation includes average climate change and the extreme climate variability.

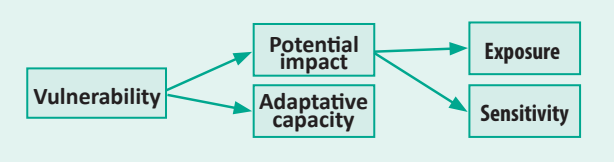
Sensitivity refers to the degree to which a system is affected, either adversely or beneficially, by climate related stimuli. The effect may be direct (e.g. a change in crop yield in response to a change in the mean, range, or variability of temperature or damages caused by an increase in the frequency of coastal flooding due to sea level rise (IPCC, 2007).

Adaptive Capacity refers to the ability of a system (in this report the “household” or “community”) to adjust to climate change (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities, or to cope with the consequences (IPCC, 2007).

Adaptive capacity (A) of a system helps the system to adjust to climate change and moderate the impacts of climate change. The more a community (system) is endowed with resources, has access to and control over resources, the more it has the capacity to adjust to climate change and moderate the impacts of climate change. Community resources can be assessed through assessment of livelihood assets of the community.

Adaptive capacity can also be understood as the ability to shift strategies as conditions change and as pre-existing livelihoods, ecosystems, institutions, infrastructure, among others no longer provide the services on which system depends upon.

Figure 3-1: Household Level Climate Change Vulnerability and Its Defining Concept



(Source: Modified from Allen Consulting, 2005)

Understanding vulnerability and its impact is complex and has many dimensions: economic, social, demographic, political, and psychological that can have overlapping effects that pose difficulty to precisely confirm the cause and effect relationship. The NCCIS considered capturing vulnerability observed at the household level depending upon specific socioeconomics situations. The vulnerability aspect at the household level is derived from potential impacts of climate change and their adaptive capacity to respond to the impact (Figure 3-1).

3.4. Survey Scope

The survey provides data and knowledge on impact and effect of climate change considering multiple dimensions. The survey covers broad topics such as demography, household income, level of education, knowledge and perception about climate change, climate induced disasters and impacts (socioeconomic), natural resources and biodiversity (changes in the floristic behavior, water resources, invasion species, etc.), climate change and health (animals and humans), and adaptation practices (farm and off-farm) adopted by households to cope with adverse situation created due to changing climate.

3.5. Statistical Unit

The statistical unit or enumeration unit of the survey is basic entity for which the required data items are covered. The NCCIS is a household survey and its enumeration unit is the household. The definition of a household for the survey is primarily adopted from the guidelines laid down by the United Nations in its "Principles and Recommendations for Population and Housing Censuses, (UN, 2008). According to the guidelines, the concept of household is based on the "arrangements made by persons, individually or in groups, for providing themselves with food or other essentials for residing". A household may consist of one person or a group of two or more persons. The persons in the group may pool their incomes, may have a common budget, may be related, unrelated or may constitute a combination of persons both related and unrelated.

3.6. Coverage

The survey covers the whole country, including both rural and urban areas. Nepal is divided into 75 administrative districts. These 75 districts are grouped into three ecological belts running from north to south – the mountains, the hills and the *Terai*. Each ecological belt is further divided into five development regions – eastern, central, western, mid-western and far-western region. Thus 15 eco-development regions (or inter-regions) are formed by the cross combination of three ecological belts and five development regions. Kathmandu Valley is treated as separate domain so the total of 16 major analytical domains was formed.

NCCIS is a special survey in which the information of long period of time is required. Hence, all households in the country were not considered eligible for selection in the survey. Those households which had the respondent aged 45 or more and residing in that locality since 25 years are only considered eligible. The household members were determined on the basis of usual location of their residence.

The survey enumerated 5,060 households from 253 PSUs from all 16 analytical domains of the country.

3.7. Sample Design

Introduction

The survey collected both quantitative and qualitative data based on sample selection strategy adopted for this survey (see below for sample

selection strategy). Firstly, questionnaire was delivered to the households, where the eligible household member responded on behalf of the household. Secondly, the open checklist was given to the respondent that captured qualitative information not included in the questionnaire survey. On the basis of the response, enumerators captured similar or distinct qualitative information for each of the PSU. Qualitative information was captured basically on change on climate parameters (perception), impact of climate change on various sectors and adaptation practices of the households that was not derived from quantitative part.

Population of Interest

Before adopting sample selection strategy, the population of interest to meet the survey objectives was determined. In case of NCCIS, the 2,996,516 household populations (as of 2016, July to November) of Nepal were of interest for the survey and thus included in the sample frame. The following sections will provide description on selection process of the representative sample of household for the entire country.

Level of Interest

Each five development regions of Nepal was divided into three ecological belt areas – *Terai*, mountain and hill. This survey produced results for each of the ecological belts (ecobelts) within each development regions, resulting in 15 areas of interest. Kathmandu Valley, located in the Central development region, was treated separately.

This has generated results for 16 different geographical areas across Nepal:

1) Kathmandu Valley
2) Central *Terai*
3) Central Mountain
4) Central Hill
5) Eastern *Terai*
6) Eastern Mountain
7) Eastern Hill
8) Far-western *Terai*
9) Far-western Mountain
10) Far-western Hill
11) Mid-western *Terai*
12) Mid-western Mountain
13) Mid-western Hill
14) Western *Terai*
15) Western Mountain
16) Western Hill

Each of these 16 areas is referred as a domain of interest, for which survey estimate was produced.

Sample Size and Allocation

Total sample size of this survey was 5,060 households. In order to ensure suitable level of accuracy for each domain of interest, smaller domains (with respect to the number of households) received a higher sample fraction than larger domains. This was achieved by allocating 5,000 samples proportional to the square root of the population of each domain.

Rounding of the sample was then applied to enable workloads of 20 households per selected PSU (see the following sample selection table 3-1), which was then modified further so that domains which had more than one village selected, had an equal number of PSU selected from each to ensure equal probability of selection of households within each domain. The resulting sample can be seen in the following Table 3-1:

Table 3-1: Sample in Different Domain for NCCIS, 2016

Domain	Household	SQRT (HH)	Sample	Rdd Sample	Cluster	Final Cluster	Final Sample (HH)
Kathmandu Valley	326512	571	337	340	17	17	340
Central Hill	688253	830	489	480	24	24	480
Central Mountain	122034	349	206	200	10	10	200
Central *Terai*	825439	909	535	540	27	28	560
Eastern Hill	346373	589	347	340	17	18	360
Eastern Mountain	84844	291	172	180	9	9	180
Eastern *Terai*	799526	894	527	520	26	26	520
Far-western Hill	161891	402	237	240	12	12	240
Far-western Mountain	83265	289	170	180	9	9	180
Far-western *Terai*	224547	474	279	280	14	14	280
Mid-western Hill	332025	576	339	340	17	18	360
Mid-western Mountain	68802	262	154	160	8	8	160
Mid-western *Terai*	294187	542	319	320	16	16	320
Western Hill	676987	823	485	480	24	24	480
Western Mountain	4753	69	41	40	2	2	40
Western *Terai*	383859	620	365	360	18	18	360
Total	**5423297**	**8490**	**5002**	**5000**	**250**	**253**	**5060**

Sample Selection

The sample selection strategy adopted for the NCCIS was done in three stages:

Stage 1: Selection of Districts
Stage 2: Selection of PSU
Stage 3: Selection of Households

The process was applied for each of 16 domains separately which were treated as a stratum. Independent samples in each stratum were selected.

Stage 1: Selection of Districts

Sample of the districts was selected from each of the 16 stratum/domains of interest. The number of districts selected from each domain was dependent on the number of districts in each domain. The number of selections was as follows: domains with 2 to 4 districts (1 selection), domains with 5 to 7 districts (2 selections), domains with 8 to 10 districts (3 selections) and domains with 11 plus districts (4 selections). This resulted in 26 districts in total selected for the survey.

The sample selection procedure adopted for the first stage was Probability Proportional to Size (PPS) sampling, where the size measure adopted for each was the number of expected households in that district. This resulted in districts with larger numbers of households having more chance of being selected in the survey, which was offset by a smaller sampling fraction being applied later in the process for these larger districts.

Stage 2: Selection of PSU

Once districts with the 16 domains were selected, a sample of PSUs was chosen to represent each district. The number of PSUs selected from each district was determined by dividing the number of households to be selected in each domain by 20 (which was the cluster size - see next step for more detail), divided by the number of districts selected in that domain. For example, the central hill domain had the following situation:

Central Hill

Total number of households in population= 6,88,253
Total number of households in sample= 480
Number of districts selected in sample = 3
Number of wards to be selected from each district = 480 / 20 * 3 = 8

The sample selection procedure adopted for this stage was once again PPS sampling, with the size measure being the number of households within each PSU. In total, 253 PSUs were selected as sample across Nepal from 26 districts.

Stage 3: Selection of Households

Before selection of households, a household listing was produced from each selected PSU. Listing was based on the eligibility of households i.e. potential respondent was 45 years or older and residing in the community for at least 25 years. Large PSUs were sub-divided into more manageable size and one of these sub-divided PSU was selected to represent the whole PSU using PPS sampling. As a rule of thumb, PSUs with more than 500 households were sub-divided into smaller units. Likewise, the interval was run through the list in a systematic manner to select 20 households from each, which represents an enumerator workload for that area. The skip for each area was simply the number of households in that area divided by 20. A random start between one and the interval was also generated to determine the starting point of the selection process in each area.

Justification of Sampling Method

The sampling approach adopted in this survey is a common approach adopted for household surveys as it ensures that the households have roughly the same chance of selection within each domain. Given the 16 domains have quite different sample fractions based on their size (with respect to HHs), the probability of selection of households differs a lot from one domain to another, but it should be similar within domains which is a good property to have for a survey of this nature.

3.8. Weights

As addressed in the above coverage section, not all households of Nepal were considered in scope of the survey. The survey was administered to only those households which had an occupant that met both the following two criteria:

a) Was 45 years of age or older
b) Had lived in the area for 25 years or more

As such, the population of interest for the survey is only those households which met these criteria, and as such, weights were generated to reflect this population only. Similarly, the computational procedure was adopted for calculating the household weights.

Initial Set of Weights

For the sample design adopted for this survey, three stages of sample selection process were adopted: selection of districts, selection of PSUs, and selection of households. Similarly, the probability of a household being selected in the survey was computed by multiplying the probability of the district being selected at stage one, by the probability of PSU being selected at stage two, and by probability of the household being selected at stage three, as such:

Pr(HH selection) = Pr (*PSU selection* at stage 1)
* Pr(*PSU selction* at stage 2)
*Pr(*HH selction* at stage 3)

The inverse of this probability was used as the starting point for the weight:

Weight= 1/Pr (HH selction)

In order to accommodate the probabilities of selection of each household in the weight calculations two factors were applied. The first factor was to adjust number of households across Nepal since the last population census in 2011. The second factor was to account for the fact that survey's population of interest is only those households in Nepal which had a member aged 45 years and above, and residing in the area for at least 25 years.

Factor 1: Adjusting Growth Since 2011 Census

To estimate the amount of growth that had taken place since 2011 population census, simple projections were computed assuming that the same growth rate witnessed between 2001 and 2011 population censuses continued on 2016 when the climate change survey was conducted. A factor to account for this growth since 2011 census was then applied to the weights at the stratum level, to reflect a more realistic population of households in 2016. This factor was calculated as follows:

$$F1=\text{Growth factor}=\frac{\text{Estimated number of households in 2016}}{\text{Actual number of households in 2011}}$$

Factor 2: Adjusting for all Households not Being in Scope

As mentioned above only those households with a member aged 45 years and above, and lived in the area for at least 25 years, were included in the survey. To adjust with this reduced scope, another factor was applied to the weights for the fact that only a proportion of households across Nepal met this criterion. To estimate the proportion of households which were in scope, interviewers undertaking the listing exercise in the field first listed all households in the selected PSU, and then flagged those households which were in scope of the survey. A sample of 20 households was then chosen from those households which were in scope of survey.

The adjustment factor to reduce the weights for a smaller in-scope population was generated at the PSU level, and calculated as follows:

$$F2=\text{scope reduction factor}=\frac{\text{estimated number of households in PSU}}{\text{number of households in PSU}}$$

Final Set of Weights Adopted For the Survey

The final weights applied to the household survey data was computed separately for each PSU and calculated as follows:

$$\text{Weight}_{\text{final(HH)}} = \text{Weight}_{\text{initial(HH)}} * (F1 * F2)$$

Using this approach to derive the household weight resulted in the sum of weights for all 5,060 households selected in the survey coming to 2,996,516. This means it was estimated that approximately 3 million households across Nepal met the criteria of having at least one person 45 years and above who had lived in the area for 25 years or more, at the time of the climate change survey in late 2016.

3.9. Pre Survey Activities

Pilot Survey

A set of questionnaire was developed and the pilot survey was conducted in five districts. The criteria for selection of the district for pilot survey were as follows:

1. One district from each of the five development region
2. Survey area from the ecological zone (Mountain, Hill and *Terai*)
3. Districts were identified referring to district vulnerability mapping in NAPA.

The pilot survey was carried out in five districts (Kathmandu, Saptari, Mustang, Dailekh and Kailali) utilising above criteria. The following procedures were used for the pilot survey:

- Purposive selection of 10 VDCs/Municipalities from each district;
- Five households were surveyed from each VDC/ municipalities
- A total of 250 households were surveyed;
- In addition, two representatives from organisations (government or non-government) working in the environment sector were also surveyed.

The data obtained from pilot survey was analysed and survey report was developed for the internal purpose. The feedback of the pilot survey was incorporated in full scale survey.

Survey Questionnaires

Firstly, a draft questionnaire was developed based on the questionnaire used in pilot survey. The following activities were undertaken to finalise the questionnaire:

Desk Review of the Pilot Survey Questionnaire

The pilot survey questionnaire was reviewed by the survey team of the environment section in CBS and by subject experts in light of available climate related documents.

Intensive Workshop

In order to reach consensus on reliable and improvised provision of data generation on vulnerability, and finalise the theme based questionnaire, the survey team conducted a one day intensive workshop with thematic experts. Feedback and comments from the workshops were reflected in finalising the questionnaire.

Thematic Workshop

There are eight thematic areas on the questionnaire. A series of workshops and meetings were conducted to finalise the respective thematic questionnaire.

International Expert Review

The revised climate change survey questionnaire was sent to international climate change expert for review and input. The input was used to revise and finalise the questionnaire.

Pre-test of the Questionnaire

The questionnaire was pre-tested to examine its overall performance. The pre-test examined the time required to complete the interview. It also tested its reliability by examining whether the questionnaire captured the desired information as well as consistency by checking whether the collected information serves the purpose of the survey. The pre-test was also utilised to assess the logistics required for the survey.

The questionnaire was pre-tested several times to assess its usage under actual field conditions in various parts of the country comprising mountain, hill and *Terai.* Both paper based and tablet based pre-test of questionnaire was conducted in sample districts and some inconsistences observed in the questionnaire were corrected after the pre-test.

Finalisation of the Questionnaire

Following the pre-tests and feedbacks obtained from potential data users and subject experts, the questionnaire was tabled at the technical committee for approval. The committee provided final observations and opinions, which were subsequently addressed and the questionnaire was finalised.

Manual Preparation

The manual was drafted at the time of pre-test as a survey guideline for field work. The manual aimed to clarify concepts, content, and terms used in questionnaire for understanding of the enumerators, supervisor, and respondents. It was modified incorporating the feedback from pre-test and finalised after the questionnaire was endorsed by the technical committee.

3.10. Field Work Organisation

Training Program

A total of 36 field staffs were trained for the survey through 33 Statistics Offices (SOs). The comprehensive five day training was conduted in June 2016 in Lumle, Kaski District. Different methods of training were adopted including reflection of the questionnaire and reference manual, classroom sessions, class exercise sessions, mock interviews, field visits, practices and discussion sessions.

Selection of the Enumerators

Fifteen field teams collected data from the field. Each team consisted of 2 enumerators and covered 15 to 20 PSUs. Each team was equipped with two tablets, power packs, and other logistics required in the field. Additional six enumerators were kept in reserve for replacement if required. Each team was responsible for a particular area of the country. The teams were based in appropriate SO of the CBS.

Data Collection and Supervision

The data collection was primarily based on recall method. The respondents provided information related to change in temperature, precipitation, and seasonal shift in the last 25 years and that on the impact of climate induced disasters in last 5 years.

The data collection was undertaken between July and December of 2016. There were 15 field teams/groups, each with two enumerators from the SOs. During the survey period, the field work was constantly supervised and monitored by the core team members. Supervision was done at two levels. The CBS had the central supervision team. A list of instructions was prepared for the central supervision. Similarly, the chief of the SOs was also the supervisor at field. A supervision form was developed for field supervision.

Enumeration areas were assigned to the enumerators in three phases. After completing first phase, a three day mid-term review was conducted for reflection and quality control in next phases of the survey.

3.11. Data Management

Data collection was carried out using tablets so there was no extra time needed for data entry. The data entry program was pre-designed for controlling and avoiding errors of the data collection. The process of real time entry of data in the field reduced time lag between data collection and processing. After completion of the survey from each PSU, the data was synced to national server. The synced data was then transformed into Statistical Package for the Social Sciences (SPSS) and Stata database for further editing and analysis. The appropriate coding was also assigned to the qualitative data generated during the survey.

The final data set was used to estimate percentage and frequency tables for each of analytical domains.

3.12. Analytical Domains

The survey provides estimate of the following 16 eco-development regions called the analytical domains of the country.

Table 3-2: Eco-Development Regions as the Analytical Domain

Mountain	Hill	*Terai*
1. Eastern Mountain	2. Eastern Hill	3. Eastern *Terai*
4. Central Mountain	5. Central Hill	6. Central *Terai*
7. Western Mountain	8. Western Hill	9. Western *Terai*
10. Mid-western Mountain	11. Mid-western Hill	12. Mid-western *Terai*
13. Far-Western Mountain	14. Far-western Hill	15. Far-western *Terai*
16. Kathmandu Valley		

Aiming to capture Nepal's diverse climatic variations and vulnerabilities, **additional analytical domains** were included. These additional analytical domains are based on NAPA climate vulnerability mapping (MoE, 2010) and bio-climatic zones. The details of additional domains are given in the Table 3-3.

Table 3-3: Additional Analytical Domain

NAPA Combined vulnerability Index	Very high	High	Moderate	Low	Very low
	(0.787-1.000)	0.601-0.786	0.356-0.600	0.181-0.355	0.000-0.180
Bio-Climatic Zones:					
1. Tropical (<1000m)					
2. Sub-tropical (1000m-2000m)					
3. Temperate (2000m -3000 m)					
4. Sub-alpine (3000m-4000m)					
5. Alpine (4000m-5000m)					

CHAPTER 4

HOUSEHOLD AND POPULATION CHARACTERISTICS

4.1. Summary of Findings

The households under the criteria for NCCIS show higher percentage of female population (52.40%) than male (47.60%). The average household size of the population is 5.05. There is a discrepancy in the literacy of respondents across different categories. Overall percentage of illiterate respondents is 45.31 per cent in which female respondents are more illiterate than male respondents. The major occupation of households is agriculture. Majority of households (79.5%) reported agriculture as the main source of household income. Overall 48.9 per cent households have access to piped water system for drinking water. Overall 88.7 per cent households reported use of firewood for cooking. Similarly, 80.07 per cent households use electricity as major source of light. Majority of households (43.57%) in central *Terai* do not have toilet in their homes.

Households within a reach of five km distance for selected services like motorable road, health institution, high school, local market, and agriculture service centre are 87.1, 88.9, 92.1, 69.8, and 84.8 per cent respectively. As a whole, 23.3 per cent households reported that they are adopting some kind of farm mechanisation.

Table 4-1: Distribution of Household by Level of Education of Respondent

Analytical Domain	Level of Education of Respondent (%)									Total
	Informal Education	Primary (1-5)	Lower Sec.(6-8)	Secondary (9-10)	SLC	Class 12 Certificate	Bachelor	Master and above	Illiterate	
Urban/Rural										
Urban	17.76	12.43	8.49	6.99	7.38	5.56	3.65	1.81	35.93	100
Rural	21.58	12.81	5.71	3.69	4.34	1.55	0.75	0.38	49.19	100
Ecological Belt										
Mountain	26.60	9.66	3.73	2.97	3.30	1.42	0.53	0.00	51.79	100
Hill	25.29	16.04	6.28	4.99	5.45	2.83	1.71	1.03	36.38	100
Terai	14.62	9.91	7.24	4.60	5.36	2.84	1.67	0.70	53.06	100
Eco-Development Region										
Eastern Mountain	36.21	15.59	5.56	3.40	5.35	3.36	0.43	0.00	30.10	100
Eastern Hill	34.31	14.61	6.06	3.50	5.49	1.63	0.53	0.54	33.33	100
Eastern *Terai*	16.70	13.49	9.95	5.30	6.49	4.05	2.10	1.05	40.86	100
Central Mountain	32.69	10.71	2.96	2.35	4.16	0.45	0.46	0.00	46.21	100
Central Hill	31.37	13.16	3.38	4.52	5.53	2.71	2.56	1.07	35.72	100
Central *Terai*	11.35	2.57	3.09	2.53	3.63	1.13	1.07	0.16	74.47	100
Western Mountain	2.80	2.20	7.20	6.61	2.20	4.40	2.20	0.00	72.38	100
Western Hill	19.51	21.85	9.13	7.18	5.56	2.70	0.62	0.70	32.76	100
Western *Terai*	14.83	19.50	13.76	8.07	9.06	5.71	2.47	1.08	25.52	100
Mid-western Mountain	16.80	5.03	2.59	3.13	1.81	0.85	0.66	0.00	69.13	100

Analytical Domain	Level of Education of Respondent (%)									Total
	Informal Education	Primary (1-5)	Lower Sec.(6-8)	Secondary (9-10)	SLC	Class 12 Certificate	Bachelor	Master and above	Illiterate	
Mid-western Hill	30.52	14.75	4.88	3.57	3.29	2.41	0.16	0.00	40.42	100
Mid-western *Terai*	21.99	13.14	6.17	6.06	4.31	1.67	1.67	1.46	43.52	100
Far-western Mountain	14.38	5.33	3.82	3.22	0.70	1.20	0.60	0.00	70.75	100
Far-western Hill	3.94	15.27	6.21	2.52	2.48	1.12	0.41	0.00	68.05	100
Far-western *Terai*	10.83	10.62	6.30	4.22	3.82	2.73	1.32	0.00	60.16	100
Kathmandu Valley	9.64	11.38	9.92	7.12	11.48	9.34	9.94	6.48	24.70	100
Sex										
Male	21.32	15.75	8.09	6.05	7.02	3.59	2.20	1.13	34.84	100
Female	18.61	6.10	3.14	1.63	1.37	0.84	0.29	0.06	67.95	100
Age										
45-54 Yrs.	7.71	6.15	3.23	2.91	3.23	1.42	0.71	0.36	14.81	40.54
55-64 Yrs.	6.01	4.02	2.06	1.02	1.41	0.91	0.57	0.28	13.93	30.20
65-74 Yrs.	4.56	2.22	0.90	0.52	0.49	0.32	0.24	0.10	11.47	20.82
75+ Yrs.	2.17	0.31	0.33	0.21	0.10	0.07	0.08	0.06	5.10	8.43
Income Quintile										
First Quintile (Lowest)	19.98	9.76	3.42	3.50	1.71	0.40	0.36	0.00	60.88	100
Second Quintile	21.63	12.58	4.43	3.58	5.21	1.38	0.55	0.00	50.64	100
Third Quintile	21.75	14.04	7.63	4.32	4.27	1.40	0.83	0.08	45.69	100
Fourth Quintile	21.83	14.55	9.73	4.87	6.35	4.75	1.21	1.06	35.65	100
Fifth Quintile (Highest)	19.03	14.17	9.60	8.14	10.87	8.00	6.36	3.85	19.98	100
NAPA Combined Vulnerability Index										
Very High	23.09	11.20	6.24	4.90	7.53	4.51	2.82	1.60	38.12	100
High	20.89	10.33	4.53	4.06	3.83	1.51	0.90	0.54	53.40	100
Moderate	19.94	10.07	4.49	4.40	4.14	1.49	1.02	0.33	54.11	100
Low	20.18	15.59	8.64	4.32	4.64	2.63	1.65	0.75	41.60	100
Very Low	14.77	23.13	13.03	7.03	7.38	4.90	1.75	0.78	27.23	100
Bio-Climatic Zone										
Tropical	17.82	11.47	6.77	5.19	5.35	2.77	1.56	0.71	48.36	100
Sub-tropical	24.61	14.24	6.33	3.93	5.60	2.93	1.87	1.06	39.44	100
Temperate	24.46	17.65	4.73	2.98	0.97	0.55	0.04	0.00	48.62	100
Sub-alpine	5.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	90.00	100
Nepal	**20.46**	**12.70**	**6.52**	**4.65**	**5.23**	**2.72**	**1.60**	**0.80**	**45.31**	**100**

Table 4-1 represents the percentage distribution of household by level of education of respondents under different categories. Respondent's education level is higher in urban and hill areas including that of male respondents. Substantial proportions of the respondent are illiterate (45.31%). Illiteracy rate among the respondents is higher in central Terai (74.47%) followed by western mountain (72.38%), mid-western mountain (69.13%), far-western hill (60.16%), and far-western Terai (60.16%). Highest percentage of illiterate respondents (60.88%) belongs to the lowest income quintile group whereas illiteracy percentage of respondents is higher in the moderate to very high vulnerable areas based on NAPA combined vulnerability index.

4.2. Personal and Household Information

Table 4-2: Distribution of Households by Mean Years of Residing

Analytical Domain	Mean Years of Residing	Household size
Urban/Rural		
Urban	47.35	4.87
Rural	52.75	5.12
Ecological Belt		
Mountain	54.20	4.63
Hill	52.47	4.36
Terai	49.35	5.80
Eco-Development Region		
Eastern Mountain	51.16	4.64
Eastern Hill	52.77	4.26
Eastern *Terai*	48.65	5.52
Central Mountain	57.09	3.46
Central Hill	53.17	4.06
Central *Terai*	53.07	6.46
Western Mountain	50.56	3.25
Western Hill	53.24	4.33
Western *Terai*	44.40	5.77
Mid-western Mountain	52.36	5.80
Mid-western Hill	53.45	4.68
Mid-western *Terai*	47.54	4.66
Far-western Mountain	54.68	5.70
Far-western Hill	51.83	5.35
Far-western *Terai*	43.20	5.18
Kathmandu Valley	44.56	4.37
Nepal	**51.17**	**5.05**

Table 4-2 shows the mean years of residing of household in the enumeration areas across the categories. The total mean year of residing is 51.17. Mean residing years of households is higher in hills and mountains across all the regions compared to *Terai* regions.

The overall average household size is 5.05. The average household size is higher in rural (5.12) and *Terai* (5.8) enumeration areas. Similarly, average household size is highest (6.23) in lowest income quintile groups.

Table 4-3 shows percentage distribution of household head by occupation under several categories. Agriculture (58.51%) is reported by the majority as the household occupation. Households in Kathmandu Valley largely depend on non-agri-business (33.09%). Households in fifth quintile (highest) in terms of per person yearly income reported their engagement in agriculture (36.87%) followed by salary/wage (21.43%), and non-agri-business (19.34%). Similarly, the occupation of majority of households residing in very high to moderate vulnerability areas is agriculture.

Table 4-4 represents the percentage distribution of households by sources of household income. Agriculture occupies the largest share (79.5%) of income source of the households followed by salary/wage (38.4%) and remittance (29.5%). Among the eco-development region, remittance covers the largest source of household income in mid-western hills (43.1%) whereas least is reported in mid-western mountains (8.3%). In a very low combined vulnerability area, highest percentage of households (82.9%) reported agriculture as their source of household income.

Table 4-3: Distribution of Household Head by Occupation

Analytical Domain	Occupation (%)							Total
	Agriculture	Salary/ Wage	Non-Agri. business	Household work	Seeking job	No work	Unable to work	
Urban/Rural								
Urban	39.22	16.90	18.21	6.68	0.20	14.78	4.00	100
Rural	66.49	11.56	6.82	5.31	0.11	6.39	3.32	100
Ecological Belt								
Mountain	73.61	9.96	4.45	4.24	0.25	5.59	1.89	100
Hill	63.55	8.83	9.27	6.24	0.16	9.24	2.70	100
Terai	50.90	17.94	12.01	5.43	0.09	9.02	4.62	100
Eco-Development Region								
Eastern Mountain	74.73	5.16	3.30	3.00	0.56	12.82	0.43	100
Eastern Hill	69.15	7.29	3.73	4.79	0.28	10.18	4.59	100
Eastern *Terai*	48.59	21.90	13.54	3.27	0.21	10.18	2.31	100
Central Mountain	79.42	11.51	2.72	3.24	0.00	1.09	2.01	100
Central Hill	61.56	9.98	9.06	8.89	0.05	7.29	3.17	100
Central *Terai*	46.94	20.38	10.32	7.74	0.00	6.34	8.28	100
Western Mountain	69.17	8.81	13.21	2.20	0.00	6.61	0.00	100
Western Hill	67.25	7.92	9.87	4.31	0.25	9.57	0.83	100
Western *Terai*	52.39	12.68	15.41	3.68	0.14	11.82	3.89	100
Mid-western Mountain	63.85	17.38	7.55	7.68	0.00	2.70	0.85	100
Mid-western Hill	76.26	6.69	5.02	5.21	0.00	4.64	2.17	100
Mid-western *Terai*	65.17	8.08	11.57	6.67	0.00	7.20	1.30	100
Far-western Mountain	71.56	5.64	5.51	4.29	0.60	7.76	4.64	100
Far-western Hill	81.15	6.88	6.36	0.64	0.00	4.24	0.74	100
Far-western *Terai*	62.35	7.04	7.75	4.85	0.00	16.24	1.77	100
Kathmandu Valley	1.40	17.77	33.09	14.21	0.39	26.88	6.25	100
Income Quintile								
First Quintile (Lowest)	67.92	9.54	5.83	6.97	0.00	5.21	4.55	100
Second Quintile	66.92	10.92	7.12	3.89	0.08	7.16	3.91	100
Third Quintile	61.54	11.63	11.15	4.34	0.21	7.14	4.00	100
Fourth Quintile	52.02	15.36	12.96	6.91	0.13	10.50	2.11	100
Fifth Quintile (Highest)	36.87	21.43	19.34	6.03	0.38	14.37	1.57	100
Not Stated	58.87	11.52	1.75	7.66	0.00	14.28	5.91	100
NAPA Combined Vulnerability Index								
Very High	51.15	16.46	12.96	7.65	0.08	9.17	2.53	100
High	66.86	11.06	7.51	3.59	0.14	6.80	4.04	100
Moderate	59.44	13.15	8.46	6.91	0.17	7.62	4.25	100
Low	56.53	12.87	10.48	5.29	0.16	11.02	3.65	100
Very Low	57.15	10.68	13.80	4.13	0.09	11.73	2.43	100
Bio-Climatic Zone								
Tropical	55.37	15.50	10.94	5.29	0.12	8.72	4.06	100
Sub-tropical	61.09	9.90	9.68	6.55	0.18	9.62	2.98	100
Temperate	80.26	6.08	3.46	4.95	0.00	4.75	0.49	100
Sub-alpine	100	0.00	0.00	0.00	0.00	0.00	0.00	100
Nepal	**58.51**	**13.13**	**10.15**	**5.71**	**0.13**	**8.85**	**3.52**	**100**

Table 4-4: Distribution of Households by Income Sources

Analytical Domain	Income Sources (%)[5]				
	Agriculture	Salary/ wage	Non agri-business	Remittance	Others
Urban/Rural					
Urban	56.3	45.8	31.4	22.9	17.3
Rural	89.1	35.3	15.3	32.2	9.3
Ecological Belt					
Mountain	95.2	38.4	12.2	13.6	6.8
Hill	83.2	32.1	18.0	29.3	15.1
Terai	73.2	44.6	23.4	32.4	9.0
Eco-Development Region					
Eastern Mountain	97.0	16.0	8.2	14.6	1.3
Eastern Hill	90.8	21.9	10.8	24.7	5.6
Eastern *Terai*	65.3	50.1	24.9	26.8	8.9
Central Mountain	97.2	52.7	5.2	9.2	2.9
Central Hill	88.0	34.9	17.1	14.0	8.5
Central *Terai*	74.4	43.3	21.6	34.8	5.9
Western Mountain	84.6	39.4	40.6	15.6	4.4
Western Hill	85.1	30.9	18.0	42.0	27.5
Western *Terai*	81.2	45.9	31.7	36.3	14.1
Mid-western Mountain	88.5	46.0	24.9	8.3	12.8
Mid-western Hill	94.2	35.2	12.8	43.1	13.8
Mid-western *Terai*	80.6	35.2	17.3	39.9	9.7
Far-western Mountain	96.4	32.3	15.7	25.5	15.2
Far-western Hill	97.6	24.2	11.4	36.9	4.4
Far-western *Terai*	81.9	34.4	19.0	29.8	17.8
Kathmandu Valley	2.2	53.6	55.7	18.0	29.1
Income Quintile					
First Quintile (Lowest)	89.9	34.3	13.6	18.4	7.1
Second Quintile	87.6	32.9	17.6	28.9	10.6
Third Quintile	81.2	40.7	20.2	34.9	11.6
Fourth Quintile	74.4	43.5	25.4	38.4	12.7
Fifth Quintile (Highest)	59.1	47.7	32.7	38.0	17.6
NAPA Combined Vulnerability Index					
Very High	71.1	45.2	22.3	17.9	10.3
High	86.1	26.8	14.5	36.6	8.0
Moderate	84.4	39.6	19.6	30.1	13.3
Low	74.0	42.7	21.0	30.3	12.0
Very Low	82.9	38.7	27.6	37.1	19.5
Bio-Climatic Zone					
Tropical	77.0	41.3	21.8	32.6	10.4
Sub-tropical	81.9	33.9	18.0	25.2	14.0
Temperate	94.6	34.6	11.7	21.0	10.6
Sub-alpine	100.0	35.0	45.0	20.0	0.00
Nepal	**79.5**	**38.4**	**20.0**	**29.5**	**11.6**

[5] The result is based on multiple response

4.3. Socioeconomic Characteristics

Table 4-5: Distribution of Households Receiving Remittance During Last One Year

Analytical Domain	Received Remittance (%)		Total
	Yes	No	
Urban/Rural			
Urban	27.04	72.96	100
Rural	38.96	61.04	100
Ecological Belt			
Mountain	17.72	82.28	100
Hill	33.21	66.79	100
Terai	40.75	59.25	100
Eco-Development Region			
Eastern Mountain	21.94	78.06	100
Eastern Hill	29.83	70.17	100
Eastern *Terai*	28.81	71.19	100
Central Mountain	14.78	85.22	100
Central Hill	16.06	83.94	100
Central *Terai*	53.06	46.94	100
Western Mountain	20.60	79.40	100
Western Hill	45.17	54.83	100
Western *Terai*	37.76	62.24	100
Mid-western Mountain	9.07	90.93	100
Mid-western Hill	47.86	52.14	100
Mid-western *Terai*	44.78	55.22	100
Far-western Mountain	26.54	73.46	100
Far-western Hill	44.57	55.43	100
Far-western *Terai*	31.53	68.47	100
Kathmandu Valley	23.74	76.26	100
Income Quintile			
First Quintile (Lowest)	30.48	69.52	100
Second Quintile	32.58	67.42	100
Third Quintile	39.94	60.06	100
Fourth Quintile	42.43	57.57	100
Fifth Quintile (Highest)	44.09	55.91	100
NAPA Combined Vulnerability Index			
Very High (0.787-1.000)	20.40	79.60	100
High (0.601-0.786)	40.56	59.44	100
Moderate (0.356-0.600)	44.76	55.24	100
Low 0.181-0.355	33.85	66.15	100
Very Low (0.000-0.180)	38.98	61.02	100
Bio-Climatic Zone			
Tropical	39.94	60.06	100
Sub-tropical	29.01	70.99	100
Temperate	24.82	75.18	100
Sub-alpine	25.00	75.00	100
Nepal	**35.47**	**64.53**	**100**

Table 4-5 indicates the percentage distribution of households that received remittance in past one year. Households receiving remittance is higher in rural area (38.96%) than in urban area (27.04%). Of the three ecological belts, household of *Terai* region received highest percentage of remittance (40.75%) followed by hill (33.21%) and mountain (17.72%). Households under fifth quintile received high remittance (44.09%) compared to other quintiles in past one year. On the other hand, very high combined vulnerability area had the highest percentage of households (79.6%) not receiving the remittance.

Table 4-6: Distribution of Households Having Agricultural Land

Analytical Domain	Have Agri. Land (%)		Total
	Yes	No	
Urban/Rural			
Urban	57.58	42.42	100
Rural	92.61	7.39	100
Ecological Belt			
Mountain	96.79	3.21	100
Hill	84.80	15.20	100
Terai	77.46	22.54	100
Eco-Development Region			
Eastern Mountain	95.51	4.49	100
Eastern Hill	92.61	7.39	100
Eastern *Terai*	64.12	35.88	100
Central Mountain	99.54	0.46	100
Central Hill	86.60	13.40	100
Central *Terai*	85.86	14.14	100
Western Mountain	84.58	15.42	100
Western Hill	90.47	9.53	100
Western *Terai*	79.38	20.62	100
Mid-western Mountain	93.42	6.58	100
Mid-western Hill	97.01	2.99	100
Mid-western *Terai*	86.01	13.99	100
Far-western Mountain	97.33	2.67	100
Far-western Hill	95.00	5.00	100
Far-western *Terai*	83.04	16.96	100
Kathmandu Valley	1.61	98.39	100
NAPA Combined Vulnerability Index			
Very High	72.21	27.79	100
High	87.51	12.49	100
Moderate	94.09	5.91	100
Low	73.24	26.76	100
Very Low	83.93	16.07	100
Bio-Climatic Zone			
Tropical	80.79	19.21	100
Sub-tropical	83.12	16.88	100
Temperate	97.33	2.67	100
Sub-alpine	100	0.00	100
Nepal	**82.36**	**17.64**	**100**

Table 4-6 represents percentage distribution of households having agricultural land. Highest percentage of households in rural area own agricultural land (92.61%). In the ecological belt, highest percentages of households in mountain region (96.79%) possess agricultural land followed by hills (84.80%) and *Terai* (77.46%). Majority of households have agricultural land across all the categories of vulnerability index so as in all the Bio-Climatic Zones.

Table 4-7: Household Distribution by Land Holding Size in 2073 BS (2016 AD)

Land categories	Land Holding in 2073 BS (ha.)						Total	Average Land Holding (ha)
	Up to 0.10 ha.	0.10 - 0.50 ha.	0.50 - 1.00 ha.	1.00 - 5.00 ha.	5.00 - 10.00 ha.	More than 10.00 ha.		
Nepal								
Land occupied by house and shelter	88.0	11.0	0.6	0.3	0.1	0.0	100.0	0.06
Land with temporal crops	6.7	50.2	25.5	17.0	0.5	0.1	100.0	0.62
Land with pond/wetland	29.1	44.4	19.8	6.7	0.00	0.00	100.0	0.34
Land with fruit garden	48.1	42.3	5.8	3.7	0.00	0.00	100.0	0.19
Land left fallow or used for other purposes	16.6	60.0	16.7	6.5	0.2	0.1	100.0	0.35
Rented or leased land	5.8	55.0	25.3	13.6	0.1	0.1	100.0	0.54

Table 4-7 indicates percentage distribution of household by area of land in hector in the year 2073 BS (2016 AD). Temporarily cultivated and owned land comprised highest average land area (0.62 ha) in 2073 BS (2016 AD). Similarly, percentage distribution of households having between 0.10 ha to 0.50 ha is highest (55.0%). Overall, 88.0 per cent respondents reported having land occupied by house and shelter.

Table 4-8: Household Distribution by Land Holding Size in 2068 BS (2011 AD)

Analytical Domain	Land Holding in 2068 BS (ha.)						Total	Average Land Holding (ha)
	Up to 0.10 ha.	0.10 - 0.50 ha.	0.50 - 1.00 ha.	1.00 - 5.00 ha.	5.00 - 10.00 ha.	More than 10.00 ha.		
Nepal								
Land occupied by house and shelter	87.5	11.3	0.6	0.4	0.1	0.00	100.0	0.07
Land with temporary crops	6.6	48.3	25.8	18.4	0.7	0.1	100.0	0.65
Land with pond/wetland	29.2	44.6	18.7	6.9	0.6	0.00	100.0	0.37
Land with fruit garden	50.0	42.3	4.9	2.8	0.00	0.00	100.0	0.16
Land left fallow or used for other purposes	16.8	60.0	16.6	6.2	0.2	0.2	100.0	0.34
Rented or leased land	5.3	50.5	26.8	17.3	0.00	0.1	100.0	0.49

Table 4-8 presents percentage distribution of household by area of land in hector in the year 2068 BS (2011 AD). Temporarily cultivated own land was the highest average land area (0.65 ha) in 2068 BS. Similarly, highest percentages (50.5%) of households are holding the land between 0.10 ha to 0.50 ha. Land occupied by house and shelter is reported by highest percentage of respondents (87.5%) in 2068 BS (2011AD). The average landholding has decreased during past five year period under different categories. However, 'land left fallow or used for other purposes', in average, has slightly increased (0.34 ha to 0.35 ha) during that period.

Table 4-9: Household Head by Years of Involvement in Agriculture

Analytical Domain	Years of Involvement (%)												Total	Mean (yr)
	0-4	5-9	10-14	15-19	20-24	25-34	35-44	45-54	55-64	65-74	75-84	85+		
Urban/Rural														
Urban	25.33	3.84	4.21	3.81	6.49	19.00	18.54	14.26	3.69	0.80	0.03	0.00	100	24.53
Rural	4.94	1.60	2.14	2.58	5.54	24.86	26.91	21.20	7.19	2.42	0.58	0.04	100	35.70
Ecological Belt														
Mountain	0.92	0.13	0.23	0.70	4.33	22.18	26.80	28.42	11.62	4.08	0.47	0.12	100	41.95
Hill	8.24	1.25	1.78	1.84	5.09	20.71	24.66	23.64	8.69	3.29	0.77	0.05	100	36.28
Terai	15.28	3.62	4.14	4.41	6.79	25.72	23.87	13.14	2.72	0.24	0.07	0.00	100	26.96
Eco-Development Region														
Eastern Mountain	2.41	0.00	0.00	1.32	14.33	19.60	24.06	25.42	9.57	2.86	0.43	0.00	100	38.66
Eastern Hill	1.98	1.98	0.47	0.93	6.45	19.15	27.41	26.61	9.06	4.01	1.67	0.27	100	40.09
Eastern *Terai*	23.91	5.32	4.46	3.08	6.81	19.58	22.89	11.44	2.33	0.00	0.20	0.00	100	23.38
Central Mountain	0.46	0.00	0.00	0.00	0.46	23.23	29.34	29.56	12.43	4.52	0.00	0.00	100	43.21
Central Hill	3.11	0.78	2.40	1.70	7.07	17.87	21.48	25.56	12.05	6.29	1.69	0.00	100	39.95
Central *Terai*	12.23	3.18	4.85	5.72	7.18	29.36	23.06	12.85	1.43	0.15	0.00	0.00	100	26.88
Western Mountain	2.20	2.20	0.00	2.20	0.00	23.21	36.19	25.60	8.39	0.00	0.00	0.00	100	38.63
Western Hill	4.80	0.71	0.92	1.95	4.45	25.45	27.36	24.34	8.37	1.65	0.00	0.00	100	36.66
Western *Terai*	9.94	3.06	3.36	6.43	8.95	32.97	20.29	12.63	2.36	0.00	0.00	0.00	100	28.13
Mid-western Mountain	0.75	0.56	1.17	1.84	0.00	13.57	18.22	38.03	17.31	6.06	1.88	0.61	100	46.08
Mid-western Hill	1.68	1.11	1.58	1.39	3.28	18.69	34.14	27.45	8.10	2.57	0.00	0.00	100	39.46
Mid-western *Terai*	9.82	1.28	1.43	2.72	2.65	22.07	31.13	18.29	9.65	0.96	0.00	0.00	100	34.82
Far-western Mountain	0.00	0.00	0.00	0.00	3.61	32.15	33.77	20.41	7.07	2.98	0.00	0.00	100	39.68
Far-western Hill	0.79	0.52	1.98	3.23	3.27	39.98	24.62	20.72	4.44	0.45	0.00	0.00	100	36.52
Far-western *Terai*	5.11	1.71	3.86	2.54	6.54	29.15	29.89	17.29	2.49	1.42	0.00	0.00	100	32.68
Kathmandu Valley	78.07	4.27	6.30	4.00	1.49	3.83	0.80	0.66	0.57	0.00	0.00	0.00	100	3.83
NAPA Combined Vulnerability Index														
Very High	17.59	2.88	3.64	2.06	7.85	21.86	19.93	15.43	5.12	2.84	0.79	0.00	100	28.84
High	4.53	0.81	1.01	1.69	6.49	24.31	28.93	21.12	7.47	2.67	0.84	0.13	100	36.94
Moderate	7.27	2.11	3.64	4.22	4.24	24.81	24.40	21.19	6.13	1.81	0.17	0.00	100	33.53
Low	16.30	3.49	2.98	3.02	4.11	17.77	24.80	20.19	6.21	1.13	0.00	0.00	100	30.52
Very Low	8.24	2.02	2.10	4.83	7.02	31.10	23.57	15.77	5.35	0.00	0.00	0.00	100	31.03
Bio-Climatic Zone														
Tropical	12.31	2.96	3.50	3.67	6.02	24.80	24.44	16.60	4.19	1.18	0.33	0.00	100	30.01
Sub-tropical	9.81	1.31	1.77	1.94	5.75	20.51	23.88	22.37	8.97	3.14	0.48	0.06	100	35.39
Temperate	0.77	0.04	0.00	0.82	3.62	21.08	28.92	29.06	11.19	3.14	1.15	0.21	100	42.08
Sub-alpine	0.00	0.00	0.00	0.00	0.00	10.00	45.00	30.00	15.00	0.00	0.00	0.00	100	43.25
Nepal	**10.91**	**2.26**	**2.74**	**2.94**	**5.82**	**23.14**	**24.46**	**19.17**	**6.16**	**1.94**	**0.42**	**0.03**	**100**	**32.43**

Table 4-9 indicates the distribution of household heads by years of involvement in agriculture. The result shows that the highest percentages of household heads (24.4%) are involved in agriculture for 35 to 44 years followed by 23.1 per cent households for 25 to 34 years and 19.17 per cent for 45 to 54 years. Highest mean year of involvement is found in mid-western mountain (46.08%).

In ecological belt, majority of household heads in mountains, and hills have (25 to 34), (35 to 44), and (45 to 54) years of involvement in agriculture. Across the eco-development region, the result reveals that high percentage of household (78.07%) in Kathmandu Valley have least involvement in agriculture (0 to 4 years). In areas with very high vulnerability index, the highest years of involvement in agriculture was found to be 35 to 44 years. Mean years of involvement in agriculture is highest (43.25 years) in sub-alpine climatic zone.

Table 4-10: Households with Membership of Co-operatives and Saving Groups

Analytical Domain	Membership of Co-operatives and Saving Groups (%)			Total
	Yes	No	Not applicable	
Urban/Rural				
Urban	53.57	46.27	0.16	100
Rural	46.36	53.40	0.24	100
Ecological Belt				
Mountain	64.52	34.27	1.21	100
Hill	48.21	51.59	0.20	100
Terai	45.97	53.97	0.06	100
Eco-Development Region				
Eastern Mountain	62.33	37.67	0.00	100
Eastern Hill	41.80	57.65	0.55	100
Eastern *Terai*	48.55	51.45	0.00	100
Central Mountain	78.08	21.92	0.00	100
Central Hill	57.70	42.30	0.00	100
Central *Terai*	41.93	57.90	0.17	100
Western Mountain	51.01	48.99	0.00	100
Western Hill	42.62	57.38	0.00	100
Western *Terai*	43.02	56.98	0.00	100
Mid-western Mountain	46.45	47.40	6.15	100
Mid-western Hill	57.49	42.51	0.00	100
Mid-western *Terai*	64.20	35.80	0.00	100
Far-western Mountain	61.14	38.86	0.00	100
Far-western Hill	40.24	59.76	0.00	100
Far-western *Terai*	33.06	66.94	0.00	100
Kathmandu Valley	38.03	60.48	1.49	100
NAPA Combined Vulnerability Index				
Very High	47.84	51.95	0.21	100
High	48.65	50.95	0.41	100
Moderate	44.21	55.47	0.31	100
Low	54.52	45.48	0.00	100
Very Low	47.16	52.84	0.00	100
Bio-Climatic Zone				
Tropical	49.44	50.51	0.05	100
Sub-tropical	47.20	52.53	0.27	100
Temperate	45.16	52.75	2.09	100
Sub-alpine	40.00	60.00	0.00	100
Nepal	**48.47**	**51.31**	**0.22**	**100**

Table 4-10 represents the percentage distribution of household by membership of co-operative/small savings group. Overall percentage distribution shows that 51.31 per cent households do not have any membership of co-operative/small savings group. More households with membership reside in urban area (53.57%) in comparison to rural area (46.36%). In ecological belts, households of mountain region have highest percentage of membership (64.52%) while lowest (45.97%) in *Terai*. Mid-western mountain shows almost equal percentage of households having membership (46.45%) and not having membership (47.40%) of co-operative/small savings group. Significant percentage of households (51.95%) residing in very high combined vulnerability area do not have membership of cooperative or small saving groups.

Table 4-11: Household Saving Regularly in Co-operatives and Saving Groups in Past 12 Months

Analytical Domain	Saving Regularly (%)			Total
	Yes	No	Not applicable	
Urban/Rural				
Urban	58.50	41.22	0.28	100
Rural	50.53	49.21	0.26	100
Ecological Belt				
Mountain	63.91	34.89	1.21	100
Hill	55.82	44.02	0.16	100
Terai	48.03	51.76	0.21	100
Eco-Development Region				
Eastern Mountain	58.78	41.22	0.00	100
Eastern Hill	48.01	51.71	0.28	100
Eastern *Terai*	47.11	52.70	0.20	100
Central Mountain	76.70	23.30	0.00	100
Central Hill	70.11	29.89	0.00	100
Central *Terai*	42.80	56.83	0.37	100
Western Mountain	46.01	53.99	0.00	100
Western Hill	49.46	50.54	0.00	100
Western *Terai*	56.45	43.55	0.00	100
Mid-western Mountain	47.23	46.62	6.15	100
Mid-western Hill	56.87	43.13	0.00	100
Mid-western *Terai*	64.79	35.21	0.00	100
Far-western Mountain	64.42	35.58	0.00	100
Far-western Hill	54.93	45.07	0.00	100
Far-western *Terai*	41.67	58.33	0.00	100
Kathmandu Valley	42.99	55.38	1.64	100
NAPA Combined Vulnerability Index				
Very High	53.88	45.89	0.23	100
High	52.03	47.42	0.55	100
Moderate	46.46	53.32	0.22	100
Low	56.73	43.12	0.15	100
Very Low	60.73	39.27	0.00	100
Bio-Climatic Zone				
Tropical	52.38	47.46	0.16	100
Sub-tropical	54.20	45.58	0.22	100
Temperate	49.29	48.63	2.09	100
Sub-alpine	35.00	65.00	0.00	100
Nepal	**52.86**	**46.87**	**0.27**	**100**

Table 4-11 represents the percentage distribution of household saving regularly in co-operatives/ small saving group in past 12 months. The total of 52.86 per cent of households are saving regularly while 46.87 per cent are not doing so. The highest saving group is from mountain belt (63.91%) in which central mountain is the highest (76.70%). Larger percentage (51.76%) of households in *Terai* do not have regular savings with highest being the far-western *Terai* (58.33%).

As a whole, 60.73 per cent of households residing in very low vulnerability area are engaged in regular saving whereas households in moderate vulnerability are not engaged in regular saving (53.32%). The percentage of households who have regular saving is found higher in tropical (52.38%), sub-tropical (54.20%) and temperate (49.29%) climatic zones.

Table 4-12: Households' Involvement in Community Organisation

Analytical Domain	Involvement in Community Organisation (%)			Total
	Yes	No	Not applicable	
Urban/Rural				
Urban	38.11	61.72	0.17	100
Rural	37.63	62.16	0.20	100
Ecological Belt				
Mountain	39.76	60.24	0.00	100
Hill	44.43	55.41	0.16	100
Terai	30.82	68.92	0.27	100
Eco-Development Region				
Eastern Mountain	62.51	37.49	0.00	100
Eastern Hill	47.42	52.31	0.27	100
Eastern *Terai*	18.53	81.04	0.42	100
Central Mountain	34.24	65.76	0.00	100
Central Hill	44.39	55.61	0.00	100
Central *Terai*	30.37	69.31	0.32	100
Western Mountain	38.81	61.19	0.00	100
Western Hill	49.13	50.87	0.00	100
Western *Terai*	47.10	52.90	0.00	100
Mid-western Mountain	41.82	58.18	0.00	100
Mid-western Hill	52.17	47.83	0.00	100
Mid-western *Terai*	52.59	47.41	0.00	100
Far-western Mountain	19.36	80.64	0.00	100
Far-western Hill	29.52	70.48	0.00	100
Far-western *Terai*	34.96	65.04	0.00	100
Kathmandu Valley	16.52	81.91	1.58	100
NAPA Combined Vulnerability Index				
Very High	35.41	64.22	0.37	100
High	31.61	68.28	0.11	100
Moderate	40.97	58.90	0.12	100
Low	35.47	64.26	0.27	100
Very Low	56.54	43.46	0.00	100
Bio-Climatic Zone				
Tropical	34.74	65.06	0.20	100
Sub-tropical	43.39	56.40	0.21	100
Temperate	35.83	64.17	0.00	100
Sub-alpine	30.00	70.00	0.00	100
Nepal	**37.77**	**62.03**	**0.20**	**100**

Table 4-12 shows the percentage of household in terms of involvement in community organisations that include community forest user groups and water users' committee, and farmers' groups. It reveals that a total of 62.03 per cent households are not involved in community organisations. Significant percentage of households both in urban (61.72%) and rural (62.16%) are not involved in any of the community organisations. However, majority of households in eastern mountain (62.51%) were found to be involved in community organisations while in Kathmandu Valley only 16.52 per cent were involved. Similarly, households in high combined vulnerability areas have relatively high percentage (68.28 %) of non-involvement in community organisation.

Table 4-13: Households Receiving Support from Agriculture Service Centre in Last 12 Months

Analytical Domain	Received Support (%)			Total
	Yes	No	Not applicable	
Urban/Rural				
Urban	18.62	59.28	22.10	100
Rural	20.80	77.62	1.58	100
Ecological Belt				
Mountain	24.24	74.80	0.96	100
Hill	20.49	71.65	7.86	100
Terai	19.14	72.40	8.46	100
Eco-Development Region				
Eastern Mountain	39.12	60.03	0.85	100
Eastern Hill	31.11	68.89	0.00	100
Eastern *Terai*	10.07	76.08	13.85	100
Central Mountain	13.00	87.00	0.00	100
Central Hill	18.45	76.03	5.52	100
Central *Terai*	28.69	68.04	3.27	100
Western Mountain	39.82	55.77	4.40	100
Western Hill	18.54	78.21	3.26	100
Western *Terai*	8.00	78.00	14.00	100
Mid-western Mountain	23.57	74.93	1.50	100
Mid-western Hill	30.63	68.96	0.41	100
Mid-western *Terai*	25.33	70.58	4.09	100
Far-western Mountain	26.35	71.51	2.14	100
Far-western Hill	7.73	91.99	0.28	100
Far-western *Terai*	23.52	70.36	6.11	100
Kathmandu Valley	0.40	22.38	77.22	100
NAPA Combined Vulnerability Index				
Very High	14.37	68.65	16.98	100
High	19.31	78.13	2.56	100
Moderate	28.75	69.60	1.65	100
Low	20.03	71.22	8.75	100
Very Low	14.38	75.32	10.30	100
Bio-Climatic Zone				
Tropical	20.93	72.07	7.00	100
Sub-tropical	19.39	70.98	9.63	100
Temperate	15.79	84.13	0.07	100
Sub-alpine	20.00	80.00	0.00	100
Nepal	**20.16**	**72.25**	**7.59**	**100**

Table 4-13 indicates the percentage of households receiving agricultural extension support or services from Agriculture Service Centre in past 12 months. The result depicts the highest percentage (72.25%) of households have not received any service from agriculture service centres in past one year. Among the households which received support, highest percentage of households are in western mountain (39.82%) followed by eastern mountain (39.12%).

Overall, the survey result shows that majority of respondents in all analytical domains reported of not receiving any kind of agricultural extension services.

Table 4-14: Average Distance to Nearest Facilities and Service Centres

Analytical Domain	Distance to Motorable Road (km)	Distance to Health Centre (km)	Distance to Nearest High School (km)	Distance to Local Market (km)	Distance to Agriculture Service Centre (km)
Urban/Rural					
Urban	0.83	1.76	1.39	2.23	3.25
Rural	3.39	3.12	2.76	6.48	6.33
Ecological Belt					
Mountain	10.47	3.28	3.09	9.09	6.07
Hill	2.88	3.31	2.67	6.52	6.71
Terai	1.05	2.05	1.93	3.29	4.04
Eco-Development Region					
Eastern Mountain	13.24	4.28	4.27	9.05	7.81
Eastern Hill	5.84	3.86	3.21	6.88	6.83
Eastern *Terai*	1.46	2.61	2.14	3.47	4.82
Central Mountain	1.29	3.80	3.47	6.13	8.33
Central Hill	2.08	2.53	2.15	5.93	6.19
Central *Terai*	0.38	1.37	1.75	2.37	2.58
Western Mountain	0.11	1.37	1.74	1.37	1.40
Western Hill	0.90	3.90	2.13	9.06	6.43
Western *Terai*	0.54	1.63	1.34	1.79	3.35
Mid-western Mountain	23.98	1.19	1.13	14.39	2.11
Mid-western Hill	3.58	4.46	5.29	5.83	9.75
Mid-western *Terai*	1.80	2.90	2.65	8.44	6.69
Far-western Mountain	10.87	3.32	2.98	9.67	3.92
Far-western Hill	8.29	3.18	2.60	5.60	9.23
Far-western *Terai*	2.77	2.59	1.90	2.67	5.79
Kathmandu Valley	0.01	0.43	0.32	0.16	1.38
NAPA Combined Vulnerability Index					
Very High	1.13	2.38	2.35	3.94	4.76
High	5.08	3.20	3.12	5.46	5.90
Moderate	2.15	2.83	2.33	6.06	4.62
Low	2.93	2.72	1.95	5.67	7.08
Very Low	0.68	2.08	1.41	4.72	4.26
Bio-Climatic Zone					
Tropical	1.43	2.39	2.16	3.81	4.70
Sub-tropical	3.73	3.22	2.59	6.75	6.50
Temperate	10.38	3.43	3.30	12.77	7.06
Sub-alpine	0.20	2.45	2.20	2.45	2.50
Nepal	**2.64**	**2.73**	**2.36**	**5.23**	**5.43**

Table 4-14 shows average distance to reach to the nearest facilities and service centres. Households in rural areas in average require long distance to reach to access the services. The households have to travel long distances to access local markets and agricultural extension service centre. Similarly, households in mountain and hills, in average, have to travel long distance to access services. While in total, average distance to the nearest high school is found shortest (2.36 km).

Table 4-15: Households Using Machinery in Agriculture

Analytical Domain	Machinery Used in Agriculture (%)			Total
	Yes	No	Not applicable	
Urban/Rural				
Urban	26.5	39.5	34.0	100.0
Rural	22.0	73.3	4.7	100.0
Ecological Belt				
Mountain	0.2	97.9	1.9	100.0
Hill	5.4	84.6	10.0	100.0
Terai	45.1	36.4	18.5	100.0
Eco-Development Region				
Eastern Mountain	0.00	98.5	1.5	100.0
Eastern Hill	2.1	96.6	1.4	100.0
Eastern *Terai*	57.8	9.8	32.5	100.0
Central Mountain	0.4	99.1	0.5	100.0
Central Hill	5.0	88.4	6.6	100.0
Central *Terai*	32.1	59.7	8.2	100.0
Western Mountain	2.2	86.8	11.0	100.0
Western Hill	6.3	88.9	4.9	100.0
Western *Terai*	72.3	8.5	19.2	100.0
Mid-western Mountain	0.00	96.4	3.6	100.0
Mid-western Hill	13.3	83.6	3.2	100.0
Mid-western *Terai*	21.0	66.7	12.3	100.0
Far-western Mountain	0.00	97.3	2.7	100.0
Far-western Hill	0.9	97.0	2.1	100.0
Far-western *Terai*	38.7	49.1	12.1	100.0
Kathmandu Valley	0.8	12.5	86.7	100.0
NAPA Combined Vulnerability Index				
Very High	30.6	48.1	21.3	100.0
High	17.2	77.0	5.8	100.0
Moderate	10.5	85.7	3.8	100.0
Low	27.6	48.4	24.1	100.0
Very Low	45.6	40.9	13.5	100.0
Bio-Climatic Zone				
Tropical	37.0	48.0	15.0	100.0
Sub-tropical	2.3	85.7	12.1	100.0
Temperate	0.4	99.4	0.2	100.0
Sub-alpine	0.00	100.0	0.00	100.0
Nepal	**23.3**	**63.4**	**13.3**	**100.0**

Table 4-15 represents the percentage of households using machinery in agriculture. Use of machineries includes (sprayer, tracker, harvester, thrasher, etc.) Overall 63.4 per cent households do not use any kind of machineries. Machinery use is found higher in urban households (26.5%) than in rural households (22.0%). Least percentage of households using machinery for agriculture is in mountain (0.2%) followed by hill (5.4%) where as in *Terai,* significant percentage (45.1%) of households use machinery in agriculture. Western *Terai* has the highest percentage of households (72.3%) using machinery. Very low combined vulnerability area has the highest percentage of households (45.6%) using machinery followed by 30.6 per cent households in very high vulnerability area.

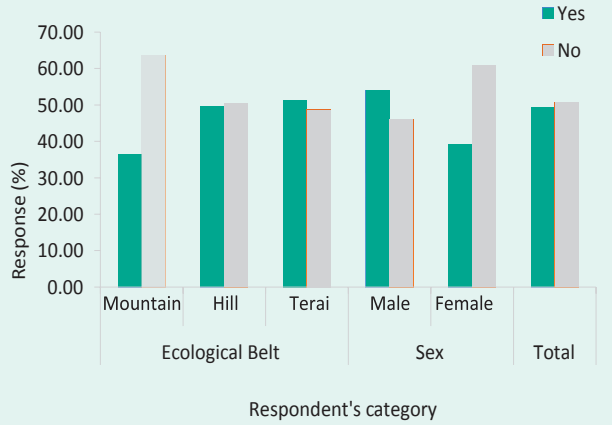
CHAPTER 5

PERCEPTION OF CLIMATE CHANGE

5.1. Summary of Findings

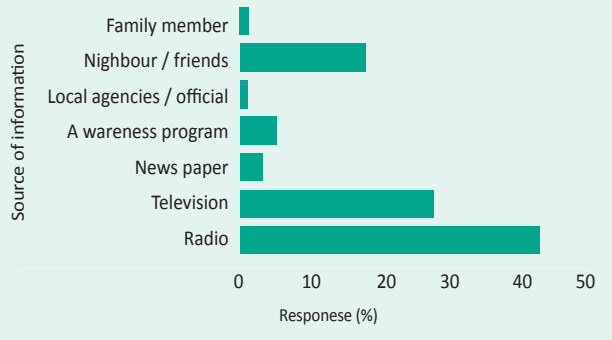
The survey indicates that about half of the households (49.33%) have heard about climate change. Majority of households in the mountain (63.59%) and female respondents (60.92%) are found to have not heard about it. Based on ecological belt, up to 80.35 per cent of the households in Mid-western mountain have not heard about climate change. Households from *Terai* ecological belt (51%) are found to be more informed (Figure 5-1).

Figure 5-1: Households' Knowledge on Climate Change



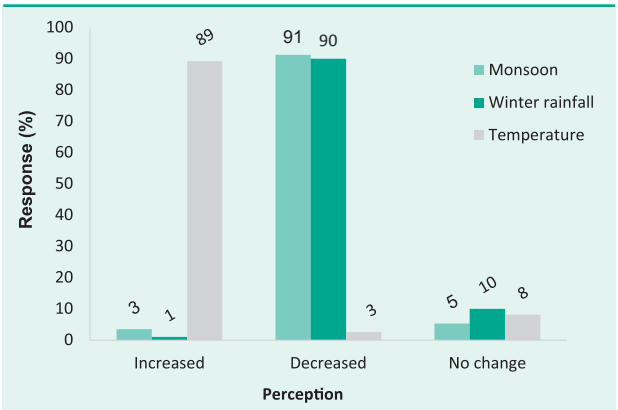
The source of information about climate change varies (Figure 5-2). Majority of the households (42.8%) said that they have received information on climate change from radio and the second most (27.63%) information source was television.

Figure 5-2: Main Source of Information About Climate Change



Households reported significant change in monsoon, winter rainfall and temperature over the period of past 25 years. As a whole, 91 per cent of respondent said that monsoon is decreasing while only 3 per cent said it is increasing and 5 per cent said there is no change in monsoon. Similarly, 90 per cent of the respondents said winter rainfall has been decreasing. Likewise, 89 per cent of the respondents reported that they have felt increasing temperature over the period of past 25 years (Figure 5-3).

Figure 5-3: Change on Climatic Variables in Last 25 years



People have different perceptions on the effects of climate change as 86.1, 43.4, 32.5, and 28.1 per cent of the households believed that drought, Disease/insects, hailstorm, and flood respectively are the main effects of climate change (Figure 5-4).

Figure 5-4: Potential Results of Climate Change

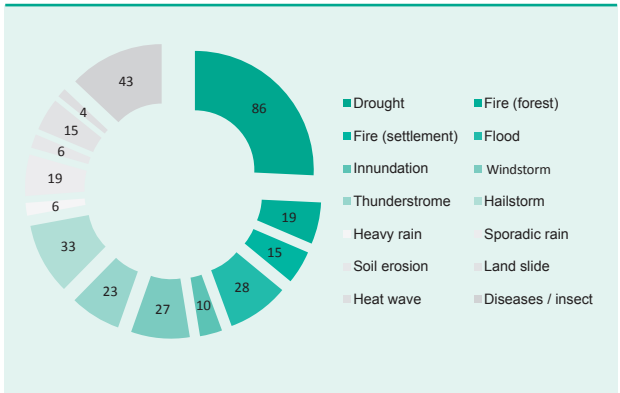
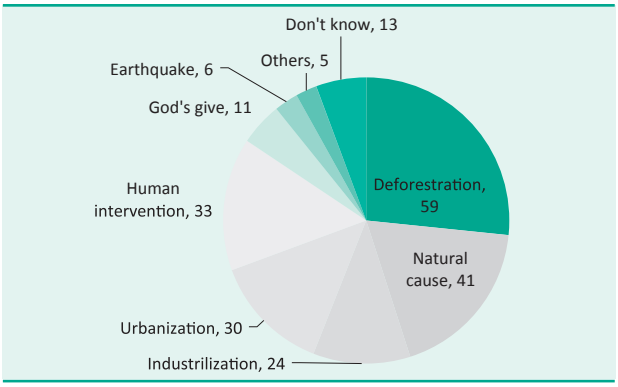


Figure 5-5: People's Perception on Reason of Climate Change



Majority of the households (59%) opined that deforestation was the main cause for climate change. While 41 per cent of households believed that it is caused by natural phenomenon, 33 per cent and 30 per cent of households think human interventions and urbanisation respectively are other major causes of climate change (Figure 5-5).

The detail analytical domain-wise statistical data of perception on public knowledge of climate change, source of information, changes on climatic variables, potential causes, and potential results has been described in sub-sections coming up next.

5.2. Perception on Climate Change

Table 5-1: Households Which Have Heard About Climate Change

Analytical Domain	Perception (%)		Total
	Yes	No	
Urban/Rural			
Urban	56.79	43.21	100.00
Rural	46.24	53.76	100.00
Ecological Belt			
Mountain	36.41	63.59	100.00
Hill	49.53	50.47	100.00
Terai	51.35	48.65	100.00
Eco-Development Region			
Eastern Mountain	59.38	40.62	100.00
Eastern Hill	61.28	38.72	100.00
Eastern *Terai*	44.09	55.91	100.00
Central Mountain	35.67	64.33	100.00
Central Hill	59.06	40.94	100.00
Central *Terai*	56.67	43.33	100.00
Western Mountain	29.23	70.77	100.00
Western Hill	42.73	57.27	100.00
Western *Terai*	56.86	43.14	100.00
Mid-western Mountain	19.65	80.35	100.00
Mid-western Hill	28.92	71.08	100.00
Mid-western *Terai*	50.40	49.60	100.00
Far-western Mountain	26.32	73.68	100.00
Far-western Hill	29.56	70.44	100.00
Far-western *Terai*	49.88	50.12	100.00
Kathmandu Valley	66.89	33.11	100.00
Sex			
Male	54.07	45.93	100.00
Female	39.08	60.92	100.00
Age Group			
45-54 Yrs.	55.16	44.84	100.00
55-64 Yrs.	47.61	52.39	100.00
65-74 Yrs.	43.84	56.16	100.00
75+ Yrs.	41.01	58.99	100.00

Analytical Domain	Perception (%)		Total
	Yes	No	
Education Level			
Informal education	51.83	48.17	100.00
Primary (1-5)	52.87	47.13	100.00
Lower Sec.(6-8)	67.97	32.03	100.00
Secondary (9-10)	73.60	26.40	100.00
SLC	85.49	14.51	100.00
Class 12 / Certificate	91.22	8.78	100.00
Bachelor	94.62	5.38	100.00
Master and above	98.85	1.15	100.00
Illiterate	32.87	67.13	100.00
NAPA Combined Vulnerability Index			
Very High	53.18	46.82	100.00
High	42.04	57.96	100.00
Moderate	53.59	46.41	100.00
Low	49.34	50.66	100.00
Very Low	47.37	52.63	100.00
Bio-Climatic Zone			
Tropical	50.46	49.54	100.00
Sub-tropical	49.13	50.87	100.00
Temperate	36.19	63.81	100.00
Sub-alpine	5.00	95.00	100.00
Nepal	**49.33**	**50.67**	**100.00**

Table 5-1 depicts percentage of households having knowledge about climate change. Out of total, 50.67 per cent responded their unawareness about climate change. More households of urban areas (56.79%) have heard of climate change in comparison to the households of rural areas (46.24%). Significant percentage of households in mountain (63.59%) and hill (50.47%) do not know about climate change. While, 51.35 per cent households of *Terai* belt know about climate change in which households of eastern *Terai* (55.91%) and far-western *Terai* (50.12%) do not have information on climate change. In mountain strata, households of eastern mountain (59.38%) reported that they have heard about climate change whereas large percentage of households of mid-western mountain (80.35%), far-western mountain (73.68%), western mountain (70.77%) and central mountain (64.33%) stated that they have not heard about climate change.

Based on the gender of the respondents, more male population (54.07%) knows about climate change than female polupation (39.08 %). Age group of households shows that the knowledge about climate change diminishes with increasing age group. There is subsequent increase in percentage of households who know about climate change with increase in level of education i.e. informal education (51.83%), primary (52.87%), lower secondary (67.97%), secondary (73.60%), SLC (85.49%), high school (91.22%), Bachelor's (94.62%) and Master's (98.85%). This shows education is an important factor contributing to climate change awareness.

Based on the NAPA combined vulnerability index, highest percentage of the households (57.96%) in high vulnerable districts does not know about climate change, whereas majority of households (53.18%) in a very high vulnerable districts have some knowledge of climate change. According to climatic zones, highest percentage of households of sub-alpine (95%) has not heard about climate change.

Table 5-2: Distribution of Households by Sources of Climate Information

Analytical Domain	Source of Information About Climate Change (%)								Total
	Radio	Television	News paper	Awareness programmes	Local agencies /official	Neighbor /friends	Family member	Others	
Urban/Rural									
Urban	27.25	46.58	7.60	3.17	1.00	12.01	1.90	0.49	100.00
Rural	50.72	17.99	1.18	6.18	1.33	21.02	1.08	0.50	100.00
Ecological Belt									
Mountain	68.10	10.86	0.12	7.10	1.16	10.45	2.22	0.00	100.00
Hill	51.24	24.24	4.77	5.07	1.48	11.32	1.55	0.32	100.00
Terai	31.65	32.91	2.37	5.02	0.98	25.28	1.07	0.73	100.00
Eco-Development Region									
Eastern Mountain	86.01	3.89	0.00	1.75	0.00	3.90	4.44	0.00	100.00
Eastern Hill	61.34	18.12	2.94	1.54	0.56	13.16	2.34	0.00	100.00
Eastern *Terai*	24.16	44.37	3.63	0.00	1.43	22.28	2.07	2.07	100.00
Central Mountain	66.12	19.96	0.00	9.34	0.00	4.57	0.00	0.00	100.00
Central Hill	62.66	19.98	4.75	2.56	1.07	7.52	0.62	0.84	100.00
Central *Terai*	43.06	9.56	0.97	7.42	1.35	37.64	0.00	0.00	100.00
Western Mountain	15.07	47.25	15.07	22.61	0.00	0.00	0.00	0.00	100.00
Western Hill	44.97	24.34	3.81	8.47	0.12	17.27	1.01	0.00	100.00
Western *Terai*	9.72	79.13	1.65	7.85	0.00	1.66	0.00	0.00	100.00
Mid-western Mountain	54.93	18.28	0.00	14.85	0.00	7.59	4.35	0.00	100.00
Mid-western Hill	45.94	20.25	1.45	11.68	6.31	11.63	2.74	0.00	100.00
Mid-western *Terai*	27.14	42.72	4.73	6.67	0.00	17.36	0.92	0.47	100.00
Far-western Mountain	35.22	0.00	0.00	9.85	8.31	46.62	0.00	0.00	100.00
Far-western Hill	52.90	0.00	0.00	16.31	12.61	10.61	7.56	0.00	100.00
Far-western *Terai*	46.34	18.12	3.73	3.97	0.00	20.43	6.17	1.26	100.00
Kathmandu Valley	6.93	66.50	16.32	3.50	0.00	5.31	0.94	0.50	100.00
Sex									
Male	43.85	27.18	4.04	5.14	1.31	17.19	0.86	0.43	100.00
Female	39.67	28.97	1.27	5.23	0.95	20.36	2.85	0.70	100.00
Education Level									
Informal education	56.19	22.57	1.37	2.92	0.38	15.10	1.37	0.09	100.00
Primary (1-5)	43.14	32.26	1.83	5.91	1.05	15.18	0.12	0.50	100.00
Lower Sec.(6-8)	32.10	41.98	4.47	3.44	3.27	13.26	1.47	0.00	100.00
Secondary (9-10)	36.54	35.01	4.39	9.50	1.30	11.50	1.45	0.31	100.00
SLC	48.55	36.59	4.44	5.00	1.93	3.25	0.23	0.00	100.00
Class 12 / Certificate	33.20	51.39	9.87	3.19	0.00	2.13	0.21	0.00	100.00
Bachelor	23.35	46.95	22.79	3.71	0.00	0.61	0.33	2.27	100.00
Master and above	10.49	60.35	24.59	3.21	0.0	0.0	0.0	1.36	100.00
Illiterate	41.31	12.82	0.34	6.57	1.44	33.97	2.55	0.99	100.00
Income Quintile									
First Quintile (Lowest)	49.37	9.55	0.67	5.49	2.80	31.01	1.00	0.11	100.00
Second Quintile	54.16	16.21	1.19	5.73	0.77	19.76	1.80	0.38	100.00
Third Quintile	44.05	24.47	2.27	5.63	0.89	20.52	1.72	0.45	100.00
Fourth Quintile	38.78	39.60	3.33	4.14	0.21	12.12	1.40	0.44	100.00
Fifth Quintile (Highest)	30.88	48.18	8.85	4.43	0.95	5.43	0.72	0.56	100.00
NAPA Combined Vulnerability Index									
Very High	54.94	27.54	5.23	2.69	1.18	6.97	1.36	0.09	100.00
High	53.97	17.22	1.82	3.81	2.60	17.81	2.14	0.63	100.00

Analytical Domain	Source of Information About Climate Change (%)								Total
	Radio	Television	News paper	Awareness programmes	Local agencies /official	Neighbor /friends	Family member	Others	
Moderate	47.56	10.41	1.92	8.69	1.34	28.90	1.18	0.00	100.00
Low	21.49	44.13	4.78	3.98	0.28	22.26	1.39	1.71	100.00
Very Low	18.76	64.84	2.44	7.50	0.00	6.46	0.00	0.00	100.00
Bio-Climatic Zone									
Tropical	34.22	32.03	3.03	5.37	1.19	22.51	0.97	0.67	100.00
Sub-tropical	54.85	21.57	4.22	5.02	1.39	10.61	2.11	0.23	100.00
Temperate	78.74	7.95	0.21	2.73	0.00	9.57	0.80	0.00	100.00
Sub-alpine	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Nepal	**42.81**	**27.63**	**3.34**	**5.16**	**1.22**	**17.98**	**1.36**	**0.50**	**100.00**

Table 5-2 depicts percentage of the response by source of information related to climate change. Overall, 42.81 per cent households heard about climate change through radio, 27.63 per cent through television, and 17.98 per cent through neighbors or friends. The main source of information in rural areas was radio and neighbor or friends. The result shows that across all the analytical domains, the main source of climate information was radio, television followed by neighbor or friends.

Table 5-3: Households' Perception on Change of Climate in Last 25 Years

Analytical Domain	Households (%)		Total
	Yes	No	
Urban/Rural			
Urban	96.01	3.99	100.00
Rural	94.68	5.32	100.00
Ecological Belt			
Mountain	93.85	6.15	100.00
Hill	92.46	7.54	100.00
Terai	97.88	2.12	100.00
Eco-Development Region			
Eastern Mountain	84.62	15.38	100.00
Eastern Hill	97.32	2.68	100.00
Eastern *Terai*	97.58	2.42	100.00
Central Mountain	95.46	4.54	100.00
Central Hill	93.09	6.91	100.00
Central *Terai*	98.53	1.47	100.00
Western Mountain	68.21	31.79	100.00
Western Hill	86.28	13.72	100.00
Western *Terai*	99.61	0.39	100.00
Mid-western Mountain	98.14	1.86	100.00
Mid-western Hill	93.22	6.78	100.00
Mid-western *Terai*	95.79	4.21	100.00
Far-western Mountain	99.40	0.60	100.00
Far-western Hill	95.13	4.87	100.00
Far-western *Terai*	95.46	4.54	100.00
Kathmandu Valley	97.94	2.06	100.00
Age Group			
45-54 Yrs.	95.64	4.36	100.00
55-64 Yrs.	95.64	4.36	100.00
65-74 Yrs.	93.19	6.81	100.00
75+ Yrs.	94.96	5.04	100.00
Nepal	**95.07**	**4.93**	**100.00**

Table 5-3 indicates percentage response on change of climate in past 25 years. Majority of the households said that the climate is changing in the last 25 years. However, significant percentage of households (31.79% and 15.38%) in western mountain and eastern mountain respectively said that there was no change in the climate. There is not so much difference in responses across age-group of the households. The results confirm that majority of the households have observed change in climate.

Table 5-4: Perception on Reasons of Climate Change

Analytical Domain	Perception on Main Reason for Climate Change (%)[6]								
	Deforestation	Industrialisation	Urbanisation	Resource exploitation	God's will	Natural cause	Earthquake	Others	Don't know
Urban/Rural									
Urban	62.8	35.0	56.9	35.4	7.2	34.7	4.6	6.2	5.5
Rural	57.6	20.0	18.2	32.4	12.2	43.4	6.6	5.0	15.6
Ecological Belt									
Mountain	49.8	4.0	15.3	30.3	12.7	52.6	11.4	2.8	11.4
Hill	48.3	26.7	32.2	26.0	11.7	33.2	9.0	6.4	16.5
Terai	70.8	25.6	29.7	40.7	9.5	46.0	2.3	4.7	9.1
Eco-Development Region									
Eastern Mountain	14.9	7.3	29.4	44.5	15.6	54.0	31.7	0.00	10.0
Eastern Hill	47.9	27.9	27.8	37.4	20.9	46.5	10.5	4.3	5.3
Eastern *Terai*	74.0	38.5	49.2	41.6	5.5	38.0	1.4	5.7	2.6
Central Mountain	34.9	3.1	19.4	6.2	17.0	61.0	12.0	7.7	7.1
Central Hill	57.1	39.8	42.4	20.0	8.5	34.0	9.0	2.4	13.5
Central *Terai*	59.9	19.6	10.0	40.9	11.4	50.3	2.0	1.2	19.4
Western Mountain	22.6	6.5	0.00	9.7	4.1	58.4	12.9		31.1
Western Hill	25.9	16.1	20.7	12.5	8.9	19.0	12.5	9.9	38.3
Western *Terai*	85.5	13.4	33.6	31.6	10.3	63.7	4.6	9.1	0.1
Mid-western Mountain	66.9	1.2	6.9	2.1	0.00	0.00	0.00	0.00	31.3
Mid-western Hill	64.2	13.7	20.1	27.8	16.5	32.0	5.8	12.3	9.5
Mid-western *Terai*	67.3	23.1	33.4	30.8	18.3	23.5	3.1	6.3	8.6
Far-western Mountain	97.3	4.9	2.0	87.1	15.0	88.9	0.00	0.00	0.00
Far-western Hill	87.1	5.5	6.4	70.7	8.2	74.8	5.1	2.8	5.5
Far-western *Terai*	96.8	18.6	28.6	69.4	5.4	63.2	2.5	9.7	1.1
Kathmandu Valley	30.0	53.7	89.9	23.2	4.0	11.7	2.1	7.3	3.3
NAPA Combined Vulnerability Index									
Very High	59.8	32.9	47.1	31.2	8.7	41.8	4.3	4.4	3.4
High	56.7	15.7	16.3	43.8	15.4	36.3	8.6	3.9	14.0
Moderate	47.7	16.6	11.6	23.8	10.8	44.6	6.9	4.8	26.7
Low	71.3	37.5	46.5	37.8	8.1	38.4	4.0	6.8	4.5
Very Low	66.1	15.6	28.8	26.0	9.6	45.5	5.6	9.5	13.9
Bio-Climatic Zone									
Tropical	65.2	25.2	29.6	36.7	9.3	42.5	4.2	5.6	11.6
Sub-tropical	49.6	24.8	32.5	29.2	12.7	38.2	8.9	5.4	12.9
Temperate	49.0	10.4	9.9	18.4	16.2	37.3	8.8	2.1	22.8
Sub-alpine	0.00	0.00	0.00	0.00	9.1	36.4	0.00	0.00	54.5
Nepal	**59.1**	**24.4**	**29.7**	**33.3**	**10.8**	**40.8**	**6.0**	**5.3**	**12.6**

[6] The result is based on multiple response

Table 5-4 shows the perception of households on the main reason behind climate change. Overall figure shows 59.1 per cent households attribute deforestation as the main cause of climate change followed by natural disaster (40.8%), industrialisation (24.4%), urbanisation (29.7%) and human intervention (33.3%) among other reasons. Perceiving deforestation as major cause of climate change is seen higher in urban households (62.8%) in comparison to rural (57.6%). Similarly, households of Kathmandu Valley observed industrialisation (53.7%) and urbanisation (89.9%) as the major contributor of climate change.

Exploitation of resources (43.8%) is observed to be the major reason for climate change in high vulnerable area where as deforestation (71.3%) in low vulnerability area. Similarly, 8.6 per cent in high vulnerable areas responded that earthquake was the major reason for climate change. Overall, higher percentage of households based on the NAPA combined vulnerability areas observed deforestation and natural causes as major reasons behind climate Change.

Table 5-5: Main Climate Induced Disasters

Analytical Domain	Climate Induced Disasters Since Last 25 Years (%)[7]																	
	Drought	Forest Fire	Fire (settlement)	Flood	Inundation	Windstorm	Thunderstorm	Hailstorm	Heavy rain	Sporadic rain	Soil erosion	Land slide	Avalanche	GLOF	Hot wave	Cold wave	Disease / insect	Others
Urban/Rural																		
Urban	85.5	14.3	11.1	25.9	14.7	23.9	25.7	27.1	9.7	24.9	4.3	11.6	0.0	0.0	6.9	25.0	41.2	1.9
Rural	86.3	21.0	16.9	29.1	8.3	27.9	22.1	34.8	4.2	16.2	7.1	16.3	0.2	0.0	3.1	25.4	44.3	0.9
Ecological Belt																		
Mountain	82.1	27.6	4.6	6.1	0.0	17.1	19.1	46.9	4.7	24.5	4.7	28.0	2.1	0.2	0.0	9.6	47.1	1.0
Hill	78.9	29.4	4.0	8.9	0.0	16.2	24.3	29.4	6.1	22.9	11.5	27.5	0.0	0.0	0.1	1.0	34.3	1.5
Terai	93.5	7.9	27.5	49.8	21.4	38.1	22.8	33.1	5.8	14.0	1.7	0.9	0.0	0.0	8.8	50.7	51.3	0.9
Eco-Development Region																		
Eastern Mountain	30.4	2.1	5.6	12.5	0.0	3.3	25.4	57.8	18.8	6.5	17.7	49.4	4.7	0.8	0.0	38.7	39.1	2.4
Eastern Hill	91.4	26.8	10.4	13.5	0.0	21.4	18.3	23.2	12.3	19.7	1.9	18.3	0.0	0.0	0.0	5.2	37.9	2.6
Eastern *Terai*	94.8	5.5	26.5	40.9	28.4	51.2	35.2	21.7	5.8	12.4	1.7	1.6	0.0	0.0	1.5	41.2	51.9	0.4
Central Mountain	93.5	26.7	0.0	0.0	0.0	0.9	22.4	42.3	0.5	50.0	0.5	23.3	0.0	0.0	0.0	2.7	85.8	1.0
Central Hill	95.5	23.2	1.0	1.2	0.0	8.4	17.4	16.3	0.3	26.0	0.3	4.4	0.0	0.0	0.0	0.1	49.2	0.8
Central *Terai*	97.3	0.5	33.1	72.9	18.4	37.8	15.7	43.7	8.9	7.8	0.0	0.0	0.0	0.0	0.6	64.3	54.4	1.4
Western Mountain	67.5	3.2	0.0	0.0	0.0	35.5	0.0	37.3	6.5	0.0	41.0	36.4	32.8	0.0	0.0	0.0	66.6	6.5
Western Hill	40.8	31.1	1.6	2.6	0.0	8.7	36.5	34.2	8.0	20.8	29.2	39.8	0.0	0.0	0.0	0.0	12.2	1.3
Western *Terai*	92.5	18.3	33.7	7.4	8.5	3.3	16.0	24.7	0.0	37.6	0.6	0.2	0.0	0.0	57.2	75.4	56.4	0.3
Mid-Western Mountain	100	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.0	14.7	0.0
Mid-western Hill	84.0	41.9	6.1	33.3	0.0	43.8	24.0	37.2	7.7	11.6	14.9	55.6	0.0	0.0	0.6	0.0	43.2	0.3
Mid-western *Terai*	84.6	19.6	11.5	44.5	16.1	40.1	14.9	30.4	3.2	7.4	6.5	2.7	0.0	0.0	4.3	3.2	34.9	0.0
Far-western Mountain	99.6	81.3	16.3	16.6	0.0	77.2	26.3	90.9	1.9	23.6	1.8	39.0	4.1	0.0	0.0	0.9	18.3	0.0
Far-western Hill	94.9	62.2	3.7	1.4	0.0	6.4	28.8	73.9	0.7	1.7	22.7	76.4	0.0	0.0	0.0	0.4	48.6	0.4
Far-western *Terai*	77.5	27.7	10.0	50.9	35.7	35.1	23.5	53.1	1.7	24.8	6.8	1.3	0.0	0.0	8.3	43.2	43.2	2.2
Kathmandu Valley	93.4	0.7	3.1	8.9	0.0	14.7	20.2	23.9	6.5	66.8	0.0	0.0	0.0	0.0	0.0	0.0	17.0	5.7
Nepal	**86.1**	**19.0**	**15.2**	**28.1**	**10.2**	**26.7**	**23.2**	**32.5**	**5.8**	**18.8**	**6.3**	**14.9**	**0.2**	**0.0**	**4.2**	**25.3**	**43.4**	**1.2**

[7] The result is based on the multiple response

Table 5-5 depicts the percentage distribution of households' response by top climate induced disasters. Drought is observed as the top climate induced disaster (86.1%) by majority of households followed by hailstorm (32.5%) and flood (28.1%) among others. As a whole, 100 per cent households in mid-western mountain followed by far-western mountain (99.6%), central *Terai* (97.3%), central hill (95.5%), far-western hill (94.9%) and eastern *Terai* (94.8%) observed drought as the main climate induced disaster.

Similarly, forest fire is observed as main climate induced disasters mainly in far-western mountain (81.3%) followed by far-western hill (62.2%). Households in *Terai* ecological belt (49.8%) observe flood as main climate induced disaster with high percentage in central *Terai* (72.9%) as well as far-western *Terai* (50.9%) and mid-western *Terai* (44.9%). Windstorm is another major climate induced disaster observed in *Terai* belt (38.1%) with high percentage of households in eastern *Terai* (51.2%) as well as central *Terai* (37.8%). In far-western mountain, majority of households (77.2%) observed windstorm as the main climate induced disaster. Similarly, hailstorm is observed as main climate induced disaster in far-western mountain (90.9%), far-western hill (73.9%) and eastern mountain (57.8%).

Further, 66.8 per cent households reported sporadic rain as major climate induced incidence in Kathmandu Valley. Landslide is observed in hilly region by majority of households in far-western hill (76.4%) and mid-western hill (55.6%) as the major disaster. Occurrence of Disease is observed high in *Terai* (51.3%) ecological belt.

5.3. Change in Monsoon and Winter Precipitation

Table 5-6: Change in Monsoon in the Last 25 Years

Analytical Domain	Change in Monsoon Precipitation (%)			Total
	Increased	Decreased	No change	
Urban/Rural				
Urban	3.56	91.81	4.63	100.00
Rural	3.43	90.97	5.60	100.00
Ecological Belt				
Mountain	15.29	75.06	9.65	100.00
Hill	3.77	87.11	9.12	100.00
Terai	1.14	98.07	0.79	100.00
Eco-Development Region				
Eastern Mountain	29.48	39.12	31.41	100.00
Eastern Hill	6.04	86.59	7.38	100.00
Eastern *Terai*	1.09	97.81	1.11	100.00
Central Mountain	22.37	72.50	5.13	100.00
Central Hill	2.26	96.15	1.60	100.00
Central *Terai*	0.56	99.24	0.20	100.00
Western Mountain	2.20	77.80	20.00	100.00
Western Hill	3.93	72.47	23.60	100.00
Western *Terai*	0.41	98.34	1.24	100.00
Mid-western Mountain	0.0	100.00	0.0	100.00
Mid-western Hill	4.31	91.87	3.82	100.00
Mid-western *Terai*	4.08	94.77	1.15	100.00
Far-western Mountain	0.46	99.54	0.0	100.00
Far-western Hill	2.21	96.97	0.81	100.00
Far-western *Terai*	1.69	97.11	1.20	100.00
Kathmandu Valley	3.69	92.23	4.08	100.00

Analytical Domain	Change in Monsoon Precipitation (%)			Total
	Increased	Decreased	No change	
NAPA Combined Vulnerability Index				
Very High	4.38	93.85	1.78	100.00
High	4.99	91.48	3.53	100.00
Moderate	2.64	84.58	12.78	100.00
Low	2.88	94.54	2.57	100.00
Very Low	0.74	94.04	5.22	100.00
Very Low	8.03	90.04	1.92	100.00
Bio-Climatic Zone				
Tropical	1.61	95.40	3.00	100.00
Sub-tropical	6.74	85.07	8.18	100.00
Temperate	3.57	82.12	14.32	100.00
Sub-alpine	0.0	80.00	20.00	100.00
Nepal	**3.47**	**91.22**	**5.31**	**100.00**

Table 5-6 represents respondent's perception of change in rainfall during monsoon as compared to past 25 years. Overall households (91.22%) reported decrease in monsoon rainfall in the recent years in comparison to past 25 years. In mid-western mountain, 100 per cent households observed decrease in monsoon rainfall. On the other hand, in eastern mountain, 31.41 per cent households observed no change in monsoon rainfall.

Majority of households disaggregated according to NAPA combined vulnerability index reported decrease in monsoon in past 25 years. Among the climatic zones, highest percentage of households at tropical zone (95.40%) reported decrease in monsoon followed by sub-tropical (85.07%), temperate (82.12%) and sub-alpine (80%) regions.

Table 5-7: Change in Winter Precipitation in Last 25 Years

Analytical Domain	Change in Winter Precipitation (%)			Total
	Increased	Decreased	No change	
Urban/Rural				
Urban	1.17	90.78	8.05	100.00
Rural	0.47	89.05	10.48	100.00
Ecological Belt				
Mountain	0.31	79.23	20.46	100.00
Hill	0.87	91.57	7.56	100.00
Terai	0.54	89.34	10.13	100.00
Eco-Development Region				
Eastern Mountain	1.20	32.53	66.26	100.00
Eastern Hill	0.97	84.22	14.81	100.00
Eastern *Terai*	0.50	87.06	12.44	100.00
Central Mountain	0.0	89.21	10.79	100.00
Central Hill	0.84	95.94	3.22	100.00
Central *Terai*	0.40	85.39	14.21	100.00
Western Mountain	2.20	79.40	18.39	100.00
Western Hill	0.42	87.84	11.74	100.00
Western *Terai*	0.47	97.10	2.43	100.00
Mid-western Mountain	0.0	98.29	1.71	100.00

Analytical Domain	Change in Winter Precipitation (%)			Total
	Increased	Decreased	No change	
Mid-western Hill	1.40	94.62	3.99	100.00
Mid-western *Terai*	0.83	97.50	1.67	100.00
Far-western Mountain	0.0	100.00	0.0	100.00
Far-western Hill	0.0	98.22	1.78	100.00
Far-western *Terai*	1.23	97.75	1.03	100.00
Kathmandu Valley	2.29	95.93	1.78	100.00
NAPA Combined Vulnerability Index				
Very High	0.91	88.95	10.14	100.00
High	0.39	84.91	14.70	100.00
Moderate	0.53	86.86	12.61	100.00
Low	1.04	96.07	2.89	100.00
Very Low	0.40	95.59	4.01	100.00
Bio-Climatic Zone				
Tropical	0.76	89.68	9.56	100.00
Sub-tropical	0.61	89.46	9.92	100.00
Temperate	0.04	88.79	11.17	100.00
Sub-alpine	0.0	75.00	25.00	100.00
Nepal	**0.67**	**89.56**	**9.77**	**100.00**

Table 5-7 depicts households' perception of change in winter rainfall as compared to past 25 years. Of the total households, 89.56 per cent reported decrease in winter rainfall in the recent years as compared to past 25 years. This figure is observed highest in far-western mountain whereby 100 per cent households observed decrease in winter rainfall.

On the other hand, highest percentage of households of eastern mountain (66.26%) observed no change in winter rainfall. Similarly, 95.93 per cent households of Kathmandu Valley observed decrease in winter rainfall whilst 2.29 per cent reported increase and 1.78 per cent observed no change. Further, households of combined vulnerability area observed decrease in winter rainfall. Among the climatic zones, highest percentage of households (89.68%) from tropical zone observed decrease in winter precipitation followed by sub-tropical (89.46%), temperate (88.79%), and sub-alpine (75%) regions.

5.4. Changes in Summer and Winter Temperature

Table 5-8: Change in Summer Temperature in the Last 25 Years

Analytical Domain	Change in Summer Temperature (%)			Total
	Increased	Decreased	No change	
Urban/Rural				
Urban	92.26	1.91	5.83	100.00
Rural	88.00	2.92	9.08	100.00
Ecological Belt				
Mountain	86.47	0.91	12.61	100.00
Hill	86.35	1.57	12.08	100.00
Terai	92.60	3.97	3.43	100.00
Eco-Development Region				
Eastern Mountain	75.64	1.20	23.15	100.00
Eastern Hill	88.32	2.78	8.91	100.00
Eastern *Terai*	92.68	3.50	3.82	100.00

Analytical Domain	Change in Summer Temperature (%)			Total
	Increased	Decreased	No change	
Central Mountain	79.69	1.40	18.91	100.00
Central Hill	89.46	1.94	8.59	100.00
Central *Terai*	92.62	6.05	1.33	100.00
Western Mountain	90.60	0.0	9.40	100.00
Western Hill	78.79	0.91	20.30	100.00
Western *Terai*	94.36	1.62	4.02	100.00
Mid-western Mountain	98.77	0.61	0.61	100.00
Mid-western Hill	83.92	0.58	15.50	100.00
Mid-western *Terai*	88.22	2.72	9.06	100.00
Far-western Mountain	100.00	0.0	0.0	100.00
Far-western Hill	93.11	2.79	4.10	100.00
Far-western *Terai*	95.55	0.49	3.96	100.00
Kathmandu Valley	97.47	0.40	2.13	100.00
NAPA Combined Vulnerability Index				
Very High	93.43	1.94	4.64	100.00
High	89.35	2.46	8.19	100.00
Moderate	87.86	3.76	8.37	100.00
Low	88.21	2.51	9.28	100.00
Very Low	84.50	2.02	13.47	100.00
Bio-Climatic Zone				
Tropical	90.46	3.38	6.16	100.00
Sub-tropical	86.88	1.35	11.76	100.00
Temperate	90.92	2.16	6.93	100.00
Sub-alpine	95.00	0.0	5.00	100.00
Nepal	**89.25**	**2.62**	**8.13**	**100.00**

Table 5-8 represents the change in temperature during summer season as compared to past 25 years. Majority of the households (89.25%) observed increase in feeling of temperature during summer season whereas some households (8.13%) observed no change and few (2.62%) reported a decrease. Highest percentage of households stating an increase in temperature is observed in *Terai* (92.6%) among the ecological belts and in far-western mountain (100%) among the eco-development regions. Similarly, majority of households from combined vulnerability areas observed an increase of temperature. Among four climatic zones, highest percentage of households observing an increase in temperature is in sub-alpine (95%) followed by temperate (90.92%), tropical (90.46%), and sub-tropical (86.88%) region.

Table 5-9: Change in Winter Temperature in Last 25 Years

Analytical Domain	Change in Winter Temperature (%)			Total
	Increased	Decreased	No change	
Urban/Rural				
Urban	27	58	15	100
Rural	25	54	21	100
Ecological Belt				
Mountain	17	55	29	100
Hill	28	48	24	100
Terai	25	62	13	100

Analytical Domain	Change in Winter Temperature (%)			Total
	Increased	Decreased	No change	
Eco-Development Region				
Eastern Mountain	10	32	58	100
Eastern Hill	26	47	27	100
Eastern *Terai*	26	68	6	100
Central Mountain	36	25	39	100
Central Hill	22	59	19	100
Central *Terai*	10	70	20	100
Western Mountain	13	75	12	100
Western Hill	30	30	40	100
Western *Terai*	43	46	11	100
Mid-western Mountain	1	97	2	100
Mid-western Hill	45	36	18	100
Mid-western *Terai*	32	52	16	100
Far-western Mountain	6	94	0.0	100
Far-western Hill	19	76	5	100
Far-western *Terai*	65	31	3	100
Kathmandu Valley	18	78	4	100
NAPA Combined Vulnerability Index				
Very High	20	72	9	100
High	24	54	22	100
Moderate	20	52	28	100
Low	38	48	14	100
Very Low	32	41	27	100
Bio-Climatic Zone				
Tropical	28	55	17	100
Sub-tropical	22	54	24	100
Temperate	16	65	19	100
Sub-alpine		95	5	100
Nepal	**26**	**57**	**18**	**101**

Table 5-9 represents the perception of change in temperature by households during winter season compared to past 25 years. The finding shows 57 per cent of households observed decrease in temperature in the recent years compared to past 25 years followed by 26 per cent observing an increase and 18 per cent reporting no change. The response varies among the eco-development regions as 65 per cent households in far-western *Terai* observed an increase, 97 per cent in mid-western mountain reported decrease, and 58 per cent of households in eastern mountain households informed no change in temperature during winter season.

Likewise, 18 per cent of households of Kathmandu Valley observed an increase in winter temperature while 78 per cent reported decrease and 4 per cent observed no change. Among the climatic zones, highest percentage of households (89.68%) observing decrease in temperature is found in sub-alpine zones (95%) followed by temperate (65%), tropical (55%), and sub-tropical (54%) zones. None of the households from sub-alpine zone observed increase in winter temperature.

5.5. Change in Onset of Summer and Winter Season

Table 5-10: Change in Onset of Summer Season in Last 25 Years

Analytical Domain	Summer Season's Time Shift (in week)							Total	Average time shift (Weeks)
	More than 4 Weeks before	3-4 Weeks before	1-2 Weeks before	No Shift	1-2 Weeks delay	3-4 Weeks delay	More than 4 Week Delay		
Urban/Rural									
Urban	15.74	35.35	25.43	16.37	4.03	2.10	0.99	100.00	-2.39
Rural	11.24	33.66	27.59	16.77	4.81	4.37	1.55	100.00	-1.98
Ecological Belt									
Mountain	18.28	32.31	28.53	15.56	3.33	1.05	0.95	100.00	-2.54
Hill	6.81	29.88	23.68	29.34	6.13	2.89	1.28	100.00	-1.53
Terai	17.28	38.72	29.95	4.24	3.26	4.97	1.58	100.00	-2.60
Eco-Development Region									
Eastern Mountain	20.61	28.87	16.64	23.63	6.93	2.12	1.20	100.00	-2.44
Eastern Hill	10.12	36.32	17.21	19.24	9.91	5.04	2.17	100.00	-1.69
Eastern *Tarai*	18.84	40.16	30.40	3.19	3.82	3.03	0.55	100.00	-2.85
Central Mountain	5.33	33.89	38.55	17.79	3.05	0.50	0.89	100.00	-1.95
Central Hill	3.52	13.69	20.15	51.93	5.81	2.79	2.11	100.00	-0.67
Central *Tarai*	15.13	39.59	27.56	2.33	2.39	9.67	3.33	100.00	-2.23
Western Mountain	2.20	30.60	31.19	33.81	2.20	0.0	0.0	100.00	-1.50
Western Hill	5.90	30.62	27.46	25.09	7.22	3.08	0.63	100.00	-1.52
Western *Tarai*	3.81	46.39	40.90	3.43	4.11	0.94	0.43	100.00	-2.32
Mid-western Mountain	32.66	50.71	9.03	2.37	1.71	1.81	1.71	100.00	-3.87
Mid-western Hill	7.92	45.81	24.64	17.48	2.37	1.08	0.71	100.00	-2.35
Mid-western *Tarai*	32.11	31.30	19.85	10.15	4.04	1.90	0.65	100.00	-3.48
Far-western Mountain	25.62	15.04	44.56	13.74	1.05	0.0	0.0	100.00	-2.47
Far-western Hill	4.93	33.40	48.58	7.24	4.87	0.99	0.0	100.00	-2.17
Far-western *Tarai*	24.96	21.82	36.36	13.96	2.59	0.0	0.32	100.00	-2.56
Kathmandu Valley	14.52	40.07	15.02	25.75	1.85	2.32	0.48	100.00	-2.33
NAPA Combined Vulnerability Index									
Very High	10.83	29.01	27.17	27.74	2.93	1.89	0.43	100.00	-1.96
High	9.43	34.67	27.71	17.31	5.35	3.75	1.78	100.00	-1.94
Moderate	13.78	34.12	25.17	11.75	4.81	7.68	2.69	100.00	-1.88
Low	20.79	35.88	24.92	10.77	4.60	2.09	0.96	100.00	-2.75
Very Low	3.14	41.91	33.92	13.44	6.08	1.24	0.27	100.00	-1.96
Bio-Climatic Zone									
Tropical	15.06	37.18	28.01	9.44	3.93	4.70	1.66	100.00	-2.35
Sub-tropical	8.06	28.95	24.43	29.57	5.73	2.35	0.91	100.00	-1.64
Temperate	13.39	33.10	31.89	14.95	4.59	0.77	1.32	100.00	-2.25
Sub-alpine		35.00	40.00	25.00	0.0	0.0	0.0	100.00	-1.70
Nepal	**12.56**	**34.15**	**26.96**	**16.65**	**4.58**	**3.71**	**1.39**	**100.00**	**-2.10**

Table 5-10 shows the shift in the onset of summer. Majority of the households (34.15%) reported of 3 to 4 weeks prior shift. Similarly, 26.96 per cent households said 1 to 2 weeks prior shift in the summer. Overall, in average, prior shift is found 2.1 weeks. However, 16.65 per cent of households reported no change in the onset of summer.

Table 5-11: Change in Onset of Winter Season in Last 25 Years

Analytical Domain	Winter Season's Time Shift (in week)							Total	Average time shift (Weeks)
	More than 4 Weeks before	3-4 Weeks before	1-2 Weeks before	No Shift	1-2 Weeks delay	3-4 Weeks delay	More than 4 Week Delay		
Urban/Rural									
Urban	0.16	1.63	2.95	15.71	25.89	34.69	18.98	100.00	2.72
Rural	1.42	4.65	7.00	21.75	24.61	26.97	13.59	100.00	1.85
Ecological Belt									
Mountain	0.79	6.51	11.31	26.66	20.22	18.57	15.92	100.00	1.52
Hill	2.00	5.46	7.37	30.54	22.44	21.79	10.41	100.00	1.35
Terai	0.16	1.61	3.32	8.36	28.33	38.46	19.77	100.00	2.96
Eco-Development Region									
Eastern Mountain	1.94	5.85	9.85	50.30	14.11	14.75	3.20	100.00	0.45
Eastern Hill	2.90	5.56	3.41	23.48	19.64	32.81	12.20	100.00	1.75
Eastern *Tarai*	0.0	1.88	2.47	3.08	20.08	46.05	26.44	100.00	3.52
Central Mountain	0.44	14.21	23.47	30.80	18.15	9.48	3.44	100.00	-0.14
Central Hill	1.80	4.65	6.51	47.66	14.68	17.60	7.10	100.00	0.88
Central Tarai	0.0	0.85	0.72	9.17	35.30	34.15	19.81	100.00	3.05
Western Mountain	2.20	0.0	8.81	53.39	26.79	8.81	0.0	100.00	0.35
Western Hill	2.17	6.73	12.80	32.92	25.42	12.54	7.42	100.00	0.78
Western *Tarai*	0.0	0.12	3.14	5.56	37.83	50.51	2.84	100.00	2.37
Mid-western Mountain	0.0	0.0	0.0	1.47	15.08	53.62	29.83	100.00	4.08
Mid-western Hill	2.62	7.91	7.85	21.86	24.81	24.17	10.76	100.00	1.40
Mid-western *Tarai*	1.64	5.64	7.42	14.06	12.85	30.87	27.51	100.00	2.80
Far-western Mountain	0.70	0.0	2.19	13.50	36.67	5.12	41.83	100.00	3.37
Far-western Hill	0.0	3.06	4.76	6.75	60.49	21.95	2.99	100.00	1.69
Far-western *Tarai*	0.0	1.17	17.77	29.37	37.58	10.46	3.65	100.00	0.80
Kathmandu Valley	0.34	0.74	0.90	9.82	9.70	41.76	36.74	100.00	3.99
Combined Vulnerability									
Very High	0.25	3.75	5.92	23.22	17.62	33.42	15.83	100.00	2.18
High	2.09	5.57	5.66	21.66	27.03	30.58	7.41	100.00	1.58
Moderate	1.66	4.71	6.07	21.50	27.32	18.68	20.06	100.00	2.06
Low	0.36	1.67	5.60	13.82	24.03	31.89	22.63	100.00	2.79
Very Low	0.33	1.34	5.73	17.42	34.13	37.22	3.84	100.00	1.87
Bio-Climatic Zone									
Tropical	0.68	2.58	4.94	14.16	25.48	34.19	17.97	100.00	2.56
Sub-tropical	1.69	5.85	7.15	30.55	23.60	21.15	10.02	100.00	1.33
Temperate	1.19	3.88	7.29	17.37	28.68	24.59	17.00	100.00	2.03
Sub-alpine	0.0	0.0	0.0	60.00	40.00	0.0	0.0	100.00	0.50
Nepal	**1.05**	**3.76**	**5.81**	**19.98**	**24.99**	**29.23**	**15.17**	**100.00**	**2.11**

Table 5-11 shows the shift in the onset of winter. Majority of households (29.23%) reported 3 to 4 weeks delay in winter. Whereas, 24.99 per cent households said 1 to 2 weeks delay in the onset of winter season. Overall, average delay is found to be 2.11 weeks. However, 19.98 per cent households reported no change in the onset of summer.

5.6. Change In Monsoon And Winter Precipitation

Table 5-12: Change in Monsoon Start in Last 25 Years

Analytical Domain	Monsoon Seasons' Time Shift (in week)							Total	Average time shift (Weeks)
	More than 4 Weeks before	3-4 Weeks before	1-2 Weeks before	No Shift	1-2 Weeks delay	3-4 Weeks delay	More than 4 Week Delay		
Urban/Rural									
Urban	0.16	0.80	1.23	7.47	20.38	40.22	29.73	100.00	3.62
Rural	0.17	0.92	2.14	7.40	22.64	41.26	25.47	100.00	3.35
Ecological Belt									
Mountain	0.34	2.89	7.90	8.64	16.26	34.96	29.03	100.00	3.01
Hill	0.04	0.63	2.36	12.63	22.60	34.98	26.77	100.00	3.24
Terai	0.27	0.79	0.35	2.05	22.35	47.92	26.27	100.00	3.69
Eco-Development Region									
Eastern Mountain	1.39	9.04	8.01	28.38	8.75	11.93	32.51	100.00	2.33
Eastern Hill	0.0	0.47	0.27	5.94	8.67	38.14	46.51	100.00	4.61
Eastern *Tarai*	0.0	0.55	0.20	1.78	10.62	51.55	35.30	100.00	4.32
Central Mountain	0.0	1.95	16.54	3.65	19.84	40.13	17.89	100.00	2.41
Central Hill	0.0	0.92	1.48	6.13	15.86	37.23	38.38	100.00	3.90
Central *Tarai*	0.56	1.37	0.49	2.82	29.79	45.11	19.85	100.00	3.25
Western Mountain	0.0	0.0	2.20	45.00	14.40	33.39	5.00	100.00	1.60
Western Hill	0.05	0.82	6.28	32.26	33.13	24.98	2.49	100.00	1.40
Western *Tarai*	0.0	0.72	0.29	1.55	28.18	50.81	18.45	100.00	3.20
Mid-western Mountain	0.0	0.0	0.0	0.0	13.83	57.58	28.58	100.00	3.99
Mid-western Hill	0.0	0.26	1.10	2.55	28.45	43.04	24.62	100.00	3.48
Mid-western *Tarai*	0.60	0.0	0.50	1.45	16.29	39.53	41.63	100.00	4.36
Far-western Mountain	0.0	0.0	0.0	0.0	21.60	31.36	47.04	100.00	4.06
Far-western Hill	0.0	0.45	0.39	1.27	31.74	45.62	20.53	100.00	3.17
Far-western *Tarai*	0.0	0.0	0.29	0.74	40.37	52.49	6.12	100.00	2.76
Kathmandu Valley	0.39	0.0	0.0	8.13	23.94	31.94	35.60	100.00	3.94
Combined Vulnerability									
Very High	0.06	0.24	2.72	4.57	13.18	47.68	31.55	100.00	3.91
High	0.37	2.29	1.30	5.60	28.39	43.07	18.97	100.00	3.08
Moderate	0.17	0.42	2.75	15.46	21.33	36.25	23.61	100.00	3.05
Low	0.13	0.58	0.48	2.06	19.12	37.29	40.33	100.00	4.14
Very Low	0.0	0.73	2.03	10.14	35.62	39.37	12.12	100.00	2.54
Bio-Climatic Zone									
Tropical	0.22	0.81	0.71	4.04	22.00	45.72	26.51	100.00	3.61
Sub-tropical	0.11	1.09	3.36	11.86	22.71	33.53	27.34	100.00	3.19
Temperate	0.0	0.31	6.18	18.61	16.38	33.58	24.95	100.00	2.89
Sub-alpine	0.0	0.0	0.0	45.00	10.00	40.00	5.00	100.00	1.75
Nepal	**0.17**	**0.88**	**1.87**	**7.42**	**21.98**	**40.95**	**26.72**	**100.00**	**3.43**

Table 5-12 shows the shift in the start of monsoon. Majority of households (40.95%) reported 3 to 4 weeks delay in onset of monsoon. Similarly, 26.72 per cent of the households said more than 4 weeks delay in the onset of monsoon. Overall, average delay is found 3.43 weeks. The result shows delayed onset of monsoon in average. However, 7.42 per cent of households reported no change in the onset of monsoon. The high percentage response on the delay by more than four weeks might indicate to the higher variability in the onset of monsoon.

Table 5-13: Change in Winter Precipitation Timing in Last 25 Years

Analytical Domain	Winter Precipitation Time Shift (in week)							Total	Average time shift (Weeks)
	More than 4 Weeks before	3-4 Weeks before	1-2 Weeks before	No Shift	1-2 Weeks delay	3-4 Weeks delay	More than 4 Week Delay		
Urban/Rural									
Urban	0.61	2.49	3.00	16.82	18.19	26.76	32.14	100.00	3.46
Rural	0.47	1.23	1.90	18.73	20.96	27.54	29.17	100.00	3.30
Ecological Belt									
Mountain	0.08	0.0	3.04	26.40	18.58	35.83	16.07	100.00	2.56
Hill	0.55	0.35	1.77	16.34	23.24	28.14	29.61	100.00	3.33
Terai	0.55	3.11	2.53	18.58	17.35	25.03	32.86	100.00	3.49
Eco-development Region									
Eastern Mountain	0.35	0.0	7.75	55.39	10.92	16.63	8.95	100.00	1.32
Eastern Hill	1.02	0.29	1.74	18.30	12.17	26.53	39.94	100.00	4.12
Eastern *Tarai*	0.20	0.30	0.69	24.36	7.37	22.12	44.96	100.00	4.73
Central Mountain	0.0	0.0	2.77	10.36	25.60	39.69	21.58	100.00	3.12
Central Hill	0.66	0.14	0.82	15.28	25.96	32.41	24.73	100.00	3.13
Central *Tarai*	0.23	1.46	0.48	23.24	28.63	26.49	19.47	100.00	2.67
Western Mountain	0.0	0.0	0.0	51.61	23.99	21.61	2.80	100.00	1.30
Western Hill	0.66	0.88	3.21	23.62	28.51	25.18	17.94	100.00	2.19
Western *Tarai*	3.11	19.74	16.62	2.83	18.69	21.97	17.03	100.00	1.03
Mid-western Mountain	0.0	0.0	0.86	7.59	17.85	57.42	16.28	100.00	3.19
Mid-western Hill	0.0	0.0	1.04	4.64	14.86	22.73	56.73	100.00	5.33
Mid-western *Tarai*	0.0	0.0	0.33	4.41	6.61	30.53	58.12	100.00	5.27
Far-western Mountain	0.0	0.0	0.0	37.60	15.63	31.54	15.23	100.00	2.52
Far-western Hill	0.0	0.0	2.81	3.31	35.21	43.13	15.54	100.00	2.83
Far-western *Tarai*	0.25	0.69	0.72	11.72	18.43	29.56	38.62	100.00	3.66
Kathmandu Valley	0.0	0.18	0.46	21.48	25.86	24.16	27.86	100.00	3.21
Combined Vulnerability									
Very High	0.29	0.14	1.27	27.85	19.05	26.83	24.57	100.00	2.88
High	0.20	0.45	1.48	23.25	24.23	30.27	20.12	100.00	2.82
Moderate	0.47	1.01	1.78	18.13	25.43	28.10	25.08	100.00	2.93
Low	0.49	0.32	0.49	4.21	10.35	24.96	59.19	100.00	5.79
Very Low	2.05	12.71	11.67	12.41	20.46	24.02	16.68	100.00	1.44
Bio-Climatic Zone									
Tropical	0.54	2.55	2.28	17.11	18.75	26.15	32.61	100.00	3.51
Sub-tropical	0.33	0.12	2.14	19.76	22.35	27.95	27.34	100.00	3.15
Temperate	1.44	0.0	2.09	20.04	21.90	37.99	16.54	100.00	2.65
Sub-alpine	0.0	0.0	0.0	45.00	35.00	15.00	5.00	100.00	1.50
Nepal	**0.51**	**1.59**	**2.22**	**18.17**	**20.15**	**27.31**	**30.04**	**100.00**	**3.35**

Table 5-13 shows the shift in winter precipitation. Majority of households (30.04%) reported more than 4 weeks delay of winter precipitation. Likewise, 27.31 per cent households said 3 to 4 weeks delay in winter precipitation. Overall, average delay is found 3.35 weeks. The result shows delayed onset of the winter precipitation in average. However, 18.17 per cent households reported no change in the winter precipitation timing.

CHAPTER 6

CLIMATE INDUCED DISASTERS AND IMPACT

6.1. Summary of Findings

Survey results reveal that households are observing different climate induced disasters including flooding, landslides, drought, hailstorm, and Disease/insects in last 25 years. About 99 per cent respondents have observed the ascending incidences of drought in the last 25 years, followed by Disease/insects (97.69%), landslide (78.12%), and inundation (51.47%) (Figure 6-1).

The survey shows that households are observing impacts of different types of disasters in last 25 years. The results depicts that 38.3 per cent households have bear impacted by dry wind wave followed by landslides (35.2%), fire (in settlements) (31.8%), and flood (31.7%). However, less than 10 per cent household reported impact from heat wave, snow storm, sporadic rain, and forests fire (Figure 6-2).

Households are observing impacts of climate induced disasters on different aspects of livelihood in last 25 years. The survey result shows that households are missing their working days due to such disasters. Similarly, they also are experiencing the issue of food insecurity due to different climate induced disasters. About 32.86 per cent households reported that they are having food scarcity due to the drought while 26 per cent and 21.69 per cent reported so due to hailstorm and Disease/insects respectively. However, about 1 per cent reported that they are having food insecurity due to thunderstorm while about 2 per cent reported so from forest fire. Moreover, no one reported an impact on food insecurity due to heat wave, avalanche, and snow storm (Figure 6-3).

Different analytical domain wise response incidences of disaster, potential reasons, and impacts are presented in the following subsections.

Figure 6-1: Observed Change in Climate Induced Hazards/ Disasters in Last 25 Years

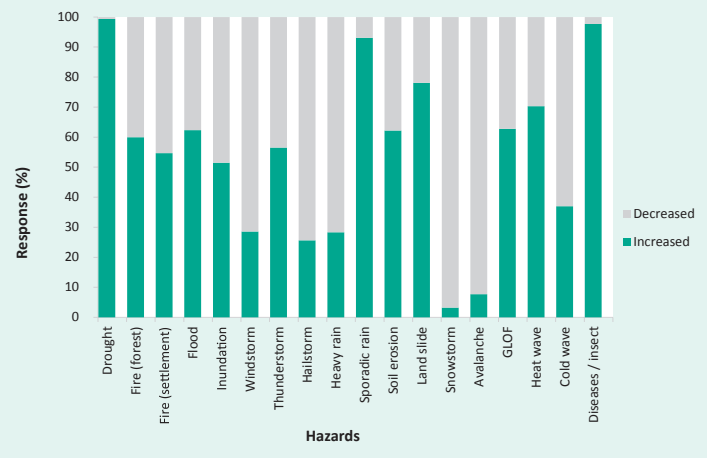


Figure 6-2: Households Affected by Disasters in Last 25 Years

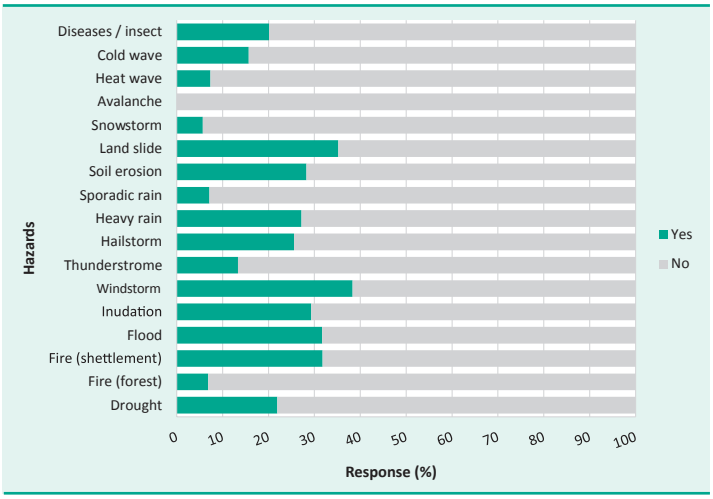
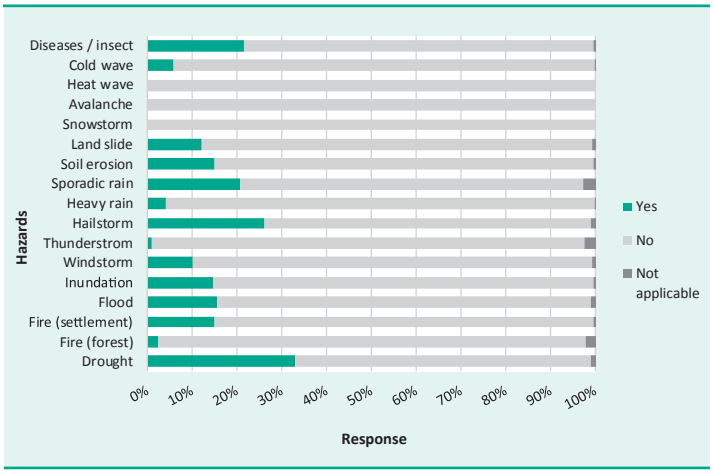


Figure 6-3: Household Experiencing Food Insecurity Due to Disasters in Last Five Years



6.2. Changes in Climate Induced Disasters

Table 6-1: Observed Changes in Climate Induced Disasters in the Last 25 Years

Climate Induced Hazards/Disasters	Observed Changes (%)			Total
	Yes	No	Not applicable	
Drought	90.06	9.84	0.10	100.00
Fire (in forest)	30.23	51.34	18.43	100.00
Fire (in settlement)	27.30	69.39	3.32	100.00
Flood	36.77	54.04	9.18	100.00
Inundation	14.12	56.21	29.67	100.00
Windstorm	38.38	56.35	5.27	100.00
Thunderstorm	44.16	54.87	0.97	100.00
Hailstorm	54.72	44.78	0.49	100.00
Heavy rain	24.67	73.30	2.03	100.00
Sporadic rain	41.82	56.39	1.79	100.00
Soil erosion	16.27	64.17	19.56	100.00
Landslide	23.08	39.02	37.90	100.00
Snowstorm	0.74	21.35	77.92	100.00
Avalanche	0.06	20.03	79.91	100.00
GLOF	0.03	19.18	80.79	100.00
Heat wave	9.51	45.26	45.23	100.00
Cold wave	39.60	32.11	28.28	100.00
Disease/insect	73.74	23.05	3.21	100.00

Table 6-1 represents the percentage distribution of households observing changes on climate induced disasters in last 25 years. Majority of households reported changes on incidence of climate induced disaster such as drought, hailstorm, and Disease/insects. Higher percentage of households (90.06%) reported to change on incidences of drought followed by Disease/insects (73.74%) and hailstorm storm (54.72%). However, less than 1 per cent households reported so for GLOF (0.03%), avalanche (0.06%), and snowstorm (0.74%). Meanwhile, significant portion of households reported the incidence of sporadic rain (41.82%) and flood (36.77%) as changing in last 25 years.

Table 6-2: Change in Climate Induced Disasters in Last 25 Years

Hazards/Disasters	Change		Total
	Increased (%)	Decreased (%)	
Drought	99.33	0.67	100.00
Fire (in forest)	59.99	40.01	100.00
Fire (in settlement)	54.68	45.32	100.00
Flood	62.31	37.69	100.00
Inundation	51.47	48.53	100.00
Windstorm	28.57	71.43	100.00
Thunderstorm	56.56	43.44	100.00
Hailstorm	25.66	74.34	100.00
Heavy rain	28.31	71.69	100.00
Sporadic rain	93.07	6.93	100.00
Soil erosion	62.23	37.77	100.00
Landslide	78.12	21.88	100.00
Snowstorm	3.27	96.73	100.00
Avalanche	7.72	92.28	100.00
GLOF	62.76	37.24	100.00
Heat wave	70.31	29.69	100.00
Cold wave	37.00	63.00	100.00
Disease/insect	97.69	2.31	100.00

Table 6-2 depicts percentage of household observing an increase or decrease in climate induced disasters in last 25 years. The survey reveals that almost all households are observing an increase on incidence of drought (99.33%) in last 25 years followed by disease/insect (97.69%) and sporadic rain (93.07%). On the other hand, higher percentage of households is observing the decrease in incidence of snowstorm (96.73%), avalanche (92.28%), heavy rain (71.69%), and windstorm (71.43%). However, households are divided about the change on incidence of inundation n last 25 years as 51.47 per cent households reported to an increase while 48.53 per cent observed to decrease.

Table 6-3: Changes in Climate Induced Disasters by Rural and Urban Area

Urban	Change (%)		Total	Rural	Change (%)		Total
	Increased	Decreased			Increased	Decreased	
Drought	99.31	0.69	100.00	Drought	99.34	0.66	100.00
Fire (forest)	60.09	39.91	100.00	Fire (forest)	59.96	40.04	100.00
Fire (settlement)	53.85	46.15	100.00	Fire (settlement)	55.00	45.00	100.00
Flood	56.45	43.55	100.00	Flood	64.56	35.44	100.00
Inundation	36.88	63.12	100.00	Inundation	59.89	40.11	100.00
Windstorm	18.79	81.21	100.00	Windstorm	32.48	67.52	100.00
Thunderstorm	52.89	47.11	100.00	Thunderstorm	58.27	41.73	100.00
Hailstorm	21.53	78.47	100.00	Hailstorm	27.13	72.87	100.00
Heavy rain	32.45	67.55	100.00	Heavy rain	26.65	73.35	100.00
Sporadic rain	94.54	5.46	100.00	Sporadic rain	92.40	7.60	100.00
Soil erosion	53.73	46.27	100.00	Soil erosion	64.88	35.12	100.00
Landslide	85.46	14.54	100.00	Landslide	76.07	23.93	100.00
Snowstorm	0.0	100.00	100.00	Snowstorm	3.76	96.24	100.00
Heat wave	0.0	33.34	100.00	Avalanche	7.72	92.28	100.00
Cold wave	40.44	59.56	100.00	GLOF	62.76	37.24	100.00
Disease/insect	97.68	2.32	100.00	Heat wave	73.39	26.61	100.00
				Cold wave	35.39	64.61	100.00
				Disease/ insect	97.69	2.31	100.00

Table 6-3 shows the percentage distribution of households observing changes in climate induced disasters in rural and urban area in last 25 years. Majority of households in both urban and rural areas are observing an increase on the incidences of drought, sporadic rain, landslide, and disease/ insect. Highest percentage of households reported such increase in disease/insect in both urban (97.68%) and rural (97.69%) areas in last 25 years. Similarly, all households (100%) in urban area and 96.24 per cent in rural area reported on decrease of incidences of snowstorm in last 25 years.

Table 6-4: Changes in Climate Induced Disasters by Eco-Development Regions

Hazards/Disasters	Changes (%)		Total
	Increased	Decreased	
Eastern Mountain			
Drought	100.0	0.0	100.00
Fire (forest)	68.64	31.36	100.00
Fire (settlement)	100.0	0.0	100.00
Flood	100.0	0.0	100.00
Windstorm	100.0	0.0	100.00
Thunderstorm	91.36	8.64	100.00
Hailstorm	90.41	9.59	100.00
Heavy rain	89.91	10.09	100.00
Sporadic rain	78.63	21.37	100.00
Soil erosion	96.87	3.13	100.00
Landslide (Glacier)	94.99	5.01	100.00
Snowstorm	0.0	100.0	100.00
Avalanche	0.0	100.0	100.00
GLOF	62.76	37.24	100.00
Cold wave	24.77	75.23	100.00
Disease/insect	97.18	2.82	100.00
Eastern Hill			
Drought	99.71	0.29	100.00
Fire (forest)	67.08	32.92	100.00
Fire (settlement)	68.86	31.14	100.00
Flood	29.82	70.18	100.00
Windstorm	33.70	66.30	100.00
Thunderstorm	75.71	24.29	100.00
Hailstorm	25.41	74.59	100.00
Heavy rain	54.69	45.31	100.00
Sporadic rain	98.69	1.31	100.00
Soil erosion	20.86	79.14	100.00
Landslide	51.67	48.33	100.00
Heat wave	0.0	100.0	100.00
Cold wave	3.81	96.19	100.00
Disease/insect	98.57	1.43	100.00
Eastern *Terai*			
Drought	99.38	0.62	100.00
Fire (forest)	62.65	37.35	100.00
Fire (settlement)	50.50	49.50	100.00
Flood	42.11	57.89	100.00
Inundation	30.39	69.61	100.00
Windstorm	14.35	85.65	100.00

Hazards/Disasters	Changes (%)		Total
	Increased	Decreased	
Thunderstorm	45.90	54.10	100.00
Hailstorm	5.27	94.73	100.00
Heavy rain	21.33	78.67	100.00
Sporadic rain	95.04	4.96	100.00
Soil erosion	34.39	65.61	100.00
Landslide	91.74	8.26	100.00
Heat wave	56.25	43.75	100.00
Cold wave	30.24	69.76	100.00
Disease/insect	97.26	2.74	100.00
Central Mountain			
Drought	100.0	0.0	100.00
Fire (forest)	96.56	3.44	100.00
Fire (settlement)	100.0	0.0	100.00
Windstorm	100.0	0.0	100.00
Thunderstorm	100.0	0.0	100.00
Hailstorm	94.82	5.18	100.00
Heavy rain	100.0	0.0	100.00
Sporadic rain	98.85	0.0	100.00
Soil erosion	0.0	100.0	100.00
Landslide	0.0	0.0	100.00
Cold wave	100.0	0.0	100.00
Disease/insect	100.0	0.0	100.00
Central Hill			
Drought	98.75	1.25	100.00
Fire (forest)	86.53	13.47	100.00
Fire (settlement)	53.71	46.29	100.00
Flood	60.78	39.22	100.00
Windstorm	84.09	15.91	100.00
Thunderstorm	93.45	6.55	100.00
Hailstorm	26.10	73.90	100.00
Heavy rain	9.46	90.54	100.00
Sporadic rain	99.63	0.37	100.00
Soil erosion	78.16	21.84	100.00
Landslide	70.26	29.74	100.00
Cold wave	0.0	100.0	100.00
Disease/insect	98.35	1.65	100.00
Central *Terai*			
Drought	99.80	0.20	100.00
Fire (forest)	52.34	47.66	100.00
Fire (settlement)	54.31	45.69	100.00

Hazards/Disasters	Changes (%)		Total
	Increased	Decreased	
Flood	76.31	23.69	100.00
Inundation	62.79	37.21	100.00
Windstorm	1.97	98.03	100.00
Thunderstorm	14.50	85.50	100.00
Hailstorm	2.35	97.65	100.00
Heavy rain	0.78	99.22	100.00
Sporadic rain	86.51	13.49	100.00
Heat wave	32.04	67.96	100.00
Cold wave	28.07	71.93	100.00
Disease/insect	96.70	3.30	100.00
Western Mountain			
Drought	100.0	0.0	100.00
Fire (forest)	100.0	0.0	100.00
Windstorm	100.0	0.0	100.00
Hailstorm	70.12	29.88	100.00
Heavy rain	100.00	0.0	100.00
Soil erosion	67.46	32.54	100.00
Landslide	100.00	35.29	100.00
Snowstorm	64.71	0.0	100.00
Avalanche	100.0	0.0	100.00
Disease/insect	100.0	0.0	100.00
Western Hill			
Drought	97.30	2.70	100.00
Fire (forest)	59.86	40.14	100.00
Fire (settlement)	36.60	63.40	100.00
Flood	75.09	24.91	100.00
Windstorm	86.83	13.17	100.00
Thunderstorm	77.88	22.12	100.00
Hailstorm	54.00	46.00	100.00
Heavy rain	91.37	8.63	100.00
Sporadic rain	97.21	2.79	100.00
Soil erosion	87.82	12.18	100.00
Landslide	90.86	9.14	100.00
Cold wave	29.14	70.86	100.00
Disease/insect	98.93	1.07	100.00
Western *Terai*			
Drought	100.00	0.0	100.00
Fire (forest)	47.62	52.38	100.00
Fire (settlement)	87.73	12.27	100.00
Flood	81.82	18.18	100.00
Inundation	82.94	17.06	100.00

Hazards/Disasters	Changes (%)		Total
	Increased	Decreased	
Windstorm	38.08	61.92	100.00
Thunderstorm	10.48	89.52	100.00
Hailstorm	3.49	96.51	100.00
Heavy rain	0.0	100.0	100.00
Sporadic rain	82.41	17.59	100.00
Soil erosion	76.36	23.64	100.00
Landslide	100.0	0.0	100.00
Heat wave	81.61	18.39	100.00
Cold wave	70.57	29.43	100.00
Disease/insect	96.65	3.35	100.00
Mid-Western Mountain			
Drought	100.0	0.0	100.00
Fire (forest)	64.81	35.19	100.00
Fire (settlement)	100.0	0.0	100.00
Flood	100.0	0.0	100.00
Hailstorm	0.0	100.0	100.00
Heavy rain	0.0	0.0	100.00
Landslide	100.0	0.0	100.00
Disease/insect	92.98	7.02	100.00
Mid-Western Hill			
Drought	99.62	0.38	100.00
Fire (forest)	22.67	77.33	100.00
Fire (settlement)	30.56	69.44	100.00
Flood	53.73	46.27	100.00
Windstorm	49.26	50.74	100.00
Thunderstorm	56.38	43.62	100.00
Hailstorm	19.86	80.14	100.00
Heavy rain	23.04	76.96	100.00
Sporadic rain	93.68	6.32	100.00
Soil erosion	37.56	62.44	100.00
Landslide	59.22	40.78	100.00
Heat wave	100.0	0.0	100.00
Cold wave	76.13	23.87	100.00
Disease/insect	98.58	1.42	100.00
Mid-Western *Terai*			
Drought	98.42	1.58	100.00
Fire (forest)	46.24	53.76	100.00
Fire (settlement)	18.90	81.10	100.00
Flood	58.95	41.05	100.00
Inundation	68.00	32.00	100.00

Hazards/Disasters	Changes (%)		Total
	Increased	Decreased	
Windstorm	40.83	59.17	100.00
Thunderstorm	56.48	43.52	100.00
Hailstorm	22.97	77.03	100.00
Heavy rain	5.79	94.21	100.00
Sporadic rain	97.48	2.52	100.00
Soil erosion	50.08	49.92	100.00
Landslide	68.69	31.31	100.00
Heat wave	88.15	11.85	100.00
Cold wave	80.17	19.83	100.00
Disease/insect	100.0	0.0	100.00
Far-Western Mountain			
Drought	100.0	0.0	100.00
Fire (forest)	60.42	39.58	100.00
Fire (settlement)	37.96	62.04	100.00
Flood	94.05	5.95	100.00
Windstorm	46.57	53.43	100.00
Thunderstorm	9.93	90.07	100.00
Hailstorm	58.16	41.84	100.00
Heavy rain	3.61	96.39	100.00
Sporadic rain	48.06	51.94	100.00
Soil erosion	30.77	69.23	100.00
Landslide	92.94	7.06	100.00
Snowstorm	0.0	100.0	100.00
Avalanche	0.0	100.0	100.00
Cold wave	3.64	96.36	100.00
Disease/insect	89.76	10.24	100.00
Far-Western Hill			
Drought	100.0	0.0	100.00
Fire (forest)	86.21	13.79	100.00
Fire (settlement)	71.59	28.41	100.00
Flood	58.91	41.09	100.00
Windstorm	55.91	44.09	100.00
Thunderstorm	67.64	32.36	100.00
Hailstorm	50.03	49.97	100.00
Heavy rain	80.79	19.21	100.00
Sporadic rain	87.17	12.83	100.00
Soil erosion	100.0	0.0	100.00
Landslide	97.46	2.54	100.00
Cold wave	0.0	100.0	100.00
Disease/insect	98.19	1.81	100.00

Hazards/Disasters	Changes (%)		Total
	Increased	Decreased	
Far-Western *Terai*			
Drought	100.0	0.0	100.00
Fire (forest)	54.43	45.57	100.00
Fire (settlement)	87.75	12.25	100.00
Flood	88.40	11.60	100.00
Inundation	78.12	21.88	100.00
Windstorm	51.73	48.27	100.00
Thunderstorm	45.32	54.68	100.00
Hailstorm	44.46	55.54	100.00
Heavy rain	26.81	73.19	100.00
Sporadic rain	90.10	9.90	100.00
Soil erosion	90.06	9.94	100.00
Landslide	88.08	11.92	100.00
Heat wave	92.45	7.55	100.00
Cold wave	80.69	19.31	100.00
Disease/insect	96.18	3.82	100.00
Kathmandu Valley			
Drought	99.05	0.95	100.00
Fire (forest)	55.28	44.72	100.00
Fire (settlement)	22.80	77.20	100.00
Flood	45.61	54.39	100.00
Windstorm	24.13	75.87	100.00
Thunderstorm	28.60	71.40	100.00
Hailstorm	10.67	89.33	100.00
Heavy rain	59.16	40.84	100.00
Sporadic rain	94.41	5.59	100.00
Landslide	100.0	0.0	100.00
Disease/insect	98.40	1.60	100.00

Table 6-4 shows the percentage distribution of households observing changes in climate induced disasters across eco-development regions in last 25 years. Highest percentage of households in all eco-development regions reported an increase in drought followed by disease/insect in the last 25 years. Similarly, 100 per cent households of central mountain region observed an increase in cold wave while another 100 per cent reported to decrease in such incidences in central hill. It is seen that 56.25 per cent of eastern *Terai* households are observing an increase in heat wave while none of the household are observing so in eastern hill.

Table 6-5: Changes in Climate Induced Disasters by Climatic Zone

Hazards/Disasters	Perception in Changes (%)		Total
	Increased	Decreased	
Tropical			
Drought	99.60	0.40	100.00
Fire (forest)	56.97	43.03	100.00
Fire (settlement)	54.50	45.50	100.00
Flood	63.81	36.19	100.00
Inundation	51.47	48.53	100.00
Windstorm	22.92	77.08	100.00
Thunderstorm	44.98	55.02	100.00
Hailstorm	17.23	82.77	100.00
Heavy rain	16.34	83.66	100.00
Sporadic rain	91.78	8.22	100.00
Soil erosion	57.07	42.93	100.00
Landslide	74.25	25.75	100.00
Snowstorm	0.0	100.00	100.00
Avalanche	0.0	100.00	100.00
Heat wave	74.22	25.78	100.00
Cold wave	38.56	61.44	100.00
Disease/insect	97.54	2.46	100.00
Sub-Tropical			
Drought	99.10	0.90	100.00
Fire (forest)	62.73	37.27	100.00
Fire (settlement)s	55.48	44.52	100.00
Flood	51.88	48.12	100.00
Windstorm	48.31	51.69	100.00
Thunderstorm	74.72	25.28	100.00
Hailstorm	36.78	63.22	100.00
Heavy rain	56.91	43.09	100.00
Sporadic rain	95.19	4.81	100.00
Soil erosion	66.49	33.51	100.00
Landslide	79.15	20.85	100.00
Snowstorm	0.0	100.00	100.00
Avalanche	0.0	100.00	100.00
GLOF	62.76	37.24	100.00
Heat wave	6.17	93.83	100.00
Cold wave	16.28	83.72	100.00
Disease/insect	98.35	1.65	100.00
Temperate			
Drought	96.95	3.05	100.00
Fire (forest)	71.23	28.77	100.00
Fire (settlement)	64.05	35.95	100.00
Flood	72.94	27.06	100.00
Windstorm	65.60	34.40	100.00
Thunderstorm	81.12	18.88	100.00
Hailstorm	64.14	35.86	100.00
Heavy rain	70.60	29.40	100.00
Sporadic rain	96.02	3.98	100.00
Soil erosion	75.69	24.31	100.00

Hazards/Disasters	Perception in Changes (%)		Total
	Increased	Decreased	
Landslide	92.00	8.00	100.00
Snowstorm	0.0	100.00	100.00
Avalanche	0.0	100.00	100.00
Heat wave	0.0	100.00	100.00
Cold wave	10.93	89.07	100.00
Disease/insect	95.24	4.76	100.00
Sub-Alpine			
Drought	100.00	0.0	100.00
Hailstorm	20.00	80.00	100.00
Soil erosion	70.59	29.41	100.00
Landslide	100.00	0.0	100.00
Snowstorm	64.71	35.29	100.00
Avalanche	100.00	0.0	100.00
Disease/insect	100.00	0.0	100.00

Table 6-5 shows percentage distribution of households observing changes in climate induced disasters by climatic zone in last 25 years. Highest percentage of the households reported an increase in the incidences of drought in all climatic zones. All households (100%) in sub-alpine zone are observing an increase in drought, landslide, avalanche, and Disease/insect. Similarly, 63.81 per cent households are observing so in case of flood and 51.47 per cent in case of inundation in tropical zone. Highest percentage of households in temperate region (64.05%) reported an increase in incidence of fire in settlement.

6.3. Impacts of Climate Induced Disasters

Table 6-6: Extent of Impact of Climate Induced Disaster in Last 25 Years

Hazards/Disasters	Magnitude of Impact (%)					Total	Average Impact (on scale 1 to 5)
	Extremely low (1)	Low (2)	Moderate (3)	High (4)	Extremely high (5)		
Drought	17.59	19.36	30.19	24.99	7.87	100.00	2.9
Fire (forest)	39.76	28.94	27.34	3.75	0.22	100.00	2.0
Fire (settlement)	47.66	23.25	19.59	5.04	4.46	100.00	2.0
Flood	30.13	18.90	19.40	13.33	18.24	100.00	2.7
Inundation	37.36	21.05	20.42	5.36	15.81	100.00	2.4
Windstorm	44.46	17.08	25.83	7.36	5.26	100.00	2.1
Thunderstorm	52.41	20.72	22.05	4.58	0.23	100.00	1.8
Hailstorm	41.04	21.38	25.15	8.93	3.49	100.00	2.1
Heavy rain	30.83	19.54	25.11	21.22	3.30	100.00	2.5
Sporadic rain	31.83	28.58	29.04	9.83	0.72	100.00	2.2
Soil erosion	26.46	30.33	30.94	11.58	0.69	100.00	2.3
Landslide	28.45	22.67	36.92	10.66	1.30	100.00	2.3
Snowstorm	62.71	29.35	3.53	4.11	0.30	100.00	1.5
Avalanche	96.14	3.86	0.0	0.0	0.0	100.00	1.0
GLOF	62.76	37.24	0.0	0.0	0.0	100.00	1.4
Heat wave	18.92	42.54	34.24	3.97	0.33	100.00	2.2
Cold wave	29.19	23.72	23.81	9.13	14.15	100.00	2.6
Disease/insect	16.51	20.21	32.07	22.90	8.30	100.00	2.9

Table 6-6 represents the percentage household distribution on extent of impact of climate induced disasters in last 25 years. Higher percentage of households reported that the impact of flood (18.24%) is extremely high followed by inundation (15.81%) and heat wave (14.15%) in last 25 years. However, higher percentage of households reported extremely low impact of avalanche (96.14%), GLOF (62.76%), snowstorm (62.71%), thunderstorm (52.41%), fire in settlement (47.66%), and windstorm (44.46%). The result shows that drought and disease/insects have higher magnitude of impact with the mean response 2.9.

Table 6-7: Extent of Impact of Climate Induced Disaster by Rural-Urban Households in Last 25 Years

Hazards/Disasters	Magnitude of Impact (%)					Total	Average Impact (on scale 1 to 5)
	Extremely low (1)	Low (2)	Moderate (3)	High (4)	Extremely high (5)		
Urban							
Drought	27.76	23.62	27.23	17.16	4.23	100.00	2.5
Fire (forest)	41.38	29.40	26.92	2.29	0.0	100.00	1.9
Fire (settlement)	39.52	25.96	21.97	6.62	0.0	100.00	2.1
Flood	37.67	23.06	21.20	9.06	9.01	100.00	2.3
Inundation	34.66	29.39	31.96	3.99	0.0	100.00	2.1
Windstorm	50.02	19.96	23.38	3.96	0.0	100.00	1.9
Thunderstorm	49.93	24.20	22.40	3.14	0.33	100.00	1.8
Hailstorm	48.51	25.56	20.87	4.23	0.83	100.00	1.8
Heavy rain	33.72	24.50	22.60	15.44	3.75	100.00	2.3
Sporadic rain	38.54	31.37	23.25	6.61	0.23	100.00	2.0
Soil erosion	36.04	25.05	31.98	6.71	0.21	100.00	2.1
Landslide	40.42	13.25	35.57	9.64	1.12	100.00	2.2
Snowstorm	66.67	33.33	0.0	0.0	0.0	100.00	1.3
Heat wave	21.30	47.77	29.75	1.17	0.0	100.00	2.1
Cold wave	28.72	31.98	29.13	3.60	0.0	100.00	2.3
Disease/insect	19.35	27.18	29.72	17.33	6.41	100.00	2.6
Rural							
Drought	13.37	17.60	31.41	28.24	0.0	100.00	3.0
Fire (forest)	39.22	28.78	27.47	4.23	0.29	100.00	2.0
Fire (settlement)	50.79	22.21	18.68	4.44	3.89	100.00	1.9
Flood	27.24	17.30	18.70	14.97	21.79	100.00	2.9
Inundation	38.91	16.24	13.77	6.16	24.92	100.00	2.6
Windstorm	42.24	15.93	26.82	8.71	6.30	100.00	2.2
Thunderstorm	53.56	19.10	21.89	5.26	0.19	100.00	1.8
Hailstorm	38.39	19.89	26.68	10.60	4.43	100.00	2.2
Heavy rain	29.67	17.56	26.12	23.54	3.12	100.00	2.5
Sporadic rain	28.71	27.28	31.73	11.33	0.95	100.00	2.3
Soil erosion	23.47	31.97	30.62	13.10	0.84	100.00	2.4
Landslide	25.10	25.31	37.30	10.94	1.35	100.00	2.4
Snowstorm	62.12	28.75	4.07	4.72	0.34	100.00	1.5
Avalanche	96.14	3.86	0.0	0.0	0.0	100.00	1.0
GLOF	62.76	37.24	0.0	0.0	0.0	100.00	1.4
Heat wave	16.91	38.12	38.02	6.34	0.61	100.00	2.4
Cold wave	29.41	19.85	21.32	11.72	17.69	100.00	2.7
Disease/insect	15.42	17.55	32.97	25.03	9.02	100.00	2.9

Table 6-7 shows the percentage distribution of households on extent of impact of climate induced disaster by rural-urban categories in last 25 years. Households are observing higher magnitude of impact of disasters such as droughts, Disease/insects, and flood in rural area with mean response 2.9 while it is 2.7 in urban areas. Similarly, more than one fourth households in both urban (27.23%) and in rural (31.41%) areas are observing moderate level of impact of drought with mean response 2.5 and 3.0 respectively.

Table 6-8: Extent of Impact of Climate Induced Disaster by Sex of the Respondent in Last 25 Years

Hazards/Disaster	Magnitude of Impact (%)					Total	Average Impact (on scale 1 to 5)
	Extremely low (1)	Low (2)	Moderate (3)	High (4)	Extremely high (5)		
Male							
Drought	17.16	19.60	31.20	24.43	7.61	100.00	2.9
Fire (forest)	39.49	28.65	28.26	3.45	0.15	100.00	2.0
Fire (settlement)	47.67	23.15	19.89	4.78	4.51	100.00	2.0
Flood	31.18	18.43	19.64	13.50	17.24	100.00	2.7
Inundation	38.07	19.61	17.86	6.43	18.03	100.00	2.5
Windstorm	45.26	16.67	25.66	7.31	5.10	100.00	2.1
Thunderstorm	51.71	20.18	22.86	5.03	0.23	100.00	1.8
Hailstorm	40.82	20.95	25.78	8.80	3.64	100.00	2.1
Heavy rain	28.53	19.60	26.34	21.71	3.82	100.00	2.5
Sporadic rain	31.02	28.50	30.05	9.78	0.65	100.00	2.2
Soil erosion	25.76	29.40	33.56	10.90	0.39	100.00	2.3
Landslide	26.49	23.04	38.06	11.21	1.20	100.00	2.4
Snowstorm	59.82	30.05	4.86	4.82	0.45	100.00	1.6
Avalanche	100.00	0.0	0.0	0.0	0.0	100.00	1.0
GLOF	100.00	0.0	0.0	0.0	0.0	100.00	1.0
Heat wave	18.35	43.02	34.56	4.07	0.0	100.00	2.2
Cold wave	29.16	23.37	25.26	8.36	13.85	100.00	2.5
Disease/insect	16.32	20.18	32.71	22.56	8.23	100.00	2.9
Female							
Drought	18.54	18.84	27.96	26.22	8.44	100.00	2.9
Fire (forest)	40.44	29.68	24.98	4.49	0.41	100.00	1.9
Fire (settlement)	47.64	23.55	18.70	5.82	4.29	100.00	2.0
Flood	27.27	20.19	18.73	12.85	20.96	100.00	2.8
Inundation	34.62	26.56	30.23	1.28	7.31	100.00	2.2
Windstorm	42.48	18.11	26.27	7.48	5.67	100.00	2.2
Thunderstorm	53.94	21.90	20.30	3.61	0.25	100.00	1.7
Hailstorm	41.55	22.35	23.72	9.22	3.16	100.00	2.1
Heavy rain	36.32	19.40	22.17	20.07	2.04	100.00	2.3
Sporadic rain	34.08	28.78	26.23	9.98	0.93	100.00	2.1

Hazards/Disaster	Magnitude of Impact (%)					Total	Average Impact (on scale 1 to 5)
	Extremely low (1)	Low (2)	Moderate (3)	High (4)	Extremely high (5)		
Soil erosion	28.51	33.00	23.37	13.57	1.56	100.00	2.3
Landslide	33.02	21.80	34.29	9.37	1.53	100.00	2.2
Snowstorm	68.49	27.95	0.89	2.67	0.0	100.00	1.4
Avalanche	92.43	7.57	0.0	0.0	0.0	100.00	1.1
GLOF	0.0	100.00	0.0	0.0	0.0	100.00	2.0
Heat wave	20.47	41.22	33.37	3.70	1.23	100.00	2.2
Cold wave	29.28	24.67	19.87	11.23	14.97	100.00	2.6
Disease/insect	16.99	20.31	30.49	23.74	8.47	100.00	2.9

Table 6-8 depicts percentage distribution of households observing an extent of impact of climate induced disaster based on Sex of the respondents in last 25 years. The result demonstrates that both male and female are observing higher impact of drought and Disease/insects with mean response 2.9. The similar magnitude of impact is observed by both male and female category with the mean response 2.7 and 2.8 respectively.

Table 6-9: Extent of Impact of Climate Induced Disaster by Eco-Development Regions in Last 25 Years

Hazards/Disasters	Magnitude of Impact (%)					Total	Average Impact (on scale 1 to 5)
	Extremely low (1)	Low (2)	Moderate (3)	High (4)	Extremely high (5)		
Eastern Mountain							
Drought	5.28	25.99	36.58	32.15	0.00	100.00	3.0
Fire (forest)	45.70	31.96	0.00	22.34	0.00	100.00	2.0
Fire (settlement)	49.07	32.68	11.84	3.20	3.20	100.00	1.8
Flood	35.13	13.76	27.00	24.11	0.00	100.00	2.4
Windstorm	10.00	50.00	40.00	0.00	0.00	100.00	2.3
Thunderstorm	11.88	13.00	58.43	16.69	0.00	100.00	2.8
Hailstorm	6.80	9.29	30.09	39.21	14.61	100.00	3.5
Heavy rain	1.93	17.17	43.53	37.37	0.00	100.00	3.2
Sporadic rain	5.94	42.25	46.61	5.19	0.00	100.00	2.5
Soil erosion	10.36	17.06	50.97	21.61	0.00	100.00	2.8
Landslide	17.85	14.63	36.31	26.87	4.34	100.00	2.9
Snowstorm	51.80	22.09	12.47	13.64	0.00	100.00	1.9
Avalanche	100.00	0.00	0.00	0.00	0.00	100.00	1.0
GLOF	62.76	37.24	0.00	0.00	0.00	100.00	1.4
Cold wave	33.15	19.05	28.37	16.76	2.67	100.00	2.4
Disease/insect	4.13	12.90	36.28	43.41	3.28	100.00	3.3
Eastern Hill							
Drought	3.86	10.62	46.65	33.15	5.71	100.00	3.3
Fire (forest)	8.13	10.43	77.42	3.44	0.58	100.00	2.8
Fire (settlement)	3.09	12.29	76.16	7.43	1.03	100.00	2.9
Flood	13.64	12.02	68.72	5.62	0.00	100.00	2.7
Windstorm	1.39	6.56	79.29	12.76	0.00	100.00	3.0

Hazards/Disasters	Magnitude of Impact (%)					Total	Average Impact (on scale 1 to 5)
	Extremely low (1)	Low (2)	Moderate (3)	High (4)	Extremely high (5)		
Thunderstorm	17.03	4.65	72.66	5.67	0.00	100.00	2.7
Hailstorm	20.16	8.58	57.35	12.34	1.57	100.00	2.7
Heavy rain	2.53	4.57	88.76	4.15	0.00	100.00	2.9
Sporadic rain	1.03	8.33	70.64	13.10	6.90	100.00	3.2
Soil erosion	1.05	11.04	81.92	5.98	0.00	100.00	2.9
Landslide	2.98	8.08	84.34	3.47	1.14	100.00	2.9
Heat wave	0.00	19.63	80.37	0.00	0.00	100.00	2.8
Cold wave	18.96	10.52	67.55	2.97	0.00	100.00	2.5
Disease/insect	2.14	6.64	49.16	39.27	2.79	100.00	3.3
Eastern *Terai*							
Drought	38.08	23.22	25.20	13.34	0.17	100.00	2.1
Fire (forest)	46.81	18.87	29.12	5.21	0.00	100.00	1.9
Fire (settlement)	60.96	17.79	16.36	4.64	0.25	100.00	1.7
Flood	51.31	28.27	16.21	3.81	0.40	100.00	1.7
Inundation	40.98	23.46	30.53	5.04	0.00	100.00	2.0
Windstorm	62.53	17.37	18.64	1.46	0.00	100.00	1.6
Thunderstorm	53.02	24.02	16.08	6.87	0.00	100.00	1.8
Hailstorm	85.95	10.71	3.10	0.25	0.00	100.00	1.2
Heavy rain	42.31	46.48	9.96	1.24	0.00	100.00	1.7
Sporadic rain	47.35	24.87	15.36	12.00	0.43	100.00	1.9
Soil erosion	59.05	29.96	6.97	4.02	0.00	100.00	1.6
Landslide	73.39	21.57	5.04	0.00	0.00	100.00	1.3
Heat wave	35.74	16.47	37.04	10.75	0.00	100.00	2.2
Cold wave	49.63	26.02	20.52	3.70	0.13	100.00	1.8
Disease/insect	30.12	29.35	31.57	8.97	0.00	100.00	2.2
Central Mountain							
Drought	1.00	2.04	20.13	76.83	0.00	100.00	3.7
Fire (forest)	51.59	43.75	4.66	0.00	0.00	100.00	1.5
Fire (settlement)	66.22	33.78	0.00	0.00	0.00	100.00	1.3
Windstorm	0.00	31.39	68.61	0.00	0.00	100.00	2.7
Thunderstorm	59.32	25.44	9.79	5.45	0.00	100.00	1.6
Hailstorm	2.02	34.65	49.54	13.79	0.00	100.00	2.8
Heavy rain	0.00	100.0	0.00	0.00	0.00	100.00	2.0
Sporadic rain	12.11	41.03	39.29	7.57	0.00	100.00	2.4
Soil erosion	100.00	0.00	0.00	0.00	0.00	100.00	1.0
Landslide	56.20	30.49	9.35	3.96	0.00	100.00	1.6
Cold wave	16.67	50.00	33.33	0.00	0.00	100.00	2.2
Disease/insect	1.20	10.63	29.23	58.95	0.00	100.00	3.5
Central Hill							
Drought	10.81	19.40	32.49	35.72	1.58	100.00	3.0
Fire (forest)	69.33	18.25	11.53	0.89	0.00	100.00	1.4
Fire (settlement)	66.56	27.30	6.14	0.00	0.00	100.00	1.4
Flood	64.78	0.00	26.20	9.02	0.00	100.00	1.8

Hazards/Disasters	Magnitude of Impact (%)					Total	Average Impact (on scale 1 to 5)
	Extremely low (1)	Low (2)	Moderate (3)	High (4)	Extremely high (5)		
Windstorm	70.17	21.08	8.76	0.00	0.00	100.00	1.4
Thunderstorm	90.10	5.94	1.81	2.15	0.00	100.00	1.2
Hailstorm	88.50	8.80	2.70	0.00	0.00	100.00	1.1
Heavy rain	100.00	0.00	0.00	0.00	0.00	100.00	1.0
Sporadic rain	46.36	37.20	16.44	0.00	0.00	100.00	1.7
Soil erosion	7.35	34.03	39.08	19.54	0.00	100.00	2.7
Landslide	54.94	14.83	21.46	6.94	1.82	100.00	1.9
Cold wave	100.00	0.00	0.00	0.00	0.00	100.00	1.0
Disease/insect	15.24	10.83	29.97	39.78	4.18	100.00	3.1
Central *Terai*							
Drought	11.01	7.36	18.99	31.86	30.77	100.00	3.6
Fire (forest)	47.95	17.83	34.21	0.00	0.00	100.00	1.9
Fire (settlement)	46.87	16.31	13.22	9.04	14.56	100.00	2.3
Flood	16.57	7.13	6.98	23.06	46.27	100.00	3.8
Inundation	39.58	3.67	2.49	4.80	49.47	100.00	3.2
Windstorm	37.87	6.15	9.45	22.01	24.53	100.00	2.9
Thunderstorm	55.23	20.17	17.76	5.50	1.33	100.00	1.8
Hailstorm	26.80	15.87	28.08	18.14	11.12	100.00	2.7
Heavy rain	0.51	2.42	25.43	60.72	10.92	100.00	3.8
Sporadic rain	27.05	12.38	34.76	24.91	0.90	100.00	2.6
Heat wave	70.16	0.00	5.34	12.25	12.25	100.00	2.0
Cold wave	21.94	7.81	10.97	19.13	40.15	100.00	3.5
Disease/insect	11.99	6.15	19.55	24.49	37.83	100.00	3.7
Western Mountain							
Drought	15.73	38.86	41.41	4.00	0.00	100.00	2.3
Fire (forest)	100.00	0.00	0.00	0.00	0.00	100.00	1.0
Windstorm	41.67	0.00	0.00	0.00	0.00	100.00	1.9
Hailstorm	37.05	27.22	35.72	0.00	0.00	100.00	2.0
Heavy rain	100.00	0.00	0.00	0.00	0.00	100.00	1.0
Soil erosion	21.29	5.62	56.22	16.87	0.00	100.00	2.7
Landslide	62.09	18.14	19.77	0.00	0.00	100.00	1.6
Snowstorm	35.29	29.41	11.76	17.65	5.88	100.00	2.3
Avalanche	50.00	50.00	0.00	0.00	0.00	100.00	1.5
Disease/insect	16.53	31.81	51.65	0.00	0.00	100.00	2.4
Western Hill							
Drought	22.13	29.62	41.13	5.93	1.19	100.00	2.3
Fire (forest)	46.78	31.25	17.04	4.92	0.00	100.00	1.8
Fire (settlement)	66.64	19.07	6.96	0.00	7.33	100.00	1.6
Flood	63.68	25.84	10.49	0.00	0.00	100.00	1.5
Windstorm	30.32	10.18	59.50	0.00	0.00	100.00	2.3
Thunderstorm	57.39	20.07	18.49	3.57	0.49	100.00	1.7
Hailstorm	27.45	31.54	31.86	4.65	4.50	100.00	2.3
Heavy rain	57.66	20.19	16.40	5.75	0.00	100.00	1.7

Hazards/Disasters	Magnitude of Impact (%)					Total	Average Impact (on scale 1 to 5)
	Extremely low (1)	Low (2)	Moderate (3)	High (4)	Extremely high (5)		
Sporadic rain	37.86	37.47	13.41	10.87	0.39	100.00	2.0
Soil erosion	25.22	40.16	16.08	17.51	1.03	100.00	2.3
Landslide	26.47	30.62	28.10	13.35	1.46	100.00	2.3
Cold wave	32.90	37.97	29.14	0.00	0.00	100.00	2.0
Disease/insect	46.75	30.38	19.84	3.02	0.00	100.00	1.8
Western *Terai*							
Drought	12.36	60.25	27.39	0.00	0.00	100.00	2.2
Fire (forest)	18.45	69.29	12.26	0.00	0.00	100.00	1.9
Fire (settlement)	19.57	62.51	17.92	0.00	0.00	100.00	2.0
Flood	22.67	60.87	16.46	0.00	0.00	100.00	1.9
Inundation	21.18	60.27	18.54	0.00	0.00	100.00	2.0
Windstorm	33.72	62.95	3.33	0.00	0.00	100.00	1.7
Thunderstorm	18.04	66.09	15.88	0.00	0.00	100.00	2.0
Hailstorm	11.11	72.10	16.79	0.00	0.00	100.00	2.1
Heavy rain	38.54	47.44	14.02	0.00	0.00	100.00	1.8
Sporadic rain	9.20	59.46	31.33	0.00	0.00	100.00	2.2
Soil erosion	8.06	89.73	2.21	0.00	0.00	100.00	1.9
Landslide	7.28	92.72	0.00	0.00	0.00	100.00	1.9
Heat wave	14.10	65.18	20.54	0.18	0.00	100.00	2.1
Cold wave	8.14	66.12	25.74	0.00	0.00	100.00	2.2
Disease/insect	6.63	65.79	26.69	0.89	0.00	100.00	2.2
Mid-Western Mountain							
Drought	2.70	7.26	26.12	31.65	32.27	100.00	3.8
Fire (forest)	0.00	39.81	35.19	25.00	0.00	100.00	2.9
Fire (settlement)	0.00	0.00	100.00	0.00	0.00	100.00	3.0
Flood	0.00	100.0	0.00	0.00	0.00	100.00	2.0
Hailstorm	0.00	100.0	0.00	0.00	0.00	100.00	2.0
Heavy rain	0.00	0.00	100.00	0.00	0.00	100.00	3.0
Landslide	38.05	25.00	24.63	12.32	0.00	100.00	2.1
Disease/insect	2.07	20.63	64.26	13.04	0.00	100.00	2.9
Mid-Western Hill							
Drought	22.34	16.87	38.44	22.35	0.00	100.00	2.6
Fire (forest)	40.59	31.12	27.58	0.71	0.00	100.00	1.9
Fire (settlement)	47.45	34.72	14.64	1.52	1.67	100.00	1.8
Flood	32.53	19.36	36.90	11.22	0.00	100.00	2.3
Windstorm	46.44	13.19	36.11	4.26	0.00	100.00	2.0
Thunderstorm	31.03	27.59	39.53	1.85	0.00	100.00	2.1
Hailstorm	44.61	31.21	21.88	2.30	0.00	100.00	1.8
Heavy rain	47.27	17.58	30.17	4.98	0.00	100.00	1.9
Sporadic rain	15.55	18.95	60.16	5.34	0.00	100.00	2.6
Soil erosion	33.44	22.81	42.16	1.60	0.00	100.00	2.1
Landslide	44.74	21.10	30.79	3.37	0.00	100.00	1.9
Heat wave	10.90	0.00	78.20	10.90	0.00	100.00	2.9

Hazards/Disasters	Magnitude of Impact (%)					Total	Average Impact (on scale 1 to 5)
	Extremely low (1)	Low (2)	Moderate (3)	High (4)	Extremely high (5)		
Cold wave	0.00	21.54	78.46	0.00	0.00	100.00	2.8
Disease/insect	6.95	24.86	57.82	10.37	0.00	100.00	2.7
Mid-Western *Terai*							
Drought	13.16	27.24	37.31	21.37	0.91	100.00	2.7
Fire (forest)	50.12	23.12	26.15	0.61	0.00	100.00	1.8
Fire (settlement)	54.69	26.33	17.98	1.00	0.00	100.00	1.7
Flood	25.62	22.74	36.59	14.47	0.58	100.00	2.4
Inundation	41.04	27.76	20.45	10.75	0.00	100.00	2.0
Windstorm	34.02	29.82	31.95	4.21	0.00	100.00	2.1
Thunderstorm	49.63	26.70	23.67	0.00	0.00	100.00	1.7
Hailstorm	45.95	17.19	25.49	9.71	1.66	100.00	2.0
Heavy rain	45.20	19.42	35.38	0.00	0.00	100.00	1.9
Sporadic rain	11.04	20.22	58.11	10.63	0.00	100.00	2.7
Soil erosion	31.43	22.16	35.00	11.41	0.00	100.00	2.3
Landslide	28.65	31.01	36.94	3.40	0.00	100.00	2.2
Heat wave	0.00	18.80	72.07	9.13	0.00	100.00	2.9
Cold wave	5.19	11.63	79.75	3.43	0.00	100.00	2.8
Disease/insect	5.07	18.89	57.60	17.96	0.48	100.00	2.9
Far-Western Mountain							
Drought	1.16	1.40	8.48	58.97	29.99	100.00	4.2
Fire (forest)	57.07	30.06	12.88	0.00	0.00	100.00	1.6
Fire (settlement)	48.36	51.64	0.00	0.00	0.00	100.00	1.5
Flood	35.42	28.13	8.45	28.01	0.00	100.00	2.3
Windstorm	31.88	34.02	33.05	1.05	0.00	100.00	2.0
Thunderstorm	76.87	22.10	1.03	0.00	0.00	100.00	1.2
Hailstorm	14.80	14.60	55.02	15.13	0.45	100.00	2.7
Heavy rain	37.12	51.16	11.72	0.00	0.00	100.00	1.7
Sporadic rain	26.60	63.77	8.29	1.34	0.00	100.00	1.8
Soil erosion	32.52	57.50	7.07	2.91	0.00	100.00	1.8
Landslide	40.88	30.65	19.28	9.20	0.00	100.00	2.0
Snowstorm	68.25	31.75	0.00	0.00	0.00	100.00	1.3
Avalanche	100.00	0.00	0.00	0.00	0.00	100.00	1.0
Cold wave	16.49	46.66	36.85	0.00	0.00	100.00	2.2
Disease/insect	5.16	3.22	8.50	83.12	0.00	100.00	3.7
Far-Western Hill							
Drought	0.68	16.04	47.71	33.93	1.64	100.00	3.2
Fire (forest)	1.20	32.13	41.17	23.24	2.27	100.00	2.9
Fire (settlement)	3.61	26.36	54.83	15.19	0.00	100.00	2.8
Flood	0.00	100.0	0.00	0.00	0.00	100.00	2.0
Windstorm	2.44	44.57	40.18	12.81	0.00	100.00	2.6
Thunderstorm	1.32	17.59	58.18	22.90	0.00	100.00	3.0
Hailstorm	0.44	34.04	43.46	20.70	1.36	100.00	2.9
Heavy rain	0.00	52.64	47.36	0.00	0.00	100.00	2.5
Sporadic rain	0.00	0.00	37.97	62.03	0.00	100.00	3.6

Hazards/Disasters	Magnitude of Impact (%)					Total	Average Impact (on scale 1 to 5)
	Extremely low (1)	Low (2)	Moderate (3)	High (4)	Extremely high (5)		
Soil erosion	1.20	12.54	46.53	35.05	4.68	100.00	3.3
Landslide	0.00	19.91	47.10	28.98	4.00	100.00	3.2
Cold wave	0.00	0.00	0.00	100.0	0.00	100.00	4.0
Disease/insect	1.60	11.68	60.98	25.74	0.00	100.00	3.1
Far-Western *Terai*							
Drought	8.57	16.36	49.31	25.23	0.53	100.00	2.9
Fire (forest)	52.29	30.19	14.86	2.66	0.00	100.00	1.7
Fire (settlement)	66.11	22.36	5.73	4.81	0.99	100.00	1.5
Flood	29.65	24.32	31.28	13.98	0.78	100.00	2.3
Inundation	18.94	32.95	38.74	9.37	0.00	100.00	2.4
Windstorm	34.93	39.54	18.91	6.62	0.00	100.00	2.0
Thunderstorm	59.52	24.18	14.34	1.96	0.00	100.00	1.6
Hailstorm	20.37	30.39	34.09	15.15	0.00	100.00	2.4
Heavy rain	45.45	31.92	22.63	0.00	0.00	100.00	1.8
Sporadic rain	24.97	24.22	39.04	11.77	0.00	100.00	2.4
Soil erosion	43.46	17.34	28.34	8.64	2.22	100.00	2.1
Landslide	44.18	20.34	0.00	35.48	0.00	100.00	2.3
Heat wave	34.07	37.24	25.19	3.50	0.00	100.00	2.0
Cold wave	5.70	15.54	67.22	11.54	0.00	100.00	2.8
Disease/insect	11.59	13.25	32.16	42.78	0.22	100.00	3.1
Kathmandu Valley							
Drought	67.41	21.62	10.97	0.00	0.00	100.00	1.4
Fire (forest)	100.00	0.00	0.00	0.00	0.00	100.00	1.0
Fire (settlement)	77.20	22.80	0.00	0.00	0.00	100.00	1.2
Flood	37.16	58.26	3.27	1.32	0.00	100.00	1.7
Windstorm	89.46	7.99	2.55	0.00	0.00	100.00	1.1
Thunderstorm	94.65	4.20	1.14	0.00	0.00	100.00	1.1
Hailstorm	92.33	6.06	1.61	0.00	0.00	100.00	1.1
Heavy rain	89.79	10.21	0.00	0.00	0.00	100.00	1.1
Sporadic rain	76.74	21.74	1.52	0.00	0.00	100.00	1.2
Landslide	100.00	0.00	0.00	0.00	0.00	100.00	1.0
Disease/insect	17.98	57.65	17.25	7.12	0.00	100.00	2.1

Table 6-9 depicts the percentage distribution of households on magnitude of climate induced disaster impact by eco-development regions in last 25 years. It is observed that households of Kathmandu Valley have lowest mean response for disasters and none of the households observed extremely high magnitude of impact of any disasters. Highest mean response is observed in far-western mountain with 4.2 for drought. Similarly, 32.27 per cent households of mid-western mountain reported extremely high magnitude of impact of drought while no one reported so for other disasters.

Table 6-10: Extent of Impact of Climate Induced Disaster by Income Quintile in Last 25 Years

Hazards/Disasters	Magnitude of Impact (%)					Total	Average Impact (on scale 1 to 5)
	Extremely low (1)	Low (2)	Moderate (3)	High (4)	Extremely high (5)		
First Quintile (Lowest)							
Drought	9.40	12.58	32.32	32.18	13.51	100.00	3.3
Fire (forest)	38.81	23.49	32.39	4.59	0.71	100.00	2.0
Fire (settlement)	48.81	21.64	18.13	5.20	6.22	100.00	2.0
Flood	23.30	16.92	14.87	13.31	31.59	100.00	3.1
Inundation	38.07	12.32	8.95	5.35	35.31	100.00	2.9
Windstorm	37.24	14.15	25.55	11.02	12.03	100.00	2.5
Thunderstorm	53.88	15.99	24.30	5.49	0.35	100.00	1.8
Hailstorm	35.90	17.04	29.56	12.74	4.76	100.00	2.3
Heavy rain	21.64	15.68	27.16	32.94	2.58	100.00	2.8
Sporadic rain	31.10	21.14	37.08	10.10	0.57	100.00	2.3
Soil erosion	23.30	24.63	37.17	12.90	2.00	100.00	2.5
Landslide	18.59	21.97	43.50	14.65	1.28	100.00	2.6
Snowstorm	62.40	27.69	4.53	5.38	0.00	100.00	1.5
Avalanche	100.00	0.00	0.00	0.00	0.00	100.00	1.0
Heat wave	20.15	21.21	45.72	12.91	0.00	100.00	2.5
Cold wave	23.50	12.21	17.72	16.16	30.42	100.00	3.2
Disease/insect	11.56	10.52	34.83	29.51	13.58	100.00	3.2
Second Quintile							
Drought	11.99	14.19	35.82	29.58	8.43	100.00	3.1
Fire (forest)	38.66	29.14	25.96	5.88	0.36	100.00	2.0
Fire (settlement)	41.89	21.54	25.10	5.87	5.60	100.00	2.1
Flood	26.86	19.71	19.18	13.46	20.79	100.00	2.8
Inundation	32.27	21.01	18.48	7.16	21.08	100.00	2.6
Windstorm	42.00	13.84	29.78	9.64	4.73	100.00	2.2
Thunderstorm	54.94	17.68	23.51	3.59	0.28	100.00	1.8
Hailstorm	41.33	18.23	28.27	9.92	2.26	100.00	2.1
Heavy rain	25.29	19.86	31.20	22.56	1.10	100.00	2.5
Sporadic rain	23.78	29.88	33.71	11.89	0.75	100.00	2.4
Soil erosion	21.75	31.09	31.49	14.54	1.14	100.00	2.4
Landslide	31.78	24.75	31.57	9.66	2.24	100.00	2.3
Snowstorm	23.61	61.36	15.03	0.00	0.00	100.00	1.9
Avalanche	100.00	0.00	0.00	0.00	0.00	100.00	1.0
GLOF	100.00	0.00	0.00	0.00	0.00	100.00	1.0
Heat wave	13.88	35.90	44.81	5.41	0.00	100.00	2.4
Cold wave	30.81	18.74	27.42	9.83	13.20	100.00	2.6
Disease/insect	14.57	17.39	34.30	26.17	7.58	100.00	2.9
Third Quintile							
Drought	19.20	22.64	26.93	24.11	7.11	100.00	2.8
Fire (forest)	41.27	28.96	27.27	2.50	0.00	100.00	1.9
Fire (settlement)	49.07	20.07	20.42	4.89	5.55	100.00	2.0
Flood	31.78	19.61	21.89	13.21	13.52	100.00	2.6
Inundation	29.47	25.99	28.03	6.84	9.67	100.00	2.4
Windstorm	44.25	18.19	26.96	7.25	3.35	100.00	2.1
Thunderstorm	46.15	19.91	28.43	4.98	0.53	100.00	1.9
Hailstorm	36.21	22.68	26.91	9.35	4.85	100.00	2.2

Hazards/Disasters	Magnitude of Impact (%)					Total	Average Impact (on scale 1 to 5)
	Extremely low (1)	Low (2)	Moderate (3)	High (4)	Extremely high (5)		
Heavy rain	36.56	16.79	21.07	18.33	7.25	100.00	2.4
Sporadic rain	27.01	29.74	30.19	11.72	1.33	100.00	2.3
Soil erosion	28.59	33.13	28.50	9.78	0.00	100.00	2.2
Landslide	27.49	21.25	39.53	9.76	1.97	100.00	2.4
Snowstorm	65.94	29.54	0.00	4.51	0.00	100.00	1.4
Avalanche	0.00	100.0	0.00	0.00	0.00	100.00	2.0
Heat wave	21.22	37.68	38.98	2.12	0.00	100.00	2.2
Cold wave	33.22	21.66	28.30	5.53	11.29	100.00	2.4
Disease/insect	20.17	22.57	26.90	22.54	7.83	100.00	2.8
Fourth Quintile							
Drought	25.44	22.70	26.26	21.00	4.60	100.00	2.6
Fire (forest)	41.57	29.83	25.21	3.39	0.00	100.00	1.9
Fire (settlement)	46.96	27.39	20.61	3.40	1.64	100.00	1.9
Flood	30.69	21.40	24.90	15.57	7.45	100.00	2.5
Inundation	26.51	30.15	35.93	5.63	1.77	100.00	2.3
Windstorm	52.14	18.75	25.70	2.81	0.60	100.00	1.8
Thunderstorm	50.28	24.38	20.23	5.11	0.00	100.00	1.8
Hailstorm	44.76	23.72	21.54	6.50	3.48	100.00	2.0
Heavy rain	34.98	24.45	21.25	16.89	2.42	100.00	2.3
Sporadic rain	34.32	29.93	24.50	10.91	0.34	100.00	2.1
Soil erosion	23.11	36.45	30.20	10.24	0.00	100.00	2.3
Landslide	30.17	25.05	34.58	9.98	0.21	100.00	2.2
Snowstorm	66.21	18.50	1.92	11.44	1.92	100.00	1.6
Avalanche	100.00	0.00	0.00	0.00	0.00	100.00	1.0
GLOF	0.00	100.0	0.00	0.00	0.00	100.00	2.0
Heat wave	14.13	47.69	33.48	4.70	0.00	100.00	2.3
Cold wave	34.52	29.04	27.04	4.67	4.73	100.00	2.2
Disease/insect	21.74	25.55	27.79	19.15	5.77	100.00	2.6
Fifth Quintile (Highest)							
Drought	28.03	27.87	24.78	16.32	3.01	100.00	2.4
Fire (forest)	32.10	36.38	28.14	3.38	0.00	100.00	2.0
Fire (settlement)	37.67	33.90	20.01	7.35	1.07	100.00	2.0
Flood	30.89	26.27	25.52	9.17	8.15	100.00	2.4
Inundation	30.48	39.12	29.62	0.77	0.00	100.00	2.0
Windstorm	39.26	26.68	26.73	4.87	2.45	100.00	2.0
Thunderstorm	47.38	28.75	18.97	4.90	0.00	100.00	1.8
Hailstorm	39.54	34.78	21.25	3.36	1.07	100.00	1.9
Heavy rain	42.42	24.12	23.88	8.56	1.02	100.00	2.0
Sporadic rain	41.44	31.15	20.56	5.93	0.92	100.00	1.9
Soil erosion	32.39	27.56	30.33	9.72	0.00	100.00	2.2
Landslide	37.24	19.76	34.48	8.27	0.25	100.00	2.1
Snowstorm	48.73	46.44	4.84	0.00	0.00	100.00	1.6
Heat wave	21.09	56.97	21.06	0.88	0.00	100.00	2.0
Cold wave	17.26	51.46	22.11	4.42	4.75	100.00	2.3
Disease/insect	16.09	33.25	27.85	18.10	4.71	100.00	2.6

Table 6-10 depicts percentage distribution of households on magnitude of impact of climate induced disasters by income quintile in last 25 years. Households of the first quintile are observing extremely high magnitude of impact of inundation (35.31%) followed by flood (31.59%), and cold wave (30.42%) with the mean response of 3.1, 2.9 and 3.2 respectively. However, only 8.15 per cent respondents reported extremely high magnitude of impact from flood in high income quantile with 2.4 mean responses.

Table 6-11: Extent of Impact of Climate Induced Disasters by Climatic Zone in Last 25 Years

Hazards/ Disasters	Magnitude of Impact (%)					Total	Average Impact (on scale 1 to 5)
	Extremely low (1)	Low (2)	Moderate (3)	High (4)	Extremely high (5)		
Tropical							
Drought	19.38	21.60	28.91	20.81	9.30	100.00	2.8
Fire (forest)	42.64	31.03	24.14	2.05	0.14	100.00	1.9
Fire (settlement)	49.71	22.84	17.34	5.07	5.04	100.00	1.9
Flood	30.19	17.16	17.38	14.27	21.00	100.00	2.8
Inundation	37.36	21.05	20.42	5.36	15.81	100.00	2.4
Windstorm	47.42	16.24	21.73	7.93	6.68	100.00	2.1
Thunderstorm	51.05	24.92	19.27	4.48	0.28	100.00	1.8
Hailstorm	43.51	21.40	22.58	8.01	4.51	100.00	2.1
Heavy rain	25.72	19.14	23.71	26.79	4.63	100.00	2.7
Sporadic rain	30.92	27.32	29.55	11.88	0.33	100.00	2.2
Soil erosion	34.19	24.43	29.03	11.75	0.60	100.00	2.2
Landslide	42.46	17.51	33.86	4.69	1.48	100.00	2.1
Snowstorm	100.00	0.00	0.00	0.00	0.00	100.00	1.0
Avalanche	100.00	0.00	0.00	0.00	0.00	100.00	1.0
Heat wave	19.89	44.08	31.65	4.03	0.35	100.00	2.2
Cold wave	29.41	23.85	22.40	9.24	15.10	100.00	2.6
Disease/insect	17.58	23.38	29.52	18.09	11.43	100.00	2.8
Sub-Tropical							
Drought	16.04	16.18	31.41	32.50	3.88	100.00	2.9
Fire (forest)	37.15	25.37	31.38	5.77	0.33	100.00	2.1
Fire (settlement)	35.21	24.25	34.77	5.11	0.66	100.00	2.1
Flood	28.62	30.86	33.25	7.27	0.00	100.00	2.2
Windstorm	34.70	19.59	41.95	3.76	0.00	100.00	2.1
Thunderstorm	54.54	12.85	27.58	4.87	0.17	100.00	1.8
Hailstorm	39.05	21.51	28.78	9.06	1.59	100.00	2.1
Heavy rain	42.71	19.23	30.02	8.03	0.00	100.00	2.0
Sporadic rain	34.78	29.73	27.12	6.86	1.51	100.00	2.1
Soil erosion	19.18	36.49	31.40	12.10	0.82	100.00	2.4
Landslide	21.82	25.47	37.61	13.80	1.29	100.00	2.5
Snowstorm	68.17	27.64	2.09	2.09	0.00	100.00	1.4
Avalanche	100.00	0.00	0.00	0.00	0.00	100.00	1.0
GLOF	62.76	37.24	0.00	0.00	0.00	100.00	1.4
Heat wave	3.09	17.74	76.08	3.09	0.00	100.00	2.8
Cold wave	23.20	22.60	46.18	7.50	0.52	100.00	2.4
Disease/insect	14.45	13.72	37.26	32.10	2.48	100.00	2.9

Hazards/ Disasters	Magnitude of Impact (%)					Total	Average Impact (on scale 1 to 5)
	Extremely low (1)	Low (2)	Moderate (3)	High (4)	Extremely high (5)		
Temperate							
Drought	1.37	8.70	40.68	32.14	17.10	100.00	3.5
Fire (forest)	29.10	47.00	21.36	2.53	0.00	100.00	2.0
Fire (settlement)	15.77	60.26	23.98	0.00	0.00	100.00	2.1
Flood	72.94	14.21	12.85	0.00	0.00	100.00	1.4
Windstorm	18.12	28.06	29.62	24.21	0.00	100.00	2.6
Thunderstorm	55.35	22.27	18.58	3.80	0.00	100.00	1.7
Hailstorm	15.48	19.46	34.28	25.59	5.19	100.00	2.9
Heavy rain	52.96	37.25	9.79	0.00	0.00	100.00	1.6
Sporadic rain	18.28	41.17	39.38	1.17	0.00	100.00	2.2
Soil erosion	20.39	27.31	52.30	0.00	0.00	100.00	2.3
Landslide	26.84	17.23	49.97	5.96	0.00	100.00	2.4
Snowstorm	50.47	35.86	6.25	7.42	0.00	100.00	1.7
Avalanche	100.00	0.00	0.00	0.00	0.00	100.00	1.0
Heat wave	0.00	0.00	100.00	0.00	0.00	100.00	3.0
Cold wave	36.90	19.35	33.79	8.03	1.91	100.00	2.2
Disease/insect	14.42	15.99	35.46	34.14	0.00	100.00	2.9
Sub-Alpine							
Drought	0.00	35.71	57.14	7.14	0.00	100.00	2.7
Hailstorm	40.00	40.00	20.00	0.00	0.00	100.00	1.8
Soil erosion	17.65	5.88	58.82	17.65	0.00	100.00	2.8
Landslide	50.00	0.00	50.00	0.00	0.00	100.00	2.0
Snowstorm	35.29	29.41	11.76	17.65	5.88	100.00	2.3
Avalanche	50.00	50.00	0.00	0.00	0.00	100.00	1.5
Disease/insect	0.00	50.00	50.00	0.00	0.00	100.00	2.5

Table 6-11 represents percentage distribution of households on extent of impact of climate induced disasters by climatic zone in last 25 years. The survey result shows that households are observing extremely high magnitude of impact from flood (21%) in tropical zone with 2.8 average responses while it is drought in sub-tropical zone (3.88%), and temperate (17.1%) with 2.9 and 3.5 average response respectively. However, snowstorm is the single disaster (5.88%) observing extremely high magnitude of impact in sub-alpine zone with 2.3 mean responses.

Table 6-12 represents percentage distribution of households on extent of impact of climate induced disasters by NAPA combined vulnerability index in last 25 years. The survey reveals that disease/insect is observed to have high magnitude of impact in all areas except in very low vulnerable area in last 25 years. However, flood is reported to have high magnitude of impact from landslide (18.21%) in very low vulnerable areas. Similarly, heat wave is observed to have extremely low magnitude of impact in very high vulnerable area (100%) while avalanche in high (100%) and moderate (95.22%) vulnerable areas. Similarly, fire (settlement) in low (41.71%) and heavy rain in very low (79.27%) vulnerable area is observed to have extremely low magnitude of impact respectively.

Table 6-12: Extent of Impact of Climate Induced Disaster by NAPA Combined Vulnerability Index in Last 25 Years

Hazards Disasters	Magnitude of Impact (%)					Total	Average Impact (on scale 1 to 5)
	Extremely low (1)	Low (2)	Moderate (3)	High (4)	Extremely high (5)		
Very High							
Drought	33.73	14.03	24.86	26.57	0.81	100.00	2.5
Fire (forest)	72.74	19.35	5.95	1.96	0.00	100.00	1.4
Fire (settlement)	81.03	15.63	2.07	0.71	0.56	100.00	1.2
Flood	70.78	24.74	1.79	1.91	0.78	100.00	1.4
Inundation	76.10	18.32	4.53	1.05	0.00	100.00	1.3
Windstorm	84.32	11.91	3.78	0.00	0.00	100.00	1.2
Thunderstorm	88.35	8.22	1.73	1.70	0.00	100.00	1.2
Hailstorm	80.24	10.57	7.74	1.45	0.00	100.00	1.3
Heavy rain	81.10	14.56	2.29	2.05	0.00	100.00	1.3
Sporadic rain	55.67	28.55	14.52	1.27	0.00	100.00	1.6
Soil erosion	61.13	26.20	7.37	5.29	0.00	100.00	1.6
Landslide	48.02	19.89	26.35	3.93	1.81	100.00	1.9
Heat wave	100.00	0.00	0.00	0.00	0.00	100.00	1.0
Cold wave	71.68	18.60	9.07	0.65	0.00	100.00	1.4
Disease/insect	23.45	15.30	31.14	28.27	0.00	100.00	2.7
High							
Drought	11.48	15.67	36.81	29.42	6.63	100.00	3.0
Fire (forest)	40.46	22.39	29.83	6.76	0.55	100.00	2.0
Fire (settlement)	54.12	15.15	11.21	6.39	13.13	100.00	2.1
Flood	33.50	10.33	18.68	22.83	14.65	100.00	2.7
Inundation	86.39	3.29	2.22	8.10	0.00	100.00	1.3
Windstorm	59.00	14.14	21.17	5.29	0.41	100.00	1.7
Thunderstorm	54.50	14.68	26.06	4.76	0.00	100.00	1.8
Hailstorm	47.58	15.74	25.93	9.17	1.57	100.00	2.0
Heavy rain	19.12	8.63	29.51	35.28	7.45	100.00	3.0
Sporadic rain	33.26	23.41	31.34	11.45	0.54	100.00	2.2
Soil erosion	28.18	17.37	40.39	12.87	1.20	100.00	2.4
Landslide	28.72	19.05	33.84	16.40	1.99	100.00	2.4
Snowstorm	51.80	22.09	12.47	13.64	0.00	100.00	1.9
Avalanche	100.00	0.00	0.00	0.00	0.00	100.00	1.0
GLOF	62.76	37.24	0.00	0.00	0.00	100.00	1.4
Heat wave	48.34	0.00	45.93	5.73	0.00	100.00	2.1
Cold wave	45.35	14.48	14.89	10.56	14.72	100.00	2.3
Disease/insect	15.82	10.40	42.14	22.25	9.38	100.00	3.0
Moderate							
Drought	7.08	12.10	25.47	27.06	28.29	100.00	3.6
Fire (forest)	48.47	28.96	20.35	1.83	0.39	100.00	1.8
Fire (settlement)	42.08	21.88	16.32	8.95	10.77	100.00	2.2
Flood	14.82	12.67	6.21	16.44	49.86	100.00	3.7
Inundation	9.25	3.91	2.66	2.66	81.52	100.00	4.4
Windstorm	9.48	10.50	29.54	23.44	27.04	100.00	3.5
Thunderstorm	52.03	23.41	18.71	4.97	0.88	100.00	1.8
Hailstorm	16.99	21.23	34.19	17.22	10.38	100.00	2.8
Heavy rain	17.61	14.50	25.12	37.75	5.02	100.00	3.0
Sporadic rain	23.13	33.35	27.14	13.91	2.47	100.00	2.4
Soil erosion	22.38	42.19	18.23	16.48	0.72	100.00	2.3

Hazards Disasters	Magnitude of Impact (%)					Total	Average Impact (on scale 1 to 5)
	Extremely low (1)	Low (2)	Moderate (3)	High (4)	Extremely high (5)		
Landslide	27.36	28.41	31.95	10.88	1.40	100.00	2.3
Snowstorm	66.08	31.59	0.78	1.17	0.39	100.00	1.4
Avalanche	95.22	4.78	0.00	0.00	0.00	100.00	1.0
Heat wave	48.32	0.00	0.00	25.84	25.84	100.00	2.8
Cold wave	7.89	5.81	11.54	23.54	51.22	100.00	4.0
Disease/insect	16.35	13.00	19.12	25.57	25.96	100.00	3.3
Low							
Drought	17.32	21.81	35.87	24.72	0.28	100.00	2.7
Fire (forest)	30.40	24.12	43.46	2.02	0.00	100.00	2.2
Fire (settlement)	41.71	19.85	32.75	5.48	0.21	100.00	2.0
Flood	27.28	23.63	38.74	10.14	0.21	100.00	2.3
Inundation	22.63	28.07	40.76	8.54	0.00	100.00	2.4
Windstorm	26.74	23.15	44.74	5.37	0.00	100.00	2.3
Thunderstorm	27.96	26.51	38.44	7.09	0.00	100.00	2.2
Hailstorm	32.03	23.01	36.12	8.34	0.51	100.00	2.2
Heavy rain	34.43	34.07	29.55	1.95	0.00	100.00	2.0
Sporadic rain	21.76	19.60	43.49	14.82	0.34	100.00	2.5
Soil erosion	19.92	20.31	54.62	4.96	0.18	100.00	2.5
Landslide	25.37	15.58	55.81	2.98	0.26	100.00	2.4
Heat wave	18.65	20.93	52.46	7.96	0.00	100.00	2.5
Cold wave	15.67	26.87	50.17	7.11	0.18	100.00	2.5
Disease/insect	8.85	28.91	38.17	23.95	0.12	100.00	2.8
Very Low							
Drought	14.82	57.03	23.91	3.38	0.86	100.00	2.2
Fire (forest)	27.95	52.66	14.44	4.95	0.00	100.00	2.0
Fire (settlement)	18.84	63.13	18.03	0.00	0.00	100.00	2.0
Flood	21.96	62.09	15.95	0.00	0.00	100.00	1.9
Inundation	21.18	60.27	18.54	0.00	0.00	100.00	2.0
Windstorm	44.61	47.86	7.52	0.00	0.00	100.00	1.6
Thunderstorm	34.68	45.63	16.90	2.04	0.74	100.00	1.9
Hailstorm	19.07	62.27	17.95	0.71	0.00	100.00	2.0
Heavy rain	79.27	8.25	4.63	7.85	0.00	100.00	1.4
Sporadic rain	21.42	45.23	26.36	6.57	0.42	100.00	2.2
Soil erosion	29.93	47.21	5.85	15.59	1.42	100.00	2.1
Landslide	27.39	40.49	12.53	18.21	1.37	100.00	2.3
Heat wave	14.10	65.18	20.54	0.18	0.00	100.00	2.1
Cold wave	8.04	65.95	26.01	0.00	0.00	100.00	2.2
Disease/insect	16.91	60.09	21.77	1.23	0.00	100.00	2.1

Table 6-13 indicates percentage distribution of households on overall response on reasons behind climate induced disasters in last 25 years. Majority of households reported the reason to increase incidence of drought is due to insufficient rainfall (91.7%) followed by temperature increase (58.8%) and deforestation (32.4%). Similarly, highest percentage of households observe an increase in disease/insect because of insufficient rainfall (69.9%) followed by temperature increase (56.8%). Households observe heavy rainfall (53.1%) followed by deforestation (15.4%) as the reason to an increase in incidence of flood. On the other hand, significant percentage of households observe decrease of incidences of snow storm and avalanche because of deforestation (62.2%) and temperature decrease (58.8%) respectively.

Table 6-13: Reasons of Climate Induced Disaster in Last 25 Years

Hazards/ Disasters	Reasons[8]																				
	Increased (%)											Decreased (%)									
	Insufficient rainfall	Heavy rainfall	Temperature Increase	Temperature decrease	Road construction	Urbanisation	Deforestation	Heavy use of underground water	Earthquake	Population increase	Others	Insufficient rainfall	Heavy rainfall	Temperature Increase	Temperature decrease	Road construction	Urbanisation	Deforestation	Heavy use of under-ground water	Earthquake	Population increase	Others
Drought	91.7	0.0	58.8	0.0	4.2	9.2	32.4	2.6	3.7	12.5	2.7	0.2	0.1	0.3	0.0	0.2	0.1	0.2	0.0	0.0	0.1	0.1
Fire (forest)	27.5	0.0	40.1	0.4	2.5	4.5	11.1	0.1	0.0	22.3	13.3	3.7	0.2	13.6	0.2	0.9	3.4	3.6	0.1	0.1	8.1	24.8
Fire (settlement)	37.8	0.2	35.3	0.3	0.3	6.6	5.5	0.3	0.1	12.5	13.6	2.5	0.2	1.4	0.1	0.4	5.5	1.8	0.1	0.0	9.9	38.3
Flood	0.7	53.1	3.6	0.1	6.4	4.4	15.4	0.0	2.3	4.1	2.8	33.4	0.5	9.6	0.3	1.6	3.8	8.6	0.4	0.6	2.3	4.3
Inundation	0.3	43.4	2.3	0.3	4.9	8.5	7.7	0.3	0.4	5.2	7.1	41.3	1.4	15.2	0.7	2.6	8.5	14.9	0.5	0.3	3.9	9.8
Windstorm	11.1	1.3	10.6	0.1	0.0	0.0	9.7	1.0	0.0	1.3	7.2	37.1	7.3	16.6	0.5	0.5	6.2	20.4	0.5	0.6	7.6	14.3
Thunderstorm	24.6	2.8	27.8	0.4	0.0	3.7	7.3	0.6	0.0	5.6	19.2	22.8	4.9	16.2	0.7	0.0	2.3	8.9	0.6	0.0	1.4	10.2
Hailstorm	10.1	3.6	9.5	0.9	0.0	1.1	4.7	0.0	0.0	1.9	7.3	38.2	15.0	33.0	2.2	0.0	5.0	13.4	0.7	0.0	3.6	9.7
Heavy rain	2.3	9.0	14.0	0.1	1.0	6.1	9.7	0.4	0.0	3.7	2.9	24.2	35.8	7.0	0.9	0.4	1.6	12.5	0.3	0.0	1.0	4.7
Sporadic rain	56.3	2.4	34.0	0.5	3.7	9.5	40.5	5.2	0.0	11.3	10.5	4.2	0.1	2.6	0.3	0.1	0.7	1.9	0.0	0.2	0.3	1.2
Soil erosion	5.4	16.4	7.7	0.0	36.5	4.1	21.7	0.0	9.2	6.6	7.8	24.7	5.1	6.8	0.4	4.6	3.4	7.9	0.3	1.1	2.7	2.6
Landslide	0.0	36.8	9.4	0.4	41.1	4.4	33.7	0.4	21.9	4.4	3.4	18.7	0.4	2.9	0.3	2.0	0.4	2.1	0.3	1.6	0.7	1.1
Snowstorm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	48.1	27.8	34.7	54.0	0.0	0.0	62.2	0.0	0.0	0.0	13.4
Avalanche	0.0	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	44.9	0.0	33.5	58.8	0.0	0.0	44.9	0.0	0.0	0.0	0.0
GLOF	0.0	0.0	62.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.4	0.0	0.0	37.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heat wave	35.0	0.6	57.3	0.2	1.0	8.9	37.8	6.9	0.2	11.1	2.3	13.6	0.3	19.9	1.8	0.1	8.5	8.9	0.5	0.0	7.4	2.0
Cold wave	21.5	1.4	4.6	14.4	0.1	3.7	12.1	1.1	0.2	2.2	5.2	36.6	2.5	20.7	21.1	0.1	4.1	11.9	0.6	0.4	5.7	3.9
Disease/insect	69.9	1.1	56.8	1.3	2.7	13.2	17.4	0.6	0.5	28.3	20.9	1.4	0.0	1.0	0.1	0.1	0.2	0.5	0.1	0.0	0.8	0.6

[8] The result is based on the multiple response

Table 6-14: Reasons of Climate Induced Disaster by Eco-Development Regions

Disasters	Reasons[9]																			
	Increased (%)										Decreased (%)									
	Insufficient rainfall	Heavy rainfall	Temperature Increase	Temperature decrease	Road construction	Urbanisation	Deforestation	Heavy use of underground water	Earthquake	Population increase	Others	Insufficient rainfall	Heavy rainfall	Temperature Increase	Temperature decrease	Road construction	Urbanisation	Deforestation	Heavy use of underground water	Earthquake	Population increase
Eastern Mountain																				
Drought	97.1	0.0	56.5	0.0	6.7	2.3	3.7	0.0	7.7	1.9	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fire (forest)	22.3	0.0	22.3	0.0	0.0	0.0	11.2	0.0	0.0	33.5	35.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fire (settlement)	13.7	0.0	5.0	0.0	0.0	46.7	0.0	0.0	0.0	78.1	46.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flood	0.0	97.1	22.2	2.9	38.7	16.4	3.7	0.0	7.7	5.8	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Windstorm	0.0	30.0	60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Thunderstorm	63.7	21.1	9.1	0.0	0.0	0.9	0.0	1.7	0.0	0.0	20.8	3.6	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hailstorm	74.8	2.8	14.1	1.0	0.0	0.0	0.0	0.0	0.0	0.0	22.7	6.1	2.6	0.9	0.0	0.0	0.0	0.0	0.0	0.0
Heavy rain	0.0	89.9	4.0	0.0	1.0	1.6	0.0	1.0	0.0	0.0	18.6	2.5	6.3	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0
Sporadic rain	78.6	5.2	5.2	0.0	0.0	0.0	5.2	0.0	0.0	0.0	10.4	9.5	0.0	5.9	0.0	5.2	0.0	0.0	0.0	0.0	0.0
Soil erosion	3.4	63.3	10.9	0.0	60.1	12.9	9.3	0.0	16.5	4.1	0.0	0.0	0.0	0.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0
Landslide	0.0	77.8	10.4	0.8	46.4	9.6	2.7	1.3	47.1	2.5	0.7	2.5	1.3	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0
Snowstorm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.7	0.0	57.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Avalanche	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GLOF	0.0	0.0	62.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.4	0.0	0.0	37.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cold wave	17.8	0.0	1.6	1.3	0.0	0.0	0.0	0.0	0.0	0.0	6.7	36.6	0.0	55.2	1.6	0.0	1.0	0.0	0.0	0.0	2.0
Disease/insect	29.7	1.9	62.2	0.0	0.0	6.5	8.3	0.0	0.0	21.2	21.3	1.1	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eastern Hill																				
Drought	95.7	0.0	61.9	0.0	5.5	16.7	25.3	1.0	5.3	14.7	3.1	0.0	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fire (forest)	26.8	0.0	51.2	0.0	3.2	13.0	9.7	0.0	0.0	19.1	17.6	0.9	0.0	5.0	0.0	0.9	3.5	3.3	0.0	0.0	13.3
Fire (settlement)	62.7	0.0	25.2	0.0	0.7	23.3	13.4	0.0	0.0	23.3	6.3	0.0	0.0	0.0	0.0	0.0	12.2	0.0	0.0	0.0	13.3
Flood	0.0	12.0	0.8	0.0	18.3	6.6	12.8	0.0	3.0	5.5	0.0	56.9	2.1	26.4	1.7	8.9	14.9	23.0	0.0	4.1	12.3

[8] The result is based on the multiple response

Disasters	Reasons[9]																			
	Increased (%)											Decreased (%)								
	Insufficient rainfall	Heavy rainfall	Temperature Increase	Temperature decrease	Road construction	Urbanisation	Deforestation	Heavy use of underground water	Earthquake	Population increase	Others	Insufficient rainfall	Heavy rainfall	Temperature Increase	Temperature decrease	Road construction	Urbanisation	Deforestation	Heavy use of underground water	Earthquake	Population increase
Windstorm	21.4	0.5	15.6	0.0	0.0	0.0	6.2	0.5	0.0	2.7	1.9	53.9	0.7	40.5	0.6	0.0	11.9	20.5	0.0	0.0	13.6
Thunderstorm	45.2	0.6	56.0	0.0	0.0	11.6	18.6	0.0	0.0	20.6	7.2	18.1	0.7	12.3	0.7	0.0	7.3	4.7	0.0	0.0	2.9
Hailstorm	19.9	0.5	3.8	0.5	0.0	1.5	1.5	0.0	0.0	0.5	4.4	57.4	1.1	41.9	1.8	0.0	18.0	22.5	0.7	0.0	15.8
Heavy rain	18.5	2.6	36.5	0.0	0.0	43.5	27.4	1.3	0.0	16.9	0.0	33.6	0.0	24.8	0.0	1.0	9.7	12.9	1.8	0.0	3.6
Sporadic rain	66.5	3.9	48.5	0.8	1.5	22.6	37.4	1.5	0.0	19.2	0.0	0.7	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6
Soil erosion	1.1	2.0	2.4	0.0	16.2	2.2	4.8	0.0	5.7	7.6	2.3	45.2	0.0	33.6	1.5	20.8	23.0	33.5	0.0	5.9	16.6
Landslide	0.0	13.8	10.1	0.0	34.8	6.9	23.8	0.0	27.8	8.8	0.0	41.4	0.0	6.6	0.0	8.1	0.7	9.4	0.6	6.6	3.3
Heat wave	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	77.7	3.4	50.2	0.0	0.0	17.4	31.9	0.0	0.0	42.5
Cold wave	3.8	0.0	0.9	0.0	0.0	1.6	1.6	0.0	0.0	0.0	0.0	46.1	1.1	62.4	0.0	0.0	33.4	37.1	0.0	0.9	21.3
Disease/insect	68.8	0.7	57.0	0.7	3.0	30.1	15.8	0.3	0.0	31.9	17.3	1.1	0.0	0.7	0.4	0.0	0.0	0.7	0.3	0.0	0.0
Eastern *Terai*																					
Drought	92.8	0.0	60.1	0.0	0.7	7.6	32.2	2.5	0.2	12.4	1.7	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1
Fire (forest)	19.2	0.0	52.9	0.0	0.0	13.5	7.1	0.0	0.0	37.8	10.7	4.6	0.9	21.6	1.1	0.9	15.0	13.9	0.0	0.0	15.7
Fire (settlement)	43.8	0.6	36.4	0.6	0.0	6.6	4.4	0.4	0.0	6.0	9.3	1.1	0.4	1.2	0.2	0.6	11.0	1.3	0.2	0.0	11.3
Flood	0.0	33.5	2.7	0.0	6.0	4.9	14.0	0.0	0.0	6.9	1.9	51.0	0.3	14.0	0.8	0.8	8.7	10.9	1.1	0.0	4.3
Inundation	0.0	24.0	1.3	0.4	1.9	9.5	3.2	0.0	0.6	6.1	6.6	58.2	2.3	22.6	1.4	2.4	17.2	16.2	1.0	0.6	6.6
Windstorm	5.2	0.0	5.6	0.0	0.0	0.0	6.4	2.5	0.0	0.2	2.8	42.6	0.3	18.6	0.8	0.5	11.6	30.3	1.3	1.4	13.4
Thunderstorm	16.0	1.4	22.0	0.4	0.0	5.4	4.7	1.3	0.0	4.3	22.4	41.9	0.0	10.2	0.9	0.0	2.1	12.2	0.5	0.0	1.9
Hailstorm	3.8	0.0	3.1	0.0	0.0	0.0	1.1	0.0	0.0	0.5	0.7	68.0	5.2	21.1	5.6	0.0	10.7	23.3	1.0	0.0	6.7
Heavy rain	2.6	6.9	12.1	0.0	0.0	9.6	10.4	0.8	0.0	5.3	2.2	21.4	38.5	1.9	0.0	0.0	2.4	12.3	0.9	0.0	1.4
Sporadic rain	77.9	0.3	27.5	1.8	0.5	10.8	39.8	0.5	0.0	6.0	9.2	2.4	0.0	1.3	0.0	0.0	0.8	1.3	0.0	0.0	0.0
Soil erosion	8.8	1.8	7.7	0.0	5.9	7.0	15.1	0.0	1.3	12.6	18.9	34.8	7.6	11.6	0.0	4.0	7.7	18.7	0.0	3.5	3.2

Disasters	Reasons[9]																			
	Increased (%)											Decreased (%)								
	Insufficient rainfall	Heavy rainfall	Temperature Increase	Temperature decrease	Road construction	Urbanisation	Deforestation	Heavy use of underground water	Earthquake	Population increase	Others	Insufficient rainfall	Heavy rainfall	Temperature Increase	Temperature decrease	Road construction	Urbanisation	Deforestation	Heavy use of underground water	Earthquake	Population increase
Landslide	0.0	13.3	45.0	0.0	5.0	76.6	61.9	0.0	13.3	60.1	0.0	0.0	0.0	8.3	0.0	0.0	0.0	8.3	8.3	0.0	0.0
Heat wave	31.2	0.0	42.7	0.0	1.1	1.5	19.8	21.6	0.0	2.8	1.2	27.2	0.0	23.8	6.3	0.0	19.6	21.6	2.6	0.0	13.6
Cold wave	19.0	0.4	6.1	8.6	0.0	1.2	8.7	1.3	0.0	1.8	2.2	56.1	0.2	29.0	6.3	0.0	4.9	16.7	1.3	0.3	7.7
Disease/insect	69.2	0.2	20.0	0.0	0.0	15.4	24.1	1.3	0.0	37.3	35.5	1.1	0.0	0.0	0.0	0.0	0.3	0.4	0.3	0.0	1.5
Central Mountain																					
Drought	60.8	0.0	49.5	0.0	1.5	2.8	15.8	0.0	26.0	26.2	8.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fire (forest)	6.1	0.0	50.7	0.0	1.5	15.0	6.0	0.0	0.0	65.1	17.6	0.0	0.0	3.4	0.0	0.0	0.0	1.5	0.0	0.0	3.4
Fire (settlement)	0.0	0.0	100	0.0	0.0	0.0	0.0	0.0	0.0	33.1	33.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Windstorm	0.0	0.0	0.0	31.4	0.0	0.0	0.0	0.0	0.0	0.0	68.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Thunderstorm	4.0	0.0	24.7	0.0	0.0	0.0	7.3	0.0	0.0	5.2	64.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hailstorm	24.5	1.0	37.1	0.0	0.0	5.4	21.7	0.0	0.0	6.3	29.7	1.0	2.0	2.1	0.0	0.0	2.0	3.0	0.0	0.0	0.0
Heavy rain	0.0	100	0.0	0.0	0.0	100	100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sporadic rain	9.4	0.0	69.3	0.0	1.8	0.0	24.4	0.0	0.0	17.2	14.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Soil erosion	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100	100	0.0	100	0.0	0.0	0.0	0.0	0.0
Landslide	0.0	34.9	4.1	0.0	10.8	5.4	19.8	0.0	77.6	11.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cold wave	66.7	0.0	16.7	16.7	0.0	0.0	0.0	0.0	0.0	0.0	16.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Disease/insect	27.5	0.0	85.5	0.6	3.5	6.6	5.5	0.0	9.9	27.8	18.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central Hill																					
Drought	95.2	0.0	56.2	0.0	13.4	14.4	20.7	1.7	13.8	14.1	1.2	0.8	0.3	1.2	0.3	0.3	0.0	0.3	0.0	0.0	0.0
Fire (forest)	60.7	0.0	48.4	0.7	10.4	6.1	20.0	0.0	0.0	29.6	12.3	0.9	0.0	1.5	0.0	0.0	0.0	0.9	0.0	0.0	0.0
Fire (settlement)	33.9	0.0	19.8	0.0	0.0	6.1	13.7	0.0	0.0	6.1	19.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flood	0.0	48.1	0.0	0.0	0.0	0.0	7.4	0.0	0.0	3.4	12.7	19.8	0.0	14.4	0.0	6.7	0.0	6.7	0.0	0.0	19.4
Windstorm	54.8	1.5	14.0	0.0	0.0	0.0	14.5	0.3	0.0	12.5	13.0	3.3	0.0	3.8	0.0	0.0	1.2	2.3	0.0	0.0	3.6

Disasters	Reasons[9]																			
	Increased (%)											Decreased (%)								
	Insufficient rainfall	Heavy rainfall	Temperature Increase	Temperature decrease	Road construction	Urbanisation	Deforestation	Heavy use of underground water	Earthquake	Population increase	Others	Insufficient rainfall	Heavy rainfall	Temperature Increase	Temperature decrease	Road construction	Urbanisation	Deforestation	Heavy use of underground water	Earthquake	Population increase
Thunderstorm	66.2	1.2	54.9	1.3	0.0	4.6	7.9	0.0	0.0	9.7	11.0	1.6	0.3	2.8	0.0	0.0	1.8	0.2	0.7	0.0	0.3
Hailstorm	16.3	0.9	11.8	0.0	0.0	0.0	5.4	0.0	0.0	8.2	0.8	54.3	0.0	38.5	1.2	0.0	7.7	6.0	0.9	0.0	1.6
Heavy rain	0.0	9.5	6.3	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.0	62.5	22.3	61.5	0.0	0.0	7.8	5.7	0.0	0.0	0.0
Sporadic rain	69.0	0.0	37.0	0.7	20.2	8.8	29.2	1.3	0.0	25.1	10.2	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.0	0.0	0.0
Soil erosion	0.0	78.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.3	0.0	0.0	14.5	0.0	14.5	0.0	0.0	0.0
Landslide	0.0	42.3	0.0	0.0	36.8	1.8	10.9	0.0	8.4	0.0	10.2	28.8	0.0	0.0	0.0	0.5	0.9	0.0	0.0	0.0	0.0
Cold wave	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.3	100	33.3	0.0	0.0
Disease/insect	78.9	1.3	73.0	1.4	8.7	18.8	13.4	0.1	0.4	15.3	9.9	0.8	0.0	1.2	0.4	0.4	0.0	0.0	0.0	0.0	0.2
Central *Terai*																					
Drought	99.8	0.0	71.6	0.0	0.0	0.5	22.3	0.4	0.2	4.4	2.3	0.2	0.2	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Fire (forest)	12.0	0.0	52.3	0.0	0.0	0.0	12.0	0.0	0.0	16.4	0.0	17.8	0.0	0.0	0.0	0.0	0.0	12.0	0.0	0.0	17.8
Fire (settlement)	38.9	0.0	28.9	0.0	0.0	0.0	4.1	0.0	0.0	6.3	21.1	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.3
Flood	0.4	76.3	0.0	0.0	0.0	0.0	2.3	0.0	0.0	0.0	0.6	22.6	0.4	6.1	0.0	0.0	0.0	7.3	0.0	0.0	0.0
Inundation	0.8	61.6	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	3.5	35.8	0.6	13.4	0.0	0.0	0.0	19.6	0.0	0.0	0.0
Windstorm	1.8	0.0	0.6	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.2	42.6	30.3	7.1	0.0	0.0	2.3	19.7	0.0	0.0	5.3
Thunderstorm	12.2	1.3	8.0	0.0	0.0	0.0	6.3	0.0	0.0	0.0	1.6	47.0	30.2	38.4	0.0	0.0	0.0	21.2	0.0	0.0	0.0
Hailstorm	0.9	1.0	0.6	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	38.8	56.0	42.5	0.4	0.0	0.0	13.3	0.0	0.0	0.2
Heavy rain	0.0	0.8	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	15.1	83.2	0.7	0.0	0.0	0.0	4.1	0.0	0.0	0.0
Sporadic rain	82.2	0.5	19.2	0.0	0.0	0.2	45.9	0.0	0.0	0.4	3.7	11.5	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.0	0.0
Heat wave	26.7	0.0	32.0	0.0	0.0	0.0	0.0	0.0	0.0	26.7	0.0	22.9	0.0	47.4	11.5	0.0	0.0	0.0	0.0	0.0	0.0
Cold wave	17.3	2.7	3.4	14.1	0.0	0.0	3.0	0.0	0.0	0.5	1.4	34.8	6.3	15.8	39.1	0.0	0.2	7.3	0.0	0.0	3.3
Disease/insect	89.3	1.5	60.3	4.4	0.0	0.5	4.3	0.7	0.0	8.8	25.6	2.7	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	1.6

Disasters	Reasons[9]																				
	Increased (%)											Decreased (%)									
	Insufficient rainfall	Heavy rainfall	Temperature Increase	Temperature decrease	Road construction	Urbanisation	Deforestation	Heavy use of underground water	Earthquake	Population increase	Others	Insufficient rainfall	Heavy rainfall	Temperature Increase	Temperature decrease	Road construction	Urbanisation	Deforestation	Heavy use of underground water	Earthquake	Population increase
Western Mountain																					
Drought	100	0.0	14.3	0.0	0.0	0.0	3.1	0.0	0.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fire (forest)	100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Windstorm	0.0	0.0	0.0	0.0	0.0	0.0	16.7	0.0	0.0	0.0	83.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hailstorm	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.0	0.0	65.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy rain	0.0	100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Soil erosion	0.0	50.6	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.9	0.0	32.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Landslide	0.0	100	0.0	0.0	30.2	0.0	18.1	0.0	6.0	0.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Snowstorm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	64.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Avalanche	0.0	100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Disease/insect	23.4	0.0	70.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Western Hill																					
Drought	74.6	0.0	41.3	0.0	4.1	3.2	14.3	1.0	2.6	9.1	6.0	0.6	0.0	0.9	0.0	1.6	0.6	0.6	0.0	0.0	1.1
Fire (forest)	17.3	0.0	33.2	1.3	0.8	0.8	0.8	0.0	0.0	19.3	13.8	0.6	0.0	4.5	0.0	0.6	0.0	0.0	0.0	0.0	0.3
Fire (settlement)	17.0	0.0	27.6	0.0	0.0	0.0	0.0	0.0	0.0	2.9	11.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6
Flood	0.0	34.7	16.6	0.0	18.7	6.1	10.9	0.0	42.7	3.3	6.8	7.1	0.0	10.5	0.0	6.3	0.0	2.5	0.0	8.1	1.2
Windstorm	8.6	18.4	23.3	0.0	0.0	0.0	30.4	0.0	0.0	0.0	18.0	1.1	0.0	2.2	0.0	0.0	0.0	2.2	0.0	0.0	0.0
Thunderstorm	11.8	6.0	30.7	0.4	0.0	4.2	5.5	0.4	0.0	9.4	42.9	3.7	0.8	9.5	0.0	0.0	2.2	2.5	0.0	0.0	2.0
Hailstorm	4.1	15.0	21.0	1.1	0.0	4.7	4.3	0.0	0.0	3.3	19.8	13.9	1.2	22.0	2.1	0.0	2.3	6.9	0.0	0.0	3.5
Heavy rain	3.2	16.8	55.5	1.0	2.5	4.6	27.7	0.5	0.0	5.7	10.3	1.1	0.0	2.3	0.0	0.9	0.0	2.2	0.0	0.0	1.1
Sporadic rain	10.2	10.0	55.9	0.0	4.6	11.1	23.3	0.9	0.0	11.2	23.8	1.0	0.0	1.5	0.0	0.0	0.5	0.0	0.0	0.5	0.0
Soil erosion	0.7	17.3	11.3	0.0	61.5	3.7	12.2	0.0	10.9	5.2	5.6	3.9	4.4	1.2	0.0	3.5	0.1	0.0	0.5	0.2	1.2
Landslide	0.0	38.2	12.7	0.0	57.2	2.4	11.9	0.5	28.4	1.0	3.9	4.2	0.0	3.9	0.5	2.6	0.5	0.7	0.0	2.0	0.5
Cold wave	0.0	0.0	29.1	0.0	0.0	0.0	29.1	0.0	0.0	0.0	0.0	0.0	0.0	32.2	32.9	0.0	0.0	0.0	0.0	0.0	0.0
Disease/insect	55.1	2.4	69.9	1.1	0.5	3.7	1.5	0.0	0.0	29.3	21.1	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.5

Disasters	Reasons[9]																			
	Increased (%)											Decreased (%)								
	Insufficient rainfall	Heavy rainfall	Temperature Increase	Temperature decrease	Road construction	Urbanisation	Deforestation	Heavy use of underground water	Earthquake	Population increase	Others	Insufficient rainfall	Heavy rainfall	Temperature Increase	Temperature decrease	Road construction	Urbanisation	Deforestation	Heavy use of underground water	Earthquake	Population increase
Western *Terai*																				
Drought	77.9	0.0	56.4	0.0	2.9	13.3	57.3	14.6	0.0	18.9	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fire (forest)	26.5	0.0	23.6	0.0	0.3	2.1	29.9	0.0	0.0	22.5	24.2	0.6	0.0	51.5	0.0	1.4	18.4	2.7	0.3	0.3	22.3
Fire (settlement)	25.7	0.0	72.0	0.0	1.6	17.3	11.9	0.6	1.0	37.0	16.2	7.6	0.0	3.1	0.0	0.0	0.5	4.1	0.0	0.0	13.3
Flood	8.9	56.4	4.2	0.0	21.0	16.1	44.9	0.0	1.5	2.9	3.4	13.9	1.1	6.5	0.0	8.9	2.4	13.7	1.1	0.0	2.2
Inundation	0.0	68.2	0.0	0.0	16.1	18.5	16.5	2.1	0.0	10.0	0.0	8.3	2.4	2.4	0.0	13.5	5.1	12.4	0.0	0.0	1.1
Windstorm	31.5	0.0	30.0	0.0	0.0	0.0	30.9	2.1	0.0	3.3	1.8	28.4	5.4	39.5	0.0	0.0	4.6	4.6	0.0	0.0	9.0
Thunderstorm	7.0	0.0	5.8	0.0	0.0	0.0	3.8	0.0	0.0	0.0	1.3	19.6	1.3	50.4	2.1	0.0	1.9	5.7	0.7	0.0	1.5
Hailstorm	1.3	0.0	2.2	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.9	38.6	0.6	49.2	6.3	0.0	5.4	10.0	0.0	0.0	4.5
Heavy rain	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.9	14.0	42.1	0.0	0.0	0.0	29.9	0.0	0.0	14.0
Sporadic rain	62.2	0.0	21.5	0.0	0.0	6.9	66.5	42.1	0.0	16.3	6.2	7.4	0.0	11.4	0.9	0.0	3.4	1.4	0.4	0.4	1.8
Soil erosion	28.8	0.0	4.7	0.0	53.1	13.4	76.4	0.0	0.0	37.6	0.0	0.0	21.4	0.0	0.0	0.0	0.0	11.0	0.0	0.0	0.0
Landslide	0.0	13.8	21.8	0.0	61.2	6.9	100	0.0	0.0	30.1	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heat wave	40.4	0.3	64.7	0.0	1.1	15.4	49.6	4.1	0.3	16.4	2.2	2.7	0.0	17.9	0.3	0.2	5.6	3.3	0.0	0.0	1.9
Cold wave	46.8	0.2		23.8	0.5	21.8	47.9	3.4	1.7	8.6	11.3	1.8	0.0	0.2	28.0	0.5	3.0	4.9	0.3	1.6	1.6
Disease/insect	70.8	0.5	39.0	0.8	3.6	28.5	62.2	0.8	0.0	56.2	5.8	1.3	0.0	3.3	0.0	0.0	1.9	2.0	0.0	0.0	0.6
Mid-Western Mountain																				
Drought	97.9	0.0	5.7	0.0	8.6	3.9	57.6	0.0	0.0	27.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fire (forest)	0.0	0.0	20.4	0.0	0.0	29.6	10.2	0.0	0.0	29.6	0.0	0.0	0.0	14.8	0.0	0.0	10.2	10.2	0.0	0.0	20.4
Fire (settlement)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flood	0.0	0.0	0.0	0.0	100	0.0	0.0	0.0	0.0	100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hailstorm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy rain	0.0	0.0	100	0.0	0.0	0.0	100	0.0	0.0	100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Disasters	Reasons[9]																			
	Increased (%)										Decreased (%)									
	Insufficient rainfall	Heavy rainfall	Temperature Increase	Temperature decrease	Road construction	Urbanisation	Deforestation	Heavy use of underground water	Earthquake	Population increase	Others	Insufficient rainfall	Heavy rainfall	Temperature Increase	Temperature decrease	Road construction	Urbanisation	Deforestation	Heavy use of underground water	Earthquake	Population increase
Landslide	0.0	50.4	0.0	0.0	12.7	0.0	62.3	0.0	0.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Disease/insect	83.8	0.0	31.3	0.0	0.0	7.0	25.2	0.0	0.0	21.8	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.1	0.0	0.0	2.9
Mid-Western Hill																					
Drought	95.2	0.0	41.6	0.0	5.0	4.9	41.3	0.4	1.3	8.2	2.9	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fire (forest)	18.7	0.0	11.1	0.0	0.3	0.0	7.9	0.0	0.0	4.3	8.1	2.0	0.0	17.3	0.0	0.6	1.8	2.1	0.0	0.0	5.9
Fire (settlement)	10.5	0.0	21.9	0.0	0.0	2.6	1.9	0.0	0.0	5.3	10.7	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0
Flood	2.1	41.1	0.5	0.0	9.8	5.0	24.8	0.0	1.4	5.5	4.8	46.3	0.0	7.1	0.0	0.0	0.0	2.7	0.0	0.0	0.0
Windstorm	23.4	1.6	14.0	0.0	0.0	0.0	14.2	0.8	0.0	1.4	8.0	38.5	0.0	7.9	0.0	0.0	0.6	7.9	0.0	0.0	0.4
Thunderstorm	24.0	1.8	20.2	0.0	0.0	0.0	0.8	0.0	0.0	0.0	23.9	20.4	0.7	16.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0
Hailstorm	8.0	2.8	8.7	1.2	0.0	0.0	4.0	0.0	0.0	0.0	2.8	35.3	7.6	41.7	2.7	0.0	0.0	0.9	0.0	0.0	0.5
Heavy rain	0.5	9.4	3.1	0.0	5.2	4.0	8.4	0.0	0.0	3.9	1.1	52.1	0.0	4.8	0.0	0.7	0.0	29.0	0.0	0.0	0.6
Sporadic rain	59.1		11.9	0.0	1.5	1.0	56.5	0.0	0.0	3.9	7.1	4.1	0.0	5.2	0.6	0.8	0.0	0.0	0.0	0.0	0.8
Soil erosion	14.4	6.5	3.0	0.0	15.5	0.0	28.0	0.0	9.5	0.0	6.2	60.9	1.6	1.6	0.0	0.0	0.0	1.4	0.5	0.0	0.0
Landslide	0.0	31.5	2.6	0.4	25.6	1.1	39.4	0.0	10.4	0.7	3.0	40.5		0.9	0.0	0.0	0.0	0.5	0.3	0.0	0.0
Heat wave	74.4	0.0	80.6	0.0	0.0	0.0	54.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cold wave	59.5	0.0	17.9	8.3	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	0.0	0.0	23.9	0.0	0.0	0.0	0.0	0.0	0.0
Disease/insect	79.9	2.6	73.8	0.0	4.7	4.4	17.0	0.0	1.8	19.8	23.1	0.9	0.2	0.9	0.0	0.0	0.0	0.9	0.0	0.0	0.0
Mid-Western *Terai*																					
Drought	93.1	0.0	43.2	0.0	4.3	16.5	46.6	1.0	0.2	12.0	4.8	0.2	0.3	0.2	0.0	0.0	0.0	0.2	0.3	0.0	0.0
Fire (forest)	21.4	0.0	34.8	0.0	0.7	1.4	0.8	0.7	0.0	7.5	15.6	0.9	0.0	5.8	0.0	0.0	0.6	0.7	0.0	0.0	0.7
Fire (settlement)	3.0	0.0	9.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	1.7
Flood	0.0	43.9	4.1	0.0	4.2	8.4	34.0	0.0	4.0	3.8	8.2	39.2	0.0	7.1	0.0	0.0	0.0	7.1	0.0	0.0	0.0
Inundation	0.0	49.8	0.4	0.0	3.1	8.6	14.0	0.0	0.0	5.0	18.9	26.1	0.0	2.3	0.0	1.3	1.3	1.2	0.0	0.0	1.3

Disasters	Reasons[9]																			
	Increased (%)										Decreased (%)									
	Insufficient rainfall	Heavy rainfall	Temperature Increase	Temperature decrease	Road construction	Urbanisation	Deforestation	Heavy use of underground water	Earthquake	Population increase	Others	Insufficient rainfall	Heavy rainfall	Temperature Increase	Temperature decrease	Road construction	Urbanisation	Deforestation	Heavy use of underground water	Earthquake	Population increase
Windstorm	5.2	0.0	21.2	0.0	0.0	0.0	13.3	0.5	0.0	0.0	15.3	33.4	0.5	12.0	0.0	0.0	2.6	6.8	0.0	0.0	2.3
Thunderstorm	11.8	3.0	26.0	0.0	0.0	0.7	2.8	0.0	0.0	0.0	22.0	12.8	1.1	7.2	0.6	0.0	0.0	1.8	0.0	0.0	0.0
Hailstorm	5.0	1.2	6.6	3.7	0.0	0.6	1.9	0.0	0.0	0.0	9.5	25.0	9.2	25.1	0.0	0.0	0.0	3.1	0.4	0.0	0.0
Heavy rain	0.0	3.2	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.6	56.3	4.9	5.8	0.0	0.0	1.2	26.2	0.0	0.0	1.1
Sporadic rain	52.3	0.0	14.4	0.0	0.9	10.7	45.4	1.2	0.0	3.3	19.5	1.7	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0
Soil erosion	0.5	26.2	0.0	0.0	8.0	3.3	21.9	0.0	2.7	8.0	12.4	32.7	12.2	0.0	0.0	0.0	0.0	1.3	0.0	0.0	1.3
Landslide	0.0	14.8	0.0	0.0	24.4	0.0	58.2	0.0	0.0	4.2	6.9	24.3	0.0	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heat wave	50.9	0.0	81.8	0.0	0.0	0.0	31.5	0.0	0.0	1.6	6.1	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	1.5
Cold wave	19.9	0.0	20.1	25.7	0.0	0.0	4.0	0.0	0.0	1.8	19.0	1.8	0.0	3.3	3.4	0.0	0.0	1.4	0.0	0.0	1.7
Disease/insect	41.1	1.4	75.5	0.0	9.2	15.7	6.6	0.6	1.3	30.5	27.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Far-western Mountain																					
Drought	100	0.0	96.7	0.0	0.6	1.1	96.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fire (forest)	28.8	0.0	58.0	0.6	1.4	0.0	5.4	0.0	0.0	10.9	1.5	34.8	1.2	33.1	2.3	1.2	0.0	22.1	0.0	1.3	15.1
Fire (settlement)	35.7	0.0	35.8	0.0	0.0	0.0	12.6	0.0	0.0	29.8	0.0	62.0	0.0	37.9	3.9	0.0	2.7	45.9	0.0	0.0	33.7
Flood	11.5	43.4	17.6	6.0	16.8	1.9	88.1	0.0	0.0	7.1	2.5	2.1	3.8	6.0	0.0	0.0	0.0	6.0	0.0	0.0	0.0
Windstorm	5.1	0.0	4.5	0.5	0.0	0.0	5.1	0.0	0.0	0.7	40.8	39.8	4.3	33.1	3.8	3.0	0.0	39.7	0.0	1.3	0.0
Thunderstorm	1.2	0.0	1.2	0.0	0.0	0.0	1.2	0.0	0.0	0.0	8.8	37.4	19.0	41.7	7.8	0.0	0.0	50.7	0.0	0.0	0.0
Hailstorm	9.8	6.1	9.1	4.1	0.0	0.0	14.2	0.0	0.0	0.0	42.9	28.3	6.9	27.2	6.8	0.0	0.5	33.6	0.0	0.0	0.0
Heavy rain	1.6	3.6	0.0	0.0	0.0	0.0	3.6	0.0	0.0	0.0	0.0	78.5	18.6	49.7	40.3	4.6	1.6	84.3	0.0	0.0	3.6
Sporadic rain	40.0	7.6	43.0	1.5	0.0	2.0	48.1	0.0	0.0	0.0	0.0	46.7	5.2	36.6	10.9	4.4	3.1	47.1	0.0	1.8	0.0
Soil erosion	2.9	14.5	6.8	0.0	2.9	0.0	30.8	0.0	0.0	0.0	0.0	52.5	33.0	44.8	10.7	6.9	0.0	57.6	0.0	2.2	0.0
Landslide	0.0	39.1	25.6	4.0	5.0	0.6	89.1	0.0	3.2	0.0	1.5	3.3	5.0	5.2	3.2	0.0	0.6	3.3	0.0	0.5	0.0
Snowstorm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	62.5	39.0	29.5	75.7	0.0	0.0	87.1	0.0	0.0	0.0

Disasters	Reasons[9]																			
	Increased (%)											Decreased (%)								
	Insufficient rainfall	Heavy rainfall	Temperature Increase	Temperature decrease	Road construction	Urbanisation	Deforestation	Heavy use of underground water	Earthquake	Population increase	Others	Insufficient rainfall	Heavy rainfall	Temperature Increase	Temperature decrease	Road construction	Urbanisation	Deforestation	Heavy use of underground water	Earthquake	Population increase
Avalanche	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	61.4	0.0	19.7	80.3	0.0	0.0	61.4	0.0	0.0	0.0
Cold wave	0.0	0.0	0.0	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	70.7	15.7	8.8	81.8	0.0	0.0	80.6	0.0	0.0	0.0
Disease/insect	82.7	0.0	88.1	0.7	0.0	0.0	39.9	0.0	0.0	10.3	0.0	10.2	1.0	9.2	0.0	0.0	0.0	9.5	0.0	0.0	0.8
Far-Western Hill																					
Drought	95.3	0.0	88.9	0.0	6.5	2.3	65.5	0.8	3.5	21.3	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fire (forest)	45.7	0.0	73.6	0.4	4.5	3.5	29.8	0.0	0.0	38.4	17.1	4.1	0.0	4.1	0.0	3.6	0.0	4.7	0.0	0.0	7.2
Fire (settlement)	56.1	0.0	52.1	0.0	4.6	3.6	12.5	0.0	0.0	33.3	39.7	3.6	0.0	3.6	0.0	4.6	11.3	8.2	0.0	0.0	24.2
Flood	0.0	17.8	41.1	0.0	17.8	0.0	41.1	0.0	17.8	17.8	23.3	41.1	0.0	17.8	0.0	0.0	0.0	0.0	0.0	0.0	17.8
Windstorm	47.4	0.0	51.0	0.0	0.0	0.0	30.1	0.0	0.0	10.4	0.0	30.0	10.2	31.9	0.0	5.9	6.4	19.6	0.0	4.0	2.4
Thunderstorm	51.6	6.8	48.4	2.2	0.0	2.2	35.8	1.3	0.0	2.4	1.0	28.1	0.0	23.5	1.2	0.0	3.6	17.8	0.0	0.0	2.2
Hailstorm	41.8	4.1	33.9	2.6	0.0	2.5	30.3	0.0	0.0	3.3	0.5	35.4	8.5	35.2	2.0	0.0	4.5	23.2	3.2	0.0	4.5
Heavy rain	0.0	52.6	28.1	0.0	0.0	0.0	80.8	0.0	0.0	0.0	0.0	19.2	0.0	19.2	0.0	0.0	0.0	0.0	0.0	0.0	19.2
Sporadic rain	10.4	0.0	76.8	0.0	0.0	12.8	48.4	0.0	0.0	49.2	10.4	0.0	0.0	12.8	0.0	0.0	0.0	12.8	0.0	12.8	0.0
Soil erosion	10.1	48.0	11.1	0.0	77.9	8.5	78.9	0.0	36.0	13.9	10.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Landslide	0.0	60.6	5.3	1.0	75.7	2.2	82.9	2.0	17.6	6.9	6.7	2.5	0.0	0.9	0.0	0.0	0.3	0.3	0.0	0.0	0.8
Cold wave	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100	0.0	0.0	0.0	100	0.0	0.0	100
Disease/insect	93.6	0.8	89.1	0.0	2.3	7.0	17.5	0.0	0.0	70.9	1.6	1.8	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.9
Far-Western *Terai*																					
Drought	94.7	0.0	88.6	0.0	3.6	8.4	79.2	6.7	0.6	14.4	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fire (forest)	9.9	0.0	54.4	0.9		0.8	11.4	1.7	0.0	42.8	1.9	19.9	3.1	39.7	0.0	2.0	4.1	3.4	2.2	0.0	34.2
Fire (settlement)	71.1	0.0	84.5	2.3	1.4	6.9	4.7	3.4	0.0	70.4	14.7	5.9	2.1	4.5	0.0	3.3	1.4	6.4	0.0	0.0	5.6
Flood	0.0	70.9	30.9	0.8	14.9	19.3	73.2	0.0	0.0	21.1	15.0	10.3	0.0	3.4	0.0	3.6	3.9	3.5	1.6	0.5	1.1
Inundation	0.8	48.7	23.0	1.4	34.6	28.8	48.1	2.1	1.7	16.7	19.3	14.8	0.0	5.8	0.9	4.5	4.7	5.4	0.9	0.0	10.5

Disasters	Reasons[9]																				
	Increased (%)											Decreased (%)									
	Insufficient rainfall	Heavy rainfall	Temperature Increase	Temperature decrease	Road construction	Urbanisation	Deforestation	Heavy use of underground water	Earthquake	Population increase	Others	Insufficient rainfall	Heavy rainfall	Temperature Increase	Temperature decrease	Road construction	Urbanisation	Deforestation	Heavy use of underground water	Earthquake	Population increase
Windstorm	17.5	3.1	34.1	0.0	0.0	0.0	39.5	0.0	0.0	2.5	30.0	26.8	5.6	34.2	1.1	2.8	2.9	35.9	0.5	1.1	5.1
Thunderstorm	20.1	15.4	24.1	1.3	0.0	6.7	28.7	2.7	0.0	1.2	19.2	24.7	21.7	37.2	3.8	0.0	4.7	40.0	2.8	0.0	0.5
Hailstorm	8.7	16.3	18.5	4.8	0.0	2.3	17.4	0.0	0.0	2.2	27.7	20.9	25.1	39.1	0.5	0.0	3.3	39.5	1.4	0.0	2.8
Heavy rain	1.5	11.0	19.8	0.0	0.0	3.6	13.9	0.0	0.0	7.0	16.1	17.7	37.4	54.2	3.9	4.9	6.0	36.8	0.0	0.0	2.1
Sporadic rain	45.6	14.9	63.9	0.0	4.0	12.8	85.4	15.6	0.0	3.7	19.7	3.8	1.6	8.3	0.0	0.0	0.0	9.9	0.0	0.0	0.0
Soil erosion	3.6	63.3	28.6	0.0	25.6	19.3	70.8	0.0	2.5	10.3	37.6	2.2	4.1	1.9	0.0	4.4	0.0	9.9	0.0	0.0	0.0
Landslide	0.0	88.1	23.8	0.0	16.9	0.0	79.7	8.4	0.0	11.6	0.0	0.0	11.9	11.9	0.0	0.0	0.0	11.9	0.0	0.0	0.0
Heat wave	12.4	8.8	84.6	3.0	3.9	11.5	72.3	2.9	0.0	22.0	6.6	0.0	0.0	7.6	0.0	0.0	2.6	4.2	0.0	0.0	3.7
Cold wave	17.6	6.4	12.5	54.6	1.4	4.7	24.6	3.1	0.0	4.1	40.2	5.1	2.0	8.0	7.9	0.0	5.9	4.2	0.9	0.0	8.4
Disease/insect	30.9	1.2	82.7	0.4	4.3	17.9	60.2	1.7	0.0	66.8	10.8	3.8	0.0	0.7	0.0	0.0	0.3	3.5	0.0	0.0	2.4
Kathmandu Valley																					
Drought	80.8	0.0	42.8	0.0	5.0	50.0	18.1	14.8	0.6	29.2	1.1	0.4	0.0	0.4	0.0	0.0	1.0	0.5	0.0	0.0	0.4
Fire (forest)	55.3	0.0	27.6	0.0	0.0	0.0	0.0	0.0	0.0	55.3	0.0	0.0	0.0	44.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fire (settlement)	0.0	0.0	15.2	0.0	0.0	7.6	0.0	0.0	0.0	22.8	0.0	0.0	0.0	0.0	0.0	0.0	77.2	0.0	0.0	0.0	15.2
Flood	0.0	38.4	0.0	0.0	1.9	5.4	4.3	0.0	0.0	0.0	0.9	49.2	0.0	3.6	0.0	3.2	23.4	0.0	0.0	0.0	5.9
Windstorm	9.6	2.1	9.0	0.0	0.0	0.0	2.9	1.4	0.0	5.3	3.9	7.9	4.6	17.0	0.0	3.2	21.0	23.5	4.2	0.0	12.8
Thunderstorm	8.2	0.0	10.2	0.0	0.0	2.3	3.1	4.3	0.0	4.9	4.7	26.9	0.7	21.6	0.0	0.0	15.2	6.6	15.6	0.0	12.5
Hailstorm	6.3	0.8	3.1	0.7	0.0	0.0	0.8	0.0	0.0	4.4	1.3	17.4	3.9	32.8	2.9	0.0	20.1	15.2	9.5	0.0	10.5
Heavy rain	0.0	31.9	13.9	0.0	0.0	3.2	15.1	0.0	0.0	0.0	0.0	2.6	24.1	6.2	0.0	0.0	7.9	3.4	0.0	0.0	0.0
Sporadic rain	36.6	0.5	38.9	1.0	2.0	32.8	30.7	11.5	0.0	28.5	10.4	1.3	0.0	0.9	0.0	0.0	1.8	2.7	0.0	0.0	0.5
Landslide	0.0	0.0	0.0	0.0	100	0.0	0.0	0.0	100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Disease/insect	5.6	0.0	23.5	1.3	2.6	69.7	3.5	0.7	0.0	71.6	17.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6

Table 6-14 represents percentage distribution of households by eco-development regions on reasons behind changing incidences of climate induced disasters in last 25 years. Majority of households in all eco-development regions observed insufficient rainfall as the major attributing factor to increase incidences of drought. Similarly, significant households reported that main reason to increase incidence of sporadic rain in all eco-development regions except in far-western hills is due to insufficient rainfall. However, higher percentage of households in mid-hill (76.8%) reported temperature increase as an attributing factor to increase incidences of sporadic rain in last 25 years. Similarly, respondents observed insufficient rainfall as the major attributing factor to increase incidence of drought (80.8%) and fire (forest) (55.3%) in last 25 years.

6.5. Impact of Climate Induced Disasters in Daily Life

Table 6-15: Households Affected by Climate Induced Disasters in Last 5 Years

Hazards/Disasters	Impact			Total
	Affected (%)	Observed but not affected (%)	No disaster (%)	
Drought	65.73	24.33	9.94	100.00
Fire (forest)	12.70	17.52	69.77	100.00
Fire (settlement)	3.42	23.88	72.70	100.00
Flood	12.12	24.65	63.23	100.00
Inundation	4.97	9.15	85.88	100.00
Windstorm	16.35	22.03	61.62	100.00
Thunderstorm	13.58	30.58	55.84	100.00
Hailstorm	25.06	29.66	45.28	100.00
Heavy rain	6.61	18.06	75.33	100.00
Sporadic rain	14.36	27.47	58.18	100.00
Soil erosion	4.62	11.65	83.73	100.00
Landslide	10.45	12.63	76.92	100.00
Snowstorm	0.16	0.57	99.26	100.00
Avalanche	0.00	0.05	99.94	100.00
GLOF	0.00	0.03	99.97	100.00
Heat wave	0.79	8.72	90.49	100.00
Cold wave	14.13	25.48	60.40	100.00
Disease/insect	45.12	28.61	26.26	100.00

Table 6-15 depicts the households affected by climate induced disasters in last 5 years. It reveals that higher percentage of households is affected by drought (65.73%) in last 5 years followed by Disease/insects (45.12%), and hailstorm (25.06%). Moreover, 30.58 per cent households have felt incidences of thunderstorm but are not affected in last five years followed by hailstorm (29.66%), Disease/insects (28.61%), and cold wave (25.48%). More than 99 per cent respondents reported that the incidences of avalanche (99.94%), snowstorm (99.26), and GLOF (99.97%) have not been felt in last 25 years.

Table 6-16: Households Affected by Climate Induced Disasters by Eco-Development Region in Last Five Years

Hazards/Disaster	Impact			Total
	Affected (%)	Observed but not affected (%)	No disaster (%)	
Eastern Mountain				
Drought	28.76	5.12	66.13	100.00
Fire (forest)	3.10	2.29	94.61	100.00
Fire (settlement)	6.70	4.23	89.07	100.00
Flood	12.95	5.79	81.27	100.00
Inundation	0.00	0.00	100.00	100.00
Windstorm	6.90	0.00	93.10	100.00
Thunderstorm	30.12	10.71	59.16	100.00
Hailstorm	60.17	3.76	36.07	100.00
Heavy rain	33.35	1.10	65.54	100.00
Sporadic rain	10.95	0.66	88.40	100.00
Soil erosion	13.14	6.08	80.78	100.00
Landslide	39.62	12.84	47.55	100.00
Snowstorm	2.46	6.55	90.99	100.00
Avalanche	0.00	0.56	99.44	100.00
GLOF	0.00	1.79	98.21	100.00
Heat wave	0.00	0.00	100.00	100.00
Cold wave	24.16	17.93	57.90	100.00
Disease/insect	33.84	21.29	44.87	100.00
Eastern Hill				
Drought	86.48	10.92	2.60	100.00
Fire (forest)	12.05	33.45	54.50	100.00
Fire (settlement)	3.25	22.33	74.43	100.00
Flood	2.18	29.47	68.35	100.00
Inundation	0.00	0.00	100.00	100.00
Windstorm	14.24	23.49	62.26	100.00
Thunderstorm	5.65	35.15	59.20	100.00
Hailstorm	22.55	28.04	49.42	100.00
Heavy rain	1.38	17.63	80.99	100.00
Sporadic rain	11.05	22.36	66.59	100.00
Soil erosion	1.47	20.66	77.87	100.00
Landslide	6.89	32.79	60.32	100.00
Snowstorm	0.00	0.00	100.00	100.00
Avalanche	0.00	0.00	100.00	100.00
GLOF	0.00	0.00	100.00	100.00
Heat wave	0.00	8.57	91.43	100.00
Cold wave	4.79	16.91	78.29	100.00
Disease/insect	61.80	15.89	22.32	100.00
Eastern *Terai*				
Drought	71.12	27.41	1.46	100.00
Fire (forest)	3.42	9.24	87.34	100.00
Fire (settlement)	7.03	55.66	37.31	100.00
Flood	28.67	28.18	43.15	100.00
Inundation	19.52	20.27	60.20	100.00
Windstorm	33.39	44.58	22.03	100.00

Hazards/Disaster	Impact			Total
	Affected (%)	Observed but not affected (%)	No disaster (%)	
Thunderstorm	18.61	45.05	36.33	100.00
Hailstorm	16.47	27.87	55.66	100.00
Heavy rain	27.50	6.37	66.12	100.00
Sporadic rain	7.56	38.23	54.20	100.00
Soil erosion	4.36	6.33	89.31	100.00
Landslide	0.00	2.77	97.23	100.00
Snowstorm	0.00	0.00	100.00	100.00
Avalanche	0.00	0.00	100.00	100.00
GLOF	0.00	0.00	100.00	100.00
Heat wave	1.67	11.20	87.13	100.00
Cold wave	25.28	66.57	8.16	100.00
Disease/insect	40.22	49.99	9.79	100.00
Central Mountain				
Drought	95.82	0.51	3.67	100.00
Fire (forest)	30.30	0.00	69.70	100.00
Fire (settlement)	0.44	0.90	98.66	100.00
Flood	0.00	0.00	100.00	100.00
Inundation	0.00	0.00	100.00	100.00
Windstorm	1.39	0.00	98.61	100.00
Thunderstorm	26.96	0.45	72.58	100.00
Hailstorm	44.40	0.45	55.14	100.00
Heavy rain	0.45	0.00	99.55	100.00
Sporadic rain	50.69	0.51	48.81	100.00
Soil erosion	0.45	0.00	99.55	100.00
Landslide	25.13	0.00	74.87	100.00
Snowstorm	0.00	0.00	100.00	100.00
Avalanche	0.00	0.00	100.00	100.00
GLOF	0.00	0.00	100.00	100.00
Heat wave	0.00	0.00	100.00	100.00
Cold wave	3.05	0.00	96.95	100.00
Disease/insect	87.34	0.00	12.66	100.00
Central Hill				
Drought	93.58	3.72	2.70	100.00
Fire (forest)	25.05	7.07	67.88	100.00
Fire (settlement)	1.06	1.26	97.68	100.00
Flood	0.89	1.23	97.88	100.00
Inundation	0.00	0.00	100.00	100.00
Windstorm	10.82	1.64	87.54	100.00
Thunderstorm	19.93	25.19	54.88	100.00
Hailstorm	16.77	30.11	53.12	100.00
Heavy rain	0.43	4.10	95.47	100.00
Sporadic rain	34.92	3.72	61.35	100.00
Soil erosion	0.91	0.07	99.02	100.00
Landslide	7.14	3.39	89.47	100.00
Snowstorm	0.00	0.00	100.00	100.00
Avalanche	0.00	0.00	100.00	100.00

Hazards/Disaster	Impact			Total
	Affected (%)	Observed but not affected (%)	No disaster (%)	
GLOF	0.00	0.00	100.00	100.00
Heat wave	0.00	0.00	100.00	100.00
Cold wave	0.00	0.15	99.85	100.00
Disease/insect	81.19	3.84	14.98	100.00
Central *Terai*				
Drought	68.10	30.54	1.36	100.00
Fire (forest)	0.00	1.11	98.89	100.00
Fire (settlement)	5.21	36.99	57.80	100.00
Flood	10.58	72.14	17.28	100.00
Inundation	2.55	23.43	74.02	100.00
Windstorm	22.25	25.19	52.57	100.00
Thunderstorm	7.24	22.29	70.47	100.00
Hailstorm	28.61	36.13	35.26	100.00
Heavy rain	0.70	42.17	57.13	100.00
Sporadic rain	6.68	28.77	64.55	100.00
Soil erosion	0.00	0.00	100.00	100.00
Landslide	0.00	0.00	100.00	100.00
Snowstorm	0.00	0.00	100.00	100.00
Avalanche	0.00	0.00	100.00	100.00
GLOF	0.00	0.00	100.00	100.00
Heat wave	0.00	1.48	98.52	100.00
Cold wave	43.61	36.17	20.21	100.00
Disease/insect	63.97	18.82	17.21	100.00
Western Mountain				
Drought	63.39	6.61	30.00	100.00
Fire (forest)	0.00	2.20	97.80	100.00
Fire (settlement)	0.00	0.00	100.00	100.00
Flood	0.00	0.00	100.00	100.00
Inundation	0.00	0.00	100.00	100.00
Windstorm	15.42	11.01	73.57	100.00
Thunderstorm	0.00	0.00	100.00	100.00
Hailstorm	24.82	20.00	55.18	100.00
Heavy rain	2.20	2.20	95.60	100.00
Sporadic rain	0.00	0.00	100.00	100.00
Soil erosion	2.80	46.96	50.24	100.00
Landslide	17.62	18.81	63.57	100.00
Snowstorm	33.57	13.99	52.44	100.00
Avalanche	2.80	2.80	94.40	100.00
GLOF	0.00	0.00	100.00	100.00
Heat wave	0.00	0.00	100.00	100.00
Cold wave	0.00	0.00	100.00	100.00
Disease/insect	62.20	4.40	33.39	100.00
Western Hill				
Drought	34.21	15.90	49.89	100.00
Fire (forest)	26.53	19.55	53.92	100.00
Fire (settlement)	0.50	7.56	91.94	100.00

Hazards/Disaster	Impact			Total
	Affected (%)	Observed but not affected (%)	No disaster (%)	
Flood	1.69	8.90	89.40	100.00
Inundation	0.00	0.00	100.00	100.00
Windstorm	6.98	6.02	87.00	100.00
Thunderstorm	20.80	34.97	44.24	100.00
Hailstorm	33.62	25.10	41.28	100.00
Heavy rain	6.46	20.94	72.59	100.00
Sporadic rain	20.38	30.19	49.43	100.00
Soil erosion	16.67	32.44	50.90	100.00
Landslide	26.35	27.72	45.92	100.00
Snowstorm	0.00	0.00	100.00	100.00
Avalanche	0.00	0.00	100.00	100.00
GLOF	0.00	0.00	100.00	100.00
Heat wave	0.00	0.00	100.00	100.00
Cold wave	0.26	0.64	99.10	100.00
Disease/insect	16.20	35.81	47.99	100.00
Western *Terai*				
Drought	21.85	76.92	1.23	100.00
Fire (forest)	0.14	44.81	55.04	100.00
Fire (settlement)	0.76	45.21	54.03	100.00
Flood	0.61	19.02	80.37	100.00
Inundation	0.47	18.93	80.60	100.00
Windstorm	0.30	14.00	85.70	100.00
Thunderstorm	0.92	36.36	62.72	100.00
Hailstorm	1.16	49.41	49.43	100.00
Heavy rain	0.00	1.57	98.43	100.00
Sporadic rain	0.22	64.44	35.34	100.00
Soil erosion	0.00	6.51	93.49	100.00
Landslide	0.00	2.09	97.91	100.00
Snowstorm	0.00	0.00	100.00	100.00
Avalanche	0.00	0.00	100.00	100.00
GLOF	0.00	0.00	100.00	100.00
Heat wave	0.63	86.32	13.04	100.00
Cold wave	1.13	94.41	4.46	100.00
Disease/insect	2.14	84.35	13.51	100.00
Mid-Western Mountain				
Drought	91.95	8.05		100.00
Fire (forest)	5.18	0.59	94.24	100.00
Fire (settlement)	0.59	0.00	99.41	100.00
Flood	0.60	0.00	99.40	100.00
Inundation	0.00	0.00	100.00	100.00
Windstorm	0.00	0.00	100.00	100.00
Thunderstorm	0.00	0.00	100.00	100.00
Hailstorm	0.00	0.59	99.41	100.00
Heavy rain	0.59	0.00	99.41	100.00
Sporadic rain	0.00	0.00	100.00	100.00
Soil erosion	0.00	0.00	100.00	100.00

Hazards/Disaster	Impact			Total
	Affected (%)	Observed but not affected (%)	No disaster (%)	
Landslide	4.18	0.59	95.23	100.00
Snowstorm	0.00	0.00	100.00	100.00
Avalanche	0.00	0.00	100.00	100.00
GLOF	0.00	0.00	100.00	100.00
Heat wave	0.00	0.00	100.00	100.00
Cold wave	0.00	0.00	100.00	100.00
Disease/insect	12.90	16.24	70.87	100.00
Mid-Western Hill				
Drought	41.55	49.40	9.05	100.00
Fire (forest)	4.81	61.82	33.37	100.00
Fire (settlement)	0.00	15.46	84.54	100.00
Flood	23.19	19.13	57.68	100.00
Inundation	0.00	0.00	100.00	100.00
Windstorm	9.85	47.23	42.92	100.00
Thunderstorm	2.27	45.47	52.26	100.00
Hailstorm	9.68	53.95	36.37	100.00
Heavy rain	1.94	41.94	56.12	100.00
Sporadic rain	2.03	48.92	49.05	100.00
Soil erosion	2.57	44.97	52.47	100.00
Landslide	17.73	63.27	19.00	100.00
Snowstorm	0.00	0.00	100.00	100.00
Avalanche	0.00	0.00	100.00	100.00
GLOF	0.00	0.00	100.00	100.00
Heat wave	0.26	2.13	97.61	100.00
Cold wave	0.00	2.46	97.54	100.00
Disease/insect	17.36	49.63	33.00	100.00
Mid-Western *Terai*				
Drought	54.66	43.53	1.81	100.00
Fire (forest)	9.76	37.84	52.40	100.00
Fire (settlement)	5.42	27.43	67.15	100.00
Flood	34.44	17.45	48.11	100.00
Inundation	10.67	14.94	74.39	100.00
Windstorm	20.56	48.85	30.59	100.00
Thunderstorm	4.64	44.95	50.41	100.00
Hailstorm	17.62	39.02	43.36	100.00
Heavy rain	5.33	25.94	68.73	100.00
Sporadic rain	10.30	29.70	60.00	100.00
Soil erosion	4.37	19.26	76.38	100.00
Landslide	2.27	6.54	91.20	100.00
Snowstorm	0.00	0.00	100.00	100.00
Avalanche	0.00	0.00	100.00	100.00
GLOF	0.00	0.00	100.00	100.00
Heat wave	4.03	16.19	79.78	100.00
Cold wave	3.47	14.52	82.01	100.00
Disease/insect	33.21	28.71	38.08	100.00

Hazards/Disaster	Impact			Total
	Affected (%)	Observed but not affected (%)	No disaster (%)	
Far-Western Mountain				
Drought	98.84	1.16	0.00	100.00
Fire (forest)	46.25	46.56	7.20	100.00
Fire (settlement)	9.00	16.72	74.28	100.00
Flood	18.72	9.24	72.04	100.00
Inundation	0.00	0.00	100.00	100.00
Windstorm	61.65	25.38	12.97	100.00
Thunderstorm	18.29	33.52	48.19	100.00
Hailstorm	85.76	13.16	1.07	100.00
Heavy rain	1.92	32.20	65.88	100.00
Sporadic rain	2.24	32.41	65.36	100.00
Soil erosion	9.64	14.33	76.02	100.00
Landslide	47.10	36.37	16.53	100.00
Snowstorm	5.92	28.40	65.68	100.00
Avalanche	0.00	2.70	97.30	100.00
GLOF	0.00	0.00	100.00	100.00
Heat wave	0.00	0.00	100.00	100.00
Cold wave	7.84	11.37	80.79	100.00
Disease/insect	51.05	8.61	40.35	100.00
Far-Western Hill				
Drought	95.01	3.35	1.64	100.00
Fire (forest)	60.11	8.79	31.10	100.00
Fire (settlement)	4.94	2.79	92.27	100.00
Flood	1.18	1.03	97.78	100.00
Inundation	0.00	0.00	100.00	100.00
Windstorm	7.99	3.44	88.57	100.00
Thunderstorm	26.44	9.13	64.43	100.00
Hailstorm	71.26	9.93	18.81	100.00
Heavy rain	0.69	0.77	98.55	100.00
Sporadic rain	1.71	0.98	97.32	100.00
Soil erosion	24.78	4.89	70.33	100.00
Landslide	73.07	9.90	17.03	100.00
Snowstorm	0.00	0.00	100.00	100.00
Avalanche	0.00	0.00	100.00	100.00
GLOF	0.00	0.00	100.00	100.00
Heat wave	0.00	0.00	100.00	100.00
Cold wave	0.41	0.00	99.59	100.00
Disease/insect	47.78	9.13	43.10	100.00
Far-Western *Terai*				
Drought	71.32	17.40	11.28	100.00
Fire (forest)	15.76	20.98	63.27	100.00
Fire (settlement)	5.63	14.72	79.65	100.00
Flood	43.79	11.95	44.26	100.00
Inundation	32.88	4.35	62.77	100.00
Windstorm	18.33	29.99	51.69	100.00
Thunderstorm	14.60	25.06	60.34	100.00

Hazards/Disaster	Impact			Total
	Affected (%)	Observed but not affected (%)	No disaster (%)	
Hailstorm	49.47	11.45	39.08	100.00
Heavy rain	1.38	12.29	86.33	100.00
Sporadic rain	6.64	27.79	65.57	100.00
Soil erosion	3.65	9.53	86.82	100.00
Landslide	1.88	2.08	96.04	100.00
Snowstorm	0.00	0.00	100.00	100.00
Avalanche	0.00	0.00	100.00	100.00
GLOF	0.00	0.00	100.00	100.00
Heat wave	10.20	8.61	81.19	100.00
Cold wave	43.14	17.83	39.03	100.00
Disease/insect	47.54	25.63	26.82	100.00
Kathmandu Valley				
Drought	63.06	32.80	4.14	100.00
Fire (forest)	0.37	0.30	99.33	100.00
Fire (settlement)	1.79	2.13	96.08	100.00
Flood	11.57	8.52	79.91	100.00
Inundation	0.00	0.00	100.00	100.00
Windstorm	10.39	12.09	77.53	100.00
Thunderstorm	17.27	13.68	69.05	100.00
Hailstorm	18.32	25.79	55.89	100.00
Heavy rain	1.06	10.42	88.52	100.00
Sporadic rain	49.06	28.37	22.57	100.00
Soil erosion	0.00	0.00	100.00	100.00
Landslide	0.00	0.30	99.70	100.00
Snowstorm	0.00	0.00	100.00	100.00
Avalanche	0.00	0.00	100.00	100.00
GLOF	0.00	0.00	100.00	100.00
Heat wave	0.00	0.00	100.00	100.00
Cold wave	0.00	0.00	100.00	100.00
Disease/insect	19.67	4.83	75.49	100.00

Table 6-16 shows households affected by climate induced disasters by eco-development region in last 5 years. It shows that highest percentage of household are affected by drought in all eco-development regions as 86.48 per cent households in eastern hill, 71.12 per cent in eastern *Terai*, 95.82 per cent in central mountain, 93.58 per cent in central hill, 68.10 per cent in central *Terai*, 63.39 per cent in western mountain, 34.21 per cent in western hill, 21.85 per cent in western *Terai*, 91.95 per cent in mid-western mountain, 41.55 per cent in mid-western hill, 54.66 per cent in mid-western *Terai*, 98.84 per cent in far-western mountain, 95.01 per cent in far-western hill, 71.31 per cent in far-western *Terai* and 63.06 per cent in Kathmandu Valley have reported so. However, higher percentages of households (60.17%) are reported to be affected from hailstorm in eastern mountain. Relatively high percentage of households is affected by Disease in eastern hill (61.80%), central mountain (87.34%), central hill (81.19%), central *Terai* (63.97%), western mountain (62.20%) and far-western mountain (51.05%). However, all households in Kathmandu Valley have not reported any incidences and impact of inundation, soil erosion, snowstorm, avalanche, GLOF, heat wave and cold wave in last five years.

Table 6-17: Households Affected by Climate Induced Disasters by Income Quintile in Last Five Years

Hazards/Disasters	Impact			Total
	Affected (%)	Observed but not affected (%)	No disaster (%)	
First Quintile (Lowest)				
Drought	80.46	14.74	4.80	100.00
Fire (forest)	15.54	15.65	68.81	100.00
Fire (settlement)	4.47	25.91	69.63	100.00
Flood	13.54	33.14	53.33	100.00
Inundation	3.99	12.99	83.02	100.00
Windstorm	18.61	27.25	54.14	100.00
Thunderstorm	13.16	31.03	55.80	100.00
Hailstorm	35.05	33.15	31.80	100.00
Heavy rain	3.78	23.10	73.12	100.00
Sporadic rain	10.37	25.53	64.09	100.00
Soil erosion	4.76	12.64	82.60	100.00
Landslide	12.01	13.98	74.01	100.00
Snowstorm	0.43	0.75	98.82	100.00
Avalanche	0.00	0.12	99.88	100.00
GLOF	0.00	0.00	100.00	100.00
Heat wave	0.58	3.94	95.48	100.00
Cold wave	23.26	19.72	57.02	100.00
Disease/insect	54.71	22.72	22.58	100.00
Second Quintile				
Drought	71.24	17.99	10.76	100.00
Fire (forest)	13.34	16.71	69.95	100.00
Fire (settlement)	3.69	21.61	74.70	100.00
Flood	11.89	24.12	63.99	100.00
Inundation	4.11	8.63	87.26	100.00
Windstorm	17.02	22.16	60.81	100.00
Thunderstorm	10.54	33.38	56.08	100.00
Hailstorm	24.70	31.30	44.00	100.00
Heavy rain	5.14	19.89	74.97	100.00
Sporadic rain	14.59	28.28	57.14	100.00
Soil erosion	4.91	13.18	81.90	100.00
Landslide	12.95	11.64	75.41	100.00
Snowstorm	0.06	0.30	99.64	100.00
Avalanche	0.00	0.05	99.95	100.00
GLOF	0.00	0.11	99.89	100.00
Heat wave	0.93	6.68	92.39	100.00
Cold wave	14.17	25.10	60.73	100.00
Disease/insect	49.91	26.03	24.06	100.00

Hazards/Disasters	Impact			Total
	Affected (%)	Observed but not affected (%)	No disaster (%)	
Third Quintile				
Drought	60.21	27.61	12.18	100.00
Fire (forest)	11.24	19.00	69.76	100.00
Fire (settlement)	2.80	24.71	72.49	100.00
Flood	11.62	24.83	63.55	100.00
Inundation	4.73	8.11	87.16	100.00
Windstorm	16.21	19.03	64.76	100.00
Thunderstorm	13.30	29.08	57.62	100.00
Hailstorm	22.23	26.40	51.37	100.00
Heavy rain	8.73	18.58	72.69	100.00
Sporadic rain	13.06	25.17	61.77	100.00
Soil erosion	6.18	12.34	81.49	100.00
Landslide	11.31	14.93	73.76	100.00
Snowstorm	0.04	0.43	99.53	100.00
Avalanche	0.00	0.01	99.99	100.00
GLOF	0.00	0.00	100.00	100.00
Heat wave	0.51	10.88	88.62	100.00
Cold wave	13.74	25.36	60.90	100.00
Disease/insect	43.67	30.56	25.78	100.00
Fourth Quintile				
Drought	57.68	29.18	13.14	100.00
Fire (forest)	10.69	18.42	70.88	100.00
Fire (settlement)	3.36	21.85	74.79	100.00
Flood	11.66	19.40	68.94	100.00
Inundation	6.10	5.85	88.06	100.00
Windstorm	14.35	20.75	64.90	100.00
Thunderstorm	14.66	29.61	55.73	100.00
Hailstorm	20.99	24.41	54.60	100.00
Heavy rain	10.10	14.23	75.66	100.00
Sporadic rain	15.77	24.05	60.19	100.00
Soil erosion	3.33	10.35	86.33	100.00
Landslide	9.70	11.56	78.74	100.00
Snowstorm	0.14	0.47	99.39	100.00
Avalanche	0.01	0.04	99.94	100.00
GLOF	0.00	0.07	99.93	100.00
Heat wave	1.43	10.08	88.49	100.00
Cold wave	11.66	26.53	61.81	100.00
Disease/insect	41.43	29.65	28.92	100.00
Fifth Quintile (Highest)				
Drought	48.71	39.63	11.66	100.00
Fire (forest)	9.83	21.37	68.81	100.00

Hazards/Disasters	Impact			Total
	Affected (%)	Observed but not affected (%)	No disaster (%)	
Fire (settlement)	1.61	20.44	77.94	100.00
Flood	8.56	16.21	75.22	100.00
Inundation	3.35	6.44	90.20	100.00
Windstorm	9.81	18.65	71.54	100.00
Thunderstorm	12.50	28.11	59.40	100.00
Hailstorm	15.23	31.07	53.70	100.00
Heavy rain	7.63	14.36	78.01	100.00
Sporadic rain	17.84	32.05	50.11	100.00
Soil erosion	3.73	10.27	86.00	100.00
Landslide	6.58	12.29	81.13	100.00
Snowstorm	0.02	0.31	99.68	100.00
Avalanche	0.00	0.00	100.00	100.00
GLOF	0.00	0.00	100.00	100.00
Heat wave	0.55	16.26	83.19	100.00
Cold wave	6.17	26.24	67.59	100.00
Disease/insect	33.17	32.05	34.78	100.00

Table 6-17 represents percentage distribution of households affected by climate induced disaster in last five years by income quintile. It reveals that higher percentage of households is affected by drought under all income quantile in last five years though it is 80.46 per cent households in low income quantile and only 48.71 per cent households in highest income quantile. Similarly, households in all income quantile are less affected from GLOF and avalanche.

Table 6-18: Households Affected by Climate Induced Disaster by Bio-Climatic Zone in Last Five Years

Hazards/Disasters	Impact			Total
	Affected (%)	Observed but not affected (%)	No disaster (%)	
Tropical				
Drought	63.30	31.44	5.25	100.00
Fire (forest)	8.70	17.04	74.26	100.00
Fire (settlement)	4.24	34.64	61.12	100.00
Flood	17.87	34.63	47.50	100.00
Inundation	8.17	15.03	76.80	100.00
Windstorm	20.73	28.94	50.32	100.00
Thunderstorm	11.66	33.31	55.03	100.00
Hailstorm	22.55	32.52	44.93	100.00
Heavy rain	8.22	20.64	71.13	100.00
Sporadic rain	10.68	32.53	56.80	100.00
Soil erosion	3.00	9.91	87.09	100.00
Landslide	3.29	8.54	88.18	100.00
Snowstorm	0.00	0.01	99.99	100.00
Avalanche	0.00	0.01	99.99	100.00
GLOF	0.00	0.00	100.00	100.00
Heat wave	1.27	13.46	85.27	100.00
Cold wave	21.39	39.36	39.25	100.00
Disease/insect	45.46	34.68	19.85	100.00
Sub-Tropical				
Drought	69.71	13.79	16.50	100.00
Fire (forest)	20.37	19.26	60.37	100.00
Fire (settlement)	2.29	7.75	89.96	100.00
Flood	3.60	10.02	86.37	100.00
Inundation	0.00	0.00	100.00	100.00
Windstorm	9.48	12.42	78.10	100.00
Thunderstorm	16.84	26.50	56.67	100.00
Hailstorm	29.67	26.79	43.54	100.00
Heavy rain	4.42	14.68	80.90	100.00
Sporadic rain	21.12	20.01	58.87	100.00
Soil erosion	7.92	14.94	77.13	100.00
Landslide	23.42	20.02	56.56	100.00
Snowstorm	0.19	1.31	98.50	100.00
Avalanche	0.00	0.08	99.92	100.00
GLOF	0.00	0.10	99.90	100.00
Heat wave	0.05	1.49	98.46	100.00
Cold wave	2.35	3.66	94.00	100.00
Disease/insect	44.79	18.87	36.34	100.00
Temperate				
Drought	67.92	9.55	22.53	100.00
Fire (forest)	8.26	11.05	80.68	100.00
Fire (settlement)	1.01	2.66	96.33	100.00

Hazards/Disasters	Impact			Total
	Affected (%)	Observed but not affected (%)	No disaster (%)	
Flood	0.00	2.65	97.35	100.00
Inundation	0.00	0.00	100.00	100.00
Windstorm	10.02	2.85	87.13	100.00
Thunderstorm	14.61	25.48	59.91	100.00
Hailstorm	23.83	13.46	62.71	100.00
Heavy rain	1.72	9.42	88.86	100.00
Sporadic rain	12.43	16.72	70.85	100.00
Soil erosion	1.25	9.34	89.40	100.00
Landslide	7.90	11.47	80.63	100.00
Snowstorm	1.58	2.19	96.23	100.00
Avalanche	0.00	0.35	99.65	100.00
GLOF	0.00	0.00	100.00	100.00
Heat wave	0.00	0.34	99.66	100.00
Cold wave	6.54	5.76	87.69	100.00
Disease/insect	43.02	21.69	35.29	100.00
Sub-Alpine				
Drought	70.00	0.00	30.00	100.00
Fire (forest)	0.00	0.00	100.00	100.00
Fire (settlement)	0.00	0.00	100.00	100.00
Flood	0.00	0.00	100.00	100.00
Inundation	0.00	0.00	100.00	100.00
Windstorm	0.00	0.00	100.00	100.00
Thunderstorm	0.00	0.00	100.00	100.00
Hailstorm	5.00	20.00	75.00	100.00
Heavy rain	0.00	0.00	100.00	100.00
Sporadic rain	0.00	0.00	100.00	100.00
Soil erosion	5.00	80.00	15.00	100.00
Landslide	0.00	10.00	90.00	100.00
Snowstorm	60.00	25.00	15.00	100.00
Avalanche	5.00	5.00	90.00	100.00
GLOF	0.00	0.00	100.00	100.00
Heat wave	0.00	0.00	100.00	100.00
Cold wave	0.00	0.00	100.00	100.00
Disease/insect	60.00	0.00	40.00	100.00

Table 6-18 depicts the percentage distribution of households affected by climate induced disaster by climatic zones in last 5 years. Higher percentages of households in tropical, sub-tropical and temperate zones reported that they are mostly affected by Disease, drought, windstorm, hailstorm, and cold wave. Similarly, 60 per cent households in sub-alpine zone are affected from snowstorm. The survey further reveals that cold wave (39.36%) and thunderstorm (33.31%) are felt high but not affected in tropical zone in last 5 years. Moreover, 80 per cent households in sub-alpine zone have observed but not affected from soil erosion in their locality.

Table 6-19: Working Days Missed due to Climate Induced Disasters in Last Five years

Hazards/Disaster	Working Days Missed (%)								Total	Average days missed
	Not missed	Up to 1 week	1 - 2 week	2 - 3 week	3 weeks - 1 month	1 - 3 month	3 - 6 month	More than 6 month		
Drought	54.73	13.61	6.49	11.22	8.34	5.13	0.45	0.03	100.00	8.6
Fire (forest)	88.64	10.33	0.53	0.15	0.00	0.35	0.00	0.00	100.00	0.5
Fire (settlement)	65.64	9.46	10.11	4.77	9.20	0.83	0.00	0.00	100.00	4.8
Flood	62.70	18.26	8.66	6.28	2.55	1.54	0.00	0.00	100.00	4.6
Inundation	59.01	23.50	6.73	4.69	1.54	4.52	0.00	0.00	100.00	6.6
Windstorm	80.46	15.52	1.91	1.70	0.17	0.23	0.00	0.00	100.00	1.1
Thunderstorm	94.25	4.83	0.60	0.08	0.25	0.00	0.00	0.00	100.00	0.3
Hailstorm	78.75	16.54	2.63	1.50	0.18	0.38	0.00	0.00	100.00	1.3
Heavy rain	60.61	21.52	15.59	1.31	0.51	0.44	0.00	0.00	100.00	3.1
Sporadic rain	87.74	5.32	1.53	1.84	0.33	1.76	1.47	0.00	100.00	3.7
Soil erosion	91.33	7.68	0.48	0.23	0.00	0.29	0.00	0.00	100.00	0.5
Landslide	83.48	11.72	2.67	1.46	0.58	0.10	0.00	0.00	100.00	1.1
Snowstorm	39.18	51.57	2.66	6.59	0.00	0.00	0.00	0.00	100.00	2.8
Avalanche	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Heat wave	92.75	4.30	0.58	2.37	0.00	0.00	0.00	0.00	100.00	0.7
Cold wave	63.24	10.55	10.98	7.41	3.36	4.45	0.00	0.00	100.00	5.4
Disease/insect	81.30	12.94	2.75	1.29	1.09	0.47	0.00	0.16	100.00	2.0

Table 6-19 presents the percentage distribution of households missing working days due to climate induced disasters in last 5 years. It depict that households have missed 8.6 working days in an average due to drought in last 5 years. Similarly, household have missed 6.6 and 4.6 working days in an average due to inundation and flood in last 5 years respectively. However, households have reported to have missed less than one working day in an average due to fire (forest), thunderstorm, soil erosion, and heat wave. Furthermore, households have not missed any working day due to avalanche in last five years.

Table 6-20: Working Days Missed due to Climate Induced Disasters by Eco-Development Regions in Last Five Years

Hazards/Disasters	Working Days Missed (%)								Total	Average days missed
	Not missed	Up to 1 week	1 - 2 week	2 - 3 week	3 weeks - 1 month	1- 3 month	3 - 6 month	More than 6 month		
Eastern Mountain										
Drought	82.50	0.00	0.00	0.00	0.00	15.10	2.4	0.00	100.00	9.6
Fire (forest)	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Fire (settlement)	89.55	0.00	0.00	0.00	5.22	5.22	0.00	0.00	100.00	3.9
Flood	93.10	0.00	0.00	4.20	0.00	2.70	0.00	0.00	100.00	2.2
Windstorm	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Thunderstorm	98.14	0.00	0.00	1.86	0.00	0.00	0.00	0.00	100.00	0.4

Hazards/Disasters	Working Days Missed (%)								Total	Average days missed
	Not missed	Up to 1 week	1 - 2 week	2 - 3 week	3 weeks - 1 month	1- 3 month	3 - 6 month	More than 6 month		
Hailstorm	87.62	1.73	0.00	4.70	2.04	3.91	0.00	0.00	100.00	3.1
Heavy rain	91.55	0.00	0.00	0.00	5.30	3.15	0.00	0.00	100.00	2.7
Sporadic rain	53.75	0.00	0.00	0.00	5.50	40.75	0.00	0.00	100.00	23.2
Soil erosion	90.62	0.00	0.00	4.13	0.00	5.25	0.00	0.00	100.00	3.5
Landslide	86.00	0.00	0.00	7.54	5.08	1.37	0.00	0.00	100.00	3.5
Snowstorm	77.13	0.00	0.00	22.87	0.00	0.00	0.00	0.00	100.00	3.4
Cold wave	58.31	0.00	0.00	5.52	7.41	28.77	0.00	0.00	100.00	17.9
Disease/insect	98.22	0.00	0.00	0.00	0.00	1.78	0.00	0.00	100.00	0.9
Eastern Hill										
Drought	55.69	15.63	2.81	5.98	4.67	11.20	3.76	0.27	100.00	15.5
Fire (forest)	91.43	2.18	0.00	1.93	0.00	4.46	0.00	0.00	100.00	2.2
Fire (settlement)	76.27	0.00	0.00	8.47	7.16	8.09	0.00	0.00	100.00	6.3
Flood	57.73	0.00	31.62	10.65	0.00	0.00	0.00	0.00	100.00	5.5
Windstorm	80.96	17.11	0.00	1.93	0.00	0.00	0.00	0.00	100.00	0.7
Thunderstorm	96.35	0.00	3.65	0.00	0.00	0.00	0.00	0.00	100.00	0.3
Hailstorm	73.52	8.93	4.19	9.40	1.22	2.74	0.00	0.00	100.00	4.1
Heavy rain	83.17	0.00	0.00	16.83	0.00	0.00	0.00	0.00	100.00	3.0
Sporadic rain	55.74	2.65	0.00	0.00	0.00	18.38	23.2	0.00	100.00	41.9
Soil erosion	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Landslide	92.16	0.00	4.03	0.00	3.81	0.00	0.00	0.00	100.00	1.4
Cold wave	92.06	7.94	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.1
Disease/insect	82.09	14.29	1.95	1.00	0.67	0.00	0.00	0.00	100.00	1.0
Eastern *Terai*										
Drought	67.22	5.63	6.27	12.49	8.06	0.32	0.00	0.00	100.00	5.6
Fire (forest)	95.18	4.82	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Fire (settlement)	87.73	4.99	2.53	2.53	2.21	0.00	0.00	0.00	100.00	1.4
Flood	63.82	15.15	12.23	4.69	0.80	3.30	0.00	0.00	100.00	6.0
Inundation	58.37	18.34	9.45	5.36	1.21	7.27	0.00	0.00	100.00	9.2
Windstorm	81.69	13.39	0.71	2.98	0.53	0.71	0.00	0.00	100.00	1.5
Thunderstorm	98.95	1.05	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Hailstorm	96.51	1.00	2.49	0.00	0.00	0.00	0.00	0.00	100.00	0.3
Heavy rain	49.94	25.08	23.47	1.52	0.00	0.00	0.00	0.00	100.00	3.8
Sporadic rain	67.01	2.79	8.47	18.78	2.96	0.00	0.00	0.00	100.00	4.9
Soil erosion	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Heat wave	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Cold wave	76.49	14.78	5.30	1.49	1.94	0.00	0.00	0.00	100.00	1.8
Disease/insect	91.89	2.83	1.65	2.28	0.96	0.00	0.00	0.39	100.00	2.2
Central Mountain										
Drought	13.69	49.81	10.97	21.90	3.11	0.52	0.00	0.00	100.00	7.8
Fire (forest)	68.75	31.25	0.00	0.00	0.00	0.00	0.00	0.00	100.00	1.0
Fire (settlement)	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Windstorm	32.05	67.95	0.00	0.00	0.00	0.00	0.00	0.00	100.00	2.7

Hazards/Disasters	Working Days Missed (%)								Total	Average days missed
	Not missed	Up to 1 week	1 - 2 week	2 - 3 week	3 weeks - 1 month	1- 3 month	3 - 6 month	More than 6 month		
Thunderstorm	89.66	8.30	2.04	0.00	0.00	0.00	0.00	0.00	100.00	0.4
Hailstorm	33.25	66.75	0.00	0.00	0.00	0.00	0.00	0.00	100.00	1.7
Heavy rain	0.00	100	0.00	0.00	0.00	0.00	0.00	0.00	100.00	5.0
Sporadic rain	63.30	31.24	2.68	2.78	0.00	0.00	0.00	0.00	100.00	1.4
Soil erosion	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Landslide	63.98	29.26	4.51	2.25	0.00	0.00	0.00	0.00	100.00	1.9
Cold wave	0.00	50.00	16.67	33.33	0.00	0.00	0.00	0.00	100.00	8.8
Disease/insect	54.24	44.42	1.35	0.00	0.00	0.00	0.00	0.00	100.00	1.4
Central Hill										
Drought	48.34	26.16	5.09	9.85	7.91	2.66	0.00	0.00	100.00	7.1
Fire (forest)	94.23	5.77	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.2
Fire (settlement)	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Flood	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Windstorm	95.31	4.69	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.1
Thunderstorm	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Hailstorm	93.0	7.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.2
Heavy rain	83.18	0.00	16.82	0.00	0.00	0.00	0.00	0.00	100.00	1.3
Sporadic rain	96.64	3.36	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.1
Soil erosion	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Landslide	82.71	8.44	4.43	4.43	0.00	0.00	0.00	0.00	100.00	1.4
Disease/insect	64.90	29.42	5.26	0.42	0.00	0.00	0.00	0.00	100.00	1.6
Central *Terai*										
Drought	40.44	1.84	5.40	14.90	20.84	16.59	0.00	0.00	100.00	16.0
Fire (settlement)	24.40	3.26	30.78	12.39	29.17	0.00	0.00	0.00	100.00	13.0
Flood	33.94	11.76	16.59	21.20	14.89	1.62	0.00	0.00	100.00	10.3
Inundation	60.52	7.76	7.54	15.30	8.89	0.00	0.00	0.00	100.00	6.0
Windstorm	67.66	23.60	6.20	2.54	0.00	0.00	0.00	0.00	100.00	2.0
Thunderstorm	71.09	25.78	3.13	0.00	0.00	0.00	0.00	0.00	100.00	1.1
Hailstorm	66.08	24.08	6.86	2.98	0.00	0.00	0.00	0.00	100.00	2.2
Heavy rain	31.83	68.17	0.00	0.00	0.00	0.00	0.00	0.00	100.00	3.2
Sporadic rain	94.16	2.88	2.96	0.00	0.00	0.00	0.00	0.00	100.00	0.3
Cold wave	52.65	7.89	16.17	11.98	4.79	6.52	0.00	0.00	100.00	7.6
Disease/insect	87.59	2.95	2.28	2.13	3.27	1.33	0.00	0.45	100.00	3.9
Western Mountain										
Drought	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Windstorm	85.71	0.00	14.29	0.00	0.00	0.00	0.00	0.00	100.00	1.4
Hailstorm	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Heavy rain	0.00	0.00	0.00	100	0.00	0.00	0.00	0.00	100.00	20.0
Soil erosion	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Landslide	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Snowstorm	75.0	8.33	16.67	0.00	0.00	0.00	0.00	0.00	100.00	1.9
Avalanche	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0

Hazards/Disasters	Working Days Missed (%)								Total	Average days missed
	Not missed	Up to 1 week	1 - 2 week	2 - 3 week	3 weeks - 1 month	1- 3 month	3 - 6 month	More than 6 month		
Disease/insect	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Western Hill										
Drought	76.12	8.74	13.48	1.66	0.00	0.00	0.00	0.00	100.00	2.1
Fire (forest)	96.80	3.20	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.1
Fire (settlement)	39.15	0.00	60.85	0.00	0.00	0.00	0.00	0.00	100.00	7.3
Flood	91.45	0.00	0.00	8.55	0.00	0.00	0.00	0.00	100.00	1.3
Windstorm	95.67	4.33	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.2
Thunderstorm	93.15	5.58	0.00	0.00	1.27	0.00	0.00	0.00	100.00	0.5
Hailstorm	93.73	2.67	3.60	0.00	0.00	0.00	0.00	0.00	100.00	0.4
Heavy rain	90.64	9.36	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.5
Sporadic rain	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Soil erosion	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Landslide	91.30	3.23	4.31	1.16	0.00	0.00	0.00	0.00	100.00	0.6
Cold wave	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Disease/insect	98.13	0.00	1.87	0.00	0.00	0.00	0.00	0.00	100.00	0.2
Western *Terai*										
Drought	19.86	16.62	0.00	32.81	27.81	2.90	0.00	0.00	100.00	14.9
Fire (forest)	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Fire (settlement)	80.95	19.05	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.8
Flood	63.90	36.10	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.7
Inundation	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Windstorm	0.00	0.00	100	0.00	0.00	0.00	0.00	0.00	100.00	10.0
Thunderstorm	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Hailstorm	18.92	81.08	0.00	0.00	0.00	0.00	0.00	0.00	100.00	2.2
Sporadic rain	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Heat wave	0.00	47.75	0.00	52.25	0.00	0.00	0.00	0.00	100.00	11.2
Cold wave	26.79	0.00	73.21	0.00	0.00	0.00	0.00	0.00	100.00	7.3
Disease/insect	47.83	52.17	0.00	0.00	0.00	0.00	0.00	0.00	100.00	2.1
Mid-Western Mountain										
Drought	36.19	0.00	4.53	40.19	11.95	7.14	0.00	0.00	100.00	13.9
Fire (forest)	67.01	32.99	0.00	0.00	0.00	0.00	0.00	0.00	100.00	1.3
Fire (settlement)	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Flood	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Heavy rain	0.00	0.00	0.00	0.00	0.00	100	0.00	0.00	100.00	40.0
Landslide	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Disease/insect	78.77	11.17	10.06	0.00	0.00	0.00	0.00	0.00	100.00	1.7
Mid-Western Hill										
Drought	52.16	30.21	8.29	4.54	4.25	0.00	0.55	0.00	100.00	4.9
Fire (forest)	95.10	4.90	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.1
Flood	76.50	12.97	3.97	6.55	0.00	0.00	0.00	0.00	100.00	1.9
Windstorm	82.64	14.56	2.80	0.00	0.00	0.00	0.00	0.00	100.00	0.7
Thunderstorm	77.27	22.73	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.3

Hazards/Disasters	Working Days Missed (%)								Total	Average days missed
	Not missed	Up to 1 week	1 - 2 week	2 - 3 week	3 weeks - 1 month	1- 3 month	3 - 6 month	More than 6 month		
Hailstorm	79.02	20.98	0.00	0.00	0.00	0.00	0.00	0.00	100.00	1.1
Heavy rain	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Sporadic rain	70.56	29.44	0.00	0.00	0.00	0.00	0.00	0.00	100.00	1.3
Soil erosion	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Landslide	92.49	7.51	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.2
Heat wave	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Disease/insect	84.12	15.88	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.6
Mid-Western *Terai*										
Drought	77.09	13.00	1.73	5.95	1.64	0.58	0.00	0.00	100.00	2.6
Fire (forest)	96.75	3.25	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.1
Fire (settlement)	94.15	5.85	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.1
Flood	62.70	34.56	2.74	0.00	0.00	0.00	0.00	0.00	100.00	1.7
Inundation	71.04	28.96	0.00	0.00	0.00	0.00	0.00	0.00	100.00	1.0
Windstorm	95.54	4.46	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.2
Thunderstorm	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Hailstorm	47.65	50.58	1.77	0.00	0.00	0.00	0.00	0.00	100.00	2.1
Heavy rain	47.53	52.47	0.00	0.00	0.00	0.00	0.00	0.00	100.00	2.0
Sporadic rain	94.60	5.40	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.2
Soil erosion	85.46	14.54	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.7
Landslide	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Heat wave	90.79	9.21	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.4
Cold wave	36.58	63.42	0.00	0.00	0.00	0.00	0.00	0.00	100.00	3.3
Disease/insect	87.10	4.21	4.09	3.70	0.90	0.00	0.00	0.00	100.00	1.4
Far-Western Mountain										
Drought	15.30	4.37	37.49	38.36	4.47	0.00	0.00	0.00	100.00	11.9
Fire (forest)	86.70	13.30	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.3
Fire (settlement)	19.98	80.02	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.8
Flood	90.23	9.77	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.2
Windstorm	75.99	24.01	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.3
Thunderstorm	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Hailstorm	60.0	40.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.6
Heavy rain	36.40	63.60	0.00	0.00	0.00	0.00	0.00	0.00	100.00	3.5
Sporadic rain	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Soil erosion	65.16	34.84	0.00	0.00	0.00	0.00	0.00	0.00	100.00	1.1
Landslide	88.03	10.99	0.99	0.00	0.00	0.00	0.00	0.00	100.00	0.3
Snowstorm	8.99	91.01	0.00	0.00	0.00	0.00	0.00	0.00	100.00	2.6
Cold wave	47.44	14.42	22.95	15.19	0.00	0.00	0.00	0.00	100.00	5.9
Disease/insect	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Far-Western Hill										
Drought	75.81	19.59	4.27	0.33	0.00	0.00	0.00	0.00	100.00	1.2
Fire (forest)	64.74	31.33	3.93	0.00	0.00	0.00	0.00	0.00	100.00	1.3
Fire (settlement)	36.58	63.42	0.00	0.00	0.00	0.00	0.00	0.00	100.00	1.2

Hazards/Disasters	Working Days Missed (%)								Total	Average days missed
	Not missed	Up to 1 week	1 - 2 week	2 - 3 week	3 weeks - 1 month	1- 3 month	3 - 6 month	More than 6 month		
Flood	33.33	33.33	33.33	0.00	0.00	0.00	0.00	0.00	100.00	4.0
Windstorm	39.64	60.36	0.00	0.00	0.00	0.00	0.00	0.00	100.00	1.6
Thunderstorm	94.42	4.39	1.19	0.00	0.00	0.00	0.00	0.00	100.00	0.2
Hailstorm	75.19	24.33	0.48	0.00	0.00	0.00	0.00	0.00	100.00	0.5
Heavy rain	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Sporadic rain	36.53	23.13	40.33	0.00	0.00	0.00	0.00	0.00	100.00	5.7
Soil erosion	60.72	36.19	3.09	0.00	0.00	0.00	0.00	0.00	100.00	1.3
Landslide	66.63	31.79	1.59	0.00	0.00	0.00	0.00	0.00	100.00	1.2
Cold wave	0.00	100	0.00	0.00	0.00	0.00	0.00	0.00	100.00	3.0
Disease/insect	97.96	2.04	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.1
Far-Western *Terai*										
Drought	71.73	10.79	10.42	5.46	0.95	0.66	0.00	0.00	100.00	3.1
Fire (forest)	97.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.1
Fire (settlement)	90.46	9.54	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.2
Flood	57.81	39.19	1.72	1.27	0.00	0.00	0.00	0.00	100.00	1.5
Inundation	53.00	45.99	1.01	0.00	0.00	0.00	0.00	0.00	100.00	1.4
Windstorm	82.39	17.61	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.4
Thunderstorm	94.09	5.91	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.1
Hailstorm	98.33	1.67	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Heavy rain	65.78	34.22	0.00	0.00	0.00	0.00	0.00	0.00	100.00	1.4
Sporadic rain	86.34	0.00	13.66	0.00	0.00	0.00	0.00	0.00	100.00	1.4
Soil erosion	83.89	16.11	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.3
Landslide	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Heat wave	98.42	0.00	1.58	0.00	0.00	0.00	0.00	0.00	100.00	0.2
Cold wave	89.14	8.06	2.14	0.67	0.00	0.00	0.00	0.00	100.00	0.5
Disease/insect	90.22	6.93	2.85	0.00	0.00	0.00	0.00	0.00	100.00	0.4
Kathmandu Valley										
Drought	98.62	0.47	0.90	0.00	0.00	0.00	0.00	0.00	100.00	0.1
Fire (forest)	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Fire (settlement)	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Flood	88.21	11.79	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.4
Windstorm	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Thunderstorm	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Hailstorm	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Heavy rain	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Sporadic rain	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Disease/insect	67.56	4.97	8.13	8.06	3.15	8.13	0.00	0.00	100.00	6.6

Table 6-20 presents the percentage distribution of households missing working days due to climate induced disasters by eco-development region in last 5 years. The result shows that household has missed more working days due to drought in all eco-development regions. Households Kathmandu valley reported of having 6.6 working days missed in an average due to disease/insect in last 5 years while less than one working day was missed due to drought and flood. Households in Kathmandu valley further reported that they have not missed any working day due to other listed disasters in last five years.

Table 6-21: Working Days Missed due to Climate Induced Disasters by Bio-Climatic Zone in Last Five Years

Hazards/Disasters	Working Days Missed (%)								Total	Average days missed
	Not missed	Up to 1 week	1 - 2 week	2 - 3 week	3 week - 1 month	1 - 3 months	3 - 6 months	More than 6 months		
Tropical										
Drought	53.32	9.15	6.57	12.55	12.09	6.18	0.15	0.00	100.00	9.5
Fire (forest)	93.87	5.73	0.00	0.00	0.00	0.41	0.00	0.00	100.00	0.3
Fire (settlement)	64.39	4.76	13.39	5.44	11.19	0.84	0.00	0.00	100.00	5.7
Flood	60.93	19.00	8.84	6.73	2.85	1.65	0.00	0.00	100.00	4.9
Inundation	59.01	23.50	6.73	4.69	1.54	4.52	0.00	0.00	100.00	6.6
Windstorm	79.54	15.58	2.33	2.02	0.22	0.30	0.00	0.00	100.00	1.3
Thunderstorm	93.06	6.38	0.55	0.00	0.00	0.00	0.00	0.00	100.00	0.2
Hailstorm	81.91	12.96	3.90	1.24	0.00	0.00	0.00	0.00	100.00	1.1
Heavy rain	52.00	26.27	20.42	1.32	0.00	0.00	0.00	0.00	100.00	3.5
Sporadic rain	89.68	3.33	2.48	3.46	0.55	0.18	0.33	0.00	100.00	1.5
Soil erosion	96.27	3.73	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.1
Landslide	83.84	5.98	7.16	1.94	1.08	0.00	0.00	0.00	100.00	1.3
Heat wave	92.59	4.40	0.59	2.42	0.00	0.00	0.00	0.00	100.00	0.7
Cold wave	63.08	10.66	11.60	7.49	3.38	3.80	0.00	0.00	100.00	5.1
Disease/insect	86.35	6.91	2.77	1.58	1.58	0.53	0.00	0.27	100.00	2.5
Sub-Tropical										
Drought	58.98	20.05	5.94	7.64	2.62	3.71	0.99	0.08	100.00	7.2
Fire (forest)	85.98	12.46	0.97	0.27	0.00	0.32	0.00	0.00	100.00	0.7
Fire (settlement)	71.24	21.78	0.00	2.86	3.27	0.85	0.00	0.00	100.00	2.1
Flood	78.17	11.80	7.11	2.38	0.00	0.54	0.00	0.00	100.00	1.9
Windstorm	82.22	16.56	0.53	0.69	0.00	0.00	0.00	0.00	100.00	0.5
Thunderstorm	97.02	2.06	0.16	0.19	0.57	0.00	0.00	0.00	100.00	0.2
Hailstorm	75.75	19.88	1.23	1.86	0.35	0.94	0.00	0.00	100.00	1.5
Heavy rain	88.05	6.55	0.60	1.25	2.23	1.32	0.00	0.00	100.00	1.7
Sporadic rain	88.14	4.81	0.62	0.35	0.16	3.31	2.60	0.00	100.00	5.7
Soil erosion	87.84	10.48	0.81	0.38	0.00	0.49	0.00	0.00	100.00	0.7
Landslide	82.74	13.56	1.68	1.41	0.48	0.13	0.00	0.00	100.00	1.1
Snowstorm	28.95	71.05	0.00	0.00	0.00	0.00	0.00	0.00	100.00	2.1
Heat wave	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Cold wave	60.69	11.81	3.40	6.25	2.92	14.93	0.00	0.00	100.00	10.1
Disease/insect	73.53	22.13	2.76	0.83	0.35	0.40	0.00	0.00	100.00	1.4
Temperate										
Drought	38.91	19.14	9.82	22.66	6.19	3.28	0.00	0.00	100.00	8.9
Fire (forest)	64.88	35.12	0.00	0.00	0.00	0.00	0.00	0.00	100.00	1.0
Fire (settlement)	39.78	60.22	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.6
Windstorm	93.01	6.61	0.37	0.00	0.00	0.00	0.00	0.00	100.00	0.2
Thunderstorm	82.77	12.36	4.87	0.00	0.00	0.00	0.00	0.00	100.00	0.7
Hailstorm	67.11	30.35	0.00	1.55	0.99	0.00	0.00	0.00	100.00	1.3
Heavy rain	76.17	10.09	0.00	2.17	0.00	11.56	0.00	0.00	100.00	5.7
Sporadic rain	60.58	34.64	2.28	2.50	0.00	0.00	0.00	0.00	100.00	1.5

Hazards/Disasters	Working Days Missed (%)								Total	Average days missed
	Not missed	Up to 1 week	1 - 2 week	2 - 3 week	3 week - 1 month	1 - 3 months	3 - 6 months	More than 6 months		
Soil erosion	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Landslide	97.80	2.20	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Snowstorm	35.46	49.60	0.00	14.94	0.00	0.00	0.00	0.00	100.00	3.6
Cold wave	77.29	2.66	4.81	7.37	3.60	4.27	0.00	0.00	100.00	5.7
Disease/insect	71.02	25.67	2.45	0.86	0.00	0.00	0.00	0.00	100.00	1.2
Sub-Alpine										
Drought	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Hailstorm	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Soil erosion	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Snowstorm	75.0	8.33	16.67	0.00	0.00	0.00	0.00	0.00	100.00	1.9
Avalanche	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Disease/insect	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0

Table 6-21 presents the percentage distribution of households missing working days due to climate induced disasters in last 5 years by bio-climatic zone. Households reported that they have missed higher number of working days due to drought in tropical, sub-tropical, and temperate zones while households in sub-alpine zone reported so from snowstorm. In fact, snowstorm is the only disaster in sub-alpine zone due to which households have missed their working days in last five years

Table 6-22: Working Days Missed due to Climate Induced Disasters by Income Quintile in Last Five Years

Hazards/Disasters	Working Days Missed (%)								Total	Average days missed
	Not missed	Up to 1 week	1 - 2 week	2 - 3 week	3 week - 1 month	1 - 3 months	3 - 6 months	More than 6 months		
First Quintile (Lowest)										
Drought	39.36	16.26	9.17	14.99	12.96	7.25	0.00	0.00	100.00	11.1
Fire (forest)	83.19	16.09	0.73	0.00	0.00	0.00	0.00	0.00	100.00	0.5
Fire (settlement)	44.60	12.90	18.81	7.13	16.57	0.00	0.00	0.00	100.00	7.7
Flood	46.46	23.09	10.51	8.60	8.62	2.73	0.00	0.00	100.00	8.2
Inundation	32.82	24.44	15.63	8.60	0.00	18.5	0.00	0.00	100.00	20.9
Windstorm	74.16	19.98	0.98	3.89	0.00	0.99	0.00	0.00	100.00	1.9
Thunderstorm	88.14	10.38	1.47	0.00	0.00	0.00	0.00	0.00	100.00	0.5
Hailstorm	75.90	20.53	2.86	0.55	0.15	0.00	0.00	0.00	100.00	1.1
Heavy rain	59.16	30.88	6.93	0.00	3.03	0.00	0.00	0.00	100.00	3.1
Sporadic rain	85.46	3.53	5.15	1.59	0.00	3.20	1.08	0.00	100.00	4.2
Soil erosion	80.41	15.94	2.28	0.00	0.00	1.38	0.00	0.00	100.00	1.3
Landslide	79.09	15.90	2.87	1.16	0.55	0.43	0.00	0.00	100.00	1.3

Hazards/Disasters	Working Days Missed (%)								Total	Average days missed
	Not missed	Up to 1 week	1 - 2 week	2 - 3 week	3 week - 1 month	1 - 3 months	3 - 6 months	More than 6 months		
Snowstorm	24.30	63.16	0.00	12.53	0.00	0.00	0.00	0.00	100.00	3.7
Heat wave	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Cold wave	48.59	10.49	14.07	13.60	4.79	8.47	0.00	0.00	100.00	8.3
Disease/insect	77.45	15.17	3.69	1.60	2.09	0.00	0.00	0.00	100.00	1.7
Second Quintile										
Drought	53.15	13.43	6.37	11.76	8.50	5.53	1.13	0.13	100.00	9.9
Fire (forest)	85.57	13.25	0.37	0.00	0.00	0.81	0.00	0.00	100.00	0.7
Fire (settlement)	59.33	9.35	15.23	5.33	7.83	2.93	0.00	0.00	100.00	6.0
Flood	52.81	17.70	15.71	12.21	0.00	1.57	0.00	0.00	100.00	5.9
Inundation	43.03	20.50	15.93	11.20	4.79	4.55	0.00	0.00	100.00	7.5
Windstorm	75.26	19.76	3.38	0.77	0.83	0.00	0.00	0.00	100.00	1.4
Thunderstorm	93.12	6.45	0.43	0.00	0.00	0.00	0.00	0.00	100.00	0.2
Hailstorm	76.04	18.73	3.54	1.23	0.00	0.46	0.00	0.00	100.00	1.4
Heavy rain	59.47	16.01	17.22	6.41	0.00	0.89	0.00	0.00	100.00	3.8
Sporadic rain	84.31	6.55	1.12	2.72	0.00	3.13	2.17	0.00	100.00	5.0
Soil erosion	89.61	10.39	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.4
Landslide	81.16	14.08	3.20	0.72	0.83	0.00	0.00	0.00	100.00	1.1
Snowstorm	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Heat wave	88.55	9.02	2.44	0.00	0.00	0.00	0.00	0.00	100.00	0.6
Cold wave	71.21	8.29	11.29	6.61	0.38	2.22	0.00	0.00	100.00	3.7
Disease/insect	79.49	14.47	2.56	1.52	1.41	0.55	0.00	0.00	100.00	1.7
Third Quintile										
Drought	60.44	12.80	6.07	9.58	7.09	3.40	0.61	0.00	100.00	7.3
Fire (forest)	91.81	8.19	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.2
Fire (settlement)	91.05	4.25	4.70	0.00	0.00	0.00	0.00	0.00	100.00	0.7
Flood	64.14	20.63	9.81	2.75	1.43	1.24	0.00	0.00	100.00	3.0
Inundation	60.47	35.92	3.61	0.00	0.00	0.00	0.00	0.00	100.00	1.8
Windstorm	79.34	16.72	3.11	0.84	0.00	0.00	0.00	0.00	100.00	0.9
Thunderstorm	96.29	3.31	0.00	0.39	0.00	0.00	0.00	0.00	100.00	0.1
Hailstorm	79.52	14.86	2.60	2.54	0.00	0.47	0.00	0.00	100.00	1.3
Heavy rain	52.34	23.00	23.00	1.06	0.60	0.00	0.00	0.00	100.00	3.7
Sporadic rain	84.92	7.00	1.70	0.53	1.31	2.42	2.12	0.00	100.00	5.4
Soil erosion	93.32	5.87	0.00	0.82	0.00	0.00	0.00	0.00	100.00	0.4
Landslide	85.91	10.51	0.69	2.10	0.80	0.00	0.00	0.00	100.00	1.0
Snowstorm	75.0	0.00	25.00	0.00	0.00	0.00	0.00	0.00	100.00	2.0
Heat wave	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Cold wave	69.39	15.12	7.16	3.71	1.69	2.93	0.00	0.00	100.00	3.7

Hazards/Disasters	Working Days Missed (%)								Total	Average days missed
	Not missed	Up to 1 week	1 - 2 week	2 - 3 week	3 week - 1 month	1 - 3 months	3 - 6 months	More than 6 months		
Disease/insect	84.13	10.89	1.83	0.26	1.06	1.00	0.00	0.82	100.00	4.3
Fourth Quintile										
Drought	63.40	15.28	4.16	8.01	5.41	3.41	0.34	0.00	100.00	6.1
Fire (forest)	90.35	7.40	1.11	0.00	0.00	1.14	0.00	0.00	100.00	0.9
Fire (settlement)	80.38	10.96	0.00	3.63	3.95	1.08	0.00	0.00	100.00	2.4
Flood	79.03	18.16	0.00	2.50	0.00	0.31	0.00	0.00	100.00	1.3
Inundation	68.80	26.36	1.53	0.00	3.31	0.00	0.00	0.00	100.00	2.3
Windstorm	83.36	13.11	2.12	1.41	0.00	0.00	0.00	0.00	100.00	0.9
Thunderstorm	93.55	4.65	0.58	0.00	1.22	0.00	0.00	0.00	100.00	0.5
Hailstorm	80.23	13.64	3.03	1.19	0.91	1.00	0.00	0.00	100.00	1.7
Heavy rain	61.07	26.38	12.55	0.00	0.00	0.00	0.00	0.00	100.00	2.5
Sporadic rain	85.25	8.26	0.00	3.57	0.40	0.98	1.55	0.00	100.00	3.2
Soil erosion	96.22	3.78	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.1
Landslide	84.49	8.28	4.11	3.12	0.00	0.00	0.00	0.00	100.00	1.2
Snowstorm	83.26	8.37	8.37	0.00	0.00	0.00	0.00	0.00	100.00	1.3
Avalanche	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Heat wave	86.51	6.44	0.00	7.05	0.00	0.00	0.00	0.00	100.00	1.5
Cold wave	78.75	7.91	6.79	3.10	2.46	1.00	0.00	0.00	100.00	3.0
Disease/insect	81.91	12.39	3.61	1.25	0.00	0.84	0.00	0.00	100.00	1.4
Fifth Quintile (Highest)										
Drought	75.91	12.38	1.85	4.34	2.82	2.39	0.32	0.00	100.00	3.8
Fire (forest)	95.30	3.32	0.00	1.38	0.00	0.00	0.00	0.00	100.00	0.3
Fire (settlement)	89.4	7.63	0.00	0.00	2.97	0.00	0.00	0.00	100.00	1.1
Flood	74.01	13.16	10.54	2.29	0.00	0.00	0.00	0.00	100.00	1.9
Inundation	77.42	22.58	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.5
Windstorm	92.57	4.57	0.00	2.85	0.00	0.00	0.00	0.00	100.00	0.6
Thunderstorm	98.57	0.46	0.97	0.00	0.00	0.00	0.00	0.00	100.00	0.1
Hailstorm	82.55	9.99	1.59	5.27	0.00	0.60	0.00	0.00	100.00	1.6
Heavy rain	73.81	10.27	13.88	0.16	0.00	1.88	0.00	0.00	100.00	2.7
Sporadic rain	95.08	2.72	1.30	0.00	0.00	0.00	0.90	0.00	100.00	1.8
Soil erosion	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Landslide	91.77	3.63	3.88	0.00	0.73	0.00	0.00	0.00	100.00	0.6
Snowstorm	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Heat wave	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.0
Cold wave	80.19	10.92	3.01	3.15	0.00	2.73	0.00	0.00	100.00	2.6
Disease/insect	84.41	11.78	2.07	1.25	0.49	0.00	0.00	0.00	100.00	1.0

Table 6-22 shows the percentage distribution of households missing working days due to climate induced disasters in last 5 years by income quintile. Households in all income quantile have reported to have missed higher number of working days due to drought in last five years. However, households under lowest income quantile have reported to have missed 11.1 days in an average due to drought while it is reported that only 3.8 days in an average has been missed by the households under highest income quantile. Households under lower income quantile reported to have missed less than one working day due to forest fire, and thunderstorm while it was inundation, windstorm, thunderstorm, and windstorm for households under highest income quantile.

6.6. Food Scarcity

Table 6-23: Households Facing Food Scarcity in Last Five Years

Disasters	Households Facing Food Scarcity (%)			Total
	Yes	No	Not applicable	
Drought	32.86	65.99	1.15	100.00
Fire (forest)	2.27	95.61	2.12	100.00
Fire (settlement)	14.86	84.72	0.42	100.00
Flood	15.50	83.58	0.92	100.00
Inundation	14.71	84.90	0.39	100.00
Windstorm	10.10	89.04	0.86	100.00
Thunderstorm	0.89	96.73	2.39	100.00
Hailstorm	26.15	72.77	1.08	100.00
Heavy rain	4.20	95.56	0.24	100.00
Sporadic rain	20.78	76.49	2.72	100.00
Soil erosion	15.03	84.56	0.41	100.00
Landslide	12.21	87.04	0.75	100.00
Snowstorm	0.00	100.00	0.00	100.00
Avalanche	0.00	100.00	0.00	100.00
Heat wave	0.00	100.00	0.00	100.00
Cold wave	5.92	93.90	0.18	100.00
Disease/insect	21.69	77.99	0.32	100.00

Table 6-23 shows percentage distribution of households facing food scarcity due to climate induced disaster in last 5 years. Higher percentage of households are facing food scarcity due to drought (32.86%) followed by hailstorm (26.12%), Disease/insect (21.69%), sporadic rain (20.78%), and flood (15.50%) in last 5 years. However, all respondents reported that they have not faced food scarcity due to snowstorm, avalanche, and heatwave.

Table 6-24: Households Facing Food Scarcity Disaggregated by Urban and Rural Areas in Last Five Years

Disasters	Households Facing Food Scarcity (%)			Total
	Yes	No	Not applicable	
Urban				
Drought	22.14	74.76	3.10	100.00
Fire (forest)	6.10	88.74	5.16	100.00
Fire (settlement)	7.84	92.16	0.00	100.00
Flood	19.74	78.83	1.43	100.00
Inundation	17.84	81.52	0.64	100.00
Windstorm	3.93	95.68	0.39	100.00
Thunderstorm	0.76	95.30	3.94	100.00
Hailstorm	19.09	78.55	2.36	100.00
Heavy rain	2.55	96.75	0.70	100.00
Sporadic rain	11.08	82.91	6.02	100.00
Soil erosion	16.39	82.83	0.78	100.00
Landslide	14.39	84.10	1.50	100.00
Heat wave	0.00	100.00	0.00	100.00
Cold wave	6.39	93.61	0.00	100.00
Disease/insect	16.34	82.67	0.99	100.00
Rural				
Drought	35.99	63.43	0.58	100.00
Fire (forest)	1.69	96.65	1.66	100.00
Fire (settlement)	16.27	83.22	0.51	100.00
Flood	13.29	86.06	0.65	100.00
Inundation	9.72	90.28	0.00	100.00
Windstorm	11.81	87.20	1.00	100.00
Thunderstorm	0.94	97.32	1.74	100.00
Hailstorm	28.13	71.16	0.72	100.00
Heavy rain	5.06	94.94	0.00	100.00
Sporadic rain	24.14	74.28	1.58	100.00
Soil erosion	14.45	85.30	0.25	100.00
Landslide	11.67	87.76	0.57	100.00
Snowstorm	0.00	100.00	0.00	100.00
Avalanche	0.00	100.00	0.00	100.00
Heat wave	0.00	100.00	0.00	100.00
Cold wave	5.80	93.98	0.22	100.00
Disease/insect	23.18	76.69	0.13	100.00

Table 6-24 indicates percentage distribution of households facing food scarcity due to climate induced disasters in past 5 years by urban-rural area. Higher percentage of households in urban area is facing food scarcity due to drought (22.14%) followed by flood (19.74%), hailstorm (19.09%), inundation (17.84%) and soil erosion (16.39%). However, no household reported hailstorm as the reason behind food scarcity in urban area. Moreover, higher percentage of households in rural area are facing food scarcity due to drought (35.99%) followed by hailstorm (28.13%), sporadic rain (24.14%), and disease/insects (23.18%) in last 5 years. However, none is facing food scarcity due to snowstorm, avalanche, and heatwave in rural area as per what the households reported.

Table 6-25: Households Facing Food Scarcity by Eco-Development Region in Last Five Years

Disasters	Households Facing Food Scarcity (%)			Total
	Yes	No	Not applicable	
Eastern Mountain				
Drought	24.16	75.84	0.00	100.00
Fire (forest)	0.00	100.00	0.00	100.00
Fire (settlement)	0.00	100.00	0.00	100.00
Flood	6.90	93.10	0.00	100.00
Windstorm	0.00	100.00	0.00	100.00
Thunderstorm	0.00	100.00	0.00	100.00
Hailstorm	30.15	69.85	0.00	100.00
Heavy rain	3.12	96.88	0.00	100.00
Sporadic rain	17.15	82.85	0.00	100.00
Soil erosion	9.38	90.62	0.00	100.00
Landslide	5.74	94.26	0.00	100.00
Snowstorm	0.00	100.00	0.00	100.00
Cold wave	24.12	75.88	0.00	100.00
Disease/insect	16.70	83.30	0.00	100.00
Eastern Hill				
Drought	44.86	54.83	0.31	100.00
Fire (forest)	5.71	94.29	0.00	100.00
Fire (settlement)	15.64	84.36	0.00	100.00
Flood	29.55	70.45	0.00	100.00
Windstorm	38.86	59.69	1.45	100.00
Thunderstorm	0.00	100.00	0.00	100.00
Hailstorm	31.01	68.99	0.00	100.00
Heavy rain	0.00	100.00	0.00	100.00
Sporadic rain	32.03	67.97	0.00	100.00
Soil erosion	0.00	100.00	0.00	100.00
Landslide	13.13	86.87	0.00	100.00
Cold wave	0.00	100.00	0.00	100.00
Disease/insect	34.28	65.72	0.00	100.00
Eastern *Terai*				
Drought	26.82	72.14	1.03	100.00
Fire (forest)	0.00	93.84	6.16	100.00
Fire (settlement)	12.01	87.99	0.00	100.00
Flood	10.62	89.38	0.00	100.00
Inundation	8.87	91.13	0.00	100.00
Windstorm	2.92	95.78	1.30	100.00
Thunderstorm	0.75	98.12	1.13	100.00
Hailstorm	1.44	98.56	0.00	100.00
Heavy rain	0.00	100.00	0.00	100.00
Sporadic rain	32.79	67.21	0.00	100.00
Soil erosion	10.84	89.16	0.00	100.00
Heat wave	0.00	100.00	0.00	100.00
Cold wave	14.47	85.53	0.00	100.00
Disease/insect	17.29	82.19	0.52	100.00

Disasters	Households Facing Food Scarcity (%)			Total
	Yes	No	Not applicable	
Central Mountain				
Drought	94.50	5.50	0.00	100.00
Fire (forest)	4.80	95.20	0.00	100.00
Fire (settlement)	0.00	100.00	0.00	100.00
Windstorm	0.00	100.00	0.00	100.00
Thunderstorm	4.08	95.92	0.00	100.00
Hailstorm	95.32	4.68	0.00	100.00
Heavy rain	100.00	0.00	0.00	100.00
Sporadic rain	74.44	25.56	0.00	100.00
Soil erosion	0.00	100.00	0.00	100.00
Landslide	7.16	92.84	0.00	100.00
Cold wave	16.67	83.33	0.00	100.00
Disease/insect	84.60	15.40	0.00	100.00
Central Hill				
Drought	24.46	75.39	0.15	100.00
Fire (forest)	1.14	98.34	0.52	100.00
Fire (settlement)	0.00	100.00	0.00	100.00
Flood	32.15	67.85	0.00	100.00
Windstorm	2.40	97.60	0.00	100.00
Thunderstorm	0.00	98.41	1.59	100.00
Hailstorm	0.85	99.15	0.00	100.00
Heavy rain	0.00	100.00	0.00	100.00
Sporadic rain	19.43	80.17	0.41	100.00
Soil erosion	0.00	100.00	0.00	100.00
Landslide	12.86	87.14	0.00	100.00
Disease/insect	21.24	78.76	0.00	100.00
Central *Terai*				
Drought	10.34	88.63	1.03	100.00
Fire (settlement)	28.24	71.76	0.00	100.00
Flood	4.77	90.88	4.35	100.00
Inundation	7.76	89.14	3.11	100.00
Windstorm	2.38	97.26	0.36	100.00
Thunderstorm	0.00	100.00	0.00	100.00
Hailstorm	1.64	97.39	0.97	100.00
Heavy rain	0.00	100.00	0.00	100.00
Sporadic rain	0.00	100.00	0.00	100.00
Cold wave	0.00	100.00	0.00	100.00
Disease/insect	5.62	94.38	0.00	100.00
Western Mountain				
Drought	0.00	100.00	0.00	100.00
Windstorm	0.00	100.00	0.00	100.00
Hailstorm	0.00	100.00	0.00	100.00
Heavy rain	0.00	100.00	0.00	100.00
Soil erosion	0.00	100.00	0.00	100.00
Landslide	0.00	100.00	0.00	100.00
Snowstorm	0.00	100.00	0.00	100.00

Disasters	Households Facing Food Scarcity (%)			Total
	Yes	No	Not applicable	
Avalanche	0.00	100.00	0.00	100.00
Disease/insect	0.00	100.00	0.00	100.00
Western Hill				
Drought	17.84	79.30	2.87	100.00
Fire (forest)	0.00	99.16	0.84	100.00
Fire (settlement)	60.85	39.15	0.00	100.00
Flood	0.00	96.94	3.06	100.00
Windstorm	51.01	48.99	0.00	100.00
Thunderstorm	1.26	90.62	8.12	100.00
Hailstorm	26.20	69.65	4.15	100.00
Heavy rain	19.46	78.58	1.95	100.00
Sporadic rain	2.77	90.55	6.68	100.00
Soil erosion	5.85	93.64	0.51	100.00
Landslide	5.61	93.46	0.93	100.00
Cold wave	0.00	100.00	0.00	100.00
Disease/insect	12.50	85.07	2.43	100.00
Western *Terai*				
Drought	21.57	78.43	0.00	100.00
Fire (forest)	0.00	100.00	0.00	100.00
Fire (settlement)	0.00	100.00	0.00	100.00
Flood	0.00	100.00	0.00	100.00
Inundation	0.00	100.00	0.00	100.00
Windstorm	0.00	100.00	0.00	100.00
Thunderstorm	0.00	100.00	0.00	100.00
Hailstorm	18.92	81.08	0.00	100.00
Sporadic rain	0.00	100.00	0.00	100.00
Heat wave	0.00	100.00	0.00	100.00
Cold wave	26.79	73.21	0.00	100.00
Disease/insect	0.00	100.00	0.00	100.00
Mid-Western Mountain				
Drought	67.77	32.23	0.00	100.00
Fire (forest)	0.00	100.00	0.00	100.00
Fire (settlement)	0.00	100.00	0.00	100.00
Flood	0.00	100.00	0.00	100.00
Heavy rain	100.00	0.00	0.00	100.00
Landslide	14.05	85.95	0.00	100.00
Disease/insect	13.66	86.34	0.00	100.00
Mid-Western Hill				
Drought	50.54	49.46	0.00	100.00
Fire (forest)	0.00	100.00	0.00	100.00
Flood	19.22	80.78	0.00	100.00
Windstorm	12.52	87.48	0.00	100.00
Thunderstorm	0.00	100.00	0.00	100.00
Hailstorm	35.58	64.42	0.00	100.00
Heavy rain	0.00	100.00	0.00	100.00
Sporadic rain	0.00	100.00	0.00	100.00

Disasters	Households Facing Food Scarcity (%)			Total
	Yes	No	Not applicable	
Soil erosion	18.12	81.88	0.00	100.00
Landslide	5.72	94.28	0.00	100.00
Heat wave	0.00	100.00	0.00	100.00
Disease/insect	10.97	89.03	0.00	100.00
Mid-Western *Terai*				
Drought	36.00	64.00	0.00	100.00
Fire (forest)	0.00	100.00	0.00	100.00
Fire (settlement)	0.00	94.15	5.85	100.00
Flood	30.65	69.35	0.00	100.00
Inundation	18.38	81.62	0.00	100.00
Windstorm	9.54	90.46	0.00	100.00
Thunderstorm	0.00	100.00	0.00	100.00
Hailstorm	30.09	69.91	0.00	100.00
Heavy rain	23.99	76.01	0.00	100.00
Sporadic rain	13.06	86.94	0.00	100.00
Soil erosion	20.13	79.87	0.00	100.00
Landslide	0.00	100.00	0.00	100.00
Heat wave	0.00	100.00	0.00	100.00
Cold wave	0.00	100.00	0.00	100.00
Disease/insect	16.41	83.59	0.00	100.00
Far-Western Mountain				
Drought	86.77	11.70	1.53	100.00
Fire (forest)	0.00	88.15	11.85	100.00
Fire (settlement)	0.00	100.00	0.00	100.00
Flood	20.44	79.56	0.00	100.00
Windstorm	11.30	87.12	1.59	100.00
Thunderstorm	0.00	100.00	0.00	100.00
Hailstorm	43.85	55.01	1.14	100.00
Heavy rain	36.40	63.60	0.00	100.00
Sporadic rain	52.01	47.99	0.00	100.00
Soil erosion	18.28	76.20	5.52	100.00
Landslide	8.46	89.28	2.26	100.00
Snowstorm	0.00	100.00	0.00	100.00
Cold wave	0.00	100.00	0.00	100.00
Disease/insect	7.67	92.33	0.00	100.00
Far-Western Hill				
Drought	78.11	20.98	0.91	100.00
Fire (forest)	8.93	90.39	0.68	100.00
Fire (settlement)	21.14	78.86	0.00	100.00
Flood	33.33	66.67	0.00	100.00
Windstorm	50.16	49.84	0.00	100.00
Thunderstorm	3.44	94.07	2.49	100.00
Hailstorm	72.75	26.70	0.55	100.00
Heavy rain	40.57	59.43	0.00	100.00
Sporadic rain	63.47	36.53	0.00	100.00
Soil erosion	46.43	53.57	0.00	100.00

Disasters	Households Facing Food Scarcity (%)			Total
	Yes	No	Not applicable	
Landslide	30.57	67.94	1.48	100.00
Cold wave	0.00	0.00	100.00	100.00
Disease/insect	79.04	20.11	0.86	100.00
Far-Western *Terai*				
Drought	42.40	55.06	2.54	100.00
Fire (forest)	0.00	78.64	21.36	100.00
Fire (settlement)	5.12	94.88	0.00	100.00
Flood	29.48	68.51	2.00	100.00
Inundation	35.93	63.46	0.62	100.00
Windstorm	15.06	79.79	5.15	100.00
Thunderstorm	1.97	93.58	4.45	100.00
Hailstorm	45.68	52.96	1.36	100.00
Heavy rain	0.00	100.00	0.00	100.00
Sporadic rain	69.66	23.23	7.11	100.00
Soil erosion	44.62	55.38	0.00	100.00
Landslide	49.72	50.28	0.00	100.00
Heat wave	0.00	100.00	0.00	100.00
Cold wave	9.30	89.61	1.09	100.00
Disease/insect	9.41	90.59	0.00	100.00
Kathmandu Valley				
Drought	1.55	85.76	12.69	100.00
Fire (forest)	0.00	100.00	0.00	100.00
Fire (settlement)	0.00	100.00	0.00	100.00
Flood	2.29	97.71	0.00	100.00
Windstorm	0.00	100.00	0.00	100.00
Thunderstorm	0.00	100.00	0.00	100.00
Hailstorm	0.00	100.00	0.00	100.00
Heavy rain	0.00	100.00	0.00	100.00
Sporadic rain	1.16	86.84	12.00	100.00
Disease/insect	0.00	92.33	7.67	100.00

The table 6-25 indicates percentage distribution of households facing food scarcity in last 5 years by eco-development regions. All households (100%) in central mountain attributed heavy rainfall as major cause of food scarcity followed by hailstorm (95.32%), drought (94.50%) and disease/insect (84.60%), among others. Likewise, all households (100%) in mid-western mountain reported to have faced food scarcity due to heavy rainfall followed by drought. On the other hand, all households in the same region are not facing food scarcity due to fire and flood. Similarly, all households in Kathmandu Valley are not facing food scarcity due to fire, windstorm, thunderstorm, hailstorm, heavy rain, and disease/insects.

Table 6-26: Households Facing Food Scarcity by Bio-Climatic Zone in Last 5 Years

Disasters	Households Faced Food Scarcity (%)			Total
	Yes	No	Not applicable	
Tropical				
Drought	24.91	74.20	0.88	100.00
Fire (forest)	0.69	96.57	2.74	100.00
Fire (settlement)	16.91	82.53	0.56	100.00
Flood	15.53	83.45	1.02	100.00
Inundation	14.71	84.90	0.39	100.00
Windstorm	7.75	91.39	0.87	100.00
Thunderstorm	0.43	97.55	2.02	100.00
Hailstorm	12.16	86.73	1.10	100.00
Heavy rain	1.38	98.31	0.32	100.00
Sporadic rain	19.54	79.37	1.09	100.00
Soil erosion	11.36	88.05	0.59	100.00
Landslide	7.65	91.28	1.08	100.00
Heat wave	0.00	100.00	0.00	100.00
Cold wave	5.45	94.45	0.10	100.00
Disease/insect	15.27	84.46	0.27	100.00
Sub-Tropical				
Drought	43.04	55.23	1.73	100.00
Fire (forest)	3.39	94.85	1.76	100.00
Fire (settlement)	9.07	90.93	0.00	100.00
Flood	15.20	84.80	0.00	100.00
Windstorm	19.85	79.18	0.98	100.00
Thunderstorm	1.02	95.88	3.10	100.00
Hailstorm	41.42	57.43	1.15	100.00
Heavy rain	13.07	86.93	0.00	100.00
Sporadic rain	18.77	76.84	4.39	100.00
Soil erosion	17.82	81.88	0.30	100.00
Landslide	13.77	85.53	0.70	100.00
Snowstorm	0.00	100.00	0.00	100.00
Heat wave	0.00	100.00	0.00	100.00
Cold wave	12.71	85.84	1.45	100.00
Disease/insect	31.92	67.64	0.45	100.00
Temperate				
Drought	52.86	47.14	0.00	100.00
Fire (forest)	3.76	96.24	0.00	100.00
Fire (settlement)	0.00	100.00	0.00	100.00
Windstorm	5.14	94.86	0.00	100.00
Thunderstorm	4.67	95.33	0.00	100.00
Hailstorm	58.81	41.19	0.00	100.00
Heavy rain	11.56	88.44	0.00	100.00
Sporadic rain	60.68	39.32	0.00	100.00
Soil erosion	0.00	100.00	0.00	100.00
Landslide	2.52	97.48	0.00	100.00
Snowstorm	0.00	100.00	0.00	100.00
Cold wave	7.87	92.13	0.00	100.00
Disease/insect	31.91	68.09	0.00	100.00
Sub-Alpine				
Drought	0.00	100.00	0.00	100.00
Hailstorm	0.00	100.00	0.00	100.00
Soil erosion	0.00	100.00	0.00	100.00
Snowstorm	0.00	100.00	0.00	100.00
Avalanche	0.00	100.00	0.00	100.00
Disease/insect	0.00	100.00	0.00	100.00

Table 6-26 indicates percentage distribution of households facing food scarcity due to climate induced disasters by climatic zone in last 5 years. Majority of households in different climatic zones reported that they are not been facing food scarcity due to climate induced disasters. However, 60.68 per cent households and 58.81 per cent households in temperate zone are facing food scarcity due to sporadic rain and hailstorm respectively. Similarly, 43.04 per cent households and 41.42 per cent households in sub-tropical zone are facing food scarcity due to drought and hailstorm respectively in last five years. None in the sub-alpine zone have faced food scarcity due to climate induced disasters in last five years.

6.7 Economic Loss Due to Climate Induced Disasters

Table 6-27: Households' Economic Loss in Last Five Years

Disasters	Economic Loss (%)		Total
	Yes	No	
Drought	43.17	56.83	100.00
Fire (forest)	0.82	99.18	100.00
Fire (settlement)	0.98	99.02	100.00
Flood	5.50	94.50	100.00
Inundation	1.93	98.07	100.00
Windstorm	9.57	90.43	100.00
Thunderstorm	1.99	98.01	100.00
Hailstorm	15.17	84.83	100.00
Heavy rain	1.73	98.27	100.00
Sporadic rain	3.19	96.81	100.00
Soil erosion	1.54	98.46	100.00
Landslide	4.92	95.08	100.00
Snowstorm	0.03	99.97	100.00
Avalanche	0.00	100.00	100.00
GLOF	0.00	100.00	100.00
Heat wave	0.06	99.94	100.00
Cold wave	5.39	94.61	100.00
Disease/insect	33.01	66.99	100.00

Table 6-27 depicts the percentage distribution of households having economic loss due to climate induced disasters in last 5 years. The results reveals that higher percentage of households have economic loss due to drought (43.17%) followed by disease/insect (33.01%) and hailstorm (15%). Majority of households in overall did not perceive climate induced disasters as major cause of their economic loss. However, majority of households reported that they do not have economic loss due to climate induced disasters in last five years.

Table 6-28: Economic Loss of Households Due to Climate Induced Disasters in Last 5 Years

Analytical Domain	Household (%)						
	No loss	Below NPR 15,000	NPR 15,001-30,000	NPR 30,001-45,000	NPR 45,001-60,000	More than NPR 60,000	Total
Urban/Rural							
Urban	0.5	29.7	18.5	9.6	8.6	33.0	100.0
Rural	0.2	25.0	20.2	11.6	10.6	32.3	100.0
Ecological Belt							
Mountain	0.00	11.7	14.5	10.5	11.0	52.3	100.0
Hill	0.00	32.4	21.7	12.0	9.3	24.7	100.0
Terai	0.6	23.4	19.4	10.6	10.9	35.1	100.0
Eco-Development Region							
Eastern Mountain	0.00	1.8	5.5	5.9	7.3	79.6	100.0
Eastern Hill	0.00	19.2	17.4	10.8	10.9	41.7	100.0
Eastern Tarai	1.8	17.5	15.7	9.4	12.7	42.9	100.0
Central Mountain	0.00	1.0	7.4	14.1	15.2	62.2	100.0
Central Hill	0.00	37.0	29.3	16.8	7.9	9.1	100.0
Central Tarai	0.00	29.9	20.6	10.9	10.3	28.3	100.0
Western Mountain	0.00	56.9	15.0	6.8	6.0	15.2	100.0
Western Hill	0.00	41.7	19.2	10.3	9.6	19.3	100.0
Western Tarai	0.00	9.2	30.1	24.2	16.7	19.7	100.0
Mid-western Mountain	0.00	43.1	35.8	7.5	5.6	7.9	100.0
Mid-western Hill	0.00	30.4	15.5	9.3	11.5	33.4	100.0
Mid-western Tarai	0.00	21.7	28.3	12.7	7.8	29.5	100.0
Far-western Mountain	0.00	17.4	21.3	10.1	10.4	40.7	100.0
Far-western Hill	0.00	26.5	28.2	11.3	5.6	28.5	100.0
Far-western Tarai	0.4	21.0	13.7	5.8	6.1	52.9	100.0
Kathmandu Valley	0.00	30.0	25.6	0.00	0.00	44.5	100.0
Combined Vulnerability							
Very High	1.2	20.2	14.7	8.5	13.7	41.6	100.0
High	0.00	21.3	23.5	11.9	9.5	33.8	100.0
Moderate	0.00	31.3	19.7	12.0	8.5	28.6	100.0
Low	0.3	26.0	18.9	11.7	10.3	32.8	100.0
Very Low	0.00	43.3	24.6	10.8	9.9	11.4	100.0
Bio-Climatic Zone							
Tropical	0.5	23.9	20.6	11.8	10.4	32.7	100.0
Sub-tropical	0.00	30.0	18.8	10.4	9.2	31.6	100.0
Temperate	0.00	23.1	18.0	8.6	14.5	35.8	100.0
Sub-alpine	0.00	68.8	0.00	6.3	0.00	25.0	100.0
Nepal	0.3	26.0	19.9	11.2	10.2	32.5	100.0

Table 6-28 depicts the percentage distribution of households having economic loss due to climate induced disasters by different analytical domain in last 5 years. The survey result reveals that higher percentage of households in mountain region (52.3%) have lost more than NPR 60,000 in last 5 years followed by *Terai* (35.1%) and hill (24.7%). Similarly, 79.6 per cent households in eastern mountain have lost more than NPR 60,000 in last 5 years while only 7.9 per cent reported so in mid-western mountain region. Similarly, higher percentage of households in very high vulnerable area (41.6%) under NAPA combined vulnerability index have lost more than NPR 60,000 in last 5 years while only 11.4 per cent reported so in very low vulnerable area. Moreover, higher percentage of households in temperate zone (35.8%) have lost more than NPR 60,000 due to climate induced disasters in last 5 years followed by tropical (32.7%), sub-alpine (32.5%), sub-tropical (31.6%), and temperate zone (25.0%) respectively. Overall, 32.5 per cent households have reported to lost more than NPR 60,000 due to climate induced disasters while only 0.3 per cent households have reported no economic loss in last 5 years.

CHAPTER 7

CLIMATE CHANGE IMPACT ON HUMAN HEALTH, CROPS, AND LIVESTOCK

7.1. Summary of Findings

Households are observing range of impacts on human health, crops, and livestock due to changes in climatic condition in last 25 years. The survey result reveals that 60.25 per cent households are observing emergence of new Disease in crops. Similarly, majority of the households (66.09%) have observed the appearance of new insects/pests in crops while 45.98 per cent households observed appearance of new Disease in livestock (Figure 7.1).

The survey result shows that households are observing climate change impact on human health. Substantial percentage of households (40.12%) reported that incidence of Disease on human health is increasing in last 25 years. An 18.6 per cent household reported that the vector-borne Disease and its frequencies are ascending in last 25 years' time while 20.7 per cent households reported so for waterborne Disease (Figure 7-3).

The survey result reveals that households are observing an increase in the frequency of 14 different types of Disease out of 19 identified and listed in the questionnaire. A 38.6 per cent household observed that cough and its frequency went higher in last 25 years followed by fever (35%) and diarrhea (21.5%) (Figure 7-3).

The different analytical domain wise survey findings on climate change impact on human health, crops, and livestock are depicted in following sub-sections.

Figure 7-1: Climate Change Impact on Crops and Livestock in Last 25 Years

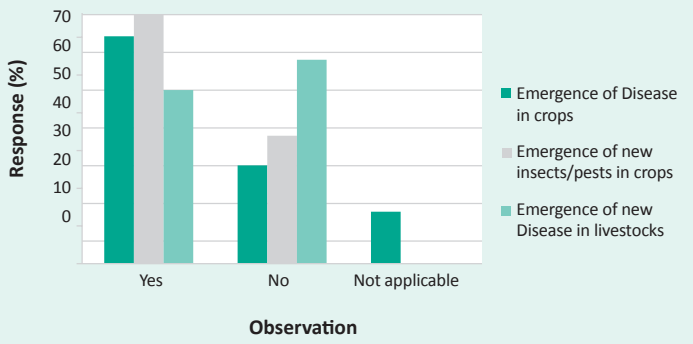


Figure 7-2: Climate Change Impacts on Human Health in Last 25 Years

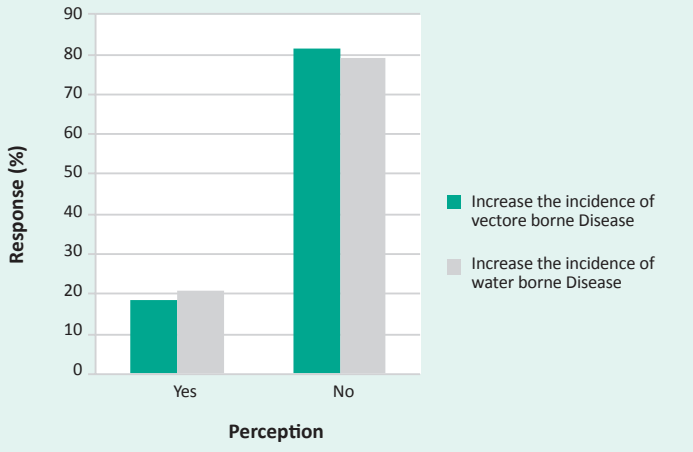
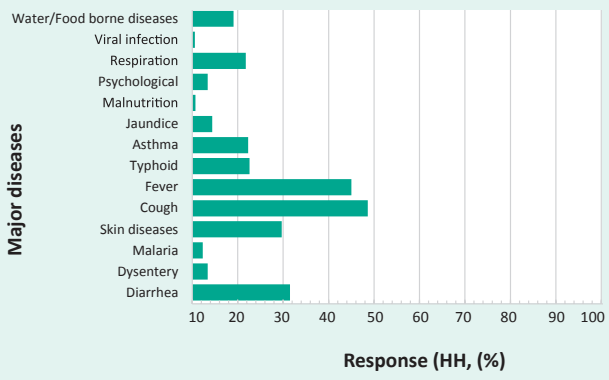


Figure 7-3: Main Disease and Frequency of Increment in Last 25 Years



7.2. Impact on Crops

Table 7-1: Emergence of New Disease in Crops in Last 25 Years

Analytical Domain	New Disease (HH, %)			Total
	Yes	No	Not applicable	
Urban/Rural				
Urban	45.47	23.76	30.77	100.00
Rural	66.37	26.95	6.69	100.00
Ecological Belt				
Mountain	78.32	19.29	2.38	100.00
Hill	52.16	39.06	8.77	100.00
Terai	65.17	14.22	20.62	100.00
Eco-Development Region				
Eastern Mountain	67.46	30.27	2.26	100.00
Eastern Hill	70.73	25.28	3.99	100.00
Eastern *Terai*	61.47	9.07	29.46	100.00
Central Mountain	92.19	7.23	0.59	100.00
Central Hill	67.79	29.32	2.89	100.00
Central *Terai*	67.46	15.84	16.69	100.00
Western Mountain	17.62	80.18	2.20	100.00
Western Hill	25.76	70.47	3.77	100.00
Western *Terai*	71.04	10.17	18.79	100.00
Mid-western Mountain	51.32	43.14	5.55	100.00
Mid-western Hill	66.79	30.65	2.56	100.00
Mid-western *Terai*	56.08	30.68	13.23	100.00
Far-western Mountain	96.78	0.55	2.67	100.00
Far-western Hill	70.57	25.92	3.50	100.00
Far-western *Terai*	74.59	14.74	10.67	100.00
Kathmandu Valley	1.13	17.49	81.38	100.00
NAPA Combined Vulnerability Index				
Very High	68.94	12.00	19.06	100.00
High	67.08	25.32	7.59	100.00
Moderate	55.95	36.15	7.90	100.00
Low	52.69	25.31	22.00	100.00
Very Low	49.14	37.70	13.16	100.00
Bio-Climatic Zone				
Tropical	63.29	20.22	16.49	100.00
Sub-tropical	53.80	35.58	10.62	100.00
Temperate	68.96	30.21	0.83	100.00
Sub-alpine	0.00	100.00	0.00	100.00
Nepal	60.25	26.01	13.74	100.00

Table 7-1 presents the percentage distribution of households on emergence of new Disease on crops in last 25 years. In total, 60.25 per cent households have reported of having observed emergence of new disease in crops while 26.01 per cent households stated the opposite. Highest percentage of households in far-western mountain (96.78%) have observed an emergence of new Disease in crops while only 1.13 per cent households reported in Kathmandu Valley. Similarly, higher percentage of households in the very high vulnerable area (68.94%) under NAPA combined vulnerability index reported emergence of Disease in crops while 49.14 per cent reported so in very low vulnerable area. Moreover, higher percentage of households in temperate zone (68.96%) has reported in emergence of new disease in crops in last 25 years compared to other climatic zones.

Table 7-2: Most Reported Disease in Crops by Climatic Zone in Last 25 Years (Local Name)

Ranking	Tropical	Sub-tropical	Temperate	Sub-alpine
1.	Marne rog (Sheath blight)	Marne rog (Sheath blight)	Marne rog (Sheath blight)	Marne rog (Sheath blight)
2.	Dadhuwa (Blight)	Gobre (Borer)	Sindure rog (Rust)	
3.	Gobre (Borer)	Dadhuwa (Blight)	Dadhuwa (Blight)	
4.	Woilaune (Wilting)	Saduwa (Root rot)	Woilaune (Wilting)	
5.	Khair (Cutch tree)e rog (Brown disease)	Pahele rog (Yellow disease)	Gobre (Borer)	
6.	Saduwa (Root rot)	Sindure rog (Rust)	Saduwa (Root rot)	
7.	Pahele rog (Yellow disease)	Woilaune (Wilting)	Pahele rog (Yellow disease)	
8.	Raate (Leaf blight)	Beruwa (Leaf roller)	Maruwa (Nematode infection)	
9.	Kalo poke (False smut)	Kalo poke (Flase smut)	Marne rog (Sheath blight)	
10.	Sete (Hispa)	Maruwa (Nematode infetion)	Sukaune kira (Blast)	
11.	Bali sukne/ bot sukne (Blight)	Marne rog (Sheath blight)	Kirako prakop (Gundhy bug)	
12.	Kaal /Kalaya	Kirako prakop (Gundhy bug)	Khumre (white grubs)	
13.	Dadelo rog	Khumre (white grubs)	Dadelo rog	
14.	Sukaune kira (Blast)	Raate (Leaf blight)	Kalo poke (False smut)	
15.	Laai (Aphids)	Madhuwa (Plant hopper)	Laai (Aphids)	

Table 7-2 shows the most frequently observed Disease in crops in four climatic zones. Respondents have reported most commonly observed Disease in their area. The survey reveals that *Marne rog* (Sheath blight) is the most common Disease in the crop in climatic zone. In fact, it is only one disease reported in sub-alpine zone. Moreover, *gobre/ gobre* (Borer)*, Woilaune* (Wilting)*, and Dadhuwa* (Blight) are commonly reported crop disease in other three climatic zones. Similarly, *Laai* (Aphids) is the less common in tropical and temperate zone while *Madhuwa* (Plant hopper) is reported so in sub-tropical zone. All Disease in the survey are reported in local name.

Table 7-3: Emergence of New Insects/Pests in Crops in Last 25 Years

Analytical Domain	Insect/Pest (HH, %)		Total
	Yes	No	
Urban/Rural			
Urban	66.57	33.43	100.00
Rural	65.94	34.06	100.00
Ecological Belt			
Mountain	79.02	20.98	100.00
Hill	60.69	39.31	100.00
Terai	69.52	30.48	100.00
Eco-Development Region			
Eastern Mountain	71.24	28.76	100.00
Eastern Hill	69.18	30.82	100.00
Eastern *Terai*	87.58	12.42	100.00
Central Mountain	88.85	11.15	100.00
Central Hill	79.69	20.31	100.00
Central *Terai*	48.80	51.20	100.00
Western Mountain	60.13	39.87	100.00
Western Hill	36.59	63.41	100.00
Western *Terai*	88.61	11.39	100.00
Mid-western Mountain	50.98	49.02	100.00

Analytical Domain	Insect/Pest (HH, %)		Total
	Yes	No	
Mid-western Hill	66.24	33.76	100.00
Mid-western *Terai*	66.42	33.58	100.00
Far-western Mountain	98.82	1.18	100.00
Far-western Hill	57.20	42.80	100.00
Far-western *Terai*	78.50	21.50	100.00
Kathmandu Valley	6.08	93.92	100.00
NAPA Combined Vulnerability Index			
Very High	84.96	15.04	100.00
High	70.65	29.35	100.00
Moderate	43.83	56.17	100.00
Low	66.81	33.19	100.00
Very Low	70.54	29.46	100.00
Bio-Climatic Zone			
Tropical	68.34	31.66	100.00
Sub-tropical	62.78	37.22	100.00
Temperate	63.58	36.42	100.00
Sub-alpine	50.00	50.00	100.00
Nepal	**66.09**	**33.91**	**100.00**

Table 7-3 depicts the percentage distribution of households observing an emergence of new insects/pests in crops in last 25 years. The results reveal that 66.09 per cent households are observing emergence of new pests/insects in their area whereas 33.91 per cent have not observed so in last 25 years. Almost similar percentage of households in urban (66.57%) and rural (65.94%) areas are observing emergence of insects/pests in crops. Moreover, higher percentage of households in far-western mountain (98.82%) eco-development region are observing emergence of new insects/pests in crops while only 36.59 per cent households in western hill and 6.08 per cent in Kathmandu Valley reported so. Similarly, higher percentage of households in very high vulnerable area (84.96%) under NAPA combined vulnerability index are observing such incidences while only 43.83 per cent households reported so in moderately vulnerable area.

Table 7-4: Most Reported Insects/Pests in Crops by Climatic Zone in Last 25 Years (Local Name)

Ranking	Tropical	Sub-tropical	Temperate	Sub-alpine
1.	Sankhe kira (Snail)	Khumle kira (White grubs)	Khumle kira (White grubs)	
2.	Patera (Sting bugs)	Jhusile (Hairy caterpillar)	Kamila (Ant)	
3.	Phatangra (Grass hopper)	Kalo kira (Hispa)	Laai (Aphids)	
4.	Jhusile (Hairy caterpillar)	Kamila (Ant)	Banselu (White grub)	
5.	Laai (Aphids)	Laai (Aphids)	Jhusile (Hairy caterpillar)	
6.	Gaandhi / gaandi (Sting bug)	Rato kira (Lady bird beetle)	Phatangra (Grass hopper)	
7.	Hariyo kira (Semi looper)	Phatangra (Grass hopper)	Kalo kira (Hispa)	
8.	Gabaaro (Borer)	Patera (Sting bugs)	Kage kira (Blister beetle)	
9.	Sete (Hispa)	Hariyo kira (Semi looper)	Gabaaro (Borer)	
10.	Kalo kira (Hispa)	Gabaaro (Borer)	Rato kira (Lady bird beetle)	
11.	Seto putali (Borer)	Kage kira (Blister beetle)	Hariyo kira (Semi looper)	
12.	Chiple kira	Banselu (White grub)	Chepto kira (Snail)	
13.	Khumle kira (white grubs)	Seto putali (Borer)	Sukaune kira (Blast)	
14.	Rato kira (Lady bird beetle)	Sete (Hispa)	Seto putali (Borer)	
15.	Gube kira (Shoot borer)	Dhamira (White ants)	Dhamira (White ants)	

Table 7-4 shows the most frequently observed insects/pests in crops in four climatic zones. Respondents have reported most commonly observed Disease in their area. The survey result depicts that *Sankhe kira* (Snail), *Patera* (Sting bugs), and *Phatangra* (Grass hopper) are most commonly observed insects/pests in tropical zone while *Khumle kira* (White grubs), *Rato kira* (Lady bird beetle), and *Gube kira* (Shoot borer) are observed less. Similarly, *Khumle kira* (White grubs), *Jhusile* (Hairy caterpillar), and *Kalo kira* (Hispa) are most commonly observed insects/pest in crops in sub-tropical zone while seto kira, *Sete* (Hispa), and *Dhamira* (White ants) are observed less in last 25 years. *Khumle kira* (white grubs), *Kamila* (Ant), and *Laai* (Aphids) are most commonly reported pests/insects in temperate zone while no any insects/pests species are reported in sub-alpine zone. Similarly, *Khumle kira* (White grubs), and *Kalo kira* (Hispa) are commonly reported insects/pests in all three climatic zone except in sub-alpine.

7.3. Impact on Livestock

Table 7-5: Emergence of New Disease in Livestock in Last 25 Years

Analytical Domain	New Disease (HH, %)		Total
	Yes	No	
Urban/Rural			
Urban	45.40	54.60	100.00
Rural	46.16	53.84	100.00
Ecological Belt			
Mountain	61.06	38.94	100.00
Hill	40.52	59.48	100.00
Terai	49.04	50.96	100.00
Eco-Development Region			
Eastern Mountain	52.23	47.77	100.00
Eastern Hill	52.23	47.77	100.00
Eastern *Terai*	70.78	29.22	100.00
Central Mountain	77.69	22.31	100.00
Central Hill	51.21	48.79	100.00
Central *Terai*	21.17	78.83	100.00
Western Mountain	14.73	85.27	100.00
Western Hill	15.34	84.66	100.00
Western *Terai*	63.99	36.01	100.00
Mid-western Mountain	4.48	95.52	100.00
Mid-western Hill	66.06	33.94	100.00
Mid-western *Terai*	64.18	35.82	100.00
Far-western Mountain	98.82	1.18	100.00
Far-western Hill	21.53	78.47	100.00
Far-western *Terai*	61.81	38.19	100.00
Kathmandu Valley	3.06	96.94	100.00
NAPA Combined Vulnerability Index			
Very High	73.99	26.01	100.00
High	38.39	61.61	100.00
Moderate	23.96	76.04	100.00
Low	55.62	44.38	100.00
Very Low	43.97	56.03	100.00
Very Low	50.60	49.40	100.00
Bio-Climatic Zone			
Tropical	46.25	53.75	100.00
Sub-tropical	45.00	55.00	100.00
Temperate	49.96	50.04	100.00
Sub-alpine	10.00	90.00	100.00
Total	**45.98**	**54.02**	**100.00**

Table 7-5 shows the percentage distribution of households observing an emergence of new Disease in livestock in last 25 years. Interestingly, total 45.98 per cent of households are observing such emergence while 54.02 per cent have not reported so. Almost similar percentage of households in urban (45.40%) and rural (46.16%) area are observing emergence of new Disease in livestock in last 25 years. Similarly, highest percentage of respondents in far-western mountain eco-development region (98.82%) are observing emergence of new Disease on livestock in last 25 years while only 3.06 per cent respondents reported so in Kathmandu Valley. Likewise, 73.99 per cent households in very high vulnerable areas under NAPA combined vulnerability index reported an emergence of new Disease in livestock. Almost half of the total respondents (49.96%) reported such observation in temperate zone while only 10 per cent did so in sub-alpine zone.

Table 7-6: Most Reported New Disease in Livestock in Last 25 Years (Local Name)

Ranking	Tropical	Sub-tropical	Temperate	Sub-alpine
1.	Khoret (Mites)	Khoret (Mites)	Khoret (Mites)	Luto (Mange)
2.	Cheruwa (Diarrhea)	Cheruwa (Diarrhea)	Cheruwa (Diarrhea)	Khoret (Mites)
3.	Paralysis	Sunine (Swelling)	Pet fulne (Tempany)	
4.	Bhyagute (Haemorhagic saepltcaemia)	Khoki (Coughing)	Khoki (Coughing)	
5.	Pet fulne (Tempany)	Pet fulne (Tempany)	Juka (Worm)	
6.	Jworo (Fever)	Juka (Worm)	Ryal kadne (Poisoning)	
7.	Galkatta/Ghumaune (Grid)	Ryal kadne (Poisoning)	Luto (Mange)	
8	Sunine (Swelling)	Bhyagute (Haemorhagic saepltcaemia)	Sunine (Swelling)	
9.	Matae rog (Liver fluke)	Paknne rog (Wound infection)	Bhyagute (Haemorhagic saepltcaemia)	
10.	Juka (Worm)	Namle (Liver fluke)	Paralysis	
11.	Charchare (Black quarter disease)	Charchare (Black quarter disease)	Paknne rog (Wound infection)	
12.	Khoki (Coughing)	Paralysis	Jworo (Fever)	
13.	Daam (Asthma)	Jworo (Fever)	Fever	
14.	Jhokrayera marne	Fever		
15.	Daam (asthma)			

Table 7-6 demonstrates most frequently observed Disease on livestock in four climatic zones in last 25 years. Respondents have reported most commonly observed Disease in their area. Respondents in tropical and sub-tropical zone have ranked 13 most prevalent Disease in livestock while only 12 Disease are identified in temperate zones and only two in sub-alpine zone. Respondents in all four climatic zones reported *Khoret* (Mites) as most prevalent disease in livestock in last 25 years. Similarly, *Cheruwa* (Diarrhea) is reported second most prevalent disease in tropical, sub-tropical, and temperate zones while *Luto* (Mange) is ranked so in sub-alpine zone. Asthma is also ranked as less prevalent disease in tropical zone while *Jworo* (Fever) is reported so in temperate and sub-tropical zone.

7-4. Impact on Human Health

Table 7-7: Increase in Incidence of Disease in Last 25 Years

Analytical Domain	Increased Incidence of Disease (HH, %)		Total
	Yes	No	
Urban/Rural			
Urban	39.96	60.04	100.00
Rural	40.19	59.81	100.00
Ecological Belt			
Mountain	53.85	46.15	100.00
Hill	29.31	70.69	100.00
Terai	48.49	51.51	100.00
Eco-Development Region			
Eastern Mountain	42.27	57.73	100.00
Eastern Hill	10.37	89.63	100.00
Eastern *Terai*	54.61	45.39	100.00
Central Mountain	47.00	53.00	100.00
Central Hill	15.49	84.51	100.00
Central *Terai*	41.61	58.39	100.00
Western Mountain	11.01	88.99	100.00
Western Hill	32.87	67.13	100.00
Western *Terai*	73.66	26.34	100.00
Mid-western Mountain	55.46	44.54	100.00
Mid-western Hill	53.41	46.59	100.00
Mid-western *Terai*	25.98	74.02	100.00
Far-western Mountain	81.72	18.28	100.00
Far-western Hill	64.47	35.53	100.00
Far-western *Terai*	42.24	57.76	100.00
Kathmandu Valley	39.93	60.07	100.00
NAPA Combined Vulnerability Index			
Very High	39.82	60.18	100.00
High	42.79	57.21	100.00
Moderate	33.59	66.41	100.00
Low	33.93	66.07	100.00
Very Low	65.37	34.63	100.00
Bio-Climatic Zone			
Tropical	43.10	56.90	100.00
Sub-tropical	34.76	65.24	100.00
Temperate	41.29	58.71	100.00
Sub-alpine	0.00	100.00	100.00
Nepal	**40.12**	**59.88**	**100.00**

Table 7-7 indicates the percentage distribution of households observing an increase in the incidence of disease in human in last 25 years. The survey reveals that 40.12 per cent respondents are observing an increase of incidence of Disease in human in last 25 years while 59.88 per cent are not observing so. The highest percentage of households in far-western mountain eco-development region (81.72%) are observing such increase while only 10.37 per cent respondents reported so in eastern hill. Similarly, 39.93 per cent respondent in Kathmandu Valley reported of increment in disease in last 25 years. The survey result further depicts that 65.37 per cent respondents in very low vulnerable areas under NAPA combined vulnerability index are observing increase in incidence of Disease in last 25 years while only 33.93 per cent respondents reported so in low vulnerable areas. Moreover, high percentages of households in tropical zone (43.10%) have reported an increase of incidence of Disease in human in last 25 years while total respondents in sub-alpine zone (100%) reported the opposite.

Table 7-8: Increase of Incidence of Type of Disease in Last 25 Years

Analytical Domain	Types of Disease[10] (HH, %)																		
	Diarrhea	Dysentery	Malaria	Skin Disease	Cough	Fever	Typhoid	Asthma	Jaundice	Malnutrition	Dengue	Psychological	Chicken Pox	Cholera	Respiration	Viral infection	Kala azar	Water/Food borne Disease	others
Urban/Rural																			
Urban	15.9	2.4	1.9	19.8	37.3	32.2	9.9	11.7	5.8	0.3	0.0	3.0	0.4	0.0	17.7	0.8	0.2	7.8	63.9
Rural	23.8	3.8	2.4	19.7	39.2	36.1	13.8	12.5	3.9	0.8	0.1	3.7	0.3	0.3	9.4	0.5	0.2	9.6	51.0
Ecological Belt																			
Mountain	43.3	13.8	2.2	26.3	88.0	78.6	25.8	10.9	6.7	0.0	0.0	0.3	0.0	0.3	14.6	0.3	0.3	20.6	13.6
Hill	13.9	2.0	0.4	10.2	30.5	23.8	9.7	14.1	3.7	1.3	0.0	4.1	0.0	0.1	15.5	0.9	0.0	7.1	49.2
Terai	21.9	2.2	3.4	24.2	34.1	33.3	11.9	11.4	4.4	0.4	0.1	3.7	0.7	0.3	9.1	0.4	0.3	8.1	65.9
Eco-Development Region																			
Eastern Mountain	17.4	0.0	11.6	23.9	67.3	69.9	33.7	7.2	29.9	0.0	0.0	1.6	0.0	1.6	10.9	1.6	1.4	11.6	5.4
Eastern Hill	22.9	4.0	2.8	25.3	44.5	49.7	25.7	5.6	19.9	0.0	0.0	2.8	0.0	0.0	18.1	0.0	0.0	14.9	16.9
Eastern *Terai*	12.7	1.7	0.4	28.8	23.2	24.8	3.6	9.3	7.6	0.4	0.4	3.6	0.7	0.0	11.5	0.4	0.4	1.7	72.8
Central Mountain	7.0	2.0	0.0	1.0	86.5	55.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35.4	0.0	0.0	0.0	0.0
Central Hill	7.0	0.9	0.9	8.5	16.8	11.4	12.0	23.1	1.8	2.4	0.0	0.0	0.0	0.0	3.6	0.0	0.0	1.8	50.0
Central *Terai*	13.3	1.5	3.9	19.0	22.9	25.0	5.4	17.1	0.8	0.6	0.0	4.8	0.9	0.9	2.4	0.0	0.4	0.5	66.6
Western Mountain	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.0	0.0	0.0	0.0	0.0	0.0	0.0	40.0	0.0	0.0	0.0	20.0
Western Hill	1.5	0.7	0.0	5.5	15.8	4.7	1.7	9.9	2.9	0.4	0.0	7.4	0.0	0.0	14.6	2.8	0.0	1.7	60.7
Western *Terai*	53.9	2.9	5.7	32.1	67.8	57.3	29.2	5.6	1.7	0.0	0.0	3.2	0.3	0.0	18.2	0.8	0.0	33.1	60.0
Mid-western Mountain	87.8	1.1	0.0	50.9	93.2	91.9	8.2	2.3	3.7	0.0	0.0	0.0	0.0	0.0	4.7	0.0	0.0	12.6	0.0
Mid-western Hill	32.7	1.5	0.0	14.3	45.0	44.6	16.1	11.7	1.5	0.5	0.0	2.4	0.0	0.5	5.7	0.0	0.0	17.9	60.3
Mid-western *Terai*	15.7	3.4	0.0	6.6	21.9	25.7	10.9	10.8	7.3	0.0	0.0	0.0	0.0	0.0	4.0	0.0	0.0	2.3	48.1
Far-western Mountain	68.6	44.3	0.0	38.1	100	100	60.7	30.8	0.7	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0	54.1	42.8
Far-western Hill	17.5	5.8	0.6	9.1	34.0	37.5	9.1	23.2	5.4	5.0	0.0	6.3	0.0	0.0	25.7	0.0	0.0	5.5	22.6
Far-western *Terai*	34.3	7.0	17.5	12.4	76.0	69.4	51.8	13.5	9.6	1.3	0.0	2.3	0.8	0.0	5.7	2.5	0.0	17.8	49.8
Kathmandu Valley	3.9	1.8	0.0	8.7	47.2	12.7	5.0	12.2	2.0	0.0	0.0	1.3	0.0	0.0	46.6	0.0	0.0	1.7	41.8

Analytical Domain	Types of Disease[10] (HH, %)																		
	Diarrhea	Dysentery	Malaria	Skin Disease	Cough	Fever	Typhoid	Asthma	Jaundice	Malnutrition	Dengue	Psychological	Chicken Pox	Cholera	Respiration	Viral infection	Kala azar	Water/Food borne Disease	others
NAPA Combined Vulnerability Index																			
Very High	12.6	1.2	0.4	16.9	39.4	32.3	2.4	10.0	2.7	0.0	0.0	3.1	0.0	0.0	15.3	0.0	0.0	1.6	57.8
High	18.6	2.5	2.6	16.1	35.8	40.0	13.2	14.1	4.3	1.7	0.0	4.0	0.3	0.4	7.3	0.1	0.1	4.8	50.0
Moderate	18.6	7.7	2.0	19.2	29.3	28.3	14.4	17.7	3.1	0.5	0.0	2.9	0.5	0.5	8.5	1.1	0.4	10.8	49.9
Low	25.6	3.6	3.0	25.7	39.3	32.8	16.2	11.2	10.1	0.7	0.5	2.1	1.0	0.3	14.5	0.9	0.5	10.3	59.4
Very Low	39.0	2.0	4.0	24.0	54.4	42.1	20.6	6.3	2.4	0.0	0.0	5.3	0.2	0.0	15.8	1.1	0.0	24.0	59.3
Bio-Climatic Zone																			
Tropical	20.2	2.2	3.0	22.0	32.2	31.4	11.3	11.6	4.4	0.6	0.1	3.7	0.6	0.3	9.0	0.6	0.3	8.0	65.4
Sub-tropical	18.7	5.4	1.0	12.1	46.6	37.3	14.7	14.3	4.8	0.9	0.0	3.5	0.0	0.3	18.9	0.7	0.0	10.2	35.6
Temperate	56.3	7.1	0.0	36.7	78.1	69.2	17.2	8.2	3.0	0.0	0.0	0.0	0.0	0.0	6.3	0.0	0.0	16.8	28.0
Nepal	21.5	3.4	2.3	19.7	38.6	35.0	12.6	12.3	4.4	0.7	0.1	3.4	0.4	0.2	11.8	0.6	0.2	9.1	54.7

[10] This result is based on multiple responses.

Table 7-8 represents the percentage distribution of households reporting an increase of incidence of Disease in last 25 years. Out of 18 identified Disease, cough (38.6%) and fever (35%) are reported to have increased while only 0.1 per cent and 0.2 per cent respondents reported so for dengue and cholera respectively. Similarly, 17.7 per cent respondents in urban area reported that the incidence of respiratory disease is increasing while 9.4 per cent respondents reported so in rural area. Cough (100%), fever (100%), diarrhea (68.6%), dysentery (44.3%) and typhoid (60.7%) are reported to have increased in far-western mountain while 46.6 per cent respondents in Kathmandu Valley reported so for respiration related disease. Similarly, cough (32.2%) is reported as most frequently appearing disease in tropical zone in the past 25 years while 46.6 per cent and 78.1 per cent respondents reported so in sub-tropical and temperate zone respectively.

Table 7-9: Increase in Incidence of Vector-Borne Disease in Last 25 Years

Analytical Domain	Increased Incidence of Vector-borne Disease (HH, %)		Total
	Yes	No	
Urban/Rural			
Urban	12.85	87.15	100.00
Rural	20.97	79.03	100.00
Ecological Belt			
Mountain	36.43	63.57	100.00
Hill	15.31	84.69	100.00
Terai	18.79	81.21	100.00
Eco-Development Region			
Eastern Mountain	25.29	74.71	100.00
Eastern Hill	13.03	86.97	100.00
Eastern *Terai*	15.47	84.53	100.00
Central Mountain	13.89	86.11	100.00
Central Hill	19.18	80.82	100.00
Central *Terai*	19.52	80.48	100.00
Western Mountain	0.0	100.00	100.00
Western Hill	3.02	96.98	100.00
Western *Terai*	19.72	80.28	100.00
Mid-western Mountain	58.75	41.25	100.00
Mid-western Hill	40.49	59.51	100.00
Mid-western *Terai*	18.16	81.84	100.00
Far-western Mountain	71.51	28.49	100.00
Far-western Hill	15.88	84.12	100.00
Far-western *Terai*	32.01	67.99	100.00
Kathmandu Valley	4.32	95.68	100.00
NAPA Combined Vulnerability Index			
Very High	22.26	77.74	100.00
High	30.25	69.75	100.00
Moderate	10.17	89.83	100.00
Low	12.48	87.52	100.00
Very Low	15.16	84.84	100.00
Bio-Climatic Zone			
Tropical	17.27	82.73	100.00
Sub-tropical	18.61	81.39	100.00
Temperate	36.10	63.90	100.00
Sub-alpine	0.0	100.00	100.00
Nepal	**18.59**	**81.41**	**100.00**

Table 7-9 depicts percentage distribution of households observing an increase in the incidence of vector-borne Disease in last 25 years. An 18.59 per cent household is observing increase in incidence of vector-borne Disease while 81.41 per cent reported to be opposite. Similarly, 71.51 per cent households in far-western mountain eco-development region are observing such increase while all respondents (100%) in western mountain reported to be opposite. Among climatic zone, 36.10 per cent respondents in temperate-zone are observing increment of incidence of vector-borne Disease while none observed so in sub-alpine zone.

Table 7-10: Increase in Incidence of Waterborne Disease in Last 25 Years

Analytical Domain	Increased Incidence of Water Borne Disease (HH, %)		Total
	Yes	No	
Urban/Rural			
Urban	17.28	82.72	100.00
Rural	22.07	77.93	100.00
Ecological Belt			
Mountain	34.56	65.44	100.00
Hill	16.72	83.28	100.00
Terai	22.20	77.80	100.00
Eco-Development Region			
Eastern Mountain	23.69	76.31	100.00
Eastern Hill	14.01	w85.99	100.00
Eastern *Terai*	16.19	83.81	100.00
Central Mountain	6.61	93.39	100.00
Central Hill	20.54	79.46	100.00
Central *Terai*	23.28	76.72	100.00
Western Mountain	0.0	100.00	100.00
Western Hill	3.52	96.48	100.00
Western *Terai*	34.35	65.65	100.00
Mid-western Mountain	52.07	47.93	100.00
Mid-western Hill	43.77	56.23	100.00
Mid-western *Terai*	21.49	78.51	100.00
Far-western Mountain	84.15	15.85	100.00
Far-western Hill	12.21	87.79	100.00
Far-western *Terai*	26.08	73.92	100.00
Kathmandu Valley	11.53	88.47	100.00
NAPA Combined Vulnerability Index			
Very High	21.61	78.39	100.00
High	30.75	69.25	100.00
Moderate	12.74	87.26	100.00
Low	15.19	84.81	100.00
Very Low	25.51	74.49	100.00
Bio-Climatic Zone			
Tropical	20.05	79.95	100.00
Sub-tropical	19.89	80.11	100.00
Temperate	34.87	65.13	100.00
Sub-alpine	0.0	100.00	100.00
Nepal	**20.67**	**79.33**	**100.00**

Table 7-10 presents the percentage distribution of households observing an increase in incidence of waterborne Disease in last 25 years. It shows that 20.67 per cent respondents have been observing increase of incidence of waterborne Disease in last 25 years while 79.33 per cent reported the opposite. Higher percentage of respondents in far (84.15%) and mid-western mountain (52.07%) regions are observing such increase while no one reported so in western mountain region. Moreover, no one in sub-alpine climatic zone reported an increase on incidence of waterborne disease in last 25 years while 34.87 per cent respondents in temperate zone, 20.05 per cent in tropical zone, and 19.89 per cent in sub-tropical zone are observing an increase in such incidences in last 25 years.

CHAPTER 8

CLIMATE CHANGE AND NATURAL RESOURCES: WATER AND BIODIVERSITY

8.1. Summary of Findings

The survey result reveals that climate change has been significantly impacting natural resources including water and biodiversity in last 25 years across the country. Some of these impacts are more direct or first order such as drying up of streams and ponds, while others are manifested as the consequential effects of the first order impacts on ecosystems, agriculture and different dimensions of livelihoods. The survey divulges that 84.5 per cent households are observing decrease in surface water while 74.4per cent reported so for overall water resources (Figure 8-1).

Similarly, the survey results shows that most households (89%) are observing changes on water resources was mainly due to insufficient rainfall followed by increase in temperature (44.1%), and deforestation (37.9%). Significant respondents are observing such change due to population increase and earthquake, while less than one per cent respondents reported so due to decrease in temperature and sufficient rainfall (Figure 8-2).

The survey has primarily assessed climate change impact on three aspects of forests and biodiversity: changes and shifts in animal and plant species, infestation of invasive species in forest and agricultural land, and changes in flowering and fruiting behavior of the vegetation. Survey result indicates that people have witnessed changes in plant and animal species primarily the birds, trees, wildlife and the insects in last 25 years. About 78 per cent households are observing changes in bird species in their areas followed by tree (70%), other wild animals (61%), insect species (57%), and shrub/bush species (43%) (Figure 8-3).

Figure 8-1: Observed Changes on Water Resources in Last 25 Years

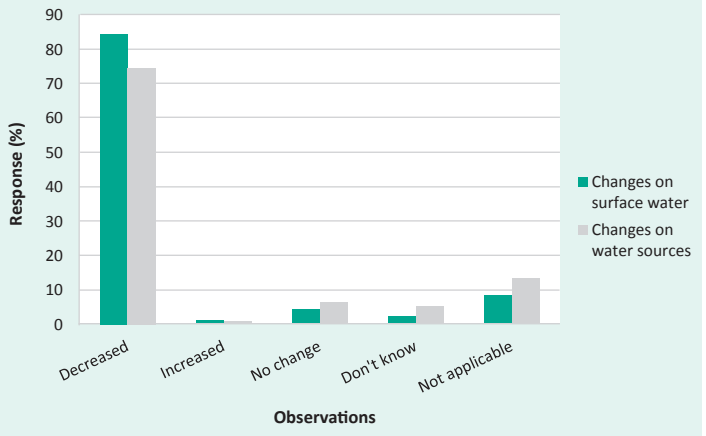


Figure 8-2: Causes of changes in water resources in last 25 years

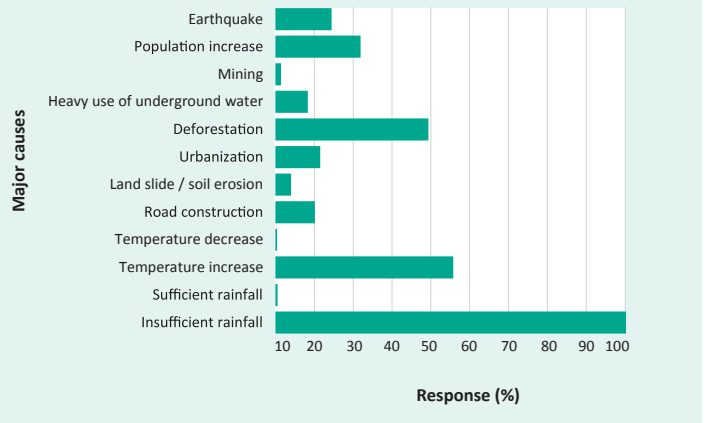
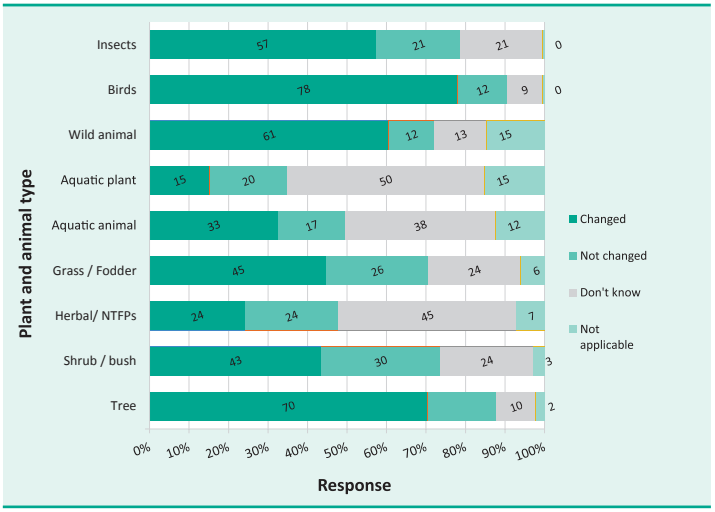


Figure 8-3: Changes in the status of animal and plant species in last 25 years



Similarly, presence of invasive species and their impact is found to be significant in last 25 years. As a whole, 36.5 per cent respondents are observing an appearance of invasive species under shrub/bush category in last 25 years followed by creeper plants in the land (16.7%) and creeper plants as climber (14.4%) respectively (Figure 8-4). However, appearance of such invasive species varies based on the land use. Higher percentage of households is observing appearance of invasive species in the agriculture land followed by forests land. Also, 92 per cent household are observing invasive species under creeper plants (land) category in agriculture land followed by that under shrub/bush (60%) and creeper plants (climber) (57%) respectively in last 25 years (Figure 8-5).

Households are observing different reasons for appearance of invasive species in their area in last 25 years. Higher percentage of households is observing natural causes as the main cause behind appearance of such invasive species. Survey result reveals that invasive

species under above mentioned three categories: creeper plant (land) (97%), creeper plant (climber) (94%), and shrub/ bush (81%), are appearing and spreading due to natural cause while less than one per cent households reported human cause for such changes (Figure 8-6).

Climate change impact on water, forest and biodiversity has affected different aspects of household livelihood including decrease in overall income. Different analytical domain wise survey result on different aspects of climate change impact on those resources and livelihood is presented in following sub-sections.

Figure 8-4: Appearance of Invasive Species in Last 25 Years

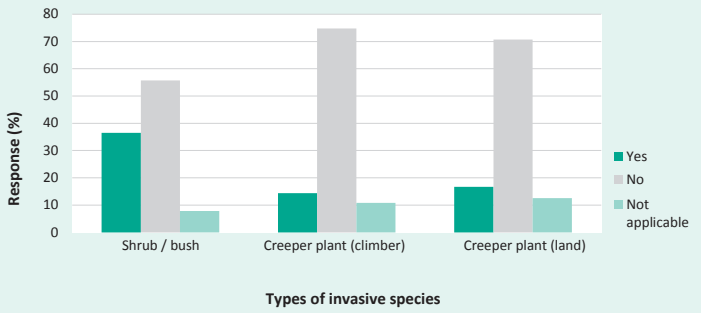


Figure 8-5: Appearance of Invasive Species Based on Land use in Last 25 Years

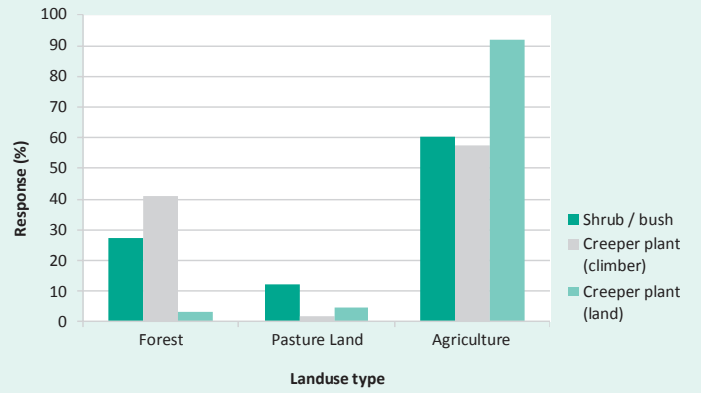
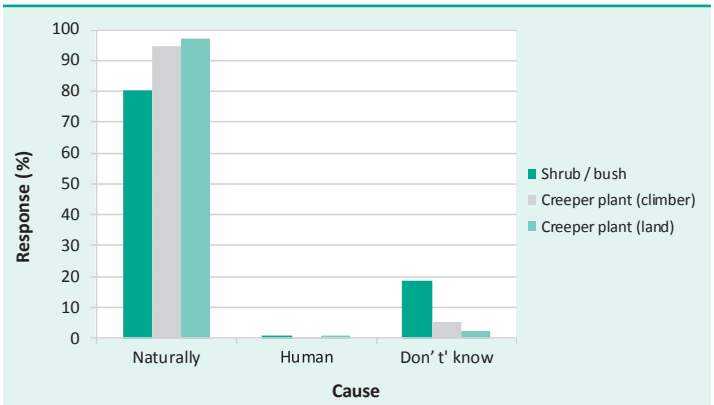


Figure 8-6: Cause for Appearance of New Invasive Species in Last 25 Years



8.2. Impact on Water Resources

Table 8-1: Observed Changes in Water Sources in Last 25 Years

Analytical Domain	Observed Change (HH, %)	
	Yes	No
Urban/ 524		
Urban	76.41	23.59
Rural	73.42	26.58
Ecological Belt		
Mountain	84.04	15.96
Hill	78.60	21.40
Terai	68.34	31.66
Eco-Development Region		
Eastern Mountain	61.54	38.46
Eastern Hill	87.97	12.03
Eastern *Terai*	59.85	40.15
Central Mountain	84.10	15.90
Central Hill	95.07	4.93
Central *Terai*	54.88	45.12
Western Mountain	88.39	11.61
Western Hill	41.97	58.03
Western *Terai*	98.37	1.63
Mid-western Mountain	96.83	3.17
Mid-western Hill	91.54	8.46
Mid-western *Terai*	96.67	3.33
Far-western Mountain	98.99	1.01
Far-western Hill	94.71	5.29
Far-western *Terai*	93.23	6.77
Kathmandu Valley	93.96	6.04
NAPA Combined Vulnerability Index		
Very High	86.68	13.32
High	84.94	15.06
Moderate	54.66	45.34
Low	70.56	29.44
Very Low	76.03	23.97
Bio-Climate Zones		
Tropical	71.58	28.42
Sub-tropical	78.73	21.27
Temperate	76.76	23.24
Sub-alpine	95.00	5.00
Nepal	**74.29**	**25.71**

Table 8-1 represents the percentage distribution of households observing changes in water sources in last 25 years. Higher percentage of households (74.29%) is observing changes in water sources. Majority of households in mountain region (84.04%) are observing changes on water sources followed by hill (78.60%) and *Terai* (68.34%) region. Similarly, 93.96 per cent households in Kathmandu Valley are observing such changes in last 25 years. Similarly, higher percentages of households in very vulnerable area (86.68%) under NAPA combined vulnerability are observing changes in water sources in last 25 years while only 54.66 per cent households reported so in moderate vulnerable area. Moreover, 95 per cent households in sub-alpine region are observing such changes while 78.73 per cent households in sub-tropical, 76.76 per cent in temperate, and 71.58 per cent in tropical region reported so.

Table 8-2: Observed Changes in Amount of Surface Water in Last 25 Years

Analytical Domain	Observed Change (HH, %)				
	Decreased	Increased	No change	Don't know	Not applicable
Urban/Rural					
Urban	86.43	1.10	2.11	2.89	7.47
Rural	83.67	0.83	5.15	1.78	8.58
Ecological Belt					
Mountain	82.67	4.62	12.43	0.27	0.0
Hill	90.80	0.46	4.58	3.07	1.10
Terai	78.51	0.72	2.55	1.45	16.78
Eco-Development Region					
Eastern Mountain	58.07	10.10	30.79	1.04	0.0
Eastern Hill	96.12	1.09	2.52	0.26	0.0
Eastern *Terai*	81.57	1.42	3.38	2.38	11.25
Central Mountain	84.57	6.00	9.43	0.0	0.0
Central Hill	97.95	0.58	1.22	0.25	0.0
Central *Terai*	74.84	0.20	2.97	1.02	20.97
Western Mountain	82.80	2.20	12.80	2.20	0.0
Western Hill	80.22	0.14	9.10	10.18	0.36
Western *Terai*	60.73	0.0	0.89	0.0	38.38
Mid-western Mountain	92.58	0.0	7.42	0.0	0.0
Mid-western Hill	91.08	0.24	7.40	0.0	1.29
Mid-western *Terai*	97.67	1.09	1.24	0.0	0.0
Far-western Mountain	100.00	0.0	0.0	0.0	0.0
Far-western Hill	99.48	0.0	0.52	0.0	0.0
Far-western *Terai*	88.68	0.83	0.71	4.11	5.66
Kathmandu Valley	82.10	0.42	3.42	2.24	11.82
NAPA Combined Vulnerability Index					
Very High	86.34	1.48	2.46	0.84	8.89
High	92.02	1.41	3.27	0.23	3.06
Moderate	75.95	0.08	7.26	4.39	12.32
Low	89.90	1.07	5.22	1.97	1.84
Very Low	70.38	0.0	1.25	4.36	24.01
Bio-Climate Zones					
Tropical	81.25	0.67	3.20	2.07	12.81
Sub-tropical	89.80	1.32	5.32	2.23	1.33
Temperate	87.13	0.99	10.27	1.60	0.0
Sub-alpine	85.00	0.0	15.00	0.0	0.0
Nepal	**84.47**	**0.91**	**4.26**	**2.10**	**8.25**

Table 8-2 shows the percentage distribution of households observing changes in amount of surface water in last 25 years. The survey result reveals that higher percent of households (84.47%) are observing decrease in amount of surface water while 4.26 per cent households reported to no change on it. Similarly, majority of households in hill (90.8%) are observing decrease in amount of water in its sources followed by mountain (82.67%) and *Terai* (78.51%). Likewise, 100 per cent households of far-western mountain and 99.48 per cent of far-western hill have observed a decrease in water amount in sources in last 25 years. Similarly, majority of households in all climatic zones are observing decrease in water amount in sources in last 25 years.

Table 8-3: Deterioration of Surface Water Quality in Last 25 Years

Analytical Domain	Deterioration (HH, %)			
	Yes	No	Don't know	Not applicable
Urban/Rural				
Urban	79.64	7.83	4.78	7.75
Rural	68.12	17.14	6.24	8.51
Ecological Belt				
Mountain	76.27	18.50	5.23	0.0
Hill	68.18	22.51	8.10	1.20
Terai	73.95	5.67	3.63	16.75
Eco-Development Region				
Eastern Mountain	44.89	46.63	8.48	0.0
Eastern Hill	70.77	26.27	1.94	1.02
Eastern *Terai*	73.55	7.81	7.33	11.31
Central Mountain	84.49	14.60	0.91	0.0
Central Hill	90.11	9.32	0.57	0.0
Central *Terai*	74.25	3.52	1.51	20.72
Western Mountain	0.0	95.60	4.40	0.0
Western Hill	34.56	38.20	27.01	0.23
Western *Terai*	60.31	0.56	0.75	38.38
Mid-western Mountain	81.25	4.47	14.28	0.0
Mid-western Hill	67.43	31.28	0.0	1.29
Mid-western *Terai*	83.98	13.91	2.11	0.0
Far-western Mountain	99.30	0.70	0.0	0.0
Far-western Hill	93.94	6.06	0.0	0.0
Far-western *Terai*	85.54	3.84	4.15	6.47
Kathmandu Valley	85.63	0.70	2.43	11.24
NAPA Combined Vulnerability Index				
Very High	83.76	6.20	1.23	8.81
High	80.32	15.51	0.96	3.21
Moderate	57.95	18.80	11.33	11.92
Low	74.26	17.16	6.17	2.40
Very Low	47.25	14.24	14.50	24.01
Bio-Climate Zones				
Tropical	73.02	9.51	4.71	12.76
Sub-tropical	69.24	21.95	7.29	1.52
Temperate	68.85	21.82	9.33	0.0
Sub-alpine	0.0	100.00	0.0	0.0
Nepal	**71.49**	**14.41**	**5.81**	**8.29**

Table 8-3 indicates the percentage distribution of households observing deterioration of surface water quality in last 25 years. It shows that 71.49 per cent households are observing deterioration in water quality in last 25 years though 5.81 per cent households do not know if it is happening. Higher percentage of households in urban area (79.64%) is observing a decrease in water quality while 68.12 per cent in rural area reported so. Similarly, majority of households in mountain region (76.27%) are observing such deterioration and so in Kathmandu Valley (85.63%). Similarly, 83.76 per cent households in very high vulnerable area under NAPA combined vulnerability index are observing deterioration in water quality in last 25 years while only 47.25 per cent households reported so in very low vulnerable area. Moreover, 73.02 per cent households in tropical region are observing such deterioration in last 25 years while no one in sub-alpine zone reported so.

Table 8-4: Observed Changes on Ground Water Level in Last 25 Years

Analytical Domain	Observed Change (HH, %)				
	Decreased	Increased	No change	Don't know	Not applicable
Urban/Rural					
Urban	79.79	0.73	2.68	5.94	10.85
Rural	72.21	0.71	8.07	4.78	14.22
Ecological Belt					
Mountain	35.16	2.08	5.14	1.82	55.81
Hill	71.42	0.32	4.36	8.79	15.11
Terai	84.16	0.88	8.85	2.05	4.06
Eco-Development Region					
Eastern Mountain	38.05	8.56	19.70	1.81	31.88
Eastern Hill	68.22	0.97	2.13	5.33	23.35
Eastern *Terai*	88.11	1.08	2.69	3.96	4.16
Central Mountain	7.55	0.0	0.0	2.39	90.07
Central Hill	86.05	0.0	1.59	1.75	10.61
Central *Terai*	72.35	1.06	20.15	0.95	5.49
Western Mountain	5.00	0.0	6.61	11.01	77.38
Western Hill	64.38	0.14	8.37	24.38	2.73
Western *Terai*	99.33	0.33	0.22	0.12	0.0
Mid-western Mountain	70.90	0.0	1.49	2.12	25.48
Mid-western Hill	52.22	0.0	8.55	0.53	38.71
Mid-western *Terai*	93.01	0.56	2.61	2.25	1.56
Far-western Mountain	48.06	0.0	0.0	0.0	51.94
Far-western Hill	96.54	1.69	1.03	0.45	0.28
Far-western *Terai*	90.14	0.16	1.17	1.72	6.82
Kathmandu Valley	64.58	0.0	0.0	7.77	27.65
NAPA Combined Vulnerability Index					
Very High	76.53	0.45	1.02	2.43	19.56
High	79.60	1.78	4.49	0.98	13.15
Moderate	58.64	0.31	17.05	10.99	13.01
Low	77.54	0.48	5.15	4.40	12.44
Very Low	90.57	0.21	0.47	8.76	0.0
Bio-Climate Zones					
Tropical	80.73	0.71	7.92	4.29	6.35
Sub-tropical	66.03	0.78	3.96	6.77	22.47
Temperate	54.67	0.28	6.83	3.92	34.29
Sub-alpine	5.00	0.0	0.0	0.0	95.00
Nepal	**74.43**	**0.72**	**6.50**	**5.12**	**13.24**

Table 8-4 represents the percentage distribution of households observing changes in ground water level in last 25 years. The survey result shows that 74.43 per cent households are observing decrease in ground water level while only 0.72 per cent household reported an increase. Similarly, 79.79 per cent households in urban area are observing decrease in ground water level and in *Terai* (84.16%) while in hill is 71.42 per cent. Similarly, higher percentage of households in tropical zone (80.73%) is observing a decrease in ground water level in last 25 years followed by sub-tropical zone (66.03%) and temperate zone (54.67%). However, only 5 per cent households in sub-alpine zone observed such change in last 25 years.

Table 8-5: Deterioration of Ground Water Quality in Last 25 Years

Analytical Domain	Deterioration (HH, %)			
	Yes	No	Don't know	Not applicable
Urban/Rural				
Urban	74.13	6.66	8.00	11.21
Rural	65.15	12.76	7.82	14.27
Ecological Belt				
Mountain	35.07	4.75	4.30	55.89
Hill	54.61	17.44	12.74	15.21
Terai	86.48	5.62	3.66	4.23
Eco-Development Region				
Eastern Mountain	39.71	16.54	11.31	32.44
Eastern Hill	56.85	9.40	7.75	25.99
Eastern *Terai*	79.71	7.94	7.99	4.36
Central Mountain	7.66	1.46	1.93	88.95
Central Hill	74.29	11.31	4.47	9.92
Central *Terai*	91.15	2.40	0.82	5.63
Western Mountain	0.0	9.40	15.42	75.18
Western Hill	29.27	33.88	34.36	2.49
Western *Terai*	99.34	0.12	0.41	0.12
Mid-western Mountain	69.64	0.60	3.63	26.12
Mid-western Hill	41.27	20.28	0.74	37.71
Mid-western *Terai*	77.82	16.12	4.50	1.56
Far-western Mountain	46.84	0.0	0.0	53.16
Far-western Hill	93.67	5.32	0.45	0.56
Far-western *Terai*	83.89	6.54	2.10	7.47
Kathmandu Valley	61.92	2.81	7.55	27.72
NAPA Combined Vulnerability Index				
Very High	70.23	6.63	3.91	19.23
High	76.18	8.21	2.11	13.51
Moderate	58.15	14.59	14.70	12.56
Low	64.72	13.85	8.04	13.40
Very Low	72.30	12.93	14.42	0.35
Bio-Climate Zones				
Tropical	79.69	7.93	6.08	6.31
Sub-tropical	50.27	15.86	11.07	22.80
Temperate	42.28	14.66	7.73	35.32
Sub-alpine	0.0	5.00	0.0	95.00
Nepal	**67.78**	**10.97**	**7.87**	**13.37**

Table 8-5 represents the percentage distribution of households observing deterioration of ground water quality in last 25 years. The table shows that 67.78 per cent households are observing a deterioration of ground water quality in last 25 years while 10.97 per cent households are not observing so. Similarly, higher percentage of households in *Terai* (86.48%) is observing such deterioration in water quality followed by hill (54.61%) and mountain (35.07%). While 79.69 per cent households in tropical zone are observing deterioration in ground water quality in last 25 years where as none observed so in sub-alpine zone.

Table 8-6: Surface Water Sources Dried in Last 25 Years

Analytical Domain	Response (HH, %)			
	Yes	No	Don't know	Not applicable
Urban/Rural				
Urban	56.42	27.01	7.05	9.51
Rural	57.85	29.34	3.92	8.88
Ecological Belt				
Mountain	74.56	21.68	3.74	0.02
Hill	63.83	27.88	6.11	2.18
Terai	48.14	30.63	3.77	17.46
Eco-Development Region				
Eastern Mountain	36.58	56.69	6.73	0.0
Eastern Hill	82.34	15.14	1.69	0.83
Eastern *Terai*	31.40	49.40	5.43	13.77
Central Mountain	83.76	10.86	5.38	0.0
Central Hill	82.05	15.06	2.55	0.34
Central *Terai*	65.38	13.04	1.22	20.35
Western Mountain	19.58	73.21	5.00	2.20
Western Hill	23.91	59.77	16.22	0.10
Western *Terai*	30.38	23.96	7.74	37.93
Mid-western Mountain	90.24	9.13	0.64	0.0
Mid-western Hill	79.46	18.97	0.16	1.41
Mid-western *Terai*	67.52	30.02	2.45	0.0
Far-western Mountain	92.09	7.91	0.0	0.0
Far-western Hill	89.08	10.45	0.47	0.0
Far-western *Terai*	40.38	47.87	4.35	7.39
Kathmandu Valley	48.11	18.70	8.44	24.75
NAPA Combined Vulnerability Index				
Very High	56.73	27.84	3.44	12.00
High	75.73	19.97	1.11	3.19
Moderate	52.03	28.99	7.26	11.72
Low	54.36	37.40	5.20	3.04
Very Low	32.71	32.67	10.89	23.72
Bio-Climate Zones				
Tropical	52.53	29.61	4.50	13.37
Sub-tropical	64.88	26.76	5.65	2.70
Temperate	66.70	29.98	3.28	0.04
Sub-alpine	35.00	60.00	5.00	0.0
Nepal	**57.43**	**28.66**	**4.84**	**9.07**

Table 8-6 shows the percentage distribution of households observing dried surface water sources -in last 25 years. As a whole, 57.43 per cent households are observing the dried up of surface water sources in last 25 years. Similarly, majority of households in far-western mountain (92.09%) and mid-western mountain (90.24%) region are observing such changes. Moreover, majority of households in temperate zone (66.70%) are observing such changes in last 25 years followed by sub-tropical (64.88%), tropical (52.53%), and sub-alpine (35%) in last 25 years.

Table 8-7: Ground Water Sources Depletion in Last 25 Years

Analytical Domain	Response (HH, %)			
	Yes	No	Don't know	Not applicable
Urban/Rural				
Urban	57.00	24.70	7.62	10.68
Rural	53.11	28.35	5.05	13.48
Ecological Belt				
Mountain	27.08	13.17	1.84	57.91
Hill	56.60	19.38	9.96	14.06
Terai	56.59	37.55	2.36	3.50
Eco-Development Region				
Eastern Mountain	41.54	49.84	5.41	3.20
Eastern Hill	62.71	7.46	9.48	20.34
Eastern *Terai*	51.05	43.41	2.37	3.17
Central Mountain	4.43	0.0	0.0	95.57
Central Hill	77.64	9.57	7.30	5.49
Central *Terai*	57.45	37.19	1.68	3.68
Western Mountain	0.0	5.00	0.0	95.00
Western Hill	31.10	44.78	21.09	3.03
Western *Terai*	59.10	34.14	5.85	0.90
Mid-western Mountain	69.39	4.59	2.69	23.33
Mid-western Hill	42.52	15.10	0.29	42.09
Mid-western *Terai*	80.21	14.29	1.20	4.30
Far-western Mountain	9.35	0.70	0.0	89.96
Far-western Hill	61.01	11.78	0.0	27.21
Far-western *Terai*	39.48	51.08	1.42	8.02
Kathmandu Valley	81.92	3.87	5.73	8.49
NAPA Combined Vulnerability Index				
Very High	59.54	18.42	5.14	16.89
High	61.83	18.89	2.39	16.90
Moderate	42.52	37.01	9.91	10.55
Low	54.17	32.56	2.39	10.89
Very Low	52.55	33.64	13.24	0.56
Bio-Climate Zones				
Tropical	57.65	32.32	4.43	5.59
Sub-tropical	50.19	18.52	8.75	22.54
Temperate	40.25	26.54	1.91	31.29
Sub-alpine	0.0	5.00	0.0	95.00
Nepal	**54.25**	**27.28**	**5.80**	**12.66**

Table 8-7 depicts the percentage distribution of households observing depletion on ground water sources in last 25 years. Almost equal percentage of households in hill (56.60%) and *Terai* (56.59%) are observing the depletion of ground water sources last 25 years while 57 per cent in urban and 53.11 per cent in rural area reported so. Moreover, 81.92 per cent of households in Kathmandu Valley are observing such depletion in last 25 years. Similarly, 57.65 per cent households in tropical zone are observing depletion on ground water sources while none in sub-alpine zone reported so.

Table 8-8: Completely Dried Ground Water Sources in Last 25 Years

Analytical Domain	Response (HH, %)				
	Yes	No	Don't know	Not applicable	Total
Urban/Rural					
Urban	42.47	38.74	7.03	11.76	100.00
Rural	36.82	43.15	5.95	14.08	100.00
Ecological Belt					
Mountain	23.67	15.32	1.71	59.30	100.00
Hill	48.81	24.60	10.86	15.73	100.00
Terai	30.76	63.55	2.49	3.21	100.00
Eco-Development Region					
Eastern Mountain	37.03	53.19	4.87	4.91	100.00
Eastern Hill	54.77	8.48	12.74	24.00	100.00
Eastern *Terai*	17.47	77.69	1.78	3.06	100.00
Central Mountain	2.05	0.0	0.0	97.95	100.00
Central Hill	73.06	9.76	10.99	6.18	100.00
Central *Terai*	33.64	60.83	2.58	2.95	100.00
Western Mountain	0.0	6.61	0.0	93.39	100.00
Western Hill	16.72	59.81	18.12	5.35	100.00
Western *Terai*	53.21	40.94	5.85	0.0	100.00
Mid-western Mountain	68.54	4.59	2.69	24.18	100.00
Mid-western Hill	39.04	17.09	1.05	42.82	100.00
Mid-western *Terai*	51.40	43.05	1.25	4.30	100.00
Far-western Mountain	2.63	7.53	0.0	89.84	100.00
Far-western Hill	55.66	15.22	0.47	28.65	100.00
Far-western *Terai*	9.55	78.99	1.13	10.33	100.00
Kathmandu Valley	77.07	9.13	5.47	8.33	100.00
NAPA Combined Vulnerability Index					
Very High	37.69	37.96	7.12	17.23	100.00
High	47.82	31.73	3.17	17.28	100.00
Moderate	29.91	48.17	9.95	11.97	100.00
Low	36.90	48.63	2.23	12.24	100.00
Very Low	42.37	45.93	11.59	0.10	100.00
Bio-Climate Zones					
Tropical	35.67	54.02	4.33	5.99	100.00
Sub-tropical	43.58	22.59	9.90	23.94	100.00
Temperate	37.67	25.98	4.67	31.67	100.00
Sub-alpine	0.0	0.0	0.0	100.00	100.00
Nepal	**38.47**	**41.86**	**6.27**	**13.40**	**100.00**

Table 8-8 depicts the percentage distribution of household observing ground water sources completely dried up in last 25 years. Table shows that 38.47 per cent of total households are observing a complete drying up of ground water sources whereas a higher proportion (41.86%) have reported the opposite. Similarly, 30.76 per cent households in *Terai* are observing such changes while 63.55 per cent households have not reported so. However, higher percentage of households in Kathmandu Valley (77.07%) reported complete drying of water resources in last 25 years. Moreover, 47.82 per cent households in high vulnerable area under NAPA combined vulnerability index are observing such instances while only 29.91 per cent households reported so in moderately vulnerable area. Similarly, 43.58 per cent households in sub-tropical zone are observing such instances in last 25 years while no one in sub-alpine zone reported so.

Table 8-9: Observed Changes in Amount of Stone-spout Water in Last 25 Years

Analytical Domain	Observed Changes (HH, %)				
	Decreased	Increased	No change	Don't know	Not applicable
Urban/Rural					
Urban	43.46	0.88	3.40	4.03	48.24
Rural	53.82	0.54	3.72	2.87	39.04
Ecological Belt					
Mountain	78.43	4.41	8.55	2.86	5.75
Hill	84.87	0.55	5.55	4.37	4.66
Terai	12.21	0.08	0.87	2.11	84.72
Eco-Development Region					
Eastern Mountain	56.52	14.56	28.23	0.69	0.0
Eastern Hill	92.69	0.76	3.62	1.96	0.97
Eastern *Terai*	3.34	0.0	0.0	1.48	95.18
Central Mountain	71.73	2.40	2.42	7.50	15.95
Central Hill	89.50	0.47	5.80	2.26	1.97
Central *Terai*	1.27	0.0	1.00	0.23	97.50
Western Mountain	77.80	2.20	17.20	0.0	2.80
Western Hill	80.59	0.0	7.74	10.85	0.82
Western *Terai*	34.07	0.0	1.41	8.75	55.77
Mid-western Mountain	96.58	0.0	3.42	0.0	0.0
Mid-western Hill	84.10	0.67	8.35	0.45	6.43
Mid-western *Terai*	53.03	0.0	1.18	2.31	43.47
Far-western Mountain	100.00	0.0	0.0	0.0	0.0
Far-western Hill	94.98	2.42	0.47	0.0	2.13
Far-western *Terai*	19.97	1.32	3.41	3.69	71.61
Kathmandu Valley	55.51	0.55	0.0	5.03	38.92
NAPA Combined Vulnerability Index					
Very High	46.98	0.57	3.22	2.91	46.32
High	62.19	1.76	4.12	0.25	31.68
Moderate	52.28	0.12	4.09	3.67	39.84
Low	40.56	0.32	3.28	2.51	53.33
Very Low	49.82	0.0	2.93	12.09	35.16
Bio-Climate Zones					
Tropical	30.24	0.19	1.91	2.81	64.84
Sub-tropical	82.56	1.42	5.65	4.03	6.34
Temperate	84.05	0.71	11.06	2.31	1.87
Sub-alpine	80.00	0.0	15.00	0.0	5.00
Nepal	**50.79**	**0.64**	**3.63**	**3.21**	**41.73**

Table 8-9 represents percentage distribution of households observing changes in amount of stone-spout water in last 25 years. Overall, 50.79 per cent household are observing a decrease in amount of stone-spout water while only 0.64 per cent reported to an increase. Similarly, 53.82 per cent households in rural area and 43.46 per cent in urban are observing such change in last 25 years. Majority of households in all eco-development regions are observing a decrease in amount of stone-sprout water in last 25 years except in central *Terai* where only 1.27 per cent households reported so. Similarly, higher percentage of households in temperate zone (84.05%) are observing such changes in last 25 years followed by sub-tropical zone (82.56%), sub-alpine zone (80%), and tropical zone (30.24%) respectively.

Table 8-10: Completely Dried Water in Stone-spout in Last 25 Years

Analytical Domain	Response (HH, %)				
	Yes	No	Don't know	Not applicable	Total
Urban/Rural					
Urban	33.38	12.90	4.56	49.16	100.00
Rural	38.47	18.60	3.36	39.56	100.00
Ecological-Belt					
Mountain	69.58	20.26	4.45	5.71	100.00
Hill	62.22	28.85	4.92	4.01	100.00
Terai	6.33	4.53	2.39	86.75	100.00
Eco-Development Region					
Eastern Mountain	35.63	56.62	7.06	0.69	100.00
Eastern Hill	81.35	16.05	2.35	0.24	100.00
Eastern *Terai*	1.08	0.0	1.05	97.87	100.00
Central Mountain	68.84	8.23	7.55	15.39	100.00
Central Hill	78.97	14.78	4.58	1.67	100.00
Central *Terai*	0.15	1.13	0.0	98.72	100.00
Western Mountain	13.99	80.42	2.80	2.80	100.00
Western Hill	23.35	66.15	10.03	0.47	100.00
Western *Terai*	12.22	19.60	12.28	55.90	100.00
Mid-western Mountain	94.02	5.98	0.0	0.0	100.00
Mid-western Hill	72.28	21.13	0.57	6.02	100.00
Mid-western *Terai*	38.80	15.75	2.40	43.05	100.00
Far-western Mountain	91.62	8.38	0.0	0.0	100.00
Far-western Hill	90.99	9.01	0.0	0.0	100.00
Far-western *Terai*	9.87	2.74	4.85	82.54	100.00
Kathmandu Valley	54.27	3.26	5.67	36.80	100.00
NAPA Combined Vulnerability Index					
Very High	41.32	7.99	4.29	46.39	100.00
High	53.87	12.91	1.02	32.21	100.00
Moderate	26.85	29.16	4.06	39.93	100.00
Low	32.31	9.67	2.28	55.73	100.00
Very Low	19.44	33.93	11.66	34.97	100.00
Bio-Climate Zones					
Tropical	19.95	10.79	3.07	66.19	100.00
Sub-tropical	63.39	26.20	4.55	5.85	100.00
Temperate	64.29	28.22	5.96	1.53	100.00
Sub-alpine	25.00	65.00	5.00	5.00	100.00
Nepal	**36.98**	**16.93**	**3.72**	**42.37**	**100.00**

Table 8-10 depicts the percentage distribution of households observing completely dried up stone-sprout last 25 years. Total 36.98 per cent households are observing completely dried stone-sprout while 16.93 per cent households reported opposite. Similarly, 38.47 per cent households in rural area are observing such changes while 33.38 per cent households in urban area reported so. Moreover, higher percentage of households in mountain region (69.58%) have reported to have observed completely dried water in stone-spout in last 25 years followed by hill (62.22%) and *Terai* (6.33%). Similarly, 54.27 per cent of the households in Kathmandu Valley reported to observe such changes in last 25 years. Moreover, higher percentages of household in temperate zones (64.29%) are observing a complete drying of water in stone-sprout while only 19.95 per cent households reported so in tropical zone.

Table 8-11: Observed Changes in Duration of Tap Water Supply in Last 25 Years

Analytical Domain	Observed Change (HH, %)					
	Decreased	Increased	No change	Stopped	Not applicable	Total
Urban/Rural						
Urban	46.36	6.36	15.76	0.48	31.05	100.00
Rural	41.91	3.53	13.41	0.13	41.02	100.00
Ecological Belt						
Mountain	74.77	3.16	20.13	0.0	1.94	100.00
Hill	66.52	8.37	19.21	0.40	5.50	100.00
Terai	14.65	0.58	7.99	0.11	76.67	100.00
Eco-Development Region						
Eastern Mountain	44.83	9.34	45.82	0.0	0.0	100.00
Eastern Hill	85.80	2.93	10.48	0.54	0.26	100.00
Eastern *Terai*	6.20	1.54	4.23	0.0	88.03	100.00
Central Mountain	82.23	1.37	15.81	0.0	0.59	100.00
Central Hill	72.16	19.92	6.46	0.0	1.45	100.00
Central *Terai*	3.07	0.13	3.72	0.0	93.08	100.00
Western Mountain	21.19	41.01	37.80	0.0	0.0	100.00
Western Hill	47.17	1.86	48.39	0.0	2.58	100.00
Western *Terai*	50.85	0.0	16.38	0.0	32.76	100.00
Mid-western Mountain	96.21	0.0	3.79	0.0	0.0	100.00
Mid-western Hill	53.35	1.00	15.72	0.0	29.93	100.00
Mid-western *Terai*	42.53	0.0	4.35	1.11	52.01	100.00
Far-western Mountain	79.50	0.0	11.55	0.0	8.94	100.00
Far-western Hill	97.68	1.24	1.09	0.0	0.0	100.00
Far-western *Terai*	16.19	0.0	44.27	0.0	39.54	100.00
Kathmandu Valley	68.73	23.27	0.18	4.39	3.43	100.00
NAPA Combined Vulnerability Index						
Very High	50.24	5.14	5.79	0.61	38.22	100.00
High	45.58	10.14	7.37	0.0	36.91	100.00
Moderate	36.04	1.11	23.61	0.18	39.06	100.00
Low	37.13	2.56	15.48	0.24	44.59	100.00
Very Low	52.28	0.0	24.13	0.0	23.59	100.00
Bio-Climate Zones						
Tropical	24.90	3.29	11.60	0.10	60.12	100.00
Sub-tropical	71.08	6.45	17.61	0.50	4.35	100.00
Temperate	76.58	2.57	20.65	0.0	0.20	100.00
Sub-alpine	30.00	30.00	40.00	0.0	0.0	100.00
Nepal	**43.21**	**4.36**	**14.10**	**0.23**	**38.10**	**100.00**

Table 8-11 represents the percentage distribution of households observing changes in duration of tap water supply in last 25 years. The result shows that 43.21 per cent households are observing decrease in the duration of tap water supply in last 25 years while only 4.36 per cent reported an increase. Similarly, 46.36 per cent households in urban area are observing a decrease in duration of tap water supply while 41.91 per cent households reported so in rural area. Among the climatic zones, higher percentage of households in temperate zone (76.58%) are observing a decrease in duration of tap water supply in last 25 years while only 24.90 per cent households in tropical and 30 per cent households in sub-alpine zone have reported so.

Table 8-12: Reasons of Changes in Water Sources

Analytical Domain	Reasons of Change (HH, %)[11]												
	Insufficient rainfall	Sufficient rainfall	Temperature increase	Temperature decrease	Road construction	Landslide / soil erosion	Urbanisation	Deforestation	Heavy use of underground water	Mining	Population increase	Earthquake	Others
Urban/Rural													
Urban	81.8	0.7	43.0	0.1	9.9	2.8	24.8	38.9	13.9	1.8	27.1	8.8	3.9
Rural	92.1	0.4	44.6	0.5	9.8	4.4	5.3	37.4	5.4	1.2	18.4	16.1	3.1
Ecological Belt													
Mountain	76.9	1.7	37.6	0.9	9.9	4.1	3.7	41.3	0.0	0.0	20.5	27.6	4.6
Hill	89.5	0.5	45.7	0.4	16.0	7.0	13.6	26.4	4.7	1.2	21.8	20.9	2.3
Terai	91.1	0.3	43.5	0.3	2.8	0.3	9.9	50.2	13.4	1.9	20.3	3.0	4.2
Eco-Development Region													
Eastern Mountain	71.7	3.7	37.7		28.9	21.5	9.4	4.8	0.0	0.0	23.6	39.3	10.4
Eastern Hill	97.9	0.5	52.3	0.3	24.4	2.3	12.6	23.8	1.9	0.2	20.0	16.5	3.6
Eastern *Terai*	84.1	0.0	16.5	0.0	3.2	0.0	10.3	42.5	17.3	1.0	25.7	4.9	6.7
Central Mountain	54.8	1.7	27.0	0.0	5.6	0.0	3.3	13.7	0.0	0.0	22.5	55.6	6.8
Central Hill	95.1	0.4	54.9	1.0	20.6	0.6	11.1	17.7	2.8	1.1	13.3	32.2	0.2
Central *Terai*	98.8	0.3	61.8	0.3	0.3	0.0	1.9	41.1	1.8	0.5	6.8	2.8	4.9
Western Mountain	91.9	2.5	21.5	5.7	5.0	16.3	0.0	17.4	0.0	0.0	0.0	8.1	24.6
Western Hill	77.5	0.4	21.5	0.0	11.4	6.2	5.4	12.1	1.1	2.0	23.3	34.9	6.0
Western *Terai*	87.6	0.1	46.5	0.5	3.5	0.4	16.9	70.8	29.0	5.9	24.1	1.1	1.1
Mid-western Mountain	94.6	0.0	2.1	0.0	8.3	0.0	2.8	59.5	0.0	0.0	34.9	2.1	0.0
Mid-western Hill	88.3	0.5	39.0	0.0	11.1	19.2	8.3	48.9	0.7	0.0	28.9	6.6	2.1
Mid-western *Terai*	91.6	0.6	34.0	0.0	7.1	1.0	16.7	47.7	10.0	2.1	35.1	3.8	3.3
Far-western Mountain	97.5	1.6	90.4	3.8	3.8	0.5	1.1	96.3	0.0	0.0	1.7	0.5	0.0
Far-western Hill	95.4	1.7	75.4	0.0	6.8	31.6	0.0	58.1	2.8	5.3	14.6	1.0	1.3
Far-western *Terai*	95.2	1.1	84.3	1.0	1.6	0.7	11.0	72.0	14.2	1.1	16.6	0.0	0.9
Kathmandu Valley	64.3	0.0	21.7	0.0	3.4	0.0	63.4	20.6	35.0	0.7	51.4	6.5	2.3
NAPA Combined Vulnerability Index													
Very High	82.2	0.4	38.3	0.6	8.5	0.2	19.4	28.9	14.5	0.7	22.1	14.3	2.7
High	96.5	0.6	49.7	0.1	12.6	6.2	5.2	36.5	0.7	1.5	16.2	19.7	3.5
Moderate	89.8	0.6	51.4	0.5	11.2	3.7	2.2	33.0	1.7	0.8	12.9	18.2	3.8
Low	87.1	0.6	39.4	0.3	9.7	7.7	14.6	46.8	7.5	1.0	29.7	5.7	4.7
Very Low	89.3	0.1	40.0	0.4	3.6	0.3	14.5	57.8	23.5	4.8	29.8	5.0	0.9
Bio-Climate Zones													
Tropical	90.3	0.3	42.3	0.4	7.6	2.0	9.2	43.9	9.9	1.7	19.7	11.4	4.2
Sub-tropical	87.5	0.8	48.0	0.4	13.2	6.7	15.3	28.4	5.9	1.0	23.1	17.8	1.9
Temperate	85.2	0.7	35.8	0.5	11.7	6.1	3.0	36.7	0.0	0.0	22.4	14.9	3.0
Sub-alpine	94.7	0.0	31.6	5.3	0.0	10.5	0.0	0.0	0.0	0.0	0.0	5.3	36.8
Nepal	**89.0**	**0.5**	**44.1**	**0.4**	**9.8**	**3.9**	**11.1**	**37.9**	**8.0**	**1.4**	**21.1**	**13.9**	**3.3**

[11] The result is based on the multiple response

Table 8-12 indicates percentage distribution of households in response to different reasons to change in water sources. The survey result reveals that higher percentage of households (89%) reported insufficient rainfall as the major cause to change on water sources in last 25 years followed by temperature increase (44.1%), and deforestation (37.9%). Similarly, 21.1 per cent households reported population increase as a reason to change on water sources while only 3.9 per cent households reported so due to landslide/ soil erosion. High percentage of households in Kathmandu Valley (64.3%) also reported insufficient rainfall as a reason of change in water sources whilst 63.4 per cent reported for urbanisation and 51.4 per cent for increased population. Similarly, majority of households in all climatic zones are observing insufficient rainfall as the main reason to change on water sources in last 25 years.

8.3. Impact on Plant and Animal Species

Table 8-13: Observed Changes in the Plant and Animal Species in Last 25 Years

Plant and Animal Species (Categories)	Observed Change (HH, %)				Total
	Changed	Not changed	Don't know	Not applicable	
Tree	70.43	17.39	10.01	2.17	100.00
Shrub/bush	43.47	30.16	23.56	2.81	100.00
Herbal plant/non-timber forest products	24.18	23.57	45.15	7.10	100.00
Grass / Fodder	44.85	25.68	23.50	5.97	100.00
Aquatic animal	32.57	16.99	38.04	12.40	100.00
Aquatic plant	15.26	19.57	49.98	15.18	100.00
Wild animal	60.56	11.54	13.34	14.56	100.00
Birds	78.09	12.44	9.00	0.47	100.00
Insects	57.45	21.37	20.81	0.38	100.00

Table 8-13 represents the percentage distribution of households observing changes in plant and animal species in last 25 years. Higher percentage of households are observing changes in birds species (78.09%) in last 25 years followed by trees (70.43%), wild animals (60.56%) and insects (57.45%).

Table 8-14: Observed Changes in the Plant and Animal Species in Rural-Urban Context in Last 25 Years

Plant and Animal Species (Categories)	Response (HH, %)				Total
	Changed	Not changed	Don't know	Not applicable	
Urban					
Tree	67.74	9.55	15.74	6.97	100.00
Shrub/bush	44.10	16.29	31.00	8.61	100.00
Herbal plant/non-timber forest product	19.84	12.19	51.89	16.09	100.00
Grass / Fodder	34.70	14.81	34.93	15.56	100.00
Aquatic animal	34.63	11.08	38.80	15.49	100.00
Aquatic plant	13.98	12.93	56.72	16.37	100.00
Wild animal	58.39	7.86	16.77	16.98	100.00
Birds	77.70	9.38	12.09	0.84	100.00
Insects	55.81	15.17	27.86	1.15	100.00

Plant and Animal Species (Categories)	Response (HH, %)				Total
	Changed	Not changed	Don't know	Not applicable	
Rural					
Tree	71.54	20.64	7.64	0.18	100.00
Shrub/bush	43.22	35.90	20.48	0.40	100.00
Herbal plant/non-timber forest product	25.97	28.29	42.36	3.38	100.00
Grass/Fodder	49.05	30.18	18.77	2.00	100.00
Aquatic animal	31.71	19.44	37.72	11.12	100.00
Aquatic plant	15.79	22.33	47.19	14.68	100.00
Wild animal	61.46	13.07	11.91	13.56	100.00
Birds	78.25	13.71	7.73	0.31	100.00
Insects	58.12	23.93	17.89	0.06	100.00

Table 8-14 depicts the percentage distribution of households observing changes in the plant and animal species by rural-urban area in last 25 years. Almost equal percentage of households in rural (78.25%) and urban (77.70%) reported to observing change in bird species. Similarly, majority households in rural area (71.54%) are observing changes in tree species while 67.74 per cent households are observing so in urban area. Moreover, 35.90 per cent households in rural area and 16.29 per cent households in urban area reported that they are not noticing such change in shrub/bush species in last 25 years.

Table 8-15: Observed Changes in the Plant and animal Species by Ecological Belt in Last 25 Years

Plant and Animal Species (Categories)	Observed Changes (HH, %)				Total
	Changed	Not changed	Don't know	Not applicable	
Mountain					
Tree	64.90	25.91	9.19	0.0	100.00
Shrub/bushShrub/bush	33.27	37.41	29.32	0.0	100.00
Herbal plant/non-timber forest product	21.63	31.76	46.32	0.29	100.00
Grass / Fodder	41.85	34.48	23.56	0.12	100.00
Aquatic animal	10.45	31.38	46.86	11.31	100.00
Aquatic plant	1.10	29.31	58.36	11.23	100.00
Wild animal	82.86	7.89	9.25	0.0	100.00
Birds	77.80	12.07	10.13	0.0	100.00
Insects	43.51	24.98	31.34	0.17	100.00
Hill					
Tree	56.70	26.80	12.57	3.94	100.00
Shrub/bush	42.04	30.99	22.86	4.11	100.00
Herbal plant/non-timber forest product	22.03	26.88	46.03	5.06	100.00
Grass / Fodder	39.57	33.49	22.42	4.53	100.00
Aquatic animal	12.04	18.05	49.11	20.80	100.00
Aquatic plant	1.42	17.60	55.95	25.03	100.00
Wild animal	68.18	13.89	12.93	5.01	100.00
Birds	68.50	19.87	11.05	0.58	100.00
Insects	45.50	28.56	25.44	0.50	100.00

Plant and Animal Species (Categories)	Observed Changes (HH, %)				Total
	Changed	Not changed	Don't know	Not applicable	
Terai					
Tree	85.01	6.59	7.61	0.79	100.00
Shrub/bush	46.65	28.10	23.26	1.99	100.00
Herbal plant/non-timber forest product	26.75	18.89	44.07	10.29	100.00
Grass / Fodder	50.61	16.43	24.56	8.40	100.00
Aquatic animal	56.74	13.47	25.53	4.26	100.00
Aquatic plant	31.44	19.86	42.62	6.08	100.00
Wild animal	49.17	9.85	14.45	26.54	100.00
Birds	87.66	5.13	6.78	0.43	100.00
Insects	71.70	13.60	14.41	0.29	100.00

Table 8-15 shows the percentage distribution of households observing changes in plant and animal species by ecological belt in last 25 years. Majority of households in all ecological belts: 87.66 per cent in *Terai*, 68.50 per cent in hill and 77.80 per cent in mountain are observing change in bird species. Similarly, high percentage of households in mountain (82.86%) and hill (68.18%) reported such change in wild animal species.

Table 8-16: Observed Changes in Plant and animal Species by Eco-Development Regions in Last 25 Years

Plant and Animal Species (Categories)	Observed Change (HH, %)				Total
	Changed	Not changed	Don't know	Not applicable	
Eastern Mountain					
Tree	59.93	31.14	8.93	0.0	100.00
Shrub/bush	39.21	54.85	5.94	0.0	100.00
Herbal plant/non-timber forest product	38.86	45.42	15.71	0.0	100.00
Grass / Fodder	37.01	58.51	4.48	0.0	100.00
Aquatic animal	9.72	56.09	33.63	0.56	100.00
Aquatic plant	1.89	50.26	46.73	1.12	100.00
Wild animal	86.02	8.37	5.61	0.0	100.00
Birds	86.11	11.53	2.36	0.0	100.00
Insects	52.74	36.36	10.90	0.0	100.00
Eastern Hill					
Tree	55.84	34.64	9.52	0.0	100.00
Shrub/bush	41.83	37.74	20.43	0.0	100.00
Herbal plant/non-timber forest product	21.54	41.62	35.67	1.17	100.00
Grass / Fodder	27.43	51.90	20.32	0.34	100.00
Aquatic animal	6.89	29.84	52.13	11.14	100.00
Aquatic plant	3.25	29.12	57.43	10.20	100.00
Wild animal	68.26	16.44	15.29	0.0	100.00
Birds	70.01	16.50	13.22	0.28	100.00
Insects	37.53	29.08	33.39	0.0	100.00
Eastern *Terai*					
Tree	90.14	2.80	5.90	1.16	100.00
Shrub/bush	58.81	8.79	28.87	3.53	100.00
Herbal plant/non-timber forest product	29.56	6.35	52.62	11.46	100.00
Grass / Fodder	62.60	5.90	25.12	6.38	100.00
Aquatic animal	63.40	4.54	22.60	9.46	100.00
Aquatic plant	41.94	8.24	42.29	7.53	100.00

Plant and Animal Species (Categories)	Observed Change (HH, %)				Total
	Changed	Not changed	Don't know	Not applicable	
Wild animal	53.35	5.01	6.96	34.67	100.00
Birds	94.35	1.03	4.38	0.23	100.00
Insects	79.92	5.26	14.46	0.36	100.00
Central Mountain					
Tree	88.94	6.98	4.08	0.0	100.00
Shrub/bush	22.45	21.56	55.98	0.0	100.00
Herbal plant/non-timber forest product	16.98	13.50	69.53	0.0	100.00
Grass / Fodder	50.80	11.23	37.97	0.0	100.00
Aquatic animal	0.0	6.83	63.06	30.11	100.00
Aquatic plant	0.0	5.23	65.56	29.21	100.00
Wild animal	100.00	0.0	0.0	0.0	100.00
Birds	99.09	0.0	0.91	0.0	100.00
Insects	49.90	4.27	45.83	0.0	100.00
Central Hill					
Tree	60.97	36.81	2.23	0.0	100.00
Shrub/bush	37.50	39.35	23.15	0.0	100.00
Herbal plant/non-timber forest product	9.42	29.71	59.04	1.83	100.00
Grass / Fodder	31.29	36.46	32.10	0.15	100.00
Aquatic animal	8.11	7.70	53.09	31.10	100.00
Aquatic plant		7.45	60.04	32.51	100.00
Wild animal	63.35	25.56	9.32	1.78	100.00
Birds	63.07	31.86	5.06	0.0	100.00
Insects	49.17	34.81	16.02	0.0	100.00
Central *Terai*					
Tree	88.35	6.55	5.09	0.0	100.00
Shrub/bush	36.35	49.93	13.73	0.0	100.00
Herbal plant/non-timber forest product	33.99	28.29	34.28	3.44	100.00
Grass / Fodder	51.85	21.88	24.29	1.97	100.00
Aquatic animal	61.05	14.59	24.36	0.0	100.00
Aquatic plant	35.18	23.40	41.41	0.0	100.00
Wild animal	34.40	15.18	13.87	36.55	100.00
Birds	90.89	5.36	3.36	0.39	100.00
Insects	75.94	16.23	7.83	0.0	100.00
Western Mountain					
Tree	87.80	10.00	2.20	0.0	100.00
Shrub/bush	40.18	53.21	6.61	0.0	100.00
Herbal plant/non-timber forest product	32.20	42.80	25.00	0.0	100.00
Grass / Fodder	51.19	41.61	7.20	0.0	100.00
Aquatic animal	4.40	51.01	44.58	0.0	100.00
Aquatic plant	0.0	37.02	62.98	0.0	100.00
Wild animal	95.00	0.0	5.00	0.0	100.00
Birds	73.99	16.61	9.40	0.0	100.00
Insects	9.40	42.20	48.39	0.0	100.00
Western Hill					
Tree	43.37	29.07	27.23	0.33	100.00
Shrub/bush	33.06	33.10	33.46	0.38	100.00

Plant and Animal Species (Categories)	Observed Change (HH, %)				Total
	Changed	Not changed	Don't know	Not applicable	
Herbal plant/non-timber forest product	30.60	23.25	45.77	0.38	100.00
Grass / Fodder	36.84	37.52	24.48	1.17	100.00
Aquatic animal	10.08	10.78	66.79	12.35	100.00
Aquatic plant	1.45	9.39	75.56	13.60	100.00
Wild animal	74.75	6.15	17.44	1.65	100.00
Birds	71.75	10.42	17.31	0.52	100.00
Insects	39.27	25.43	35.30	0.0	100.00
Western *Terai*					
Tree	83.56	6.61	8.14	1.68	100.00
Shrub/bush	39.64	25.93	29.90	4.52	100.00
Herbal plant/non-timber forest product	8.91	27.35	24.04	39.70	100.00
Grass / Fodder	7.74	29.21	19.85	43.20	100.00
Aquatic animal	39.57	31.53	23.28	5.63	100.00
Aquatic plant	14.26	34.58	29.65	21.51	100.00
Wild animal	71.21	5.97	17.40	5.43	100.00
Birds	91.92	3.17	4.22	0.69	100.00
Insects	61.22	25.72	12.69	0.37	100.00
Mid-Western Mountain					
Tree	0.0	79.80	20.20	0.0	100.00
Shrub/bush	0.0	79.16	20.84	0.0	100.00
Herbal plant/non-timber forest product	0.0	77.45	22.55	0.0	100.00
Grass / Fodder	0.0	77.45	22.55	0.0	100.00
Aquatic animal	0.0	75.59	24.41	0.0	100.00
Aquatic plant	0.0	75.83	24.17	0.0	100.00
Wild animal	56.19	28.48	15.33	0.0	100.00
Birds	37.61	41.95	20.44	0.0	100.00
Insects	3.19	66.54	29.41	0.85	100.00
Mid-Western Hill					
Tree	80.62	14.01	5.37	0.0	100.00
Shrub/bush	69.44	20.36	10.20	0.0	100.00
Herbal plant/non-timber forest product	33.37	23.48	42.11	1.04	100.00
Grass / Fodder	73.85	22.40	3.75	0.0	100.00
Aquatic animal	26.60	33.75	24.55	15.09	100.00
Aquatic plant	0.20	31.33	26.76	41.71	100.00
Wild animal	82.47	11.31	6.22	0.0	100.00
Birds	79.48	16.65	3.87	0.0	100.00
Insects	68.13	21.33	10.55	0.0	100.00
Mid-Western *Terai*					
Tree	64.06	20.50	13.95	1.48	100.00
Shrub/bush	52.39	26.00	20.13	1.48	100.00
Herbal plant/non-timber forest product	11.17	23.90	63.68	1.25	100.00
Grass / Fodder	68.72	10.79	19.24	1.25	100.00
Aquatic animal	41.74	17.11	38.62	2.52	100.00
Aquatic plant	4.08	29.24	58.98	7.70	100.00
Wild animal	54.61	13.37	30.00	2.01	100.00
Birds	65.80	15.74	17.21	1.25	100.00
Insects	61.28	17.78	19.69	1.25	100.00

Plant and Animal Species (Categories)	Observed Change (HH, %)				Total
	Changed	Not changed	Don't know	Not applicable	
Far-Western Mountain					
Tree	91.27	0.55	8.18	0.0	100.00
Shrub/bush	79.41	1.65	18.94	0.0	100.00
Herbal plant/non-timber forest product	30.07	1.51	66.93	1.49	100.00
Grass / Fodder	73.40	3.39	22.61	0.60	100.00
Aquatic animal	41.75	0.0	56.33	1.92	100.00
Aquatic plant	3.31	0.0	94.16	2.52	100.00
Wild animal	73.54	1.41	25.04	0.0	100.00
Birds	68.83	4.55	26.62	0.0	100.00
Insects	62.76	6.04	31.20	0.0	100.00
Far-Western Hill					
Tree	95.44	4.56	0.0	0.0	100.00
Shrub/bush	75.90	20.45	3.65	0.0	100.00
Herbal plant/non-timber forest product	33.46	22.64	43.90	0.0	100.00
Grass / Fodder	86.57	9.03	4.40	0.0	100.00
Aquatic animal	21.16	45.32	20.80	12.72	100.00
Aquatic plant	5.76	53.00	28.46	12.79	100.00
Wild animal	89.24	8.19	2.57	0.0	100.00
Birds	86.04	9.51	4.46	0.0	100.00
Insects	60.91	28.59	10.50	0.0	100.00
Far-Western *Terai*					
Tree	72.23	5.71	21.38	0.67	100.00
Shrub/bush	46.57	9.85	42.16	1.41	100.00
Herbal plant/non-timber forest product	27.15	6.39	64.89	1.57	100.00
Grass / Fodder	32.50	25.31	41.03	1.17	100.00
Aquatic animal	51.37	14.62	32.69	1.32	100.00
Aquatic plant	27.80	18.74	51.61	1.85	100.00
Wild animal	63.69	6.26	29.09	0.96	100.00
Birds	56.89	13.53	29.59	0.0	100.00
Insects	37.25	13.28	49.47	0.0	100.00
Kathmandu Valley					
Tree	12.53	2.97	29.11	55.39	100.00
Shrub/bush	11.65	2.34	28.26	57.74	100.00
Herbal plant/non-timber forest product	6.80	2.39	31.77	59.05	100.00
Grass / Fodder	4.60	2.04	34.23	59.14	100.00
Aquatic animal	11.86	2.04	29.34	56.76	100.00
Aquatic plant	0.67	1.74	40.52	57.07	100.00
Wild animal	13.94	1.69	25.85	58.51	100.00
Birds	35.77	34.10	24.59	5.53	100.00
Insects	17.68	28.98	46.19	7.15	100.00

Table 8-16 represents the percentage distribution of households observing changes in the plant and animal species by eco-development region in last 25 years. The survey result shows that majority of households in all eco-development regions are observing changes in birds and wild animal species. Similarly, all households in central mountain region (100%) reported to have observed change in wild animals while 99.09 per cent households reported so for bird species. Similarly, higher percentage of household in far-western hill (95.44%) are observing changes in tree species in last 25 years followed by far-western mountain (91.27%) and eastern *Terai* (90.14%). Moreover, significant percentage of households in eastern *Terai* (79.92%) and central *Terai* (75.94%) are observing changes on insect species.

Table 8-17: Observed Changes in the Plant and Animal Species by NAPA Combined Vulnerability Index in Last 25 Years

Plan and Animal Species (Categories)	Observed Change (HH, %)				Total
	Changed	Not changed	Don't know	Not applicable	
Very High					
Tree	82.20	3.72	6.21	7.87	100.00
Shrub/bush	56.65	9.15	26.11	8.09	100.00
Herbal plant/non-timber forest product	26.80	7.82	55.49	9.90	100.00
Grass / Fodder	48.00	8.89	34.47	8.65	100.00
Aquatic animal	28.83	4.40	48.63	18.14	100.00
Aquatic plant	12.68	3.88	66.23	17.21	100.00
Wild animal	57.51	2.23	9.43	30.83	100.00
Birds	84.95	7.15	6.97	0.94	100.00
Insects	71.66	6.86	20.48	1.00	100.00
High					
Tree	61.63	34.10	4.26	0.0	100.00
Shrub/bush	38.59	50.37	11.05	0.0	100.00
Herbal plant/non-timber forest product	21.99	41.26	34.68	2.07	100.00
Grass / Fodder	43.48	40.88	14.19	1.45	100.00
Aquatic animal	27.77	31.63	21.72	18.88	100.00
Aquatic plant	8.02	34.62	30.96	26.40	100.00
Wild animal	48.32	26.97	14.06	10.65	100.00
Birds	66.39	27.02	6.50	0.10	100.00
Insects	46.74	41.38	11.88	0.0	100.00
Moderate					
Tree	69.81	16.05	14.05	0.09	100.00
Shrub/bush	40.50	39.34	20.04	0.12	100.00
Herbal plant/non-timber forest product	34.20	27.77	36.87	1.16	100.00
Grass / Fodder	46.98	30.34	22.19	0.49	100.00
Aquatic animal	34.36	14.67	46.86	4.11	100.00
Aquatic plant	19.86	17.27	59.16	3.72	100.00
Wild animal	61.89	8.57	12.38	17.15	100.00
Birds	78.62	8.56	12.41	0.41	100.00
Insects	57.99	21.32	20.64	0.06	100.00
Low					
Tree	74.66	11.90	12.25	1.19	100.00
Shrub/bush	45.33	17.08	34.35	3.24	100.00
Herbal plant/non-timber forest product	19.00	12.58	59.57	8.85	100.00
Grass / Fodder	52.37	18.37	24.08	5.18	100.00

Plan and Animal Species (Categories)	Observed Change (HH, %)				Total
	Changed	Not changed	Don't know	Not applicable	
Aquatic animal	43.56	15.32	33.47	7.65	100.00
Aquatic plant	23.86	21.31	45.68	9.16	100.00
Wild animal	71.35	10.48	15.93	2.24	100.00
Birds	78.25	9.89	11.59	0.28	100.00
Insects	52.95	15.65	30.85	0.55	100.00
Very Low					
Tree	55.82	24.14	18.77	1.26	100.00
Shrub/bush	26.76	35.51	34.69	3.03	100.00
Herbal plant/non-timber forest product	8.40	30.80	35.75	25.04	100.00
Grass / Fodder	17.73	32.41	22.42	27.44	100.00
Aquatic animal	24.75	20.40	40.95	13.90	100.00
Aquatic plant	8.92	21.91	44.25	24.92	100.00
Wild animal	72.22	4.94	17.92	4.92	100.00
Birds	89.68	3.78	5.72	0.82	100.00
Insects	58.49	18.63	22.65	0.23	100.00

Table 8-17 shows the percentage distribution of households observing changes in plant and animal species by NAPA combined vulnerability index in last 25 years. Higher percentages of households in all categories are observing changes in bird species. Similarly, majority of households in very high area (82.20%) are observing changes in tree species (61.63%) while 72.22 per cent households in very low vulnerable area reported to change on wild animals.

Table 8-18: Observed Changes in Plant Species by Bio-Climatic Zones in Last 25 Years

Plan and Animal Species (Categories)	Observed Changes (%)				Total
	Changed	Not changed	Don't know	Not applicable	
Tropical					
Tree	77.59	13.14	8.59	0.67	100.00
Shrub/bush	45.34	30.52	22.57	1.58	100.00
Herbal plant/non-timber forest product	25.19	21.68	45.14	7.99	100.00
Grass / Fodder	48.58	21.83	23.00	6.60	100.00
Aquatic animal	47.46	14.17	29.64	8.73	100.00
Aquatic plant	24.37	19.26	44.70	11.67	100.00
Wild animal	53.87	12.20	13.45	20.48	100.00
Birds	81.25	10.36	8.01	0.38	100.00
Insects	64.10	18.10	17.58	0.22	100.00
Sub-Tropical					
Tree	59.91	22.93	12.06	5.10	100.00
Shrub/bush	41.80	28.23	24.63	5.35	100.00
Herbal plant/non-timber forest product	22.12	25.59	45.80	6.49	100.00
Grass / Fodder	40.33	30.39	23.62	5.66	100.00

Plan and Animal Species (Categories)	Observed Changes (%)				Total
	Changed	Not changed	Don't know	Not applicable	
Aquatic animal	10.15	19.74	50.89	19.22	100.00
Aquatic plant	1.07	18.38	58.57	21.98	100.00
Wild animal	70.63	10.11	13.20	6.06	100.00
Birds	73.49	15.53	10.30	0.68	100.00
Insects	47.84	25.55	25.95	0.66	100.00
Temperate					
Tree	54.37	32.13	13.50	0.0	100.00
Shrub/bush	31.27	39.91	28.82	0.0	100.00
Herbal plant/non-timber forest product	26.12	33.31	40.57	0.0	100.00
Grass / Fodder	29.23	41.35	29.42	0.0	100.00
Aquatic animal	4.07	33.58	52.43	9.92	100.00
Aquatic plant	1.46	32.75	55.14	10.65	100.00
Wild animal	73.32	13.75	12.92	0.0	100.00
Birds	70.77	16.81	12.43	0.0	100.00
Insects	41.96	33.03	24.72	0.29	100.00
Sub-Alpine					
Tree	90.00	10.00	0.0	0.0	100.00
Shrub/bush	60.00	40.00	0.0	0.0	100.00
Herbal plant/non-timber forest product	30.00	45.00	25.00	0.0	100.00
Grass/Fodder	60.00	35.00	5.00	0.0	100.00
Aquatic animal	0.0	40.00	60.00	0.0	100.00
Aquatic plant	0.0	15.00	85.00	0.0	100.00
Wild animal	95.00	0.0	5.00	0.0	100.00
Birds	85.00	10.00	5.00	0.0	100.00
Insects	5.00	40.00	55.00	0.0	100.00

Table 8-18 depicts percentage distribution of households observing changes in plant and animal species by Bio-Climatic Zone in last 25 years. Majority of households in all climatic zones reported to have observed changes in tree, wild animal and birds' species in last 25 years. Similarly, higher percentages of households in tropical zone (64.10%) are observing changes in insect species. Likewise, 95 per cent households in sub-alpine zone are observing change in wild animal species while 90 per cent households reported so for tree species and 85 per cent for bird species in last 25 years.

Table 8-19: Observed Changes in Plant and Animal Species by Bio-Climatic Zone in Last 25 Years

Changes Observed	Bio-Climatic Zone (%)				Total
	Tropical	Sub-tropical	Temperate	Sub-alpine	
Tree					
Decreasing	69.6	26.9	3.5	0.00	100.0
Increasing	71.8	25.4	2.8	0.1	100.0
Disappeared	87.5	12.0	0.6	0.00	100.0
New species	88.8	10.9	0.3	0.00	100.0
Shrubs					
Decreasing	63.5	33.9	2.5	0.1	100.0
Increasing	64.3	31.3	4.4	0.00	100.0
Disappeared	79.1	20.7	0.3	0.00	100.0
New species	71.5	27.5	1.1	0.00	100.0

Changes Observed	Bio-Climatic Zone (%)				Total
	Tropical	Sub-tropical	Temperate	Sub-alpine	
Herbs					
Decrease	62.7	32.1	5.1	0.1	100.0
Increasing	62.0	34.2	3.8	0.00	100.0
Disappeared	81.3	18.4	0.3	0.00	100.0
New species	29.8	63.1	7.1	0.00	100.0
Grass					
Decreasing	63.8	33.4	2.7	0.1	100.0
Increasing	75.5	22.5	2.0	0.0	100.0
Disappeared	83.5	15.6	0.9	0.00	100.0
New species	77.6	21.7	0.7	0.00	100.0
Aquatic Animals					
Decreasing	89.3	10.1	0.5	0.00	100.0
Increasing	93.2	5.9	0.9	0.00	100.0
Disappeared	96.3	3.7	0.00	0.00	100.0
New species	100.0	0.00	0.00	0.00	100.0
Aquatic Plants					
Decreasing	97.4	2.2	0.5	0.00	100.0
Increasing	98.0	1.3	0.7	0.00	100.0
Disappeared	99.5	0.5	0.00	0.00	100.0
New species	100.0	0.00	0.00	0.00	100.0
Wild Animals					
Decreasing	53.7	40.6	5.7	0.0	100.0
Increasing	46.9	48.0	4.9	0.1	100.0
Disappeared	64.2	32.3	3.5	0.00	100.0
New species	58.5	34.7	6.8	0.00	100.0
Birds					
Decreasing	64.7	31.5	3.8	0.00	100.0
Increasing	66.1	30.3	3.5	0.1	100.0
Disappeared	77.0	20.9	2.1	0.00	100.0
New species	74.0	21.0	4.7	0.4	100.0
Insects					
Decreasing	74.3	23.6	2.1	0.00	100.0
Increasing	73.2	24.8	2.0	0.00	100.0
Disappeared	73.3	25.5	1.2	0.00	100.0
New species	82.8	14.7	2.6	0.00	100.0

Table 8-19 presents percentage distribution of households observing changes in the plant and animal species by climatic zones in last 25 years. The result shows that majority of households in tropical and sub-tropical climatic zone have observed changes in plant and animal status in last 25 years. An 88.8 per cent households in tropical zone have observed emergence of new tree species in their area while have reported so in sub-alpine zone. Similarly, 74 per cent households in tropical zone have observed emergence of new bird species in last 25 years while only 21% households in sub-tropical, 4.7 in temperate, and 0.4 per cent in sub-alpine zone reported so respectively. Moreover, the majority of households in tropical zone have observed changes on status of insects while no one in sub-alpine zone have observed such changes in last 25 years.

Table 8-20: Most Reported Tree Species Observed Changing in Last 25 Years

Ranking	Tree Species (Local Name)			
	Tropical	Sub-tropical	Temperate	Sub-alpine
Decreasing				
1.	Sisau (Sissoo) (Sisso)	Salla (Pinus)	Salla (Pinus)	
2.	Sal (Shorea)	Sal (Shorea)	Banjh (Oak tree)	
3.	Aanp (Mango)	Uttish (Nepalese alder)	Guransh (Rhododendron)	
4.	Jaamun (Black plum)	Chilaaune (Schima)	Payoun (Himalayan cherry)	
5.	Simal (Cotton tree)	Banjh (Oak tree)	Gobre Sallo (Blue pine)	
6.	Saaj (Terminalia)	Guransh (Rhododendron)	Uttish (Nepalese alder)	
7.	Khayar (Cutch tree)	Baansh (Bamboo)	Chaap (Champak)	
8.	Katahar (Jackfruit)	Bakaaino (Chinaberry)	Thinge Sallo (Pine) (Himalayan fir)	
9.	Salla (Pinus)	Payoun (Himalayan cherry)	Dudhilo (Ficus tree)	
10.		Chaap (Champak)		
Increasing				
1.	Teak	Uttish (Nepalese alder)	Uttish (Nepalese alder)	Bhotepipal (Necklace poplar)
2.	Masala (Gum tree)	Salla (Pinus)	Salla (Pinus)	
3.	Kadam (Burflower tree)	Chilaaune (Schima)	Dhupi Salla (Pinus)	
4.	Sal (Shorea)	Tuni (Red cedar)	Gobre Sallo (Blue pine)	
5.	Aanp (Mango)	Sal (Shorea)	Guransh (Rhododendron)	
6.	Ipil-ipil (Leucaena)	Bhimal (Apple Bblossom tree)	Kharane (Symplocos)	
7.	Bakaaino (Chinaberry)	Guransh (Rhododendron)	Dabdabe (Garuga Plant)	
8.	Chilaaune (Schima)	Aanp (Mango)	Paatle Kattus (Oak)	
9.	Salla (Pinus)	Mauwa (Honey tree)	Kholme (Symplocos)	
10.		Bakaaino (Chinaberry)	Gogan (Sauraria)	
Disappeared				
1.	Khair (Cutch tree)	Uttish (Nepalese alder)	Dudhilo (Ficus tree)	
2.	Simal (Cotton tree)	Bakaaino (Chinaberry)	Lauth Salla (Pinus)	
3.	Sisau (Sissoo)	Siris (Albizzia)	Chanp (Champak)	
4.	Sal (Shorea)	Khari (Celtis tree)	Dabdabe (Garuga Plant)	
5.	Jaamun (Black plum)	Hadiber (Hawberry)	Kaaulo (Duthie's bay tree)	
6.	Mauwa (Honey tree)	Simal (Cotton tree)	Payoun (Himalayan cherry)	
7.	Bijayasal (Kino tree)	Sal (Shorea)	Phalant (Axle wood)	
8.	Satisal (Shorea)	Amala (Emblica)	Simal (Cotton tree)	
9.		Sallo (Pine)		
New Species				
1.	Masala (Gum tree)	Rudrakshya (Bead tree)	Uttish (Nepalese alder)	
2.	Teak	Bakaaino (Chinaberry)		
3.	Kadam (Burflower tree)	Sisam (Sissoo)		
4.	Ipil-ipil (Leucaena)	Uttish (Nepalese alder)		
5.	Asoka (Ashoka tree)	Naaspati (Pear)		
6.	Bakaaino (Chinaberry)	Katahar (Jackfruit)		
7.	Bhotepipal (Necklace poplar)	Aanp (Mango)		
8.		Masala (Gum tree)		

Table 8-20 shows the status of most reported tree species observed changing in last 25 years. Majority of households in Tropical region reported a decreasing trend of *Sissso* followed by *Sal* and *Aanp* (Mango). Similarly, both in sub-tropical and temperate climatic zone, households are observing decrease in the status of Sal. Households are observing an increase in *Teak, Masala* (Gum tree)*, Sapeta, Uttis, and Bhote Pipal* across climatic zones. Similarly, households are observing emergence of new species including *Masala* (Gum tree)*, Teak and Kadam* (Burflower tree) in tropical zone, *Rudrakshya* (Bead tree) and *Bakaaino* (Chinaberry) in sub-tropical zone, and *Sallo (Pine)* in temperate zones. However, none of the household in the sub-alpine zone is observing any change in status of tree species in their area in last 25 years.

Table 8-21: Most Reported Shrubs/bush Species Observed Changing in Last 25 Years

Ranking	Shrub/Bush Species (Local Name)			
	Tropical	**Sub-tropical**	**Temperate**	**Sub-alpine**
Decreasing				
1.	Bayar (Zizyphus)	Aiselu (Wild raspberries)	Aiselu (Wild raspberries)	Kande (Loranthus)
2.	Ambak (Guava)	Chutro (Wild blue berry)	Chutro (Wild blue berry)	
3.	Mewa (Papaya)	Dhayaro (Woodfordia)	Nibaro (Ficus)	
4.	Kera (Banana)	Kagati (Lemon)	Guransh (Rhododendron)	
5.	Dhayaro (Woodfordia)	Suntala (Orange)	Argeli (Indian rhododendron)	
6.	Kagati (Lemon)	Teti Patti (Mugwort)	Banmaaraa (Cat weed)	
7.	Amala (Emblica)	Sisnu (Stinging nettle)	Ghagaru (Pyracantha)	
8.	Sarifa (Custard Apple)	Guransh (Rhododendron)	Payoun (Himalayan cherry)	
9.	Baansh (Bamboo)		Baansh (Bamboo)	
10.	Anar (Pomegranate)			
Increasing				
1.	Banmaaraa (Cat weed)	Aiselu (Wild raspberries)	Aiselu (Wild raspberries)	Kande (Loranthus)
2.	Baansh (Bamboo)	Chutro (Wild blue berry)	Chutro (Wild blue berry)	
3.	Ambak (Guava)	Dhayaro (Woodfordia)	Guransh (Rhododendron)	
4.	Kera (Banana)	Suntala (Orange)	Nibaro (Ficus)	
5.	Dhayaro (Woodfordia)	Kagati (Lemon)	Argeli (Indian rhododendron)	
6.	Thakal	Teti Patti (Mugwort)	Banmaaraa (Cat weed)	
7.	Mewa (Papaya)	Sisnu (Stinging nettle)	Ghangaro (Himalayan firethorn)	
8.	Narkat (Giant cane)	Guransh (Rhododendron)	Payoun (Himalayan cherry)	
9.	Lychee (Litchi)		Baansh (Bamboo)	
10.	Asuro (Malbarnut)			
Disappeared				
1.	Bayar (Zizyphus)	Aiselu (Wild raspberries)	Aiselu (Wild raspberries)	
2.	Anar (Pomegranate)	Chutro (Wild blue berry)		
3.	Sarifa (Custard Apple)	Sisnu (Stinging nettle)		
4.	Teti Patti (Mugwort)	Narkat (Giant cane)		
5.	Dhayaro (Woodfordia)	Kagati (Lemon)		
6.	Amala (Emblica)	Bayar (Zizyphus)		
7.	Sanpaati (Rhododendron)	Mayal (Wild pear)		

Ranking	Shrub/Bush Species (Local Name)			
	Tropical	Sub-tropical	Temperate	Sub-alpine
New species				
1.	Banmaaraa (Cat weed)	Banmaaraa (Cat weed)	Banmaaraa (Cat weed)	
2.	Anar (Pomegranate)	Coffee	Syau (Apple)	
3.	Lychee (Litchi)	Suntala (Orange)	Japanese Naaspati (Pear)	
4.	Ipil-ipil (Leucaena)	Sugandhi Kada		
5.	Simal (Cotton tree)	Aanp (Mango)		
6.	Seto Raunne	Lychee (Litchi)		
7.	Kagati (Lemon)	Kiwi (Kiwi fruit)		
8.	Parijaat (Jasmine)	Anar (Pomegranate)		
9.	Parijaat	Rudrakshya (Bead tree)		
10.		Rudraraakhsya		

Table 8-21 shows the status of most reported shrub/bush species observed changing in last 25 years. Majority of households have observed decreasing status of *Bayar* (Zizyphus) and *Ambak* (Guava) in tropical zone; *Aiselu* (Wild raspberries) and *Chutro* (Wild blue berry) in sub-tropical and temperate zone, and *Kande* (Loranthus) in sub-alpine zone. Similarly, *baansh* (Bamboo) and *ambak* (guava) species are observed to increasing in tropical zone while *Chutro* (Wild blue berry) is observed so in Sub-tropical and temperate zone. Moreover, households are observing disappearance of *Aiselu* (Wild raspberries) in sub-tropical and temperate zones.

Table 8-22: Most Reported Medicinal and Non-Timber Forest Species Observed Changing in Last 25 Years

Ranking	Medicinal and Non-Timber Forest Products (Local Name)			
	Tropical	Sub-tropical	Temperate	Sub-alpine
Decreasing				
1.	Neem (Nim tree)	Teti Patti (Mugwort)	Chiraaito (Chiretta)	Yarshagumba (Caterpillar fungus)
2.	Harro (Black myrobalan)	Chiraaito (Chiretta)	Kurilo (Asparagus)	
3.	Amala (Emblica)	Sisnu (Stinging nettle)	Kutki (Genitan root)	
4.	Barro (Myrobalan)	Ghodtapre (Coinwort)	Teti Patti (Mugwort)	
5.	Gurjo (Guduchi)	Timmur (Nepal pepper)	Paanch Aule (Marsh orchids)	
6.	Kurilo (Asparagus)	Kutki (Genitan root)	Yarshagumba (Caterpillar fungus)	
7.	Pipala (Black pepper)	Amala (Emblica)	Chutro (Wild blue berry)	
8.	Tulasi (Basil)	Harro (Black myrobalan)		
9.		Kurilo (Asparagus)		
Increasing				
1.	Neem (Nim tree)	Timmur (Nepal pepper)	Chiraaito (Chiretta)	
2.	Teti Patti (Mugwort)	Banmaaraa (Cat weed)	Pakhanbed (Rockfoils)	
3.	Banmaaraa (Cat weed)	Chiraaito (Chiretta)	Daalchini (Cinnamon)	
4.	Timmur (Nepal pepper)	Bojho (Calamus)	Jatamasi (Musk root)	
5.	Kurilo (Asparagus)	Sisnu (Stinging nettle)	Timmur (Nepal pepper)	
6.	Mentha (Mint)	Kurilo (Asparagus)	Kurilo (Asparagus)	
7.	Chirchiri (Chaff-flower)	Pakhanbed (Rockfoils)	Nirmasi (Blue rocket)	
8.			Hadchur (Mistletoe)	

Ranking	Medicinal and Non-Timber Forest Products (Local Name)			
	Tropical	Sub-tropical	Temperate	Sub-alpine
Disappeared				
1.	Harro (Black myrobalan)	Ghodtapre (Coinwort)	Bojho (Calamus)	
2.	Barro (Myrobalan)	Asuro (Malbarnut)		
3.	Kurilo (Asparagus)	Rudilo (Cockspur patchouli)		
4.	Khayar (Cutch tree)	Hadchur (Mistletoe)		
5.	Jaamun (Black plum)	Bojho (Calamus)		
6.		Baabari (Mint)		
7.		Kurilo (Asparagus)		
8.		Ketuke (Sentry plant)		
New Species				
1.	Neem (Nim tree)	Banmaaraa (Cat weed)	Banmaaraa (Cat weed)	
2.	Timmur (Nepal pepper)	Kaalijhaar (Cat weed)		
3.	Jaamun (Black plum)	Timmur (Nepal pepper)		
4.	Jaitun (Olive)	Eaichi (Cardamom)		
5.	Bojho (Calamus)	Ghiukumari (Aloe vera)		
6.	Barro (Myrobalan)	Jaitun (Olive)		
7.	Kurilo (Asparagus)	Kurilo (Asparagus)		
8.	Lemongrass	Tulasi (Basil)		
9.	Tejpaat (Cinnamon)			

Table 8-22 shows the status of most reported NTFP species in last 25 years. Households are observing decrease in status of *Neem* (Nim tree), and *Harro* (Black myrobalan) in tropical zone, *Teti Patti* (Mugwort) and *Chiraito* in sub-tropical, *Kurilo* (Asparagus) in temperate, and *Yarsagumba* in sub-alpine zones. However, *Banmara* (Cat weed) and *Timmur* (Nepal pepper) in tropical, *Kurilo* (Asparagus) and *Bojho* (Calamus) in sub-tropical and *Chutro* (Wild blue berry) in temperate zone are observed to increasing in last 25 years. Moreover, households have observed disappearance of *Harro* (Black myrobalan) in tropical, *Ghodtapre* (Coinwort) in sub-tropical, and *Bojho* (Calamus) in temperate zones. None of the households in sub-alpine zone have reported changes in status of NTFP species in their area in last 25 years.

Table 8-23: Most Reported Grass species Observed Changing in Last 25 Years

Ranking	Grass Species (Local Name)			
	Tropical	Sub-tropical	Temperate	Sub-alpine
Decreasing				
1.	Sama ghans (Japanese millet)	Siru (Star-grass)	Babiyo (Dung weed)	Banmara (Cat weed)
2.	Dubo (Bermuda grass)	Dubo (Bermuda grass)	Banso Ghans (Carpet grass)	
3.	Siru (Star-grass)	Banso Ghans (Carpet grass)		
4.	Banso Ghans (Carpet grass)			
Increasing				
1.	Mothhe Jhar (Coco-grass)	Amriso (Broom grass)	Baansh (Bamboo)	Banso Ghans (Carpet grass)
2.	Dubo (Bermuda grass)		Malingo (Candy cane)	
3.	Nepiyer (Napier)			

Ranking	Grass Species (Local Name)			
	Tropical	Sub-tropical	Temperate	Sub-alpine
Disappeared				
1.	Siru (Star-grass)	Banso Ghans (Carpet grass)	Banso Ghans (Carpet grass)	
2.	Banso Ghans (Carpet grass)	Siru (Star-grass)		
3.	Debre Lahara (Spatholobus)	Dubo (Bermuda grass)		
4.		Ratnaulo (Biting knotweed)		
5.		Babiyo (Dung weed)		
New Species				
1.	Makai Ghas (Maize grass)	Nepiyer (Napier)		
2.	Nepiyer (Naiper)	Amriso (Broom grass)		
3.	Stailo Ghas (Stylo)	Rai Ghas (Winter ryegrass)		

Table 8-23 shows the status of most reported Grass species in last 25 years. Majority of households are observing decrease in the status of *Sama ghans* (Japanese millet) and *Dubo* (Bermuda grass) in tropical; *Bhimal* (Apple blossom tree) in sub-tropical; and *Babiyo* (Dung weed) in temperate zone. Similarly, *Nepiyer* (Naiper) in sub-tropical is observed as new species in last 25 years. However, households in sub-alpine zone are observing decrease *Banmara* (Cat weed) and increase *Banso Ghans* (Carpet grass) in last 25 years.

Table 8-24: Most Reported Aquatic Animal Species Observed Changing in Last 25 Years

Ranking	Aquatic Animal Species (Local Name)			
	Tropical	Sub-tropical	Temperate	Sub-alpine
Decreasing				
1.	Machha (Fish)	Machha (Fish)	Machha (Fish)	
2.	Gangata (Crab)	Vyaguta (Frog)	Juka (Worm)	
3.	Vyaguta (Frog)	Gangata /Crab	Gangata/Crab	
4.	Kachuwa (Tortoise)	Sarpa (Snake)	Vyaguta (Frog)	
5.	Ghungi (Snail)	Paaha (Toad)	Paaha (Toad)	
6.	Buwali Macha	Gadeule macha (Fish)	Chepagada	
7.	Sarpa (Snake)	Juka (Worm)	Gadeule macha (Fish)	
8.	Tengra macha	Jhinge macha (Fish)	Katle macha (Fish)	
9.	Gohi (Crocodile))	Tite macha (Fish)	Sankhe kira (Snail)	
10.	Haas (Duck)			
Increasing				
1.	Vyaguta (Frog)	Machha (Fish)	Juka (Worm)	
2.	Sarpa (Snake)	Vyaguta (Frog)	Vyaguta (Frog)	
3.	Haas (Duck)	Gangata (Crab)		
4.	Ghungi (Snail)	Juka (Worm)		
5.	Gangata (Crab)	Kachuwa (Tortoise)		
6.	Rahu macha	Bachwa machha (Fish)		
7.	Juka (Worm)	Chiple kira (Snail)		
8.	Machha (Fish)			
9.	Gohi (Crocodile))			

Ranking	Aquatic Animal Species (Local Name)			
	Tropical	Sub-tropical	Temperate	Sub-alpine
Disappeared				
1.	Kachuwa (Tortoise)	Vyaguta (Frog)		
2.	Gangata (Crab)	Gangata (Crab)		
3.	Buwali Macha	Chepa gada (Tadpole)		
4.	Gohi (Crocodile))	Sarpa (Snake)		
5.	Chakewa (Shelduck)	Hile macha (Fish)		
6	Chepa gada (Tadpole)	Haas (Duck)		
7.	Sankhe kira (Snail)	Jhinge macha (Fish)		
8.		Kachuwa (Tortoise)		

Table 8-24 shows the status of most reported aquatic animal species last 25 years. The result shows that majority of households are observing decrease in the status of fish, *Gangata* (Crab) and *Vyaguta* (Frog) in tropical and sub-tropical zone while *Juka* (leech) is reported so in temperate zone. Households are observing increase in the status of *Ghungi* (Snail) and *Sarpa* (Snake) in tropical zone while *Kachuwa* (Tortoise) and *bachwa* fish are reported so in sub-tropical zone. Households in sub-alpine zone are not observing any changes in the status of aquatic animals in last 25 years.

Table 8-25: Most Reported Aquatic Plant Species Observed Changing in Last 25 Years

Ranking	Aquatic Plant Species (Local Name)			
	Tropical	Sub-tropical	Temperate	Sub-alpine
Decreasing				
1.	Jal Kumbhi (Water hyacinth)	Leu (Crystal wort)	Pani sag (Wild Spinach)	
2.	Kamal (Lotus)	Pani sag (Wild Spinach)	Sim sag (Wild Spinach)	
3.	Amarlatti (Giant dodder)	Bojho (Calamus)		
4.	Dhodi sag (Wild Spinach)	Amarlatti (Giant dodder)		
5.		Niuro (Fiddlehead Fern)		
6.		Pani tarul (Yam)		
Increasing				
1.	Jal Kumbhi (Water hyacinth)	Bojho (Calamus)	Thotne (Gedilo)	
2.	Dhodi sag (Wild Spinach)	Leu (Crystal wort)		
3.	Amarlatti (Giant dodder)	Malato (Macaranga)		
4.		Niuro (Fiddlehead Fern)		
Disappeared				
1.	Kamal (Lotus)	Leu (Crystal wort)		
2.	Amarlatti (Giant dodder)	Bojho (Calamus)		
3.	Bet (Rattan)			

Table 8-25 shows the status of most reported aquatic plants species in last 25 years. It shows that majority of households in tropical zone are observing decrease in the status of *Jal Kumvi* (Water hyacinth), and *Kamal* (Lotus) while households reported so for *Leu* (Crystal wort) and *Pani sag* (Wild Spinach) in sub-tropical. *Thotne* (Gedilo) is the single species that households in temperate zone are observing to increase. Households in sub-alpine zone are not observing any change in status of aquatic plant species in their area in last 25 years.

Table 8-26: Most Reported Wild Animal Species Observed Changing in Last 25 Years

Ranking	Wild Animal Species (Local Name)			
	Tropical	Sub-tropical	Temperate	Sub-alpine
Decreasing				
1.	Syal (Jackal)	Syal (Jackal)	Bagha (Tiger)	Kharayo (Rabbit)
2.	Bagha (Tiger)	Bagha (Tiger)	Bhalu (Bear)	Phyauro (Fox)
3.	Huchil (Owl)	Bhalu (Bear)	Ghoral (Himalayan Ghoral)	Habre (Red panda)
4.	Kharayo (Rabbit)	Ghoral (Himalayan Ghoral)	Chituwa (Leopard)	Syal (Jackal)
5.	Bhalu (Bear)	Chituwa (Leopard)	Mriga (Deer)	
6.	Bandel (Wild boar)	Ratuwa (Barking deer)	Syal (Jackal)	
7.	Chital (Spotted deer)	Mriga (Deer)	Ratuwa (Barking deer)	
8.	Badar (Monkey)	Badar (Monkey)	Bandel (Wild boar)	
9.	Chituwa (Leopard)	Bandel (Wild boar)	Thar (Himalayan thar)	
10	Mriga (Deer)	Kharayo (Rabbit)	Kasturi (Musk deer)	
Increasing				
1.	Syal (Jackal)	Mriga (Deer)	Dumsi (Porcupine)	Nauri
2.	Bandel (Wild boar)	Dumsi (Porcupine)	Mriga (Deer)	Mriga (Deer)
3.	Badar (Monkey)	Badar (Monkey)	Badar (Monkey)	Phyau musa (Squirrel)
4	Dumsi (Porcupine)	Syal (Jackal)	Syal (Jackal)	Bhalu (Bear)
5.	Mriga (Deer)	Bandel (Wild boar)	Phyauro (Fox)	Syal (Jackal)
6.	Kharayo (Rabbit)	Kharayo (Rabbit)	Malsapro (Stone Marten)	
7.	Nauri	Ghoral	Ghoral	
	Nauri (Mole)	Ghoral (Himalayan Ghoral)	Ghoral (Himalayan Ghoral)	
8.	Ghodgadhi	Lokharke (Squirrel)	Bandhade (Wild cat)	
9.	Nilgai (Blue bull)	Malsapro (Stone Marten)	Kharayo (Rabbit)	
10.	Lokharke (Squirrel)	Bagha (Tiger)	Habre (Red panda)	
Disappeared				
1.	Bagha (Tiger)	Bagha (Tiger)	Bagha (Tiger)	
2.	Mriga (Deer)	Syal (Jackal)	Bhalu (Bear)	
3.	Syal (Jackal)	Chituwa (Leopard)	Bandel (Wild boar)	
4.	Hatti (Elephant)	Ban biralo (Wild cat)	Syal (Jackal)	
5.	Nilgai (Blue bull)	Bhalu (Bear)	Kasturi (Musk deer)	
6.	Chituwa (Leopard)	Salak (Pangolin)	Chituwa (Leopard)	
7.	Jarayo (Antelope)	Dumsi (Porcupine)	Langur (Monkey)	
8	Bhalu (Bear)	Phyauro (Fox)	Nauri (Mole)	
9.	Bandel (Wild boar)	Malsapro (Stone Marten)	Dumsi (Porcupine)	
10.		Mriga (Deer)	Salak (Pangolin)	
New species				
1.	Mriga (Deer)	Ratuwa (Barking deer)	Badar (Monkey)	
2.	Hatti (Elephant)	Bandel (Wild boar)	Dumsi (Porcupine)	
3.	Bagha (Tiger)	Badar (Monkey)	Ratuwa (Barking deer)	
4.	Bandel (Wild boar)	Habre (Red panda)	Habre (Red panda)	
5.	Ratuwa (Barking deer)	Mriga (Deer)	Syal (Jackal)	
6.	Badar (Monkey)	Dumsi (Porcupine)	Mriga (Deer)	
7.	Nauri (Mole)	Chutuwa (Leopard)	Ghodgadhi	
8.	Dumsi (Porcupine)	Ghoral (Himalayan Ghoral)		
9.		Kharayo (Rabbit)		
10.		Bagha (Tiger)		

Table 8-26 shows the status of most reported wild animal species in last 25 years. Majority of households reported a decreasing trend of jackal, tiger and *huchil* (Owl) in tropical; bear, *ghoral* (Himalayan Ghoral) and leopard in sub-tropical; deer and *ratuwa* (Barking deer) in temperate; and rabbit and fox in sub-alpine zones. Similarly, households are observing an increase of *bandel* (Wild boar) and monkey in tropical; *dumsi* (Porcupine) and rabbit in sub-tropical; *dumsi* (Porcupine) and *malsapro* (Stone Marten) in temperate; and *nauri* (Mole) in sub-alpine zones. Moreover, none in sub-alpine zone are observing either disappearance or emerging new species of wild animals in their area in last 25 years.

Table 8-27: Most Reported Bird Species Observed Changing in Last 25 Years

Ranking	Bird Species (Local Name)			
	Tropical	**Sub-tropical**	**Temperate**	**Sub-alpine**
Decreasing				
1.	Suga (Parrot)	Bhangera (Sparrow)	Bhangera (Sparrow)	
2.	Bhangera (Sparrow)	Kaag (Crow)	Kaliz (Pheasant)	
3.	Kaag (Crow)	Kaliz (Pheasant)	Chyakura (Chukar)	
4.	Dhukur (Dove)	Gidda (Vulture)	Danfe (Himalayan Monal)	
5.	Cheel (Eagle)	Gauthali (Swallow)	Kaag (Crow)	
6.	Gidda (Vulture)	Dhukur (Dove)	Sarew/Ruppi (Mynah)	
7.	Maina/ Dangre (Mynah)	Chyakura (Chukar)	Gauthali	
8.	Bakula (Heron)	Suga (Parrot)	Dhukur (Dove)	
9.	Kaliz (Phesant)	Sareu (Mynah)	Cheel (Eagle)	
10.		Jureli (Bulbul)		
Increasing				
1.	Kaglero (Crow)	Kaglero (Crow)	Kaglero (Crow)	
2.	Bhangera (Sparrow)	Kaliz (Pheasant)	Bhangera (Sparrow)	
3.	Suga (Parrot)	Bhangera (Sparrow)	Kaliz (Pheasant)	
4.	Parewa (Peigon)	Kokale (Tree pie)	Dhukur (Dove)	
5.	Pani Hans (Duck)	Lampuchre (Magpie)		
6.	Maina (Mynah)	Dhukur(Dove)		
7	Dhukur (Dove)	Suga (Parrot)		
8.	Kaliz (Pheasant)	Maina (Mynah)		
9.		Sarau (Mynah)		
Disappeared				
1.	Gidda (Vulture)	Gidda (Vulture)	Gidda (Vulture)	
2.	Cheel (Eagle)	Cheel (Eagle)	Bhangera (Sparrow)	
3.	Nilkantha (Magpie)	Huchil (Owl)	Danfe (Himalayan Monal)	
4.	Gadur (Shikra)	Suga (Parrot)	Chakewa (Shelduck)	
5.	Mayur (Peacock)	Chakewa (Shelduck)	Bhadrai (Babbler)	
6.	Dhanesh (Hornbill)	Bakulla (Heron)	Kaliz	
7.	Jureli (Bulbul)	Bhangera (Sparrow)	Latkosero (owl)	
8.	Gauthali (Swallow)	Jureli (Bulbul)	Ruppi (Mynah)	
9.	Baaj (Hawk)	Danfe (Himalayan Monal)	Eagle	
10	Karang kurung (Crane)	Gauthali (Swallow)	Batai (Quail)	

New Species				
1.	Lampuchre (Magpie)	Lampuchre (Magpie)	Nyauli (Great Barbet)	Dhukur (Dove)
2.	Saras (Crane)		Suga (Parrot)	
3.	Mayur (Peacock)	Parewa (Pigeon)	Kotero (Munia)	
4.	Mauri khane/Murali Chara (Bee-eater)	Parewa (Pigeon)	Bakulla (Heron)	
5.	Bhyakur (Babbler)	Kaliz (Pheasant)	Khuthukrke (Barbet)	
6.	Jureli (Bulbul)	Suga (Parrot)	Lampuchre (Magpie)	
7.	Nyauli (Great Barbet)	Munal (Lophophorus)	Koili (Cuckoo)	
8.		Kotero (Munia)		
9.		Chirchire (Finch)		
10.		Jureli (Bulbul)		

Table 8-27 shows the status of most reported bird species in last 25 years. Majority of households reported that species such as *suga* (Parrot), *bhangera* (Sparrow), *kag* (Crow), *kaliz* (Pheasant) in tropical and sub-tropical zone; and *chyakhura* (Chukar) and *danfe* (Lophophorus) in temperate are decreasing in last 25 years. Households in sub-alpine zone have not reported an observation neither increase nor decrease in disappearance of any bird species in their area in last 25 years. However, *dhukur* (Dove) is the only bird that households in sub-alpine zone reported to have appeared as a new species in their area.

8.4. Emergence of New Invasive Plant Species

Table 8-28: Emergence of New Invasive Plants in Last 25 Years

Invasive Species (Category)	Response (HH, %)			Total
	Yes	No	Not applicable	
Shrub/bush	36.47	55.70	7.83	100.00
Creeper plant (climber)	14.38	74.79	10.83	100.00
Creeper plant (land)	16.73	70.69	12.57	100.00

Table 8-28 presents the percentage distribution of households observing an emergence of new invasive plant species in last 25 years. Overall, majority of households are not observing an emergence of new invasive species in their area in last 25 years. However, 36.47 per cent households reported that they have observed an emergence of shrub/bush in last 25 years followed by creeper plant (land) (16.73%) and creeper plant (climber) (14.38%).

Table 8-29: Emergence of New Invasive Plant by Ecological Belt in Last 25 Years

Invasive Species (Category)	Observed Change (HH, %)			Total
	Yes	No	Not applicable	
Mountain				
Shrub/bush	22.69	76.55	0.76	100.00
Creeper plant (climber)	4.18	94.44	1.37	100.00
Creeper plant (land)	1.16	98.21	0.63	100.00
Hill				
Shrub/bush	43.67	48.35	7.98	100.00
Creeper plant (climber)	11.68	78.04	10.28	100.00
Creeper plant (land)	9.28	78.34	12.37	100.00
Terai				
Shrub/bush	31.70	59.42	8.89	100.00
Creeper plant (climber)	18.81	68.18	13.01	100.00
Creeper plant (land)	26.81	58.37	14.82	100.00

Table 8-29 presents the percentage distribution of households observing an emergence of new invasive plant species by ecological belt in last 25 years. A 43.67 per cent of households in hill are observing an emergence of shrub/bush species in last 25 years while 22.69 per cent households in hill and 31.70 per cent households in *Terai* have reported so.

Table 8-30: Emergence of New Invasive Plants by Eco-Development Region in Last 25 Years

Invasive Species (Category)	Observed Change (HH, %)			Total
	Yes	No	Not applicable	
Eastern Mountain				
Shrub/bush	29.80	70.20	0.0	100.00
Creeper plant (climber)	2.25	94.29	3.46	100.00
Creeper plant (land)	1.03	98.01	0.95	100.00
Eastern Hill				
Shrub/bush	21.89	75.63	2.48	100.00
Creeper plant (climber)	11.04	85.94	3.02	100.00
Creeper plant (land)	4.94	90.88	4.18	100.00
Eastern *Terai*				
Shrub/bush	41.61	44.64	13.75	100.00
Creeper plant (climber)	26.55	60.97	12.48	100.00
Creeper plant (land)	36.50	50.36	13.14	100.00
Central Mountain				
Shrub/bush	10.98	89.02	0.0	100.00
Creeper plant (climber)	4.09	95.32	0.59	100.00
Creeper plant (land)	2.52	96.93	0.55	100.00
Central Hill				
Shrub/bush	24.28	73.32	2.40	100.00
Creeper plant (climber)	3.50	94.10	2.40	100.00
Creeper plant (land)	2.45	95.08	2.47	100.00
Central *Terai*				
Shrub/bush	14.34	81.22	4.44	100.00
Creeper plant (climber)	17.73	78.12	4.16	100.00
Creeper plant (land)	26.01	66.05	7.93	100.00
Western Mountain				
Shrub/bush	2.20	95.60	2.20	100.00
Creeper plant (climber)	0.0	97.80	2.20	100.00
Creeper plant (land)	0.0	97.80	2.20	100.00
Western Hill				
Shrub/bush	71.35	24.26	4.40	100.00
Creeper plant (climber)	5.07	86.65	8.28	100.00
Creeper plant (land)	2.01	86.42	11.57	100.00
Western *Terai*				
Shrub/bush	43.35	47.82	8.83	100.00
Creeper plant (climber)	0.30	55.77	43.93	100.00
Creeper plant (land)	0.27	56.14	43.59	100.00

Invasive Species (Category)	Observed Change (HH, %)			Total
	Yes	No	Not applicable	
Mid-Western Mountain				
Shrub/bush	0.0	96.77	3.23	100.00
Creeper plant (climber)	0.0	99.07	0.93	100.00
Creeper plant (land)	0.0	99.07	0.93	100.00
Mid-Western Hill				
Shrub/bush	71.34	27.58	1.08	100.00
Creeper plant (climber)	39.00	52.30	8.70	100.00
Creeper plant (land)	49.62	35.04	15.34	100.00
Mid-Western *Terai*				
Shrub/bush	61.63	29.39	8.98	100.00
Creeper plant (climber)	22.80	64.19	13.01	100.00
Creeper plant (land)	41.05	44.01	14.93	100.00
Far-Western Mountain				
Shrub/bush	59.68	39.79	0.53	100.00
Creeper plant (climber)	11.28	88.11	0.61	100.00
Creeper plant (land)	0.0	100.00	0.0	100.00
Far-Western Hill				
Shrub/bush	57.91	41.25	0.84	100.00
Creeper plant (climber)	31.87	66.72	1.41	100.00
Creeper plant (land)	5.88	91.79	2.33	100.00
Far-Western *Terai*				
Shrub/bush	11.54	79.48	8.99	100.00
Creeper plant (climber)	12.62	78.76	8.61	100.00
Creeper plant (land)	7.63	83.45	8.92	100.00
Kathmandu Valley				
Shrub/bush	0.0	21.32	78.68	100.00
Creeper plant (climber)	0.0	20.63	79.37	100.00
Creeper plant (land)	0.0	20.63	79.37	100.00

Table 8-30 shows the percentage distribution of households observing an emergence of new invasive plant species by eco-development region in last 25 years. High percentage of households in western hill (71.35%) and mid-western Hill (71.34%) are observing an emergence of new bush/shrub plant species in last 25 years. However, high percentage of households in mid-western hill (49.62%) reported such observation for creeper plant (land) and 39 per cent households for creeper plant (climber).

Table 8-31: Emergence of New Invasive Plants by NAPA Combined Vulnerability Index in Last 25 Years

Invasive Species (Category)	Observed Changes (HH, %)			Total
	Yes	No	Not applicable	
Very High				
Shrub/bush	28.26	58.07	13.67	100.00
Creeper plant (climber)	15.38	70.89	13.73	100.00
Creeper plant (land)	14.54	71.25	14.21	100.00

Invasive Species (Category)	Observed Changes (HH, %)			Total
	Yes	No	Not applicable	
High				
Shrub/bush	40.18	58.13	1.70	100.00
Creeper plant (climber)	18.08	80.25	1.67	100.00
Creeper plant (land)	13.63	83.11	3.26	100.00
Moderate				
Shrub/bush	34.98	61.04	3.98	100.00
Creeper plant (climber)	9.71	85.65	4.65	100.00
Creeper plant (land)	18.38	74.13	7.49	100.00
Low				
Shrub/bush	35.50	51.42	13.08	100.00
Creeper plant (climber)	20.59	63.96	15.44	100.00
Creeper plant (land)	27.90	53.98	18.12	100.00
Very Low				
Shrub/bush	53.64	38.91	7.44	100.00
Creeper plant (climber)	0.46	66.01	33.53	100.00
Creeper plant (land)	0.56	65.68	33.76	100.00

Table 8-31 depicts the percentage of households observing an emergence of new invasive plant species by NAPA combined vulnerability index areas in last 25 years. Higher percentage of households in very low vulnerability area (53.64%) reported to have observed the emergence of shrub/bush species while only 0.46 per cent households and 0.56 per cent households in the same area have reported so for creeper plant (climber) and creeper plant (land) respectively.

Table 8-32: Emergence of New Invasive Plants by Bio-climatic Zones in Last 25 Years

Invasive Species (Category)	Observed Changes (HH, %)			Total
	Yes	No	Not applicable	
Tropical				
Shrub/bush	37.56	55.11	7.33	100.00
Creeper plant (climber)	19.02	69.91	11.06	100.00
Creeper plant (land)	23.86	62.64	13.51	100.00
Sub-Tropical				
Shrub/bush	35.55	54.80	9.65	100.00
Creeper plant (climber)	7.75	80.95	11.30	100.00
Creeper plant (land)	6.33	81.64	12.03	100.00
Temperate				
Shrub/bush	29.30	69.88	0.82	100.00
Creeper plant (climber)	2.78	92.89	4.33	100.00
Creeper plant (land)	0.69	94.91	4.40	100.00
Sub-Alpine				
Shrub/bush	0.0	100.00	0.0	100.00
Creeper plant (climber)	0.0	100.00	0.0	100.00
Creeper plant (land)	0.0	100.00	0.0	100.00

Table 8-32 indicates the percentage distribution of households observing an emergence of new invasive plant species by climatic zone in last 25 years. It is reported that higher percentage of households (37.56%) in tropical region are observing an emergence of new invasive species of shrub/bush followed by 35.55 per cent in sub-tropical and 29.30 per cent in temperate zone in last 25 years.

Table 8-33: Emergence of New Invasive Plants by Land Use Type

Invasive Species (Category)	Observed Change (HH, %)			Total
	Forest	Pasture Land	Agriculture	
Shrub/bush	27.47	12.24	60.29	100.00
Creeper plant (climber)	40.76	1.86	57.38	100.00
Creeper plant (land)	3.45	4.53	92.03	100.00

Table 8-33 shows the percentage distribution of households observing an emergence of new invasive species by land use type in last 25 years. Overall, higher percentage of households (92.03%) is observing emergence of creeper plant (land) in agricultural land followed by shrubs/bush (60.29%), and creeper plant (climber) (57.38%).

Table 8-34: Emergence of New Invasive Plants by Land Use Type in Ecological Belt

Invasive Species (Category)	Observed Change (HH, %)			Total
	Forest	Pasture Land	Agriculture	
Mountain				
Shrub/bush	56.82	6.68	36.51	100.00
Creeper plant (climber)	45.16	0.0	54.84	100.00
Creeper plant (land)	13.82	46.88	39.30	100.00
Hill				
Shrub/bush	36.43	11.12	52.45	100.00
Creeper plant (climber)	73.38	3.40	23.22	100.00
Creeper plant (land)	7.01	8.69	84.30	100.00
Terai				
Shrub/bush	11.60	14.46	73.94	100.00
Creeper plant (climber)	20.47	0.99	78.54	100.00
Creeper plant (land)	2.15	2.78	95.07	100.00

Table 8-34 presents the percentage distribution of households observing an emergence of new invasive species by land use type in ecological belt. Higher percentage of households in *Terai* (95.07%) have reported to have observed an emergence of creeper plant (land) in agricultural land followed by 78.54 per cent for creeper plant (climber) and 73.94 per cent for shrub/bush in last 25 years.

Table 8-35: Emergence of New Invasive Plants by Land Use Type in Eco-Development Region

Invasive Species (Category)	Observed Change (HH, %)			Total
	Forest	Pasture Land	Agriculture	
Eastern Mountain				
Shrub/bush	39.53	8.04	52.43	100.00
Creeper plant (climber)	77.84	0.0	22.16	100.00
Creeper plant (land)	0.0	0.0	100.00	100.00
Eastern Hill				
Shrub/bush	52.38	13.14	34.48	100.00
Creeper plant (climber)	68.44	16.21	15.35	100.00
Creeper plant (land)	26.87	55.72	17.41	100.00
Eastern *Terai*				
Shrub/bush	6.31	11.32	82.37	100.00
Creeper plant (climber)	24.36	0.73	74.91	100.00
Creeper plant (land)	2.50	3.95	93.55	100.00
Central Mountain				
Shrub/bush	39.30	0.0	60.70	100.00
Creeper plant (climber)	100.00	0.0	0.0	100.00
Creeper plant (land)	17.65	59.88	22.47	100.00
Central Hill				
Shrub/bush	21.80	7.98	70.22	100.00
Creeper plant (climber)	11.86	0.0	88.14	100.00
Creeper plant (land)	12.90	18.25	68.85	100.00
Central *Terai*				
Shrub/bush	0.0	0.93	99.07	100.00
Creeper plant (climber)	7.06	0.92	92.02	100.00
Creeper plant (land)	0.43	0.0	99.57	100.00
Western Mountain				
Shrub/bush	100.00	0.0	0.0	100.00
Creeper plant (climber)	100.00	0.0	0.0	100.00
Creeper plant (land)	100.00	0.0	0.0	100.00
Western Hill				
Shrub/bush	24.84	4.25	70.91	100.00
Creeper plant (climber)	92.76	0.0	7.24	100.00
Creeper plant (land)	21.28	0.0	78.72	100.00
Western *Terai*				
Shrub/bush	2.66	1.00	96.35	100.00
Creeper plant (climber)	51.39	48.61	0.0	100.00
Creeper plant (land)	100.00	0.0	0.0	100.00
Mid-western Hill				
Shrub/bush	49.82	22.19	27.99	100.00
Creeper plant (climber)	75.44	0.0	24.56	100.00
Creeper plant (land)	0.59	0.47	98.94	100.00
Mid-western *Terai*				
Shrub/bush	34.71	47.16	18.14	100.00
Creeper plant (climber)	45.43	0.0	54.57	100.00
Creeper plant (land)	0.0	5.83	94.17	100.00

Invasive Species (Category)	Observed Change (HH, %)			Total
	Forest	Pasture Land	Agriculture	
Far-Western Mountain				
Shrub/bush	73.59	8.11	18.29	100.00
Creeper plant (climber)	0.0	0.0	100.00	100.00
Far-Western Hill				
Shrub/bush	72.78	22.06	5.16	100.00
Creeper plant (climber)	89.02	3.81	7.17	100.00
Creeper plant (land)	45.26	42.81	11.92	100.00
Far-Western *Terai*				
Shrub/bush	76.34	2.54	21.12	100.00
Creeper plant (climber)	16.69	5.29	78.03	100.00
Creeper plant (land)	40.09	3.77	56.14	100.00

Table 8-35 depicts the percentage distribution of households observing an emergence of new invasive species by land use type in eco-development regions in last 25 years. The table shows that all households in central mountain region (100%) are observing an emergence of creeper plants (climber) in forests areas while all households in western mountain region (100%) and western *Terai* (100%) are observing emergence of shrub/bush and creeper plant (land) in forests area.

Table 8-36: Emergence of New Invasive Plants by Land Use Type in NAPA Combined Vulnerability Index

Invasive Species (Category)	Observed Changes (HH, %)			Total
	Forest	Pasture Land	Agriculture	
Very High				
Shrub/bush	15.05	2.21	82.73	100.00
Creeper plant (climber)	25.25	0.0	74.75	100.00
Creeper plant (land)	4.76	2.05	93.19	100.00
High				
Shrub/bush	31.44	12.80	55.76	100.00
Creeper plant (climber)	40.31	2.01	57.68	100.00
Creeper plant (land)	4.92	5.16	89.92	100.00
Moderate				
Shrub/bush	31.58	3.51	64.91	100.00
Creeper plant (climber)	26.26	0.0	73.74	100.00
Creeper plant (land)	1.22	0.0	98.78	100.00
Low				
Shrub/bush	38.40	36.00	25.60	100.00
Creeper plant (climber)	61.63	4.12	34.26	100.00
Creeper plant (land)	3.34	9.13	87.53	100.00
Very Low				
Shrub/bush	12.53	3.84	83.64	100.00
Creeper plant (climber)	80.47	19.53	0.0	100.00
Creeper plant (land)	29.88	0.0	70.12	100.00

Table 8-36 presents percentage distribution of households observing an emergence of invasive species by land use type in NAPA combined vulnerability index. Higher percentage of households in very low vulnerable area (80.47%) are observing an emergence of creeper plant (climber) in forests area while 98.78 per cent households in moderate vulnerable area reported such observation for creeper plant (land) in agricultural land in last 25 years.

Table 8-37: Emergence of New Invasive Plants by Land Use Type in Bio-climatic Zones

Invasive Species (Category)	Observed Changes (HH, %)			Total
	Forest	Pasture Land	Agriculture	
Tropical				
Shrub/bush	21.52	13.51	64.98	100.00
Creeper plant (climber)	34.51	1.33	64.16	100.00
Creeper plant (land)	2.63	3.51	93.85	100.00
Sub-Tropical				
Shrub/bush	39.62	10.36	50.02	100.00
Creeper plant (climber)	68.58	4.25	27.17	100.00
Creeper plant (land)	8.91	11.33	79.77	100.00
Temperate				
Shrub/bush	17.67	7.94	74.39	100.00
Creeper plant (climber)	24.49	0.0	75.51	100.00
Creeper plant (land)	0.0	0.0	100.00	100.00

Table 8-37 presents the percentage distribution of households observing an emergence of invasive species by land use type in bio-climatic zones. Hundred per cent household in temperate zone is observing an emergence of creeper plant (land) in agriculture area while 13.51 per cent households in tropical zone reported such observation for shrubs/bush in pasture land.

Table 8-38: Reason behind Emergence of Invasive Species

Invasive Species (Category)	Reasons (HH, %)			Total
	Naturally spread	Spread by human	Don't know	
Shrub/bush	80.57	0.75	18.68	100.00
Creeper plant (climber)	94.49	0.29	5.22	100.00
Creeper plant (land)	96.94	0.63	2.43	100.00

Table 8-38 shows the percentage distribution of household response on reasons for emergence of invasive species in last 25 years. Majority of households reported that creeper plants (land) has emerged due to natural reason (96.94%) while only 0.63 per cent observed so due to human interventions. Similarly 94.49 per cent households reported the natural cause as the main reason for emergence of creeper plants (climber) in their area while 80.57 per cent reported so for emergence of shrub/bush in last 25 years.

Table 8-39: Reason behind Emergence of New Invasive Species by Rural-Urban

Invasive Species (Category)	Reasons (HH, %)			Total
	Naturally spread	Spread by human	Don't know	
Urban				
Shrub/bush	91.14	1.50	7.36	100.00
Creeper plant (climber)	95.03	0.0	4.97	100.00
Creeper plant (land)	95.39	2.82	1.79	100.00
Rural				
Shrub/bush	77.49	0.54	21.97	100.00
Creeper plant (climber)	94.32	0.38	5.30	100.00
Creeper plant (land)	97.38	0.0	2.62	100.00

Table 8-39 shows the percentage distribution of households response on reason for emergence of new invasive species by rural-urban area. Majority of households in both urban and rural area are observing an emergence of invasive species due to natural reason. However, small proportion of households in urban area (1.50%) reported so due to human activities.

Table 8-40: Reason behind Emergence of New Invasive Species by Ecological Belt

Invasive Species (Category)	Reasons (HH, %)			Total
	Naturally spread	Spread by human	Don't know	
Mountain				
Shrub/bush	95.48	1.43	3.09	100.00
Creeper plant (climber)	91.04	0.0	8.96	100.00
Creeper plant (land)	78.29	0.0	21.71	100.00
Hill				
Shrub/bush	66.27	0.78	32.94	100.00
Creeper plant (climber)	89.71	0.22	10.07	100.00
Creeper plant (land)	90.50	2.48	7.02	100.00
Terai				
Shrub/bush	98.28	0.63	1.08	100.00
Creeper plant (climber)	97.56	0.35	2.09	100.00
Creeper plant (land)	99.29	0.0	0.71	100.00

Table 8-40 presents the percentage distribution of households response on reason of emergence of new invasive species by ecological belt. Majority of households in all ecological regions are observing such changes due to natural reason. However, 1.43 per cent households in mountain region, 0.78 per cent in hill and 0.63 per cent in *Terai* reported that human activities are the main reason behind emergence of shrub/bush in last 25 years.

Table 8-41: Reason behind Emergence of New Invasive Species by Eco-Development Region

Invasive Species (Category)	Reasons (HH, %)			Total
	Naturally spread	Spread by human	Don't know	
Eastern Mountain				
Shrub/bush	97.76	2.24	0.0	100.00
Creeper plant (climber)	100.00	0.0	0.0	100.00
Creeper plant (land)	0.0	0.0	100.00	100.00
Eastern Hill				
Shrub/bush	95.92	1.26	2.83	100.00
Creeper plant (climber)	97.57	0.0	2.43	100.00
Creeper plant (land)	100.00	0.0	0.0	100.00
Eastern *Terai*				
Shrub/bush	99.00	0.60	0.39	100.00
Creeper plant (climber)	97.81	0.73	1.46	100.00
Creeper plant (land)	99.67	0.0	0.33	100.00
Central Mountain				
Shrub/bush	78.05	4.14	17.81	100.00
Creeper plant (climber)	74.43	0.0	25.57	100.00
Creeper plant (land)	100.00	0.0	0.0	100.00
Central Hill				
Shrub/bush	47.86	0.0	52.14	100.00
Creeper plant (climber)	48.45	0.0	51.55	100.00
Creeper plant (land)	49.70	0.0	50.30	100.00
Central *Terai*				
Shrub/bush	98.90	0.0	1.10	100.00
Creeper plant (climber)	98.88	0.0	1.12	100.00
Creeper plant (land)	100.00	0.0	0.0	100.00
Western Mountain				
Shrub/bush	100.00	0.0	0.0	100.00
Creeper plant (climber)	100.00	0.0	0.0	100.00
Creeper plant (land)	100.00	0.0	0.0	100.00
Western Hill				
Shrub/bush	48.55	1.05	50.41	100.00
Creeper plant (climber)	87.36	0.0	12.64	100.00
Creeper plant (land)	50.23	0.0	49.77	100.00
Western *Terai*				
Shrub/bush	99.10	0.90	0.0	100.00
Creeper plant (climber)	100.00	0.0	0.0	100.00
Creeper plant (land)	100.00	0.0	0.0	100.00
Mid-western Hill				
Shrub/bush	94.10	0.39	5.51	100.00
Creeper plant (climber)	93.04	0.0	6.96	100.00
Creeper plant (land)	96.09	3.39	0.52	100.00
Mid-western *Terai*				
Shrub/bush	96.01	0.51	3.48	100.00
Creeper plant (climber)	92.98	0.0	7.02	100.00
Creeper plant (land)	96.79	0.0	3.21	100.00
Far-western Mountain				
Shrub/bush	100.00	0.0	0.0	100.00
Creeper plant (climber)	100.00	0.0	0.0	100.00

Invasive Species (Category)	Reasons (HH, %)			Total
	Naturally spread	Spread by human	Don't know	
Far-western Hill				
Shrub/bush	89.17	1.37	9.46	100.00
Creeper plant (climber)	94.64	1.28	4.08	100.00
Creeper plant (land)	100.00	0.0	0.0	100.00
Far-western *Terai*				
Shrub/bush	92.43	5.03	2.54	100.00
Creeper plant (climber)	96.35	0.0	3.65	100.00
Creeper plant (land)	95.63	0.0	4.37	100.00

Table 8-41 shows the percentage distribution of households response on reason behind emergence of new invasive species by eco-development region in last 25 years. It can be seen that majority of households in all eco-development region are observing such changes due to natural causes.

Table 8-42: Reason behind Emergence of New Invasive Species by Bio-Climate Zones

Invasive Species (Category)	Reasons (HH, %)			Total
	Naturally spread	Spread by human	Don't' know	
Tropical				
Shrub/bush	90.71	0.78	8.51	100.00
Creeper plant (climber)	95.44	0.26	4.30	100.00
Creeper plant (land)	97.33	0.73	1.94	100.00
Sub-tropical				
Shrub/bush	65.59	0.69	33.72	100.00
Creeper plant (climber)	90.73	0.44	8.83	100.00
Creeper plant (land)	94.27	0.0	5.73	100.00
Temperate				
Shrub/bush	44.79	0.95	54.25	100.00
Creeper plant (climber)	86.85	0.0	13.15	100.00
Creeper plant (land)	100.00	0.0	0.0	100.00

Table 8-42 represents the percentage distribution of household response on reason of emergence of new invasive species by climatic zone in last 25 years. Higher percentages of households in all Bio-Climatic Zones have attributed natural cause as main reason for emergence of new invasive species in their area. However, less than one per cent households in all climatic zones have reported human cause for such changes.

Table 8-43: Observed Impact due to Invasive Species

Invasive species (Category)	Observed Impact[12] (HH, %)							
	Decreased Income	Loss in timber	Loss in grass	Loss in firewood	Leaf litter loss	Food grass loss	Human and livestock's health problem	No affect
Shrub/bush	56.6	13.3	62.7	4.4	10.1	12.7	4.2	2.5
Creeper plant (climber)	44.9	50.1	22.4	5.4	5.0	9.0	3.1	15.7
Creeper plant (land)	87.7	2.0	13.8	0.7	1.9	37.8	4.7	2.3

[12] The result is based on multiple response

Table 8-43 represents percentage distribution of households observing impact due to emergence of invasive species in last 25 years. Higher percentages of households have observed a decrease in income due to emergence of creeper plant (land) (87.7%) followed by shrub/bush (56.6%) and creeper plant (climber) (44.9%). Similarly, 62.7 per cent households reported loss on grass due to emergence of shrubs/bush while 50.1 per cent reported loss on timber production due to emergence of creeper plant (climber).

Table 8-44: Observed Impact due to Invasive Species by Eco-Development Region

Invasive species (Category)	Observed Impact[13] (HH, %)							
	Decreased Income	Loss in timber	Loss in grass	Loss in firewood	Leaf litter loss	Food grass loss	Human and livestock's health problem	No affect
Eastern Mountain								
Shrub/bush	69.0	6.4	84.4	0.0	6.1	0.0	0.0	0.0
Creeper plant (climber)	49.0	53.7	73.2	0.0	0.0	0.0	0.0	0.0
Creeper plant (land)	100.0	58.3	41.7	0.0	0.0	0.0	0.0	0.0
Eastern Hill								
Shrub/bush	75.1	15.2	81.8	11.1	15.5	2.6	1.3	0.0
Creeper plant (climber)	49.8	47.9	73.9	9.1	19.8	12.0	0.0	0.0
Creeper plant (land)	59.7	15.4	79.2	16.0	50.1	5.9	9.4	0.0
Eastern *Terai*								
Shrub/bush	77.4	4.2	53.0	0.9	0.5	4.7	2.0	2.2
Creeper plant (climber)	69.5	61.6	17.9	2.8	0.0	3.7	1.5	6.8
Creeper plant (land)	87.6	1.2	12.3	0.0	0.0	29.7	9.5	1.1
Central Mountain								
Shrub/bush	91.8	4.6	21.0	0.0	0.0	5.4	0.0	4.2
Creeper plant (climber)	0.0	48.9	51.1	10.9	14.4	0.0	0.0	0.0
Creeper plant (land)	22.5	0.0	77.5	0.0	37.8	0.0	0.0	0.0
Central Hill								
Shrub/bush	63.3	5.0	36.1	0.8	12.7	12.9	0.0	0.0
Creeper plant (climber)	74.3	11.9	0.0	5.5	0.0	59.4	0.0	13.8
Creeper plant (land)	75.6	0.0	37.3	0.0	0.0	44.1	9.1	6.2
Central *Terai*								
Shrub/bush	86.3	0.0	26.8	0.0	0.0	0.0	5.0	10.0
Creeper plant (climber)	23.1	27.2	1.8	0.0	0.0	14.9	0.0	51.8
Creeper plant (land)	91.2	0.0	1.5	0.0	0.0	91.2	0.9	3.6
Western Mountain								
Shrub/bush	0.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0
Western Hill								
Shrub/bush	48.3	16.4	87.0	7.6	2.3	2.5	3.0	2.1
Creeper plant (climber)	11.1	67.5	16.1	0.0	0.0	4.7	0.0	16.6
Creeper plant (land)	62.5	14.1	25.5	0.0	0.0	0.0	0.0	11.9
Western *Terai*								
Shrub/bush	95.2	0.5	8.6	0.0	0.0	97.4	17.7	1.4
Creeper plant (climber)	0.0	0.0	100.0	51.4	0.0	0.0	0.0	0.0
Creeper plant (land)	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0
Mid-Western Hill								
Shrub/bush	29.9	20.4	74.8	6.5	26.3	18.2	8.3	1.5
Creeper plant (climber)	33.0	73.5	41.2	16.5	6.9	3.4	0.0	3.1
Creeper plant (land)	95.5	1.5	15.6	0.0	0.0	5.2	1.4	1.7

Invasive species (Category)	Observed Impact[13] (HH, %)							
	Decreased Income	Loss in timber	Loss in grass	Loss in firewood	Leaf litter loss	Food grass loss	Human and livestock's health problem	No affect
Mid-Western *Terai*								
Shrub/bush	28.6	16.9	76.2	0.5	28.7	5.0	0.0	6.2
Creeper plant (climber)	47.8	38.0	9.6	2.9	4.9	4.8	0.0	11.4
Creeper plant (land)	93.8	0.0	13.6		0.9	2.7	1.8	3.2
Far-Western Mountain								
Shrub/bush	14.4	17.4	91.8	23.3	44.9	18.2	10.6	0.0
Creeper plant (climber)	100.0	0.0	0.0	0.0	0.0	6.2	93.8	0.0
Far-Western Hill								
Shrub/bush	19.8	54.9	58.0	3.7	18.3	5.3	3.7	0.9
Creeper plant (climber)	22.3	58.9	37.5	5.8	29.8	6.7	8.1	1.5
Creeper plant (land)	12.6	20.5	68.6	15.7	39.8	6.1	0.0	0.0
Far-Western *Terai*								
Shrub/bush	39.0	48.1	75.3	19.0	12.1	15.7	5.1	1.8
Creeper plant (climber)	74.1	12.8	20.3	11.5	7.2	18.9	40.9	0.0
Creeper plant (land)	39.7	28.5	53.3	10.8	0.0	50.6	21.0	0.0

Table 8-44 shows the percentage distribution of households observing impact caused by invasive species in last 25 years by eco-development region. Hundred per cent household in western mountain region reported to loss in timber and grass due to emergence of shrub/bush while 100 per cent households in far-western mountain reported decrease in income due to emergence of creeper plant (climber).

Table 8-45: Observed Impact due to Invasive Species by Income Quintile

Invasive Species (Category)	Observed Impact[14] (HH, %)							
	Decreased Income	Loss in timber	Loss in grass	Loss in firewood	Leaf litter loss	Food grass loss	Human and livestock's health problem	No affect
First Quintile (Lowest)								
Shrub/bush	51.8	19.7	58.6	4.2	12.9	7.3	3.3	2.2
Creeper (climber)	46.2	43.2	23.6	4.1	6.7	13.5	4.7	14.1
Creeper plant (land)	86.3	1.3	11.5	0.3	2.8	50.0	7.5	2.5
Second Quintile								
Shrub/bush	55.5	12.6	60.6	4.2	7.5	12.5	6.1	3.6
Creeper (climber)	48.3	44.0	20.3	5.2	2.9	7.5	5.1	15.7
Creeper plant (land)	90.6	1.3	15.0	0.3	0.7	35.6	2.4	1.8
Third Quintile								
Shrub/bush	60.1	10.5	66.3	4.0	7.7	15.8	5.5	1.3
Creeper (climber)	43.7	52.2	24.2	3.8	5.2	5.6	2.5	20.2
Creeper plant (land)	88.2	2.7	12.0	0.8	2.1	33.8	3.1	2.1
Fourth Quintile								
Shrub/bush	56.2	12.1	76.0	5.2	10.3	13.6	3.1	1.4
Creeper (climber)	44.9	65.5	16.5	4.6	3.7	8.3	1.2	9.8
Creeper plant (land)	88.0	2.0	13.8	0.7	2.0	31.7	6.9	1.1
Fifth Quintile (Highest)								
Shrub/bush	53.4	13.1	66.9	4.8	12.6	18.7	3.4	3.8
Creeper (climber)	40.2	52.4	33.3	11.1	7.6	9.8	1.6	14.1
Creeper plant (land)	89.8	2.2	19.8	1.8	0.7	24.6	1.4	2.3

[13] The result is based on the multiple response
[14] The result is based on the multiple response

Table 8-45 shows the percentage distribution of households observing impacts due to invasive species in last 25 years by income quintile. Higher percentage of households in first quintile (86.3%) and fifth quintile (89.8%) attributed to decrease their income due to emergence of creeper plant (land).

Table 8-46: Observed Impact due to Invasive Species by Bio-climatic Zones

Invasive Species (Category)	Observed Impact[15] (HH, %)							
	Decreased Income	Loss in timber	Loss in grass	Loss in firewood	Leaf litter loss	Food grass loss	Human and livestock's health problem	No affect
Tropical								
Shrub/bush	63.4	11.9	54.6	2.1	7.9	16.6	4.1	3.0
Creeper (climber)	45.4	50.2	18.8	5.0	2.5	8.5	1.8	19.1
Creeper plant (land)	88.5	1.9	12.0	0.5	0.9	42.8	4.8	2.3
Sub-Tropical								
Shrub/bush	43.3	16.9	75.8	7.2	14.6	5.3	3.9	1.6
Creeper (climber)	41.3	51.4	37.7	7.2	15.1	11.4	7.2	1.7
Creeper plant (land)	82.3	3.0	26.4	2.3	8.7	5.5	3.8	2.6
Temperate								
Shrub/bush	61.4	5.2	81.2	16.9	7.0	15.0	8.8	1.4
Creeper (climber)	75.5	13.2	28.4	0.0	13.2		33.4	0.0
Creeper plant (land)	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 8-46 depicts the percentage distribution of households observing impact due to invasive species in last 25 years by climatic zone. Hundred per cent households in temperate zone reported decrease in income due to emergence of creeper plant (land) while 88.5 per cent in tropical zone and 82.3 per cent in sub-tropical zone reported so. Likewise, 81.2 per cent households in temperate zone, 75.8 per cent in sub-tropical zone, and 54.6 per cent in tropical zone have reported loss in grass due to emergence of shrub/bush in last 25 years.

Table 8-47: Early Flowering or Fruiting in the Tree Species

Analytical Domain	Response (HH, %)				Total
	Yes	No	Don't know	Not applicable	
Urban/Rural					
Urban	41.44	33.92	17.00	7.63	100.00
Rural	40.99	43.49	15.34	0.18	100.00
Ecological Belt					
Mountain	37.75	46.46	15.76	0.04	100.00
Hill	42.19	36.31	17.00	4.49	100.00
Terai	40.64	44.04	14.67	0.64	100.00
Eco-Development Region					
Eastern Mountain	24.89	66.06	9.05	0.0	100.00
Eastern Hill	62.63	24.99	12.38	0.0	100.00
Eastern *Terai*	66.98	20.75	11.72	0.55	100.00
Central Mountain	46.60	44.65	8.74	0.0	100.00
Central Hill	42.20	50.86	6.66	0.28	100.00
Central *Terai*	21.23	65.70	12.87	0.20	100.00
Western Mountain	2.20	97.80	0.0	0.0	100.00

[15] The result is based on the multiple response

Analytical Domain	Response (HH, %)				Total
	Yes	No	Don't know	Not applicable	
Western Hill	33.40	27.06	38.78	0.76	100.00
Western *Terai*	27.03	38.89	32.11	1.97	100.00
Mid-western Mountain	26.52	44.93	28.36	0.19	100.00
Mid-western Hill	32.30	64.20	3.50	0.0	100.00
Mid-western *Terai*	35.42	52.72	10.43	1.43	100.00
Far-western Mountain	50.68	24.08	25.24	0.0	100.00
Far-western Hill	88.14	10.66	1.19	0.0	100.00
Far-western *Terai*	47.98	37.74	14.28	0.0	100.00
Kathmandu Valley	2.16	12.54	24.70	60.60	100.00
NAPA Combined Vulnerability Index					
Very High	59.75	24.41	7.27	8.57	100.00
High	42.99	49.69	7.10	0.23	100.00
Moderate	24.32	52.10	23.22	0.36	100.00
Low	45.09	39.40	14.77	0.74	100.00
Very Low	25.09	30.64	42.94	1.33	100.00
Bio-Climate Zones					
Tropical	38.70	46.22	14.44	0.64	100.00
Sub-tropical	43.61	32.83	17.94	5.62	100.00
Temperate	55.01	25.81	18.39	0.78	100.00
Sub-alpine	0.0	100.00	0.0	0.0	100.00
Nepal	**41.12**	**40.69**	**15.83**	**2.36**	**100.00**

Table 8-47 and 8-48 present the percentage distribution of households observing early or delay in flowering and fruiting in the tree species in last 25 years. Almost equal percentage of households are observing early flowering or fruiting (41.12%) and delay on flowering and fruiting (40.69%) in tree species in last 25 years. However, significant percentage of households (16.52%) reported that they do not know whether flowering and fruiting time in trees species is delayed.

Table 8-48: Delay in Flowering or Fruiting in the Tree Species

Analytical Domain	Response (HH, %)				Total
	Yes	No	Don't know	Not applicable	
Urban/Rural					
Urban	12.05	62.42	17.94	7.58	100.00
Rural	10.84	73.06	15.93	0.16	100.00
Ecological Belt					
Mountain	15.39	69.85	14.77	0.0	100.00
Hill	11.42	66.20	17.77	4.60	100.00
Terai	10.25	73.68	15.58	0.49	100.00
Eco-Development Region					
Eastern Mountain	20.21	73.38	6.41	0.0	100.00
Eastern Hill	20.08	66.92	13.01	0.0	100.00
Eastern *Terai*	15.09	71.51	13.25	0.15	100.00
Central Mountain	15.86	76.02	8.11	0.0	100.00
Central Hill	10.97	83.73	5.01	0.28	100.00

Analytical Domain	Response (HH, %)				Total
	Yes	No	Don't know	Not applicable	
Central *Terai*	6.33	81.31	12.36	0.0	100.00
Western Mountain	0.0	100.00	0.0	0.0	100.00
Western Hill	4.17	52.03	42.77	1.03	100.00
Western *Terai*	4.38	61.72	31.46	2.43	100.00
Mid-western Mountain	0.59	71.69	27.72	0.0	100.00
Mid-western Hill	11.56	85.26	3.18	0.0	100.00
Mid-western *Terai*	5.90	74.82	17.85	1.43	100.00
Far-western Mountain	24.28	50.48	25.24	0.0	100.00
Far-western Hill	30.13	67.19	2.68	0.0	100.00
Far-western *Terai*	25.94	61.04	13.02	0.0	100.00
Kathmandu Valley	2.41	12.29	24.27	61.03	100.00
NAPA Combined Vulnerability Index					
Very High	11.07	73.60	6.69	8.63	100.00
High	13.24	80.27	6.42	0.07	100.00
Moderate	9.52	65.47	24.50	0.50	100.00
Low	14.51	67.83	17.22	0.43	100.00
Very Low	3.07	50.44	44.87	1.63	100.00
Bio-Climate Zones					
Tropical	9.78	74.53	15.17	0.52	100.00
Sub-tropical	13.41	61.68	19.16	5.75	100.00
Temperate	13.37	71.03	14.82	0.78	100.00
Sub-alpine	0.0	100.00	0.0	0.0	100.00
Nepal	11.20	69.95	16.52	2.34	100.00

Table 8-49: Early Flowering or Fruiting in Fruit Species

Analytical Domain	Response (HH, %)				Total
	Yes	No	Don't know	Not applicable	
Urban/Rural					
Urban	41.42	34.94	16.33	7.31	100.00
Rural	40.48	45.70	13.65	0.17	100.00
Ecological Belt					
Mountain	32.57	56.21	11.21	0.0	100.00
Hill	40.09	38.61	16.83	4.48	100.00
Terai	42.83	44.11	12.61	0.45	100.00
Eco-Development Region					
Eastern Mountain	20.98	75.98	3.04	0.0	100.00
Eastern Hill	66.22	24.36	9.42	0.0	100.00
Eastern *Terai*	69.14	21.49	9.23	0.15	100.00
Central Mountain	32.82	56.64	10.54	0.0	100.00
Central Hill	42.91	52.82	3.99	0.28	100.00
Central *Terai*	25.08	63.81	11.11	0.0	100.00
Western Mountain	6.61	93.39	0.0	0.0	100.00
Western Hill	22.76	33.25	42.69	1.30	100.00
Western *Terai*	25.61	42.81	29.46	2.12	100.00
Mid-western Mountain	27.91	60.58	11.51	0.0	100.00
Mid-western Hill	31.84	64.71	3.45	0.0	100.00

Analytical Domain	Response (HH, %)				Total
	Yes	No	Don't know	Not applicable	
Mid-western *Terai*	34.69	53.74	10.13	1.43	100.00
Far-western Mountain	52.79	24.20	23.01	0.0	100.00
Far-western Hill	84.83	13.00	2.18	0.0	100.00
Far-western *Terai*	51.95	36.89	11.16	0.0	100.00
Kathmandu Valley	5.83	11.79	24.18	58.19	100.00
NAPA Combined Vulnerability Index					
Very High	58.40	26.77	6.59	8.24	100.00
High	42.24	53.07	4.62	0.07	100.00
Moderate	24.77	52.20	22.39	0.64	100.00
Low	48.13	39.21	12.23	0.43	100.00
Very Low	18.25	36.61	43.71	1.43	100.00
Bio-Climate Zones					
Tropical	40.00	46.70	12.82	0.48	100.00
Sub-tropical	40.83	35.71	17.85	5.61	100.00
Temperate	50.63	38.40	10.24	0.73	100.00
Sub-alpine	0.0	100.00	0.0	0.0	100.00
Nepal	40.76	42.55	14.43	2.26	100.00

Table 8-50: Delay in Flowering or Fruiting in Fruit Species

Analytical Domain	Response (HH, %)				
	Yes	No	Don't know	Not applicable	Total
Urban/Rural					
Urban	14.23	61.99	16.65	7.13	100.00
Rural	17.38	67.77	14.66	0.19	100.00
Ecological Belt					
Mountain	14.91	72.25	12.84	0.0	100.00
Hill	12.59	65.61	17.57	4.23	100.00
Terai	20.56	65.49	13.35	0.60	100.00
Eco-Development Region					
Eastern Mountain	18.79	77.05	4.16	0.0	100.00
Eastern Hill	23.26	66.55	10.19	0.0	100.00
Eastern *Terai*	15.15	73.76	10.54	0.55	100.00
Central Mountain	15.05	71.59	13.36	0.0	100.00
Central Hill	11.55	84.80	3.38	0.28	100.00
Central *Terai*	33.06	55.84	11.10	0.0	100.00
Western Mountain	0.0	100.00	0.0	0.0	100.00
Western Hill	4.67	49.52	45.39	0.42	100.00
Western *Terai*	4.41	64.98	28.18	2.42	100.00
Mid-western Mountain	1.17	86.72	12.11	0.0	100.00
Mid-western Hill	10.81	86.03	3.16	0.0	100.00
Mid-western *Terai*	6.29	77.55	14.96	1.20	100.00
Far-western Mountain	24.51	51.32	24.17	0.0	100.00
Far-western Hill	36.15	60.86	2.99	0.0	100.00
Far-western *Terai*	29.25	60.11	10.64	0.0	100.00
Kathmandu Valley	2.72	14.60	24.51	58.17	100.00

Analytical Domain	Response (HH, %)				
	Yes	No	Don't know	Not applicable	Total
NAPA Combined Vulnerability Index					
Very High	11.93	72.89	6.94	8.23	100.00
High	15.12	79.76	5.05	0.07	100.00
Moderate	28.28	47.82	23.72	0.18	100.00
Low	14.93	70.24	14.13	0.69	100.00
Very Low	3.30	52.30	42.78	1.62	100.00
Bio-Climate Zones					
Tropical	17.67	68.24	13.51	0.58	100.00
Sub-tropical	14.82	60.89	18.87	5.41	100.00
Temperate	12.75	76.09	11.17	0.0	100.00
Sub-alpine	0.0	100.00	0.0	0.0	100.00
Nepal	16.46	66.08	15.24	2.22	100.00

Table 8-49 and 8-50 present the percentage distribution of households observing an early or delay in flowering or fruiting in fruit species in last 25 years. Total 40.72 per cent household are observing early flowering/ fruiting in fruit species in last 25 years while 16.46 per cent households reported to have observed delay in the phenomenon. Similarly, 42.55 per cent households have not observed an early flowering/fruiting in fruit species while 66.08 per cent households reported to such on delay on flowering/fruiting in last 25 years.

Table 8-51: Early Flowering or Fruiting in the Shrub/Bush Species

Analytical Domain	Response (HH, %)				
	Yes	No	Don't know	Not applicable	Total
Urban/Rural					
Urban	25.72	33.82	30.76	9.70	100.00
Rural	30.91	46.26	22.38	0.46	100.00
Ecological Belt					
Mountain	17.14	53.26	29.60	0.0	100.00
Hill	29.55	40.92	24.80	4.73	100.00
Terai	31.33	42.47	24.05	2.15	100.00
Eco-Development Region					
Eastern Mountain	19.20	72.51	8.29	0.0	100.00
Eastern Hill	46.81	30.94	21.66	0.59	100.00
Eastern *Terai*	49.17	20.72	24.98	5.13	100.00
Central Mountain	19.33	49.67	31.00	0.0	100.00
Central Hill	36.60	57.36	5.75	0.28	100.00
Central *Terai*	19.38	63.70	16.93	0.0	100.00
Western Mountain	0.0	100.00	0.0	0.0	100.00
Western Hill	11.56	31.66	56.36	0.42	100.00
Western *Terai*	22.79	43.11	31.85	2.24	100.00
Mid-western Mountain	2.08	67.60	30.32	0.0	100.00
Mid-western Hill	27.00	67.41	5.59	0.0	100.00
Mid-western *Terai*	23.11	53.94	21.76	1.20	100.00
Far-western Mountain	26.67	18.72	54.61	0.0	100.00
Far-western Hill	65.39	14.07	20.54	0.0	100.00
Far-western *Terai*	35.13	14.22	50.65	0.0	100.00
Kathmandu Valley	0.87	9.95	25.32	63.86	100.00

Analytical Domain	Response (HH, %)				
	Yes	No	Don't know	Not applicable	Total
NAPA Combined Vulnerability Index					
Very High	53.17	27.63	10.18	9.03	100.00
High	34.89	56.39	8.65	0.07	100.00
Moderate	12.23	52.72	34.86	0.18	100.00
Low	23.29	34.43	37.83	4.45	100.00
Very Low	14.73	35.98	47.79	1.51	100.00
Bio-Climate Zones					
Tropical	28.51	45.94	23.75	1.80	100.00
Sub-tropical	30.11	37.01	26.89	5.99	100.00
Temperate	35.94	40.13	23.93	0.0	100.00
Sub-alpine	0.0	100.00	0.0	0.0	100.00
Nepal	**29.39**	**42.61**	**24.83**	**3.16**	**100.00**

Table 8-52: Delay in Flowering or Fruiting in the Shrub/Bush Species

Analytical Domain	Response (HH, %)				
	Yes	No	Don't know	Not applicable	Total
Urban/Rural					
Urban	7.71	51.17	31.26	9.86	100.00
Rural	9.31	67.14	22.83	0.72	100.00
Ecological Belt					
Mountain	12.48	57.61	29.92	0.0	100.00
Hill	9.79	59.70	25.73	4.77	100.00
Terai	7.27	66.04	24.08	2.61	100.00
Eco-Development Region					
Eastern Mountain	18.42	73.98	7.60	0.0	100.00
Eastern Hill	20.39	55.36	23.61	0.63	100.00
Eastern *Terai*	8.16	60.70	24.59	6.55	100.00
Central Mountain	11.40	56.55	32.05	0.0	100.00
Central Hill	8.74	85.08	5.89	0.28	100.00
Central *Terai*	5.71	77.76	16.54	0.0	100.00
Western Mountain	0.0	100.00	0.0	0.0	100.00
Western Hill	1.32	41.38	56.91	0.39	100.00
Western *Terai*	1.82	64.09	32.13	1.96	100.00
Mid-western Mountain	0.0	69.68	30.32	0.0	100.00
Mid-western Hill	10.40	83.66	5.93	0.0	100.00
Mid-western *Terai*	7.24	68.83	22.73	1.20	100.00
Far-western Mountain	20.33	24.52	55.14	0.0	100.00
Far-western Hill	29.64	43.55	26.80	0.0	100.00
Far-western *Terai*	22.79	23.42	53.59	0.20	100.00
Kathmandu Valley	1.03	9.79	24.75	64.44	100.00
NAPA Combined Vulnerability Index					
Very High	11.29	69.21	10.39	9.11	100.00
High	12.19	77.98	9.75	0.07	100.00
Moderate	7.68	57.03	35.12	0.17	100.00
Low	6.97	49.35	38.09	5.59	100.00
Very Low	1.24	49.14	48.29	1.33	100.00

Analytical Domain	Response (HH, %)				
	Yes	No	Don't know	Not applicable	Total
Bio-Climate Zones					
Tropical	6.51	67.36	23.98	2.15	100.00
Sub-tropical	12.61	53.55	27.80	6.05	100.00
Temperate	11.47	64.24	24.29	0.0	100.00
Sub-alpine	0.0	100.00	0.0	0.0	100.00
Nepal	**8.84**	**62.46**	**25.30**	**3.40**	**100.00**

Table 8-51 and 8-52 depict the percentage distribution of households observing early or delay in flowering or fruiting of shrubs/bush species in last 25 years. A total 29.39 per cent household reported to have observed an early flowering/ fruiting in shrub/bush species while only 8.84 per cent households reported to have observed delay. Similarly, higher percentage of households in very high vulnerable area (53.17%) under NAPA combined vulnerable index reported of observing early flowering/ fruiting in the shrubs/bush species while only 12.19 per cent households in the area reported of observing delay in such phenomenon in shrubs/bushes in last 25 years.

Table 8-53: Early Flowering or Fruiting in Medicine Plant Species

Analytical Domain	Response (HH, %)				
	Yes	No	Don't know	Not applicable	Total
Urban/Rural					
Urban	20.42	27.34	37.22	15.03	100.00
Rural	23.54	34.33	37.63	4.49	100.00
Ecological Belt					
Mountain	12.11	49.04	38.85	0.0	100.00
Hill	21.70	37.21	34.57	6.52	100.00
Terai	25.35	24.51	40.20	9.93	100.00
Eco-Development Region					
Eastern Mountain	14.74	75.72	9.54	0.0	100.00
Eastern Hill	38.63	30.33	29.63	1.41	100.00
Eastern *Terai*	44.83	13.97	28.86	12.34	100.00
Central Mountain	19.26	46.75	33.98	0.0	100.00
Central Hill	34.37	53.54	11.38	0.72	100.00
Central *Terai*	19.01	30.70	48.40	1.89	100.00
Western Mountain	0.0	100.00	0.0	0.0	100.00
Western Hill	3.89	31.93	63.30	0.87	100.00
Western *Terai*	0.89	34.69	24.83	39.59	100.00
Mid-western Mountain	4.77	54.92	40.31	0.0	100.00
Mid-western Hill	10.57	49.09	30.94	9.39	100.00
Mid-western *Terai*	10.41	31.33	57.06	1.20	100.00
Far-western Mountain	3.57	11.14	85.30	0.0	100.00
Far-western Hill	42.90	12.78	44.33	0.0	100.00
Far-western *Terai*	28.05	14.32	57.02	0.61	100.00
Kathmandu Valley	0.87	9.59	24.12	65.42	100.00
NAPA Combined Vulnerability Index					
Very High	52.41	27.05	11.09	9.45	100.00
High	28.40	46.81	22.27	2.53	100.00
Moderate	5.57	32.49	61.40	0.54	100.00
Low	12.61	21.86	53.74	11.80	100.00
Very Low	0.77	30.64	43.37	25.23	100.00

Analytical Domain	Response (HH, %)				
	Yes	No	Don't know	Not applicable	Total
Bio-Climate Zones					
Tropical	22.58	30.98	38.41	8.04	100.00
Sub-tropical	23.25	33.75	35.27	7.73	100.00
Temperate	18.77	37.96	42.87	0.40	100.00
Sub-alpine	0.0	100.00	0.0	0.0	100.00
Nepal	**22.62**	**32.29**	**37.51**	**7.58**	**100.00**

Table 8-54: Delay in Flowering or Fruiting in Medicinal Plant Species

Analytical Domain	Response (HH, %)				
	Yes	No	Don't know	Not applicable	Total
Urban/Rural					
Urban	6.64	40.12	37.90	15.34	100.00
Rural	6.27	50.91	38.25	4.56	100.00
Ecological Belt					
Mountain	6.72	52.08	41.20	0.0	100.00
Hill	6.88	51.61	35.01	6.50	100.00
Terai	5.83	43.18	40.73	10.25	100.00
Eco-Development Region					
Eastern Mountain	11.70	75.46	12.84	0.0	100.00
Eastern Hill	14.90	52.96	30.44	1.71	100.00
Eastern *Terai*	7.68	50.59	29.03	12.70	100.00
Central Mountain	9.83	52.47	37.69	0.0	100.00
Central Hill	7.80	80.59	10.85	0.76	100.00
Central *Terai*	4.43	44.35	49.14	2.08	100.00
Western Mountain	0.0	100.00	0.0	0.0	100.00
Western Hill	0.26	35.48	63.80	0.46	100.00
Western *Terai*	0.83	32.73	25.95	40.49	100.00
Mid-western Mountain	0.0	59.69	40.31	0.0	100.00
Mid-western Hill	4.56	54.60	31.44	9.39	100.00
Mid-western *Terai*	4.33	37.76	56.71	1.20	100.00
Far-western Mountain	1.85	11.72	86.43	0.0	100.00
Far-western Hill	20.43	31.02	48.14	0.41	100.00
Far-western *Terai*	16.54	24.05	58.51	0.90	100.00
Kathmandu Valley	1.03	9.43	24.12	65.42	100.00
NAPA Combined Vulnerability Index					
Very High	10.89	68.21	11.43	9.47	100.00
High	8.73	65.46	23.08	2.73	100.00
Moderate	3.19	33.95	62.43	0.43	100.00
Low	5.00	28.68	54.09	12.23	100.00
Very Low	0.52	30.05	43.90	25.54	100.00
Bio-Climate Zones					
Tropical	5.04	47.73	38.89	8.34	100.00
Sub-tropical	8.81	47.46	36.13	7.60	100.00
Temperate	5.97	49.79	43.84	0.40	100.00
Sub-alpine	0.0	100.00	0.0	0.0	100.00
Nepal	**6.38**	**47.75**	**38.15**	**7.72**	**100.00**

Table 8-53 and 8-54 represent the percentage distribution of households observing early or delay in flowering/fruiting in the medicine plant species in last 25 years. As whole 22.62 per cent households are observing early flowering in medicinal plants while 6.38 percent households reported of observing delay in such phenomenon. Moreover, 37.51 percent households did not know whether or not the early flowering/fruiting is happening in medicinal plant species in their area in last 25 years.

Table 8-55: Changes in Shape of Flower/Fruit

Analytical Domain	Responses (HH, %)				
	No change	Decrease in size	Increase in size	Not applicable	Total
Urban/Rural					
Urban	26.31	59.29	3.93	10.46	100.00
Rural	29.20	66.69	3.37	0.74	100.00
Ecological Belt					
Mountain	53.00	42.73	4.27	0.0	100.00
Hill	34.14	55.93	3.53	6.40	100.00
Terai	18.37	76.81	3.42	1.41	100.00
Eco-Development Region					
Eastern Mountain	57.98	41.67	0.35	0.0	100.00
Eastern Hill	25.73	68.75	5.52	0.0	100.00
Eastern *Terai*	14.83	76.74	5.92	2.52	100.00
Central Mountain	27.85	67.29	4.86	0.0	100.00
Central Hill	33.89	64.97	0.66	0.48	100.00
Central *Terai*	10.30	88.46	1.24	0.0	100.00
Western Mountain	73.99	26.01	0.0	0.0	100.00
Western Hill	48.83	41.46	5.62	4.09	100.00
Western *Terai*	20.21	77.67	1.05	1.07	100.00
Mid-western Mountain	84.48	6.24	9.28	0.0	100.00
Mid-western Hill	32.97	63.84	3.19	0.0	100.00
Mid-western *Terai*	36.97	52.36	7.33	3.33	100.00
Far-western Mountain	60.40	36.36	3.24	0.0	100.00
Far-western Hill	14.23	83.29	2.48	0.0	100.00
Far-western *Terai*	54.23	43.07	1.24	1.47	100.00
Kathmandu Valley	18.92	3.86	3.12	74.10	100.00
NAPA Combined Vulnerability Index					
Very High	19.86	67.43	2.14	10.57	100.00
High	27.48	69.68	2.77	0.07	100.00
Moderate	32.35	61.86	3.77	2.03	100.00
Low	34.15	56.64	6.34	2.87	100.00
Very Low	28.15	68.81	2.05	0.98	100.00
Bio-Climate Zones					
Tropical	22.61	72.77	3.31	1.31	100.00
Sub-tropical	34.76	53.90	3.65	7.69	100.00
Temperate	55.73	35.60	5.69	2.98	100.00
Sub-alpine	85.00	15.00	0.0	0.0	100.00
Nepal	**28.35**	**64.53**	**3.54**	**3.59**	**100.00**

Table 8-55 depicts percentage distribution of households observing changes in shape of flower/ fruit of different plant species in last 25 years. Overall data shows that higher percentages of households (64.53%) are observing decrease in size of the flowers/fruit while 28.35 per cent households reported to no change. Similarly, higher percentage of households in high vulnerable area (69.68%) under NAPA combined vulnerability index are observing a decrease in size of fruit/flower in their area in last 25 years while 56.645 per cent households in low vulnerable area reported so.

CHAPTER 9

CLIMATE CHANGE AND TOURISM

9.1. Summary of Findings

One fifth (20.61%) of the total respondents reported that they have touristic places in their vicinity. Ecological zone wise survey data reveals that Sub-alpine zone has maximum touristic places as 95 per cent households in the zone mentioned so.

The survey result reveals that the number of tourists in both urban and rural area is increased in most of the ecological zones and eco-developmental regions in last 25 years as about 95 per cent households reported to be so. Comparatively, eastern Terai (87.28%) and Sub-alpine (100%) households have observed gradual increase in number of the tourists in their area. However, some households reported to decreasing number in last 25 years though the underlying causes were not explicitly related to change on climatic variables. Similarly, almost one-third (33.29%) households have reported an increase in the length of stay of tourists in their areas. The analytical domain wise survey findings on change on the number of tourists, their stay, and reasons for such change are presented in following sub-sections.

9.2. Description of Results

Table 9-1: Availability of Touristic Places

Analytical Domain	Response (HH, %)		
	Yes	No	Total
Urban/Rural			
Urban	36.74	63.26	100.00
Rural	13.93	86.07	100.00
Ecological Belt			
Mountain	33.05	66.95	100.00
Hill	24.60	75.40	100.00
Terai	14.50	85.50	100.00
Eco-Development Region			
Eastern Mountain	61.99	38.01	100.00
Eastern Hill	17.08	82.92	100.00
Eastern *Terai*	5.68	94.32	100.00
Central Mountain	14.64	85.36	100.00
Central Hill	13.64	86.36	100.00
Central *Terai*	4.55	95.45	100.00
Western Mountain	88.39	11.61	100.00
Western Hill	37.99	62.01	100.00
Western *Terai*	22.69	77.31	100.00
Mid-western Mountain	39.33	60.67	100.00
Mid-western Hill	11.83	88.17	100.00
Mid-western *Terai*	58.89	41.11	100.00
Far-western Mountain	21.69	78.31	100.00
Far-western Hill	31.14	68.86	100.00
Far-western *Terai*	37.57	62.43	100.00
Kathmandu Valley	53.95	46.05	100.00
NAPA Combined Vulnerability Index			
Very High	17.16	82.84	100.00
High	15.95	84.05	100.00
Moderate	24.79	75.21	100.00

Analytical Domain	Response (HH, %)		
	Yes	No	Total
Low	24.58	75.42	100.00
Very Low	21.31	78.69	100.00
Bio-Climatic Zone			
Tropical	17.01	82.99	100.00
Sub-tropical	26.41	73.59	100.00
Temperate	23.96	76.04	100.00
Sub-alpine	95.00	5.00	100.00
Nepal	**20.61**	**79.39**	**100.00**

Table 9-1 presents the percentage distribution of households on availability of touristic places in their vicinity. Only 20.61 per cent of total respondents reported to have touristic places in their locality. Majority of households in mountain ecological belt (33.05%) have reported there is availability of touristic spots in their area. Western mountain consist relatively more touristic places among eco-development regions as 88.39 per cent respondents reported so. Across climatic zones on the other hand, 95.00 per cent respondent in sub-alpine zone reported to have touristic places.

Table 9-2: Observed Changes in Number of Tourists

Analytical Domain	Observed Changes (%)				
	Increased	Decreased	No change	Don't know	Total
Urban/Rural					
Urban	67.12	7.63	16.34	8.91	100.00
Rural	57.84	2.18	32.89	7.09	100.00
Ecological Belt					
Mountain	64.38	0.41	32.16	3.05	100.00
Hill	61.38	3.81	24.41	10.40	100.00
Terai	64.22	8.87	20.89	6.03	100.00
Eco-Development Region					
Eastern Mountain	55.92	0.0	39.09	4.99	100.00
Eastern Hill	56.65	0.0	39.61	3.74	100.00
Eastern *Terai*	87.28	0.0	12.72	0.0	100.00
Central Mountain	87.23	0.0	12.77	0.0	100.00
Central Hill	68.88	5.58	20.24	5.31	100.00
Central *Terai*	8.93	67.10	18.88	5.08	100.00
Western Mountain	60.13	2.49	37.37	0.0	100.00
Western Hill	71.59	1.37	23.23	3.81	100.00
Western *Terai*	76.14	0.97	20.78	2.11	100.00
Mid-western Mountain	58.70	1.49	39.81	0.0	100.00
Mid-western Hill	42.52	6.50	29.38	21.60	100.00
Mid-western *Terai*	67.29	0.41	22.75	9.54	100.00
Far-western Mountain	77.44	0.0	16.38	6.17	100.00
Far-western Hill	28.36	2.21	48.46	20.96	100.00
Far-western *Terai*	63.68	3.84	24.75	7.72	100.00
Kathmandu Valley	54.59	11.64	4.79	28.98	100.00
NAPA Combined Vulnerability Index					
Very High	67.92	6.24	11.65	14.19	100.00
High	36.40	17.27	34.55	11.78	100.00

Analytical Domain	Observed Changes (%)				
	Increased	Decreased	No change	Don't know	Total
Moderate	67.72	1.29	27.48	3.51	100.00
Low	69.69	1.03	22.62	6.67	100.00
Very Low	69.57	0.64	23.91	5.88	100.00
Bio-Climatic Zone					
Tropical	65.92	7.17	21.42	5.49	100.00
Sub-tropical	59.59	3.09	25.52	11.80	100.00
Temperate	56.52	0.99	41.33	1.17	100.00
Sub-alpine	100.00	0.0	0.0	0.0	100.00
Nepal	**62.68**	**5.02**	**24.25**	**8.04**	**100.00**

Table 9-2 depicts observed changes in number of tourists in last 25 years. Majority of households (62.68 %) have observed an increase in number of tourists whereas 5.02 per cent respondents have observed a decrease in such number. Similarly, 67.12 per cent respondents in urban area have observed an increase in number of tourists in last 25 years while 57.84 per cent have observed so in rural area. Similarly, highest percentage of households in eastern *Terai* (87.28%) observed an increase in tourist number in last 25 years followed by central mountain (87.23%) and western hill (71.59%) while all respondents (100%) in sub-alpine climatic zone have observed such increase.

Table 9-3 depicts the households' response on the reasons behind decrease in number of tourists in their area. The respondents have identified and ranked 10 major causes for the decline though all of those are not explicitly linked to climatic variables. inadequate marketing and strikes are the main two reasons behind decrease in number of tourists. Similarly, households have opined that earthquake has played a vital role in decline of tourists in their area. Moreover, respondents have reported some reasons such as increases in natural disasters and rise in temperature have also caused decrease in tourists which are directly related to climatic variables.

Table 9-3: Main Reason Behind Decrease in Number of Tourists

S.N.	Reasons to Decrease Tourist Number
1.	Inadequate promotion/marketing
2.	Strikes
3.	Inadequate sanitation and hygiene
4.	Earthquake
5.	Increase in pollution
6.	Inadequate infrastructure development
7.	Inadequate transportation facilities
8.	Inadequate conservation and protection of tourists area
9.	Natural disasters
10.	Temperature rise

Table 9-4: Observed Changes in Length of Stay

Analytical Domain	Response (HH, %)				
	Increased	Decreased	No Change	Don't know	Total
Urban/Rural					
Urban	44.87	4.56	33.91	16.66	100.00
Rural	20.64	0.90	65.40	13.06	100.00
Ecological Belt					
Mountain	48.54	0.07	43.50	7.90	100.00
Hill	29.80	2.10	51.31	16.79	100.00
Terai	33.18	5.09	47.16	14.57	100.00
Eco-Development Region					
Eastern Mountain	52.11	0.0	41.82	6.07	100.00
Eastern Hill	29.25	6.75	60.25	3.74	100.00
Eastern *Terai*	22.87	0.0	62.96	14.17	100.00
Central Mountain	71.67	0.0	3.10	25.23	100.00
Central Hill	40.11	0.0	42.34	17.55	100.00
Central *Terai*	7.19	39.45	53.35	0.0	100.00
Western Mountain	60.13	2.49	37.37	0.0	100.00
Western Hill	22.21	0.92	68.07	8.81	100.00
Western *Terai*	54.71	0.97	37.11	7.21	100.00
Mid-western Mountain	10.21	0.0	88.30	1.49	100.00
Mid-western Hill	23.42	2.72	50.26	23.59	100.00
Mid-western *Terai*	22.19	0.0	55.16	22.65	100.00
Far-western Mountain	74.99	0.0	18.84	6.17	100.00
Far-western Hill	24.72	0.0	47.00	28.28	100.00
Far-western *Terai*	62.83	1.62	21.20	14.35	100.00
Kathmandu Valley	46.50	4.49	8.94	40.07	100.00
NAPA Combined Vulnerability Index					
Very High	48.82	1.98	20.67	28.52	100.00
High	29.38	8.80	47.57	14.25	100.00
Moderate	25.98	0.61	67.23	6.18	100.00
Low	29.96	2.22	51.34	16.47	100.00
Very Low	40.82	1.13	46.17	11.88	100.00
Bio-Climatic Zone					
Tropical	31.32	3.83	53.22	11.64	100.00
Sub-tropical	36.40	1.99	41.60	20.02	100.00
Temperate	23.52	0.16	71.84	4.48	100.00
Sub-alpine	100.00	0.0	0.0	0.0	100.00
Nepal	**33.29**	**2.81**	**48.96**	**14.94**	**100.00**

Table 9-4 presents the percentage distribution of households observed changes in the length of stay of tourists in their area. It demonstrates that 33.29 per cent respondent have observed an increase in length of stay of tourists whereas 2.81 per cent reported to have decreased. More respondent from urban area (44.87%) have observed an increase in the time of tourists' stay in last 25 years than those in rural areas (20.64%). Total 46.5 per cent respondents in Kathmandu Valley observed an increase whilst 4.49 per cent respondents reported to decrease.

Table 9-5: Main Reason Behind Decrease in Length of Stay of Tourists

S.N.	Reasons to Decrease on Length of Tourist Stay
1.	Strike
2.	Pollution
3.	Earthquake
4.	Expensive settlement
5.	Inadequate transportation facilities
6.	Inadequate sanitation and hygiene
7.	Inadequate promotion/marketing

Table 9-5 depicts the households' response on main reasons behind decrease in length of stay of tourist in their area. Respondents have identified and ranked seven major reasons for the decrease. It is observed that strikes, environmental pollution, and earthquake are the most common reason to decrease on the stay duration of tourists in their areas. Similarly, respondents have also opined that increasing environmental pollutions and inadequate infrastructure development has also caused decrease in stay time.

CHAPTER 10

ADAPTATION MEASURES

10.1. Summary of Findings

The survey result reveals that households are adopting different adaptation measures to minimize climate change impacts. The survey has identified total 22 farm-based and 7 off-farm based adaptation measures based on expert consultation.

Figure 10-1: Adaptation Measures (Farm Based) Adopted in Last 25 Years

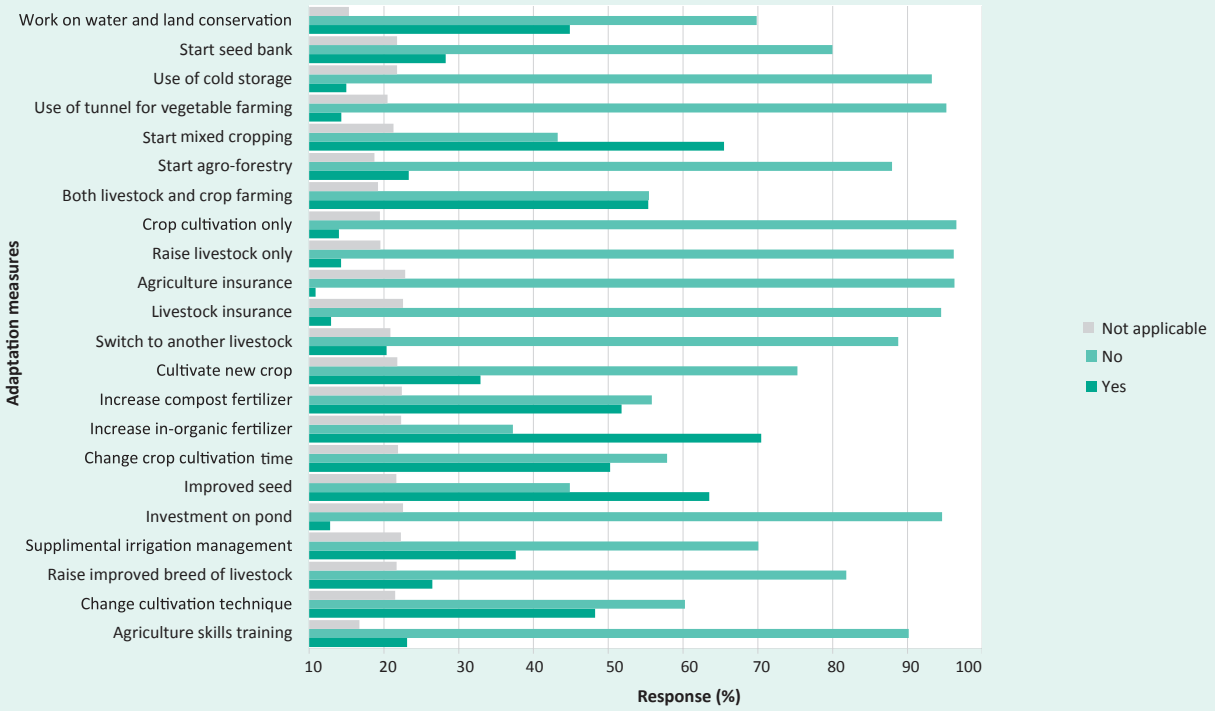
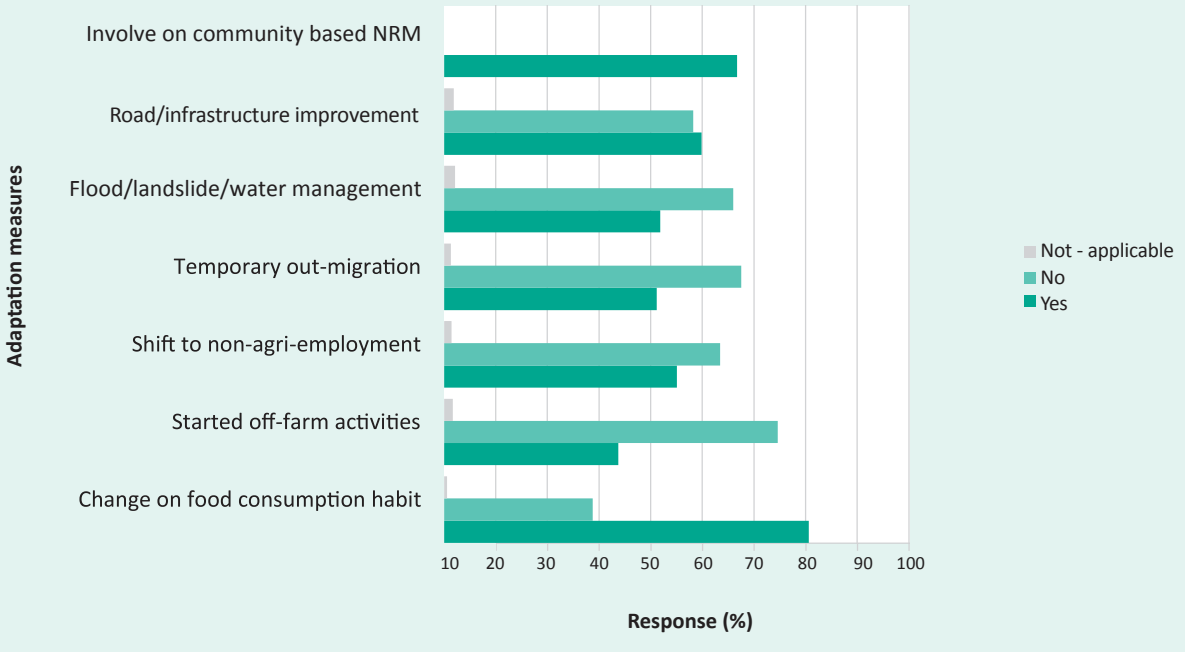


Figure 10-2: Adaptation Measures (off-farm) Adopted in last 25 years



The most adopted farm-based adaptation measures are reported to be the use of inorganic fertilisers (60.46%) followed by increased practice of mixed cropping (55.47%), and cultivation using improved seeds (53.50%) (Figure 10-1). However, very few households (0.86%) are adopting agriculture insurance as an adaptation measure

Similarly, households are also employing variety of off-farm based adaptation options. Majority of respondent are changing their food consumption habit (70.64%) followed by community based Natural Resource Management (NRM) (56.72%), and shifting to non-agriculture based employment options (45.10%) (Figure 10-2). Different analytical domain wise adaptation measures of the respondent households is presented in different table in following sub-sections.

10.2. Farm Based Adaptation

Table 10-1: Farm Based Adaption Measures Adopted in Last 25 Years

Analytical Domain	Household Taking Adaptation Measures (farm based) (%)			
	Yes	No	Not Applicable	Total
1. Taken Agriculture Skills Training				
Urban/Rural				
Urban	13.90	68.03	18.08	100.00
Rural	12.75	85.23	2.02	100.00
Ecological Belt				
Mountain	11.80	87.69	0.51	100.00
Hill	16.73	77.12	6.15	100.00
Terai	9.70	81.95	8.35	100.00
Eco-Development Region				
Eastern Mountain	13.71	86.29	0.0	100.00
Eastern Hill	14.06	85.59	0.34	100.00
Eastern *Terai*	9.14	75.88	14.98	100.00
Central Mountain	9.45	90.55	0.0	100.00
Central Hill	11.92	83.87	4.20	100.00
Central *Terai*	5.74	90.32	3.94	100.00
Western Mountain	32.62	62.98	4.40	100.00
Western Hill	25.72	72.98	1.30	100.00
Western *Terai*	12.88	78.03	9.09	100.00
Mid-western Mountain	8.29	89.84	1.87	100.00
Mid-western Hill	21.88	77.35	0.76	100.00
Mid-western *Terai*	17.16	78.00	4.85	100.00
Far-western Mountain	16.26	83.21	0.53	100.00
Far-western Hill	12.68	86.59	0.73	100.00
Far-western *Terai*	18.79	78.69	2.52	100.00
Kathmandu Valley	0.60	35.80	63.60	100.00
Income Quintile				
First Quintile (Lowest)	10.04	88.36	1.60	100.00
Second Quintile	10.24	87.99	1.77	100.00
Third Quintile	14.45	78.73	6.82	100.00
Fourth Quintile	17.59	71.00	11.40	100.00
Fifth Quintile (Highest)	16.57	66.23	17.20	100.00
NAPA Combined Vulnerability Index				
Very High	9.43	75.59	14.98	100.00
High	10.05	86.74	3.21	100.00
Moderate	13.72	85.46	0.82	100.00

Analytical Domain	Household Taking Adaptation Measures (farm based) (%)			
	Yes	No	Not Applicable	Total
Low	16.45	74.80	8.75	100.00
Very Low	20.90	72.90	6.21	100.00
Bio-Climatic Zone				
Tropical	12.99	80.40	6.61	100.00
Sub-tropical	13.62	78.57	7.81	100.00
Temperate	10.36	89.57	0.07	100.00
Sub-alpine	15.00	85.00	0.0	100.00
Nepal	13.09	80.19	6.72	100.00
2. Change on Cultivation Technique				
Urban/Rural				
Urban	33.43	36.21	30.36	100.00
Rural	40.22	56.08	3.70	100.00
Ecological Belt				
Mountain	21.49	77.22	1.29	100.00
Hill	23.24	67.08	9.68	100.00
Terai	55.99	28.94	15.08	100.00
Eco-Development Region				
Eastern Mountain	42.75	56.90	0.35	100.00
Eastern Hill	39.61	57.66	2.73	100.00
Eastern *Terai*	55.37	15.05	29.59	100.00
Central Mountain	15.65	83.89	0.46	100.00
Central Hill	20.37	73.64	5.99	100.00
Central *Terai*	56.68	37.74	5.59	100.00
Western Mountain	40.42	52.98	6.61	100.00
Western Hill	14.12	83.38	2.50	100.00
Western *Terai*	67.04	20.22	12.74	100.00
Mid-western Mountain	4.66	91.31	4.03	100.00
Mid-western Hill	43.33	55.09	1.57	100.00
Mid-western *Terai*	42.84	48.93	8.23	100.00
Far-western Mountain	21.77	77.25	0.98	100.00
Far-western Hill	10.05	87.35	2.60	100.00
Far-western *Terai*	54.19	37.99	7.82	100.00
Kathmandu Valley	0.79	6.12	93.09	100.00
Income Quintile				
First Quintile (Lowest)	40.17	57.08	2.76	100.00
Second Quintile	40.36	54.25	5.39	100.00
Third Quintile	37.06	50.53	12.42	100.00
Fourth Quintile	36.52	46.26	17.22	100.00
Fifth Quintile (Highest)	32.71	40.33	26.96	100.00
NAPA Combined Vulnerability Index				
Very High	34.32	44.43	21.24	100.00
High	34.35	61.22	4.43	100.00
Moderate	36.52	61.63	1.85	100.00
Low	45.27	33.48	21.25	100.00
Very Low	46.76	44.13	9.11	100.00
Bio-Climatic Zone				
Tropical	50.82	37.27	11.90	100.00

Analytical Domain	Household Taking Adaptation Measures (farm based) (%)			
	Yes	No	Not Applicable	Total
Sub-tropical	19.75	67.97	12.28	100.00
Temperate	10.37	89.11	0.53	100.00
Sub-alpine	25.00	75.00	0.0	100.00
Nepal	38.23	50.26	11.51	100.00
3. Raise Improved Breed of Livestock				
Urban/Rural				
Urban	14.66	53.96	31.39	100.00
Rural	17.21	79.23	3.55	100.00
Ecological Belt				
Mountain	15.98	82.49	1.53	100.00
Hill	18.95	71.25	9.80	100.00
Terai	14.08	70.58	15.34	100.00
Eco-Development Region				
Eastern Mountain	28.36	70.16	1.48	100.00
Eastern Hill	24.29	74.42	1.29	100.00
Eastern *Terai*	23.81	50.35	25.84	100.00
Central Mountain	17.75	81.79	0.46	100.00
Central Hill	11.69	81.66	6.65	100.00
Central *Terai*	2.59	90.76	6.65	100.00
Western Mountain	8.81	82.38	8.81	100.00
Western Hill	35.16	62.02	2.83	100.00
Western *Terai*	15.86	62.74	21.41	100.00
Mid-western Mountain	0.00	95.76	4.24	100.00
Mid-western Hill	10.26	88.34	1.40	100.00
Mid-western *Terai*	7.84	83.80	8.36	100.00
Far-western Mountain	13.74	85.81	0.45	100.00
Far-western Hill	4.09	93.89	2.02	100.00
Far-western *Terai*	36.63	54.42	8.95	100.00
Kathmandu Valley	0.39	4.08	95.53	100.00
Income Quintile				
First Quintile (Lowest)	9.02	87.89	3.09	100.00
Second Quintile	18.67	75.52	5.81	100.00
Third Quintile	19.49	69.01	11.50	100.00
Fourth Quintile	21.08	61.27	17.65	100.00
Fifth Quintile (Highest)	18.34	53.62	28.05	100.00
NAPA Combined Vulnerability Index				
Very High	14.77	63.92	21.31	100.00
High	9.60	85.43	4.98	100.00
Moderate	18.01	79.99	1.99	100.00
Low	19.70	61.59	18.71	100.00
Very Low	27.25	57.71	15.04	100.00
Bio-Climatic Zone				
Tropical	15.92	72.00	12.07	100.00
Sub-tropical	17.36	70.11	12.53	100.00
Temperate	17.11	82.25	0.64	100.00
Sub-alpine	0.00	100.00	0.0	100.00
Nepal	**16.47**	**71.83**	**11.70**	**100.00**

Analytical Domain	Household Taking Adaptation Measures (farm based) (%)			
	Yes	No	Not Applicable	Total
4. Supplemental Irrigation Management				
Urban/Rural				
Urban	20.94	47.83	31.24	100.00
Rural	30.42	65.15	4.43	100.00
Ecological Belt				
Mountain	17.20	77.67	5.13	100.00
Hill	10.47	79.83	9.70	100.00
Terai	46.49	37.45	16.06	100.00
Eco-Development Region				
Eastern Mountain	28.29	69.73	1.98	100.00
Eastern Hill	22.16	76.82	1.02	100.00
Eastern *Terai*	32.04	38.43	29.54	100.00
Central Mountain	13.35	86.20	0.46	100.00
Central Hill	6.11	87.55	6.35	100.00
Central *Terai*	62.04	30.84	7.12	100.00
Western Mountain	11.19	80.00	8.81	100.00
Western Hill	11.14	86.08	2.78	100.00
Western *Terai*	56.08	31.78	12.14	100.00
Mid-western Mountain	22.28	72.62	5.10	100.00
Mid-western Hill	10.86	87.40	1.74	100.00
Mid-western *Terai*	23.76	65.80	10.45	100.00
Far-western Mountain	5.55	76.84	17.62	100.00
Far-western Hill	4.00	93.98	2.02	100.00
Far-western *Terai*	49.17	38.49	12.34	100.00
Kathmandu Valley	0.00	4.44	95.56	100.00
Income Quintile				
First Quintile (Lowest)	34.36	61.68	3.96	100.00
Second Quintile	27.18	66.78	6.04	100.00
Third Quintile	29.03	58.47	12.50	100.00
Fourth Quintile	26.12	56.21	17.68	100.00
Fifth Quintile (Highest)	22.10	50.39	27.51	100.00
NAPA Combined Vulnerability Index				
Very High	16.90	60.46	22.64	100.00
High	17.05	78.04	4.91	100.00
Moderate	43.67	52.72	3.61	100.00
Low	29.34	49.68	20.98	100.00
Very Low	35.89	55.38	8.74	100.00
Climatic Zone				
Tropical	39.29	48.04	12.67	100.00
Sub-tropical	9.58	77.63	12.79	100.00
Temperate	9.17	87.52	3.31	100.00
Sub-alpine	20.00	80.00	0.0	100.00
Nepal	**27.64**	**60.08**	**12.28**	**100.00**
5. Investment on Pond				
Urban/Rural				
Urban	2.14	67.56	30.30	100.00
Rural	3.10	91.69	5.21	100.00

Analytical Domain	Household Taking Adaptation Measures (farm based) (%)			
	Yes	No	Not Applicable	Total
Ecological Belt				
Mountain	3.68	87.05	9.27	100.00
Hill	2.67	86.44	10.89	100.00
Terai	2.82	82.41	14.77	100.00
Eco-Development Region				
Eastern Mountain	12.18	83.18	4.64	100.00
Eastern Hill	5.70	91.84	2.46	100.00
Eastern *Terai*	4.09	68.19	27.71	100.00
Central Mountain	2.02	96.16	1.82	100.00
Central Hill	2.70	90.58	6.72	100.00
Central *Terai*	1.83	92.02	6.15	100.00
Western Mountain	0.00	60.60	39.40	100.00
Western Hill	2.02	91.43	6.55	100.00
Western *Terai*	3.50	84.98	11.51	100.00
Mid-western Mountain	0.00	97.54	2.46	100.00
Mid-western Hill	1.74	96.08	2.17	100.00
Mid-western *Terai*	1.22	90.54	8.25	100.00
Far-western Mountain	0.00	65.63	34.37	100.00
Far-western Hill	1.47	96.04	2.49	100.00
Far-western *Terai*	2.97	84.87	12.17	100.00
Kathmandu Valley	0.18	8.55	91.26	100.00
Income Quintile				
First Quintile (Lowest)	1.67	93.21	5.12	100.00
Second Quintile	3.42	89.59	6.99	100.00
Third Quintile	2.38	85.29	12.33	100.00
Fourth Quintile	3.13	80.07	16.80	100.00
Fifth Quintile (Highest)	4.68	68.18	27.15	100.00
NAPA Combined Vulnerability Index				
Very High	4.24	71.81	23.96	100.00
High	2.79	91.84	5.38	100.00
Moderate	2.08	91.28	6.65	100.00
Low	1.64	81.22	17.14	100.00
Very Low	4.00	88.07	7.93	100.00
Bio-Climatic Zone				
Tropical	2.54	85.04	12.42	100.00
Sub-tropical	3.49	82.47	14.04	100.00
Temperate	1.46	95.62	2.91	100.00
Sub-alpine	0.00	65.00	35.00	100.00
Nepal	**2.82**	**84.63**	**12.55**	**100.00**
6. Adopted Improved Seed				
Urban/Rural				
Urban	42.53	26.80	30.67	100.00
Rural	58.04	38.18	3.78	100.00
Ecological Belt				
Mountain	54.12	43.89	2.00	100.00
Hill	45.92	44.51	9.58	100.00
Terai	60.91	23.70	15.38	100.00

Analytical Domain	Household Taking Adaptation Measures (farm based) (%)			
	Yes	No	Not Applicable	Total
Eco-Development Region				
Eastern Mountain	23.49	74.03	2.48	100.00
Eastern Hill	41.08	57.89	1.02	100.00
Eastern *Terai*	40.97	30.25	28.78	100.00
Central Mountain	75.08	24.46	0.46	100.00
Central Hill	25.68	68.14	6.18	100.00
Central *Terai*	71.54	21.42	7.04	100.00
Western Mountain	79.40	16.19	4.40	100.00
Western Hill	76.06	21.57	2.37	100.00
Western *Terai*	70.63	18.40	10.96	100.00
Mid-western Mountain	27.57	67.33	5.10	100.00
Mid-western Hill	67.50	31.10	1.40	100.00
Mid-western *Terai*	69.99	19.54	10.47	100.00
Far-western Mountain	79.37	19.65	0.98	100.00
Far-western Hill	18.71	77.99	3.30	100.00
Far-western *Terai*	73.36	18.37	8.27	100.00
Kathmandu Valley	1.54	2.90	95.56	100.00
Income Quintile				
First Quintile (Lowest)	56.25	40.48	3.27	100.00
Second Quintile	52.25	42.09	5.65	100.00
Third Quintile	58.97	28.92	12.11	100.00
Fourth Quintile	56.02	26.49	17.49	100.00
Fifth Quintile (Highest)	48.67	24.53	26.80	100.00
NAPA Combined Vulnerability Index				
Very High	31.93	46.02	22.05	100.00
High	41.75	53.00	5.25	100.00
Moderate	71.22	26.53	2.25	100.00
Low	60.15	19.61	20.24	100.00
Very Low	76.20	16.01	7.79	100.00
Bio-Climatic Zone				
Tropical	61.25	26.61	12.14	100.00
Sub-tropical	41.24	46.50	12.26	100.00
Temperate	42.67	56.47	0.85	100.00
Sub-alpine	75.00	25.00	0.0	100.00
Nepal	**53.50**	**34.85**	**11.66**	**100.00**
7. Change Crop Cultivation Time				
Urban/Rural				
Urban	33.28	35.56	31.15	100.00
Rural	43.14	52.94	3.91	100.00
Ecological Belt				
Mountain	36.72	61.29	1.99	100.00
Hill	20.61	69.71	9.68	100.00
Terai	60.37	23.84	15.79	100.00
Eco-Development Region				
Eastern Mountain	17.59	80.43	1.98	100.00
Eastern Hill	38.77	59.60	1.63	100.00

Analytical Domain	Household Taking Adaptation Measures (farm based) (%)			
	Yes	No	Not Applicable	Total
Eastern *Terai*	46.01	23.81	30.18	100.00
Central Mountain	41.53	58.01	0.46	100.00
Central Hill	16.10	77.73	6.17	100.00
Central *Terai*	80.61	12.35	7.04	100.00
Western Mountain	19.40	73.99	6.61	100.00
Western Hill	13.39	84.14	2.47	100.00
Western *Terai*	44.20	45.65	10.16	100.00
Mid-western Mountain	4.50	90.40	5.10	100.00
Mid-western Hill	35.92	62.68	1.40	100.00
Mid-western *Terai*	42.50	47.04	10.47	100.00
Far-western Mountain	85.49	13.07	1.44	100.00
Far-western Hill	8.04	89.18	2.78	100.00
Far-western *Terai*	77.37	13.95	8.68	100.00
Kathmandu Valley	1.36	3.08	95.56	100.00
Income Quintile				
First Quintile (Lowest)	51.59	45.34	3.07	100.00
Second Quintile	42.54	51.49	5.97	100.00
Third Quintile	36.42	50.92	12.66	100.00
Fourth Quintile	32.99	49.01	18.00	100.00
Fifth Quintile (Highest)	27.74	45.50	26.76	100.00
NAPA Combined Vulnerability Index				
Very High	28.75	49.15	22.10	100.00
High	33.74	61.02	5.24	100.00
Moderate	51.53	46.17	2.30	100.00
Low	51.13	27.42	21.45	100.00
Very Low	31.51	61.10	7.39	100.00
Bio-Climatic Zone				
Tropical	52.60	34.95	12.45	100.00
Sub-tropical	21.11	66.51	12.38	100.00
Temperate	20.83	78.28	0.89	100.00
Sub-alpine	15.00	85.00	0.0	100.00
Nepal	**40.26**	**47.85**	**11.89**	**100.00**
8. Increase Use of Inorganic Fertiliser				
Urban/Rural				
Urban	49.74	18.06	32.20	100.00
Rural	64.89	31.05	4.06	100.00
Ecological Belt				
Mountain	46.54	51.25	2.21	100.00
Hill	45.55	44.75	9.70	100.00
Terai	77.64	5.75	16.61	100.00
Eco-Development Region				
Eastern Mountain	55.32	42.16	2.52	100.00
Eastern Hill	60.71	37.58	1.71	100.00
Eastern *Terai*	64.26	4.05	31.69	100.00
Central Mountain	70.00	29.54	0.46	100.00
Central Hill	57.38	36.30	6.32	100.00

Analytical Domain	Household Taking Adaptation Measures (farm based) (%)			
	Yes	No	Not Applicable	Total
Central *Terai*	90.40	2.41	7.19	100.00
Western Mountain	0.00	82.80	17.20	100.00
Western Hill	35.50	61.91	2.59	100.00
Western *Terai*	74.81	13.62	11.58	100.00
Mid-western Mountain	3.32	92.17	4.51	100.00
Mid-western Hill	58.08	40.52	1.40	100.00
Mid-western *Terai*	76.35	12.83	10.82	100.00
Far-western Mountain	38.19	59.82	1.99	100.00
Far-western Hill	14.94	82.93	2.13	100.00
Far-western *Terai*	81.94	8.69	9.37	100.00
Kathmandu Valley	2.10	2.72	95.18	100.00
Income Quintile				
First Quintile (Lowest)	69.38	27.59	3.02	100.00
Second Quintile	63.42	30.62	5.95	100.00
Third Quintile	59.09	27.77	13.14	100.00
Fourth Quintile	55.16	26.12	18.73	100.00
Fifth Quintile (Highest)	48.06	24.18	27.75	100.00
NAPA Combined Vulnerability Index				
Very High	58.64	18.95	22.41	100.00
High	60.32	34.46	5.22	100.00
Moderate	61.66	35.83	2.51	100.00
Low	62.08	15.44	22.48	100.00
Very Low	58.46	33.25	8.28	100.00
Climatic Zone				
Tropical	74.70	12.22	13.08	100.00
Sub-tropical	40.67	46.87	12.45	100.00
Temperate	20.99	78.28	0.73	100.00
Sub-alpine	0.00	85.00	15.00	100.00
Nepal	**60.46**	**27.25**	**12.30**	**100.00**
9. Increase Compost Fertiliser				
Urban/Rural				
Urban	27.35	40.46	32.19	100.00
Rural	47.77	48.02	4.21	100.00
Ecological Belt				
Mountain	77.97	20.32	1.72	100.00
Hill	33.78	56.16	10.06	100.00
Terai	43.52	39.92	16.56	100.00
Eco-Development Region				
Eastern Mountain	56.14	42.03	1.83	100.00
Eastern Hill	51.73	45.87	2.40	100.00
Eastern *Terai*	25.30	43.03	31.67	100.00
Central Mountain	97.10	2.44	0.46	100.00
Central Hill	25.20	68.03	6.77	100.00
Central *Terai*	68.90	23.91	7.19	100.00
Western Mountain	14.40	73.99	11.61	100.00
Western Hill	42.94	54.27	2.79	100.00

Analytical Domain	Household Taking Adaptation Measures (farm based) (%)			
	Yes	No	Not Applicable	Total
Western *Terai*	38.23	50.79	10.97	100.00
Mid-western Mountain	54.66	41.68	3.66	100.00
Mid-western Hill	37.93	60.67	1.40	100.00
Mid-western *Terai*	10.50	78.49	11.00	100.00
Far-western Mountain	96.79	1.76	1.44	100.00
Far-western Hill	7.51	89.95	2.54	100.00
Far-western *Terai*	53.10	37.32	9.57	100.00
Kathmandu Valley	0.86	3.58	95.56	100.00
Income Quintile				
First Quintile (Lowest)	50.63	46.00	3.38	100.00
Second Quintile	43.22	50.58	6.20	100.00
Third Quintile	42.41	44.42	13.17	100.00
Fourth Quintile	38.37	43.13	18.50	100.00
Fifth Quintile (Highest)	29.81	42.26	27.93	100.00
NAPA Combined Vulnerability Index				
Very High	30.35	46.94	22.71	100.00
High	36.38	58.17	5.45	100.00
Moderate	63.20	34.33	2.47	100.00
Low	34.97	42.49	22.54	100.00
Very Low	43.25	48.75	8.01	100.00
Bio-Climatic Zone				
Tropical	42.62	44.31	13.07	100.00
Sub-tropical	37.71	49.48	12.81	100.00
Temperate	61.85	37.71	0.44	100.00
Sub-alpine	10.00	85.00	5.00	100.00
Nepal	**41.79**	**45.81**	**12.40**	**100.00**
10. Cultivation of New Crop				
Urban/Rural				
Urban	17.31	51.57	31.12	100.00
Rural	25.23	70.99	3.79	100.00
Ecological Belt				
Mountain	26.86	71.62	1.52	100.00
Hill	17.73	72.57	9.70	100.00
Terai	27.37	57.00	15.63	100.00
Eco-Development Region				
Eastern Mountain	58.38	40.14	1.48	100.00
Eastern Hill	48.97	49.67	1.37	100.00
Eastern *Terai*	32.62	37.96	29.42	100.00
Central Mountain	28.03	71.51	0.46	100.00
Central Hill	9.76	83.98	6.25	100.00
Central *Terai*	24.17	68.79	7.04	100.00
Western Mountain	36.01	55.18	8.81	100.00
Western Hill	13.59	83.76	2.64	100.00
Western *Terai*	17.28	72.17	10.55	100.00
Mid-western Mountain	4.80	91.54	3.66	100.00
Mid-western Hill	15.64	82.96	1.40	100.00

Analytical Domain	Household Taking Adaptation Measures (farm based) (%)			
	Yes	No	Not Applicable	Total
Mid-western *Terai*	22.84	66.53	10.63	100.00
Far-western Mountain	7.02	92.01	0.98	100.00
Far-western Hill	5.10	92.10	2.80	100.00
Far-western *Terai*	45.05	45.63	9.32	100.00
Kathmandu Valley	0.57	3.87	95.56	100.00
Income Quintile				
First Quintile (Lowest)	22.51	74.43	3.05	100.00
Second Quintile	23.58	70.66	5.76	100.00
Third Quintile	22.66	65.41	11.92	100.00
Fourth Quintile	22.34	59.58	18.08	100.00
Fifth Quintile (Highest)	18.70	53.80	27.50	100.00
NAPA Combined Vulnerability Index				
Very High	23.21	54.65	22.14	100.00
High	21.51	73.38	5.11	100.00
Moderate	21.13	76.51	2.36	100.00
Low	30.09	49.06	20.85	100.00
Very Low	14.19	78.07	7.74	100.00
Bio-Climatic Zone				
Tropical	25.52	62.13	12.35	100.00
Sub-tropical	19.12	68.55	12.33	100.00
Temperate	16.72	82.84	0.44	100.00
Sub-alpine	25.00	75.00	0.0	100.00
Nepal	**22.91**	**65.30**	**11.79**	**100.00**
11. Switch to Another Livestock				
Urban/Rural				
Urban	10.26	60.49	29.25	100.00
Rural	10.39	86.33	3.28	100.00
Ecological Belt				
Mountain	14.24	84.03	1.74	100.00
Hill	11.25	79.18	9.57	100.00
Terai	8.80	77.45	13.75	100.00
Eco-Development Region				
Eastern Mountain	41.67	56.50	1.83	100.00
Eastern Hill	25.37	73.60	1.03	100.00
Eastern *Terai*	14.46	62.38	23.15	100.00
Central Mountain	6.99	92.56	0.46	100.00
Central Hill	5.97	87.57	6.46	100.00
Central *Terai*	1.61	91.85	6.54	100.00
Western Mountain	6.61	84.58	8.81	100.00
Western Hill	16.43	81.00	2.57	100.00
Western *Terai*	7.39	76.18	16.43	100.00
Mid-western Mountain	0.00	96.34	3.66	100.00
Mid-western Hill	3.28	95.56	1.17	100.00
Mid-western *Terai*	5.75	84.67	9.58	100.00
Far-western Mountain	8.08	90.24	1.68	100.00
Far-western Hill	1.23	96.80	1.97	100.00
Far-western *Terai*	28.89	64.39	6.72	100.00
Kathmandu Valley	0.00	4.76	95.24	100.00

Analytical Domain	Household Taking Adaptation Measures (farm based) (%)			
	Yes	No	Not Applicable	Total
Income Quintile				
First Quintile (Lowest)	5.26	92.22	2.51	100.00
Second Quintile	10.65	83.65	5.70	100.00
Third Quintile	13.26	76.11	10.63	100.00
Fourth Quintile	13.99	70.41	15.60	100.00
Fifth Quintile (Highest)	10.70	62.35	26.95	100.00
NAPA Combined Vulnerability Index				
Very High	7.03	71.59	21.39	100.00
High	6.94	88.05	5.01	100.00
Moderate	12.42	85.70	1.88	100.00
Low	14.91	68.87	16.22	100.00
Very Low	11.81	76.57	11.63	100.00
Bio-Climatic Zone				
Tropical	9.18	79.94	10.88	100.00
Sub-tropical	12.46	75.25	12.29	100.00
Temperate	10.14	89.42	0.44	100.00
Sub-alpine	0.00	100.00	0.0	100.00
Nepal	**10.35**	**78.77**	**10.88**	**100.00**
12. Livestock Insurance				
Urban/Rural				
Urban	2.51	66.75	30.74	100.00
Rural	3.11	91.88	5.01	100.00
Ecological Belt				
Mountain	2.31	86.78	10.91	100.00
Hill	4.18	84.67	11.15	100.00
Terai	1.80	83.99	14.21	100.00
Eco-Development Region				
Eastern Mountain	8.15	51.65	40.20	100.00
Eastern Hill	1.18	90.11	8.72	100.00
Eastern *Terai*	3.50	73.22	23.28	100.00
Central Mountain	0.94	98.61	0.46	100.00
Central Hill	2.39	90.99	6.62	100.00
Central *Terai*	0.51	92.32	7.17	100.00
Western Mountain	0.00	91.19	8.81	100.00
Western Hill	10.66	86.31	3.03	100.00
Western *Terai*	1.56	79.57	18.87	100.00
Mid-western Mountain	0.00	96.34	3.66	100.00
Mid-western Hill	2.60	96.41	0.99	100.00
Mid-western *Terai*	1.55	90.41	8.04	100.00
Far-western Mountain	0.00	99.02	0.98	100.00
Far-western Hill	0.35	97.27	2.38	100.00
Far-western *Terai*	1.05	91.66	7.30	100.00
Kathmandu Valley	0.00	4.44	95.56	100.00
Income Quintile				
First Quintile (Lowest)	0.91	95.38	3.70	100.00
Second Quintile	1.84	90.57	7.59	100.00

Analytical Domain	Household Taking Adaptation Measures (farm based) (%)			
	Yes	No	Not Applicable	Total
Third Quintile	4.02	83.59	12.39	100.00
Fourth Quintile	4.89	77.03	18.08	100.00
Fifth Quintile (Highest)	3.37	68.01	28.62	100.00
NAPA Combined Vulnerability Index				
Very High	2.36	75.96	21.68	100.00
High	1.76	89.90	8.34	100.00
Moderate	3.05	91.91	5.04	100.00
Low	2.26	82.00	15.74	100.00
Very Low	8.66	78.08	13.26	100.00
Bio-Climatic Zone				
Tropical	2.88	85.75	11.38	100.00
Sub-tropical	3.33	81.09	15.58	100.00
Temperate	0.69	94.01	5.30	100.00
Sub-alpine	0.00	100.00	0.0	100.00
Nepal	**2.93**	**84.52**	**12.54**	**100.00**
13. Agriculture Insurance				
Urban/Rural				
Urban	1.00	68.32	30.69	100.00
Rural	0.81	93.72	5.47	100.00
Ecological Belt				
Mountain	2.20	87.19	10.62	100.00
Hill	0.69	88.18	11.13	100.00
Terai	0.80	84.25	14.95	100.00
Eco-Development Region				
Eastern Mountain	8.40	51.89	39.70	100.00
Eastern Hill	1.32	89.42	9.26	100.00
Eastern *Terai*	0.91	70.98	28.11	100.00
Central Mountain	0.44	99.11	0.46	100.00
Central Hill	1.01	92.73	6.25	100.00
Central *Terai*	1.04	91.67	7.29	100.00
Western Mountain	0.00	91.19	8.81	100.00
Western Hill	0.46	96.76	2.78	100.00
Western *Terai*	0.33	89.83	9.84	100.00
Mid-western Mountain	0.00	97.20	2.80	100.00
Mid-western Hill	0.35	98.25	1.40	100.00
Mid-western *Terai*	0.46	90.58	8.96	100.00
Far-western Mountain	0.00	99.02	0.98	100.00
Far-western Hill	0.00	97.62	2.38	100.00
Far-western *Terai*	0.29	91.66	8.05	100.00
Kathmandu Valley	0.00	4.44	95.56	100.00
Income Quintile				
First Quintile (Lowest)	0.72	94.98	4.30	100.00
Second Quintile	0.48	92.39	7.14	100.00
Third Quintile	0.74	85.70	13.56	100.00
Fourth Quintile	0.86	80.36	18.78	100.00
Fifth Quintile (Highest)	1.35	70.75	27.90	100.00

Analytical Domain	Household Taking Adaptation Measures (farm based) (%)			
	Yes	No	Not Applicable	Total
NAPA Combined Vulnerability Index				
Very High	1.25	76.50	22.25	100.00
High	1.25	90.49	8.26	100.00
Moderate	0.73	94.03	5.24	100.00
Low	0.43	80.52	19.05	100.00
Very Low	0.21	92.39	7.40	100.00
Bio-Climatic Zone				
Tropical	0.71	87.35	11.93	100.00
Sub-tropical	1.24	83.22	15.54	100.00
Temperate	0.00	94.99	5.01	100.00
Sub-alpine	0.00	100.00	0.0	100.00
Nepal	**0.86**	**86.28**	**12.85**	**100.00**
14. Raise Livestock Only				
Urban/Rural				
Urban	5.53	68.29	26.18	100.00
Rural	3.76	93.60	2.64	100.00
Ecological Belt				
Mountain	4.20	93.28	2.51	100.00
Hill	1.84	88.69	9.47	100.00
Terai	6.71	82.49	10.80	100.00
Eco-Development Region				
Eastern Mountain	11.54	82.18	6.28	100.00
Eastern Hill	5.31	93.82	0.87	100.00
Eastern *Terai*	11.99	71.73	16.28	100.00
Central Mountain	3.59	95.95	0.46	100.00
Central Hill	1.11	92.52	6.37	100.00
Central *Terai*	4.20	89.92	5.88	100.00
Western Mountain	0.00	91.19	8.81	100.00
Western Hill	1.05	96.38	2.57	100.00
Western *Terai*	0.74	84.12	15.14	100.00
Mid-western Mountain	0.60	96.59	2.80	100.00
Mid-western Hill	1.62	97.39	0.99	100.00
Mid-western *Terai*	6.69	85.57	7.74	100.00
Far-western Mountain	0.00	99.02	0.98	100.00
Far-western Hill	0.28	97.35	2.38	100.00
Far-western *Terai*	4.59	88.90	6.51	100.00
Kathmandu Valley	0.79	4.67	94.55	100.00
Income Quintile				
First Quintile (Lowest)	3.86	93.91	2.23	100.00
Second Quintile	2.84	92.73	4.42	100.00
Third Quintile	5.30	86.30	8.40	100.00
Fourth Quintile	5.04	81.39	13.57	100.00
Fifth Quintile (Highest)	5.11	69.16	25.74	100.00

Analytical Domain	Household Taking Adaptation Measures (farm based) (%)			
	Yes	No	Not Applicable	Total
NAPA Combined Vulnerability Index				
Very High	2.87	76.52	20.61	100.00
High	2.02	92.96	5.02	100.00
Moderate	3.61	94.52	1.88	100.00
Low	10.75	78.34	10.91	100.00
Very Low	0.83	88.46	10.71	100.00
Bio-Climatic Zone				
Tropical	5.42	85.92	8.67	100.00
Sub-tropical	2.60	85.08	12.32	100.00
Temperate	1.85	98.00	0.15	100.00
Sub-alpine	0.00	100.00	0.0	100.00
Nepal	**4.28**	**86.19**	**9.53**	**100.00**
15. Crop Cultivation Only				
Urban/Rural				
Urban	4.48	69.63	25.89	100.00
Rural	3.77	93.55	2.68	100.00
Ecological Belt				
Mountain	7.25	91.27	1.48	100.00
Hill	3.02	87.57	9.41	100.00
Terai	4.37	84.72	10.92	100.00
Eco-Development Region				
Eastern Mountain	18.82	79.16	2.02	100.00
Eastern Hill	7.77	91.54	0.69	100.00
Eastern *Terai*	0.59	82.06	17.35	100.00
Central Mountain	3.65	95.89	0.46	100.00
Central Hill	2.68	91.06	6.26	100.00
Central *Terai*	5.20	88.26	6.55	100.00
Western Mountain	4.40	86.79	8.81	100.00
Western Hill	2.66	94.77	2.57	100.00
Western *Terai*	15.36	74.93	9.71	100.00
Mid-western Mountain	6.77	90.43	2.80	100.00
Mid-western Hill	0.29	98.72	0.99	100.00
Mid-western *Terai*	0.95	90.14	8.92	100.00
Far-western Mountain	0.00	99.02	0.98	100.00
Far-western Hill	1.55	96.02	2.44	100.00
Far-western *Terai*	3.99	88.68	7.34	100.00
Kathmandu Valley	0.18	5.28	94.55	100.00
Income Quintile				
First Quintile (Lowest)	3.11	94.57	2.33	100.00
Second Quintile	4.12	91.77	4.11	100.00
Third Quintile	3.12	88.06	8.82	100.00
Fourth Quintile	4.69	81.45	13.86	100.00
Fifth Quintile (Highest)	6.28	69.06	24.66	100.00
NAPA Combined Vulnerability Index				
Very High	1.90	77.38	20.72	100.00
High	3.76	91.24	5.00	100.00

Analytical Domain	Household Taking Adaptation Measures (farm based) (%)			
	Yes	No	Not Applicable	Total
Moderate	5.79	92.35	1.86	100.00
Low	1.76	86.19	12.06	100.00
Very Low	10.01	82.67	7.32	100.00
Bio-Climatic Zone				
Tropical	3.81	87.46	8.72	100.00
Sub-tropical	4.08	83.86	12.06	100.00
Temperate	5.37	94.48	0.15	100.00
Sub-alpine	0.00	100.00	0.0	100.00
Nepal	**3.98**	**86.55**	**9.48**	**100.00**
16. Both Livestock and Crop Farming				
Urban/Rural				
Urban	33.34	40.82	25.83	100.00
Rural	50.33	47.34	2.33	100.00
Ecological Belt				
Mountain	51.20	47.54	1.26	100.00
Hill	37.82	52.76	9.42	100.00
Terai	51.83	37.80	10.37	100.00
Eco-Development Region				
Eastern Mountain	22.82	76.05	1.13	100.00
Eastern Hill	37.70	61.96	0.34	100.00
Eastern *Terai*	50.41	32.90	16.68	100.00
Central Mountain	69.84	29.70	0.46	100.00
Central Hill	37.84	55.85	6.31	100.00
Central *Terai*	63.34	30.40	6.26	100.00
Western Mountain	0.00	91.19	8.81	100.00
Western Hill	66.41	30.85	2.73	100.00
Western *Terai*	45.51	44.97	9.52	100.00
Mid-western Mountain	54.67	42.52	2.80	100.00
Mid-western Hill	16.10	82.91	0.99	100.00
Mid-western *Terai*	16.37	75.89	7.74	100.00
Far-western Mountain	51.31	47.72	0.98	100.00
Far-western Hill	1.27	95.72	3.01	100.00
Far-western *Terai*	58.56	35.29	6.14	100.00
Kathmandu Valley	0.57	5.24	94.19	100.00
Income Quintile				
First Quintile (Lowest)	48.76	48.91	2.34	100.00
Second Quintile	43.68	52.39	3.93	100.00
Third Quintile	46.46	45.21	8.33	100.00
Fourth Quintile	44.76	41.30	13.94	100.00
Fifth Quintile (Highest)	32.93	42.97	24.10	100.00
NAPA Combined Vulnerability Index				
Very High	48.04	31.59	20.37	100.00
High	34.52	60.70	4.79	100.00
Moderate	56.10	41.91	1.99	100.00
Low	34.78	53.88	11.34	100.00
Very Low	62.39	30.51	7.10	100.00

Analytical Domain	Household Taking Adaptation Measures (farm based) (%)			
	Yes	No	Not Applicable	Total
Bio-Climatic Zone				
Tropical	48.30	43.41	8.28	100.00
Sub-tropical	38.66	49.27	12.07	100.00
Temperate	57.05	42.80	0.15	100.00
Sub-alpine	0.0	100.00	0.0	100.00
Nepal	45.36	45.43	9.21	100.00
17. Start Agro-Forestry				
Urban/Rural				
Urban	9.38	66.24	24.39	100.00
Rural	14.95	82.80	2.25	100.00
Ecological Belt				
Mountain	22.20	76.53	1.26	100.00
Hill	8.61	82.01	9.38	100.00
Terai	16.47	74.16	9.37	100.00
Eco-Development Region				
Eastern Mountain	23.61	75.26	1.13	100.00
Eastern Hill	11.33	88.33	0.34	100.00
Eastern *Terai*	30.95	54.82	14.23	100.00
Central Mountain	44.25	55.29	0.46	100.00
Central Hill	0.99	92.52	6.49	100.00
Central *Terai*	12.16	81.96	5.88	100.00
Western Mountain	35.18	56.01	8.81	100.00
Western Hill	17.75	79.83	2.42	100.00
Western *Terai*	3.90	87.01	9.09	100.00
Mid-western Mountain	0.86	96.34	2.80	100.00
Mid-western Hill	9.81	89.20	0.99	100.00
Mid-western *Terai*	6.66	85.60	7.74	100.00
Far-western Mountain	0.46	98.56	0.98	100.00
Far-western Hill	1.27	96.24	2.49	100.00
Far-western *Terai*	2.72	90.58	6.70	100.00
Kathmandu Valley	0.0	5.45	94.55	100.00
Income Quintile				
First Quintile (Lowest)	9.01	88.63	2.36	100.00
Second Quintile	13.70	82.45	3.85	100.00
Third Quintile	16.99	75.45	7.57	100.00
Fourth Quintile	17.90	69.04	13.07	100.00
Fifth Quintile (Highest)	11.75	65.04	23.21	100.00
NAPA Combined Vulnerability Index				
Very High	18.21	60.82	20.97	100.00
High	10.76	84.63	4.62	100.00
Moderate	11.46	86.80	1.73	100.00
Low	13.87	77.09	9.03	100.00
Very Low	11.42	81.96	6.62	100.00
Bio-Climatic Zone				
Tropical	14.39	78.07	7.54	100.00
Sub-tropical	11.27	76.76	11.97	100.00

Analytical Domain	Household Taking Adaptation Measures (farm based) (%)			
	Yes	No	Not Applicable	Total
Temperate	14.19	85.66	0.15	100.00
Sub-alpine	55.00	45.00	0.0	100.00
Nepal	**13.32**	**77.95**	**8.73**	**100.00**
18. Started Mixed Cropping				
Urban/Rural				
Urban	38.81	31.36	29.83	100.00
Rural	62.37	34.04	3.59	100.00
Ecological Belt				
Mountain	75.76	23.06	1.18	100.00
Hill	48.64	41.97	9.39	100.00
Terai	58.77	26.35	14.88	100.00
Eco-Development Region				
Eastern Mountain	59.83	39.39	0.78	100.00
Eastern Hill	59.06	40.25	0.69	100.00
Eastern *Terai*	55.69	15.43	28.88	100.00
Central Mountain	91.12	8.42	0.46	100.00
Central Hill	42.37	51.40	6.23	100.00
Central *Terai*	75.81	17.31	6.89	100.00
Western Mountain	33.63	57.56	8.81	100.00
Western Hill	64.35	33.42	2.23	100.00
Western *Terai*	36.20	54.71	9.09	100.00
Mid-western Mountain	60.79	36.41	2.80	100.00
Mid-western Hill	35.54	63.06	1.40	100.00
Mid-western *Terai*	31.47	60.14	8.40	100.00
Far-western Mountain	84.63	14.40	0.98	100.00
Far-western Hill	58.97	39.01	2.02	100.00
Far-western *Terai*	60.18	32.27	7.54	100.00
Kathmandu Valley	0.92	3.84	95.24	100.00
Income Quintile				
First Quintile (Lowest)	63.00	34.32	2.68	100.00
Second Quintile	60.63	33.78	5.59	100.00
Third Quintile	56.22	32.17	11.61	100.00
Fourth Quintile	50.34	32.07	17.59	100.00
Fifth Quintile (Highest)	39.67	34.30	26.03	100.00
NAPA Combined Vulnerability Index				
Very High	63.25	14.82	21.93	100.00
High	52.42	42.63	4.96	100.00
Moderate	66.53	31.39	2.09	100.00
Low	37.04	43.36	19.60	100.00
Very Low	56.38	37.11	6.52	100.00
Bio-Climatic Zone				
Tropical	53.27	34.98	11.74	100.00
Sub-tropical	56.79	31.27	11.94	100.00
Temperate	75.21	24.64	0.15	100.00
Sub-alpine	5.00	95.00	0.0	100.00
Nepal	**55.47**	**33.25**	**11.27**	**100.00**

Analytical Domain	Household Taking Adaptation Measures (farm based) (%)			
	Yes	No	Not Applicable	Total
19. Use of Tunnel for Vegetable Farming				
Urban/Rural				
Urban	4.09	67.81	28.10	100.00
Rural	4.38	92.42	3.20	100.00
Ecological Belt				
Mountain	6.61	91.81	1.59	100.00
Hill	5.30	85.41	9.29	100.00
Terai	2.89	83.89	13.22	100.00
Eco-Development Region				
Eastern Mountain	11.33	86.88	1.79	100.00
Eastern Hill	5.42	93.94	0.64	100.00
Eastern *Terai*	0.33	75.63	24.04	100.00
Central Mountain	8.37	90.72	0.91	100.00
Central Hill	5.29	88.48	6.23	100.00
Central *Terai*	4.31	88.88	6.81	100.00
Western Mountain	4.40	86.79	8.81	100.00
Western Hill	6.18	91.75	2.07	100.00
Western *Terai*	1.84	88.78	9.39	100.00
Mid-western Mountain	0.0	97.20	2.80	100.00
Mid-western Hill	3.11	95.72	1.17	100.00
Mid-western *Terai*	0.0	91.85	8.15	100.00
Far-western Mountain	4.24	94.79	0.98	100.00
Far-western Hill	11.19	86.79	2.02	100.00
Far-western *Terai*	15.27	77.02	7.71	100.00
Kathmandu Valley	0.57	4.49	94.94	100.00
Income Quintile				
First Quintile (Lowest)	4.80	92.26	2.95	100.00
Second Quintile	4.83	90.29	4.88	100.00
Third Quintile	3.74	85.42	10.84	100.00
Fourth Quintile	4.21	80.30	15.50	100.00
Fifth Quintile (Highest)	3.93	70.86	25.21	100.00
NAPA Combined Vulnerability Index				
Very High	3.93	74.63	21.44	100.00
High	5.27	89.76	4.98	100.00
Moderate	5.19	92.76	2.05	100.00
Low	3.05	80.68	16.27	100.00
Very Low	3.09	90.21	6.70	100.00
Bio-Climatic Zone				
Tropical	3.77	85.78	10.45	100.00
Sub-tropical	5.39	82.66	11.96	100.00
Temperate	3.00	96.85	0.15	100.00
Sub-alpine	0.0	100.00	0.0	100.00
Nepal	**4.29**	**85.22**	**10.49**	**100.00**
20. Use of Cold Storage				
Urban/Rural				
Urban	4.22	67.43	28.34	100.00
Rural	5.29	89.82	4.88	100.00

Analytical Domain	Household Taking Adaptation Measures (farm based) (%)			
	Yes	No	Not Applicable	Total
Ecological Belt				
Mountain	1.48	88.62	9.90	100.00
Hill	4.61	85.16	10.22	100.00
Terai	5.95	80.47	13.59	100.00
Eco-Development Region				
Eastern Mountain	5.70	58.14	36.17	100.00
Eastern Hill	0.57	93.06	6.37	100.00
Eastern *Terai*	3.30	70.95	25.75	100.00
Central Mountain	0.0	99.54	0.46	100.00
Central Hill	0.22	93.74	6.04	100.00
Central *Terai*	4.99	88.63	6.38	100.00
Western Mountain	0.0	91.19	8.81	100.00
Western Hill	2.52	95.33	2.15	100.00
Western *Terai*	0.26	90.84	8.90	100.00
Mid-western Mountain	0.0	97.20	2.80	100.00
Mid-western Hill	27.27	71.56	1.17	100.00
Mid-western *Terai*	29.20	62.27	8.53	100.00
Far-western Mountain	0.52	97.80	1.68	100.00
Far-western Hill	0.31	97.66	2.02	100.00
Far-western *Terai*	0.75	92.03	7.22	100.00
Kathmandu Valley	0.0	5.86	94.14	100.00
Income Quintile				
First Quintile (Lowest)	5.62	90.84	3.54	100.00
Second Quintile	6.04	87.47	6.49	100.00
Third Quintile	4.83	83.20	11.97	100.00
Fourth Quintile	5.71	75.77	18.52	100.00
Fifth Quintile (Highest)	3.68	71.10	25.22	100.00
NAPA Combined Vulnerability Index				
Very High	0.29	77.64	22.07	100.00
High	11.00	81.54	7.46	100.00
Moderate	2.08	93.87	4.06	100.00
Low	8.76	74.65	16.59	100.00
Very Low	0.16	93.34	6.50	100.00
Bio-Climatic Zone				
Tropical	6.25	82.99	10.76	100.00
Sub-tropical	3.34	82.13	14.53	100.00
Temperate	0.55	95.38	4.07	100.00
Sub-alpine	0.0	100.00	0.0	100.00
Nepal	**4.98**	**83.27**	**11.75**	**100.00**
21. Start Seed Bank				
Urban/Rural				
Urban	9.86	61.26	28.88	100.00
Rural	21.75	73.58	4.67	100.00
Ecological Belt				
Mountain	10.09	79.84	10.07	100.00
Hill	22.79	67.15	10.06	100.00

Analytical Domain	Household Taking Adaptation Measures (farm based) (%)			
	Yes	No	Not Applicable	Total
Terai	15.19	71.07	13.74	100.00
Eco-Development Region				
Eastern Mountain	2.14	60.42	37.44	100.00
Eastern Hill	13.69	80.47	5.84	100.00
Eastern *Terai*	18.39	55.64	25.97	100.00
Central Mountain	1.34	98.21	0.46	100.00
Central Hill	2.36	91.66	5.98	100.00
Central *Terai*	10.39	83.10	6.51	100.00
Western Mountain	0.0	91.19	8.81	100.00
Western Hill	44.98	52.83	2.20	100.00
Western *Terai*	4.66	86.44	8.90	100.00
Mid-western Mountain	1.71	95.49	2.80	100.00
Mid-western Hill	52.65	46.18	1.17	100.00
Mid-western *Terai*	32.61	58.86	8.53	100.00
Far-western Mountain	45.41	53.61	0.98	100.00
Far-western Hill	1.60	96.79	1.61	100.00
Far-western *Terai*	19.80	72.49	7.71	100.00
Kathmandu Valley	0.0	6.54	93.46	100.00
Income Quintile				
First Quintile (Lowest)	20.38	76.15	3.47	100.00
Second Quintile	21.71	71.36	6.92	100.00
Third Quintile	18.91	68.88	12.21	100.00
Fourth Quintile	17.46	64.38	18.16	100.00
Fifth Quintile (Highest)	11.33	63.53	25.14	100.00
NAPA Combined Vulnerability Index				
Very High	2.47	76.71	20.82	100.00
High	14.48	77.80	7.72	100.00
Moderate	23.80	72.46	3.74	100.00
Low	31.06	50.87	18.07	100.00
Very Low	24.15	69.34	6.50	100.00
Bio-Climatic Zone				
Tropical	15.87	73.24	10.89	100.00
Sub-tropical	21.67	64.01	14.33	100.00
Temperate	24.68	71.25	4.07	100.00
Sub-alpine	0.0	100.00	0.0	100.00
Nepal	**18.27**	**69.97**	**11.76**	**100.00**
22. Work on Water and Land Conservation				
Urban/Rural				
Urban	28.83	57.09	14.08	100.00
Rural	37.34	60.96	1.70	100.00
Ecological Belt				
Mountain	43.07	55.97	0.96	100.00
Hill	40.60	52.65	6.75	100.00
Terai	27.73	67.61	4.65	100.00
Eco-Development Region				
Eastern Mountain	16.01	83.99	0.0	100.00

Analytical Domain	Household Taking Adaptation Measures (farm based) (%)			
	Yes	No	Not Applicable	Total
Eastern Hill	25.59	72.06	2.36	100.00
Eastern *Terai*	26.88	67.23	5.89	100.00
Central Mountain	64.31	34.15	1.54	100.00
Central Hill	22.73	73.50	3.77	100.00
Central *Terai*	21.08	75.16	3.76	100.00
Western Mountain	89.40	10.60	0.0	100.00
Western Hill	69.95	28.98	1.07	100.00
Western *Terai*	36.22	58.57	5.20	100.00
Mid-western Mountain	26.33	72.55	1.12	100.00
Mid-western Hill	65.84	33.93	0.23	100.00
Mid-western *Terai*	41.43	55.01	3.56	100.00
Far-western Mountain	52.24	46.78	0.98	100.00
Far-western Hill	20.79	76.88	2.33	100.00
Far-western *Terai*	34.47	61.64	3.90	100.00
Kathmandu Valley	2.27	28.39	69.34	100.00
Income Quintile				
First Quintile (Lowest)	35.68	62.45	1.87	100.00
Second Quintile	36.69	60.56	2.75	100.00
Third Quintile	37.02	59.03	3.95	100.00
Fourth Quintile	35.32	57.63	7.05	100.00
Fifth Quintile (Highest)	34.23	50.62	15.15	100.00
NAPA Combined Vulnerability Index				
Very High	23.51	62.61	13.88	100.00
High	23.94	72.59	3.47	100.00
Moderate	45.21	53.62	1.18	100.00
Low	39.68	56.70	3.62	100.00
Very Low	53.38	43.06	3.57	100.00
Bio-Climatic Zone				
Tropical	32.39	63.81	3.80	100.00
Sub-tropical	37.66	53.62	8.72	100.00
Temperate	45.87	54.13	0.0	100.00
Sub-alpine	85.00	15.00	0.0	100.00
Nepal	**34.85**	**59.83**	**5.32**	**100.00**

Table 10-1 presents the percentage distribution of households adopting various adaptation measures in last 25 years. A total of 22 farm based adaption measures have been identified with the expert input and the households are surveyed whether those measures are being adopted.

The survey result shows that use of inorganic fertilisers (60.46%), increase or initiate mixed cropping (55.47%), and cultivation of improved seeds (53.5%) are the most practiced adaption measures. Similarly, agriculture insurance (0.86%), investment on pond (2.82%), and crop cultivation only (3.98%) are less adopted adaptation measures. Similarly, it is observed that majority of households from rural area are adopting different adaptation measures compared to that of urban areas. Furthermore, use of inorganic fertilisers is the most adopted adaptation measures in both rural (64.89%) and urban (49.74%) areas. Similarly, agriculture insurance, despite being less adopted adaptation measure is being practiced slightly more in urban areas (1.00%) in comparison to rural area (0.81%).

Similarly, use of compost fertilisers (77.97%) and mixed cropping (75.76%) are found to be most adopted adaptation measure in mountain region while mixed cropping (48.64%) in hills and use

of inorganic fertilisers (77.64%) in *Terai* regions. Moreover, investment on pond, use of cold storage, and initiation of livestock insurance is reported to be adopted as adaptation measures in all ecological belts. Comparing eco-development regions, using compost fertilisers is reported the most adopted adaptation measures in central mountain (97.10%) while use of chemical fertiliser in central *Terai* is 90.40 per cent. Most of the identified adaptation measures are adopting to all eco-development regions except Kathmandu Valley.

Both livestock and crop farming, use of inorganic fertilisers and work on water and land conservation are the most reported adaptation measures adopted in very high vulnerable areas based on NAPA combined vulnerability index. Comparatively, higher percentage of households (18.21%) also reported to have initiated agro-forestry as an adaptation measure in the same area. Moreover, about 85 per cent households are involved in water and land conservation in sub-alpine zone as most adopted adaptation measure while mixed cropping is reported in both temperate (75.21%), and sub-tropical (56.79%) zones.

10.3. Off-farm Based Adaptation

Table 10-2: Farm Based Adaption Measures Adopted in Last 25 Years

Analytical Domain	Response (HH, %)			
	Yes	No	Not Applicable	Total
1. Change on Food Consumption Habit				
Urban/Rural				
Urban	76.56	22.05	1.38	100.00
Rural	68.19	31.56	0.25	100.00
Ecological Belt				
Mountain	50.56	49.23	0.21	100.00
Hill	73.61	25.95	0.44	100.00
Terai	71.15	28.06	0.79	100.00
Eco-Development Region				
Eastern Mountain	75.28	24.72	0.0	100.00
Eastern Hill	64.78	35.22	0.0	100.00
Eastern *Terai*	90.26	9.74	0.0	100.00
Central Mountain	18.16	81.84	0.0	100.00
Central Hill	62.63	36.64	0.73	100.00
Central *Terai*	50.96	48.23	0.81	100.00
Western Mountain	97.80	2.20	0.0	100.00
Western Hill	86.50	13.50	0.0	100.00
Western *Terai*	73.55	25.40	1.05	100.00
Mid-western Mountain	39.41	60.03	0.56	100.00
Mid-western Hill	83.77	16.23	0.00	100.00
Mid-western *Terai*	69.71	27.32	2.97	100.00
Far-western Mountain	88.65	10.82	0.53	100.00
Far-western Hill	58.95	40.29	0.77	100.00
Far-western *Terai*	85.67	13.23	1.10	100.00
Kathmandu Valley	82.23	15.03	2.74	100.00
Income Quintile				
First Quintile (Lowest)	65.35	34.12	0.53	100.00
Second Quintile	68.46	31.12	0.42	100.00
Third Quintile	70.00	29.44	0.56	100.00
Fourth Quintile	74.58	24.76	0.66	100.00
Fifth Quintile (Highest)	77.34	21.58	1.08	100.00
NAPA Combined Vulnerability Index				
Very High	68.87	30.34	0.79	100.00
High	66.59	33.00	0.42	100.00
Moderate	67.70	31.97	0.34	100.00

Analytical Domain	Response (HH, %)			
	Yes	No	Not Applicable	Total
Low	79.09	20.10	0.81	100.00
Very Low	74.34	25.00	0.66	100.00
Bio-Climatic Zone				
Tropical	72.94	26.46	0.60	100.00
Sub-tropical	69.30	30.07	0.63	100.00
Temperate	49.98	50.02	0.0	100.00
Sub-alpine	100.00	0.0	0.0	100.00
Nepal	**70.64**	**28.77**	**0.58**	**100.00**
2. Started Off-farm Activities				
Urban/Rural				
Urban	38.43	56.57	5.00	100.00
Rural	31.77	67.91	0.32	100.00
Ecological Belt				
Mountain	25.15	74.10	0.75	100.00
Hill	18.90	78.33	2.76	100.00
Terai	49.90	49.31	0.79	100.00
Eco-Development Region				
Eastern Mountain	44.69	54.65	0.67	100.00
Eastern Hill	21.89	77.84	0.28	100.00
Eastern *Terai*	45.71	54.15	0.14	100.00
Central Mountain	11.19	88.81	0.0	100.00
Central Hill	9.24	89.69	1.06	100.00
Central *Terai*	67.37	32.63	0.0	100.00
Western Mountain	32.20	65.60	2.20	100.00
Western Hill	27.90	71.96	0.15	100.00
Western *Terai*	45.89	53.57	0.53	100.00
Mid-western Mountain	12.87	85.64	1.50	100.00
Mid-western Hill	12.56	87.28	0.16	100.00
Mid-western *Terai*	19.10	75.97	4.94	100.00
Far-western Mountain	38.68	59.88	1.44	100.00
Far-western Hill	14.55	84.57	0.88	100.00
Far-western *Terai*	23.47	73.39	3.14	100.00
Kathmandu Valley	30.46	36.37	33.17	100.00
Income Quintile				
First Quintile (Lowest)	36.51	63.22	0.26	100.00
Second Quintile	29.60	70.19	0.21	100.00
Third Quintile	32.56	67.00	0.45	100.00
Fourth Quintile	35.12	62.31	2.58	100.00
Fifth Quintile (Highest)	38.25	55.24	6.51	100.00
NAPA Combined Vulnerability Index				
Very High	26.08	68.69	5.24	100.00
High	23.73	75.91	0.36	100.00
Moderate	50.60	49.26	0.14	100.00
Low	29.24	69.08	1.68	100.00
Very Low	44.34	55.23	0.44	100.00
Bio-Climatic Zone				
Tropical	42.13	57.22	0.65	100.00
Sub-tropical	21.34	74.91	3.75	100.00
Temperate	15.37	84.59	0.04	100.00
Sub-alpine	30.00	70.00	0.0	100.00
Nepal	**33.72**	**64.59**	**1.69**	**100.00**

Analytical Domain	Response (HH, %)			
	Yes	No	Not Applicable	Total
3. Shift to Non-Agriculture Based Employment				
Urban/Rural				
Urban	51.25	44.55	4.20	100.00
Rural	42.56	57.17	0.27	100.00
Ecological Belt				
Mountain	37.22	62.13	0.65	100.00
Hill	30.93	66.73	2.35	100.00
Terai	60.53	38.84	0.64	100.00
Eco-Development Region				
Eastern Mountain	42.11	57.28	0.60	100.00
Eastern Hill	31.47	68.25	0.28	100.00
Eastern *Terai*	55.36	44.64	0.0	100.00
Central Mountain	17.16	82.84	0.0	100.00
Central Hill	12.88	86.31	0.81	100.00
Central *Terai*	72.51	27.49	0.0	100.00
Western Mountain	35.00	62.80	2.20	100.00
Western Hill	42.47	57.48	0.05	100.00
Western *Terai*	75.40	24.60	0.0	100.00
Mid-western Mountain	45.12	53.38	1.50	100.00
Mid-western Hill	37.31	62.53	0.16	100.00
Mid-western *Terai*	33.65	61.68	4.67	100.00
Far-western Mountain	60.43	38.59	0.98	100.00
Far-western Hill	36.74	61.92	1.33	100.00
Far-western *Terai*	29.18	67.89	2.93	100.00
Kathmandu Valley	37.77	34.11	28.13	100.00
Income Quintile				
First Quintile (Lowest)	39.02	60.71	0.26	100.00
Second Quintile	37.94	61.90	0.16	100.00
Third Quintile	48.46	51.21	0.33	100.00
Fourth Quintile	53.60	44.48	1.92	100.00
Fifth Quintile (Highest)	54.56	39.63	5.80	100.00
NAPA Combined Vulnerability Index				
Very High	30.84	64.76	4.39	100.00
High	37.73	61.86	0.41	100.00
Moderate	51.95	47.96	0.10	100.00
Low	51.47	47.05	1.48	100.00
Very Low	67.57	32.43	0.0	100.00
Bio-Climatic Zone				
Tropical	52.79	46.67	0.53	100.00
Sub-tropical	32.33	64.49	3.18	100.00
Temperate	39.23	60.73	0.04	100.00
Sub-alpine	35.00	65.00	0.0	100.00
Nepal	**45.10**	**53.48**	**1.42**	**100.00**
4. Temporary Out-Migration				
Urban/Rural				
Urban	35.56	60.41	4.04	100.00
Rural	43.50	56.32	0.18	100.00
Ecological Belt				
Mountain	26.92	72.71	0.37	100.00
Hill	25.60	72.36	2.04	100.00
Terai	59.08	40.18	0.74	100.00

Analytical Domain	Response (HH, %)			
	Yes	No	Not Applicable	Total
Eco-Development Region				
Eastern Mountain	39.06	60.94	0.0	100.00
Eastern Hill	31.60	68.40	0.0	100.00
Eastern *Terai*	50.81	48.08	1.11	100.00
Central Mountain	21.67	78.33	0.0	100.00
Central Hill	10.14	89.04	0.82	100.00
Central *Terai*	81.38	18.62	0.0	100.00
Western Mountain	65.60	34.40	0.0	100.00
Western Hill	29.34	70.66	0.0	100.00
Western *Terai*	50.30	49.70	0.0	100.00
Mid-western Mountain	7.38	91.68	0.93	100.00
Mid-western Hill	45.39	54.61	0.0	100.00
Mid-western *Terai*	36.55	60.60	2.85	100.00
Far-western Mountain	39.31	59.72	0.98	100.00
Far-western Hill	26.50	73.50	0.0	100.00
Far-western *Terai*	22.09	76.63	1.28	100.00
Kathmandu Valley	16.94	56.90	26.16	100.00
Income Quintile				
First Quintile (Lowest)	47.19	52.58	0.23	100.00
Second Quintile	40.13	59.34	0.52	100.00
Third Quintile	38.17	61.64	0.19	100.00
Fourth Quintile	39.70	58.56	1.74	100.00
Fifth Quintile (Highest)	39.93	54.89	5.18	100.00
NAPA Combined Vulnerability Index				
Very High	30.06	65.04	4.89	100.00
High	42.00	57.94	0.06	100.00
Moderate	53.64	46.30	0.06	100.00
Low	39.65	59.54	0.80	100.00
Very Low	37.20	62.80	0.0	100.00
Bio-Climatic Zone				
Tropical	52.67	46.75	0.58	100.00
Sub-tropical	24.30	72.94	2.76	100.00
Temperate	15.40	84.60	0.0	100.00
Sub-alpine	70.00	30.00	0.0	100.00
Nepal	**41.17**	**57.52**	**1.31**	**100.00**
5. Involvement in Flood/Landslide/Water Management				
Urban/Rural				
Urban	33.59	61.71	4.69	100.00
Rural	45.29	53.64	1.07	100.00
Ecological Belt				
Mountain	58.46	41.20	0.34	100.00
Hill	43.68	53.61	2.71	100.00
Terai	37.21	60.92	1.87	100.00
Eco-Development Region				
Eastern Mountain	45.75	54.25	0.0	100.00
Eastern Hill	27.22	72.78	0.0	100.00
Eastern *Terai*	23.01	76.51	0.48	100.00
Central Mountain	85.89	14.11	0.0	100.00
Central Hill	22.95	76.44	0.61	100.00
Central *Terai*	49.71	46.71	3.57	100.00
Western Mountain	95.00	5.00	0.0	100.00

Analytical Domain	Response (HH, %)			
	Yes	No	Not Applicable	Total
Western Hill	76.55	22.89	0.56	100.00
Western *Terai*	30.37	69.27	0.36	100.00
Mid-western Mountain	29.69	69.56	0.75	100.00
Mid-western Hill	74.13	25.55	0.32	100.00
Mid-western *Terai*	53.46	44.16	2.39	100.00
Far-western Mountain	50.86	48.16	0.98	100.00
Far-western Hill	15.32	84.68	0.0	100.00
Far-western *Terai*	27.51	71.14	1.35	100.00
Kathmandu Valley	4.01	62.20	33.79	100.00
Income Quintile				
First Quintile (Lowest)	46.42	51.27	2.31	100.00
Second Quintile	43.96	55.39	0.65	100.00
Third Quintile	42.68	56.64	0.68	100.00
Fourth Quintile	41.75	56.28	1.97	100.00
Fifth Quintile (Highest)	38.39	55.23	6.38	100.00
NAPA Combined Vulnerability Index				
Very High	31.56	63.10	5.33	100.00
High	27.90	71.64	0.46	100.00
Moderate	64.33	33.07	2.60	100.00
Low	39.87	59.32	0.81	100.00
Very Low	49.03	50.75	0.22	100.00
Bio-Climatic Zone				
Tropical	39.94	58.44	1.61	100.00
Sub-tropical	43.56	53.11	3.34	100.00
Temperate	54.07	45.93	0.0	100.00
Sub-alpine	95.00	5.00	0.0	100.00
Nepal	**41.86**	**56.00**	**2.13**	**100.00**
6. Road/Infrastructure Improvement for Protection from Flood and Landslide				
Urban/Rural				
Urban	43.68	52.22	4.10	100.00
Rural	52.42	46.61	0.97	100.00
Ecological Belt				
Mountain	59.65	40.02	0.34	100.00
Hill	54.41	43.20	2.39	100.00
Terai	43.66	54.69	1.65	100.00
Eco-Development Region				
Eastern Mountain	44.84	55.16	0.0	100.00
Eastern Hill	48.43	51.57	0.0	100.00
Eastern *Terai*	31.00	69.00	0.0	100.00
Central Mountain	81.14	18.86	0.0	100.00
Central Hill	33.48	66.09	0.43	100.00
Central *Terai*	52.79	43.78	3.44	100.00
Western Mountain	100.00		0.0	100.00
Western Hill	85.44	14.16	0.41	100.00
Western *Terai*	46.93	53.07	0.0	100.00
Mid-western Mountain	52.27	46.98	0.75	100.00
Mid-western Hill	79.38	20.62	0.0	100.00
Mid-western *Terai*	56.07	41.36	2.57	100.00
Far-western Mountain	43.73	55.29	0.98	100.00
Far-western Hill	19.65	80.35	0.0	100.00
Far-western *Terai*	32.14	66.16	1.70	100.00
Kathmandu Valley	12.38	56.54	31.09	100.00

Analytical Domain	Response (HH, %)			
	Yes	No	Not Applicable	Total
Income Quintile				
First Quintile (Lowest)	52.27	45.66	2.07	100.00
Second Quintile	51.07	48.47	0.46	100.00
Third Quintile	50.20	49.22	0.58	100.00
Fourth Quintile	48.81	49.40	1.79	100.00
Fifth Quintile (Highest)	53.02	41.58	5.40	100.00
NAPA Combined Vulnerability Index				
Very High	36.41	59.06	4.52	100.00
High	33.96	65.81	0.23	100.00
Moderate	69.92	27.44	2.64	100.00
Low	54.15	45.05	0.80	100.00
Very Low	62.16	37.84	0.00	100.00
Bio-Climatic Zone				
Tropical	47.12	51.50	1.38	100.00
Sub-tropical	53.07	43.91	3.02	100.00
Temperate	61.65	38.35	0.0	100.00
Sub-alpine	100.00	0.0	0.0	100.00
Nepal	**49.86**	**48.25**	**1.88**	100.00
7. Involvement in Community-Based NRM				
Urban/Rural				
Urban	48.47	48.14	3.39	100.00
Rural	60.14	39.49	0.37	100.00
Ecological Belt				
Mountain	56.72	42.95	0.34	100.00
Hill	60.25	37.79	1.96	100.00
Terai	53.23	46.06	0.71	100.00
Eco-Development Region				
Eastern Mountain	57.09	42.91	0.0	100.00
Eastern Hill	50.19	49.81	0.0	100.00
Eastern *Terai*	19.51	80.49	0.0	100.00
Central Mountain	64.32	35.68	0.0	100.00
Central Hill	48.61	50.95	0.43	100.00
Central *Terai*	73.20	25.55	1.25	100.00
Western Mountain	97.80	2.20	0.0	100.00
Western Hill	81.60	18.11	0.29	100.00
Western *Terai*	73.39	26.61	0.0	100.00
Mid-western Mountain	46.54	52.71	0.75	100.00
Mid-western Hill	91.46	8.54	0.0	100.00
Mid-western *Terai*	71.64	26.76	1.60	100.00
Far-western Mountain	50.35	48.67	0.98	100.00
Far-western Hill	32.25	67.75	0.0	100.00
Far-western *Terai*	49.60	49.05	1.35	100.00
Kathmandu Valley	11.63	62.98	25.39	100.00
Income Quintile				
First Quintile (Lowest)	61.64	37.42	0.94	100.00
Second Quintile	55.52	44.41	0.07	100.00
Third Quintile	57.20	42.55	0.25	100.00
Fourth Quintile	55.66	42.98	1.36	100.00
Fifth Quintile (Highest)	59.47	35.68	4.84	100.00

Analytical Domain	Response (HH, %)			
	Yes	No	Not Applicable	Total
NAPA Combined Vulnerability Index				
Very High	43.75	52.52	3.73	100.00
High	42.49	57.39	0.12	100.00
Moderate	79.59	19.30	1.12	100.00
Low	51.59	47.87	0.54	100.00
Very Low	77.43	22.57	0.0	100.00
Bio-Climatic Zone				
Tropical	55.06	44.29	0.65	100.00
Sub-tropical	58.41	39.10	2.49	100.00
Temperate	65.72	34.28	0.0	100.00
Sub-alpine	100.00	0.0	0.0	100.00
Nepal	**56.72**	**42.02**	**1.25**	**100.00**

Table 10-2 represents the percentage distribution of households adopting 7 identified off-farm based adaptation measures in last 25 years. The survey reveals that, change in food consumption habit (70.64%), involvement in community based NRM for protection from disasters (56.72%), and shift to non-agriculture based employment options (45.10) are the most adopted adaptation measures. Change in food consumption habit is the most adopted adaptation measures in both rural (68.19%) and urban areas (76.56%). However, shift to non-agriculture based employment option is reported to be second most adopted adaptation measures in urban areas (51.25%) while involve in community based NRM to protect from disasters (60.14%) do so in rural areas. All the respondents in western mountain eco-development region reported that improvement in road/infrastructures is the most adopted adaptation measures followed by change in food consumption habit and involvement in community based NRM (97.8%).

The change in food consumption habit has again been reported as the most adopted adaptation measure to households in different income quantiles. Highest percentage of households who belong to the fifth quintile (77.34%) are doing so seen followed by the households seeking shift to non-agriculture based employment options (54.56%), and involving in road/infrastructure improvement (53.02%). Similarly, highest percentage of households from first quintile are also changing their food consumption habit (65.35%) as the most adopted adaptation measures followed by involve in community based NRM to protect from disasters (61.64%), temporary out-migration (47.19%) and involve in flood/landslide/water management activities (46.42%).

Like in other analytical domain, change in food consumption habit is reported as the most adopted adaptation measure in all climatic zones. Road/infrastructure improvement and involve in community based NRM activities are other top most adopted adaptation measures in sub-alpine zone. However, shift to non-agriculture based employment options (52.79%) and initiation of off-farm activities (42.13%) reported as so in tropical zone.

REFERENCES

Chaulagain, N. P. (2009). Climate Change Impacts on Water Resources of Nepal with Reference to the Glaciers in the Langtang. Journal of Hydrology and Meteorology, Vol. 6, No. 1.

IPCC. (2001). Climate Change 2001: *The scientific basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change* (Houghton, J. T., Ding, Y., Griggs, D. J., Noguer, M., Van der Linden, P. J., Dai, X., Maskell, K. and Johnson, C. A. (Eds.)) Cambridge University Press, Cambridge and New York.

IPCC. (2001). *Contribution of Working Groups I, II, and III to the Third Assessment Report of the Intergovernmental Panel on Climate Change* . Cambridge: Cambridge University Press.

IPCC. (2007). *Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change.* Cambridge University Press.

IPCC. (2014). *Climate change and health: on the latest IPCC report.* IPCC.

Karki, M., Mool, P., & Shrestha, A. (2009). Climate Change and its Increasing Impacts in Nepal. *The Initiation*, 30-37.

Malla, G. (2008). Climate Change And Its Impact On Nepalese Agriculture. *The Journal of Agriculture and Environment Vol:.9*.

MoPE. (2010). National Adaptation Programme of Action to Climate Chage Ministry of Environment, Kathmandu, Nepal.

MoPE. (2012). Mountain Environment and Climate Change in Nepal: National Report prepared for the International Conference of Mountain Countries on Climate Change, 5-6 April 2012, Ministry of Environment, Kathmandu, Nepal.

Neupane, G., & Chhetri, N. (2009). Vulnerability to climate change of nature-based tourism in the Nepalese Himalayas. *Tourism Geographies*.

Regmi, B. R., Pandit, A., Pradhan, B., Kovats, S., & Lama, P. (2008). *Climate Change and Health in Nepal.* Capacity Strenghting in the least developed countries(LDCS) for adaptation to climate change (CLACC).

WECS. (2011). Water Resources of Nepal in the Context of Climate Change. Kathmandu: Water and Energy Commission Secretariat (WECS), Government of Nepal.

ANNEXES

ANNEX 1: GLOSSARY OF TERMINOLOGIES

Adaptation

In human systems, 'adaptation' is understood as the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities. In natural systems, it is defined as the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate.

Global Warming

In general, the 'global warming' is an increase in average temperature of the earth surface and the atmosphere. It is considered as an important aspect for the climate change along with rain fall and sea level change.

Climate Change Impact [on Water, Water Resources, and Livelihood]

Climate change has extended impacts not only on drinking water but also on other associated sectors including agriculture, irrigation, hydropower, water-powered small projects, and other dependent enterprises. Similar impact could be associated with water resources such as drying up of existing water holes. Melting glacier on unprecedented rate at the Himalayas does not only accelerate the risk of flooding specially in the monsoon but also decrease water availability during dry season. Climate change impacts on different aspects of water sector have been briefed as follows:

Water Quantity

Water sector has already has been pressurised due to its mounting demand mainly for irrigation, and its uses on industrial pollution and sewage management. Climate change would have further accelerated such pressure. Increasing temperature but decreasing rainfall would have diminished the available water quantity for different purposes such as drinking, on other domestic uses, and on agriculture and industrial sectors. It would result in the increased competitive demand of water and hence would need effective good governance mechanism.

Water Quality

The water quality would be the issue of more interest at the global arena especially in the areas with ascending water scarcity. The change in rainfall pattern and amount has direct link on water flow within the watershed area. Water quality would deteriorate if it encounters different chemicals during its cycle which limits utility options. For example, salt composition in water increases through rapid evaporation due to temperature rise. The increased flood frequency further catalysis water to encounter with different agricultural chemical compounds and industrial waste which reaches water table through infiltration results fading underground water quality. Similarly, increased sea level rise contaminates proximate water distribution system increasing salt compounds, which adds risk to access of people on pure water.

Access to Water

The competition over existing water resources speeds up rapidly while water quantity and quality decreases as a result of accelerated water cycle. Water demand would be increased especially for agriculture and domestic use in summer and dry season. Similarly, increasing population and temperature rise but decreasing rainfall would further enhance competition for underground water resulting conflicts.

Waterborne Disaster

The risk level would be further amplified especially from increasing frequency of climate induced natural disasters including flooding and drought. IPCC has also projected that the risk and direct impact of climate induced natural disasters to local communities would be more significant.

Different projected changes on water quantity, quality, and access would have direct impact on diverse sectors including agriculture and food security, health, and other economic activities along with human lives through conflict for water resources. Besides, direct negative impact on community livelihood, climate induced flooding has following additional impacts:

- Increases risk of waterborne disease as an outcome of contaminated water and over pressure from sewage system;
- Impact on clean water distribution system due to damage caused on infrastructures;
- Risk of different types of epidemics of malaria, jaundice, and dengue especially at the downstream communities creating enabling environment for mosquitoes;
- Increase in frequency of different types of Disease and health issues such that of dermatology related issues;
- Contribute on malnutrition and under-nutrition mainly by posing threat to income generation and food distribution system.
- Impacts on agriculture and food security due to water imbalance

Slight changes on enduring climatic conditions such as seasonal changes on rainfall pattern can invite adverse results considering interlinked relation between agriculture and the climate. It directly impacts production especially in areas where agriculture system completely depends upon rain and irrigation mechanism is not adapted adjusting to changed rainfall pattern. Such impact would fuel food insecurity in areas those are already vulnerable.

Disease

It is the process of suffering whole or parts of the plant/animal body by any microbial.

Farming System

It refers to the process of managing the farm interlinking crops, horticulture, agriculture, forestry, and animal husbandry; and utilising its physical environments such as weather, soil, and landscape.

Crop Diversification

Crop diversification is the improvement on crop, species, and crop system to increase total production and income from limited land area. It is mainly based on market demand and quality considering feasibility in the landscape and comparative benefit.

Mixed/Intercropping

Mixed/intercropping contributes to increase in per unit productivity with optimum utilisation of solar light, plant nutrition, and water. The plant species having different root system cropped in the mixed/ intercropping system uses nutrition at different times. For example, the *mung* utilises soil nutrition after 35th day of it plantation while maize does so after 50th day only in the maize-mung intercropping.

Cereal Crops

These are mainly rice, maize, wheat species, barley species, buckwheat, *latte*, *Kaguno*, *chinu*, and *Junelo*.

Legumes

These are crop species mostly containing dicotyledonous seeds including soybean and gram.

Vegetables

These are crops such as cauliflower, cabbage, and broccoli.

Invasive Species

They are the exotic and unwanted plant species which displace and impact production and expansion of already established both naturally or planted vegetation, and those which are part of livelihood. Mikenia and catweed (*banmara*) are some example of invasive species. Climate change can create favorable milieu to comparatively less economically important species and ultimately displaces native, already established, and economically important plant species.

Non Timber Forest Products (NTFPs)

Forests provide different products and services which are broadly divided into two categories: timber and products other than timber. Forest products other than timber are categorised as NTFPs. Single tree could provide both timber and NTFPs since the stem yields timber while remaining part including branches, leaves, flower, fruits, and bark offer economic benefits. Similarly, other plant species that do not yield timber or hard wood also offer other economic benefits for their medicinal, cultural, edible, and other values.

Deforestation

It is the invasion of forests areas for other land use purposes or decrement of total forest crown cover to less than 10 per cent in long run.

Forest Degradation

It is understood as the degraded state of forest which fails to offer anticipated products and services in its normal state even though there is no universal

definition. However, in context of REDD+, it is understood in terms of its ability of carbon storage mainly due to anthropogenic pressure. At such state, the total forests area remains same while its productivity is despoiled.

Forest Management

Forest management is the process of conservation, development, management, and utilisation of forests employing both technical and professional principles mainly for ecosystems, biodiversity, economic, and social prosperity. The forest management regimes and technics differ based on the management objectives. These days, the forests management also includes activities carried out to reduce carbon emission and enhance carbon stock in forests area.

Tourists

Tourists are the visitors visiting other than own residence aiming to spend at least 24 hours. However, visitors who visit other areas and spend less than 24 hours are defined as 'excursionists'. It could be categorized as domestic/internal and external/international tourists.

Tourist Area

It is an area including heritage sites and has an object to attract both domestic and international tourists to visit.

Duration of Stay

It is understood as the total time spent by any domestic and international tourists while visiting touristic areas. For example, the average duration of stay for international tourists in Nepal is 13 days. However, it differs in countries. Tourists visiting for trekking and mountaineering have comparatively longer duration of stay while it is less for tourists visiting for cultural, entertainment, and business purposes.

Windstorm

Windstorm, in this report, indicates high speed wind breeze generally happens in dry seasons - April and May. It also refers the same that happen in rainy season generally with rain. Windstorm in both seasons contributes on crop and tree plants damage and hence on reduction of total production.

ANNEX 2: Survey Questionnaire

The information asked in this questionnaire are confidential according to the statistical act, 2015. Individual information are not published and only used for statistical purposes.

Climate Change Impact Survey 2016

Questionnaire

Government of Nepal
National Planning Commission Secretariat

Central Bureau of Statistics

Thapathali, kathmandu
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PSU Code			Household No.		

Central Bureau of Statistics

Climate Change Impact Survey, 2016

- The objective of this survey is to study the impacts of climate change in the social, economic and environmental aspects. To fulfill this objective Central Bureau of Statistics is requesting to all stakeholders to provide real information.
- Questions given below shall be asked to a 45 years old person staying in that community over the past 25 years from every household.

Module 1: Introductory Information

Introduction					**Information of the respondent**							**Sex Male ..... 1 Female ... 2**			**Age (years)**
Identification of Sampling Area	Description				A07. Name of the Household H ead										
A01. PSU No.					A08. Name of the Respondent (45 years or above)										
A02. District	(code)														
A03. VDC/Municipality	(code)				A09. Contact Number of the Respondent										
A04. Ward no/ Sub-ward no					A10. Ethnicity of the respondent (See code)										
A05.Name of village/tole					A11. Qualification of respondent (See code)										
A06. Altitude/elevation of the survey area (m)					A12. Duration of stay in this community (in years)										
Enumerator	Name: Signature: Date:				Supervisor	Name: Signature: Date:									
Data entry operator	Name: Signature: Date:														

Module 2: Personal and Household Information

2.1. Personal information

B01. What is the household size including household head? Usually staying members : Absent members : Total :

S.N.	Household members' name	Relation with the head of household Household Head.....1 Husband/Wife.....2 Son/Daughter in law.....3 Daughter/Son in law.....4 Father/Mother.....5 Mother in law/Father in law.....6 Siblings.....7 Grand Children.....8 Servants.....9 Others.....10	Sex Male.....1 Female...2	Age (Complete years) s	Educational qualification (for five years & more)	Marital Status (for 10 years and above) Unmarried-1 Married-2 Widow/Widower-3 Divorced-4 Separated-5	Current occupation (for 10 years and above) Agriculture-1 Salary/wage-2 Other non-agricultural business—3 Household chores-4 Student-5 Searching for job-6 Not working-7
B02	**B03**	**B04**	**B05**	**B06**	**B07**	**B08**	**B09**
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							

2.2. Household Information

Q.No.	Description	Code	Q.No.	Description	Code
B10	Ownership of residence? 1. Owned 2. Rented 3. Institutional 4. Others		**B11**	Type of infrastructure of your main residence. 1. Permanent 2. Semi (half)-Permanent 3. Kachchi 4. Others	
B12	Sources of drinking water (rank three main sources in priority) 1. Pipeline 2. Shallow/Deep tube well 3. Well/ spring 4. Canal/River/stream water 5. Rainwater 6. Spring/stone spout 7. Jar/tanker 8. Others		**B13**	Sources of fuel used for cooking (three main sources in priority) 1. Firewood 2. Gas/LPG 3. Cow dung 4. Biogas 5. Kerosene 6. Electricity 7. Briquette/rice husk 8. Others	
B14	Main source of energy for light 1. Electricity 2. Solar Power 3. Kerosene 4. Bio-gas 5. Others		**B15**	Main type of toilet/latrine facility 1. Flush toilet (connected to sewage) 2. Flush toilet (connected to septic tank) 3. General household latrine 4. Public toilet 5. Open space/No latrine	
B16	Sources of income of the household in the past 12 months (rank three main sources in priority) 1. Agriculture 2. Salary/Wages 3. Non-Agri. Business 4. Remittance 5. Others		**B17**	Which of the facilities family are using as listed below: (multiple answers are possible for this question) 1. Radio 2. Television 3. Cable 4. Computer 5. Internet 6. Telephone 7. Mobile 8. Motorcycle 9. Car 10. Bicycle 11. Other vehicle 12. Refrigeration 13. None of above	
B18.	Has this household received remittance in the past 12 months? 1. Yes 2. No				

Module 3: Land Holding Information of Households

C01.Does your family has operational land for agriculture? **Yes ....1** **No.....2 (go to module 4)**

C02. If yes, please provide details of operational land

S.N	Land description	Unit of area Bigha.....1 Ropani....2	Present (2073/2016)			Five years ago (2068/2011)		
			Bigha/Ropani	Kattha/Aana	Dhur/ Paisa	Bigha/ Ropani	Kattha/Aana	Dhur/Paisa
1	2	3	4	5	6	7	8	9
1	Land occupied by residence							
2	Temporary crops cultivated own land							
3	Owned under Pond/Wetland							
4	Owned Orchard							
5	Owned land Others							
6	Land leased from others							
7	Total operational Land [(1 + 2 + 3 + 4 + 5+6)]							

Module 4: Household Access to Socioeconomic Services

Description	Response	Code
D01. Farming experience of household head (years)	.....years	
D02. You or any family member is a member of saving & cooperative or micro financial institutions or in informal saving groups	Yes=1 No=2	
D03. You or any family member has regular saving in the saving & cooperative or micro financial institutions or in informal saving groups over the past 12 months period	Yes=1 No=2	
D04. You or any family member of your family is a member of any other community based organization (CFUG, MGs, etc.)	Yes=1 No=2	
D05. Your household received services from agriculture support center(s) and livestock service center over the past 12 months period	Yes=1 No=2	
D06. Distance to motorable road from your house	..... km	
D07. Distance to nearest health center from hour house	.....km	
D08. Distance to nearest secondary school from your house	.....km	

D09. Distance to nearest market from your house for sale and buy	..... km	
D10. Distance to nearest agriculture support center or livestock service center form your house	..... km	
D11. Current farm mechanization at your family	Yes=1 No=2	

Module 5: Household Income Information (over the past 12 months)

Description	Amount (NRs)	
E01. Last year crop revenue from sale (rice, wheat, millet, potato, jute, maize, corn, lentil, vegetables, oilseeds, fruits, cardamom, ginger, garlic, coffee, mushroom, sugarcane, etc.)	.....	
E02. Last year livestock revenue from sale (milk/dairy products, poultry, livestock, etc.)	.....	
E03. Other agri. & forest income sources of the household (sale of timber tree, sale of fruit tree, tree branches, Straw/ash/husk, Cow dung/ manure, land mortgage, sale of land, sale-household goods, mortgage-goods, etc.)	.....	
E04. Household income from other non-agricultural sources (salary-from job, Business, day labor, remittance, interest-bank/ cooperative/micro finance saving, interest from loan, insurance bonus, share & bonds,	.....	
E05. Household income from non-agricultural business	.....	

Module 6: Knowledge and Perception about Climate Change, Reasons and Impact

6.1. Basic Information

Description	Code	Description	Code
F01. Have you heard about climate change? *Yes.....1* *No.....2* *If no, go to question F03*		**F02.** If yes, what is your main source of information about climate change? Radio....1 Television.....2, Newspaper/publications....3 Awareness campaign...4 Local bodies/authorities...5 Neighbor and friends...6 Family member....7 Others....8	
F03. Do you think climate of this place is different than it was 25 years before? *Yes....1,* *No....2,go to section 6.2*		**F04**. What may be the main reason of the climate change? Deforestation...1 Natural reason...2 Industrialization...3 Urbanization...4 Over exploitation of resources...5 God wish...6 Earthquake...7 Others...8 Do not know...9 ***(Please select 3 options based on priority)***	

F05. What are the main three incidences/consequences of climate change in this area over the past 25 years? *Drought…1Fire (in forest)…2, Fire (in community)…3, Flood…4,Inundation…5, Windstorm…6, Thunderstorm…7,Hailstorm…8,* Heavy rain… 9,Sporadic rain…10,*Erosion…11, Landslide…12, Snowstorm…13,* Avalanche *…14, GLOF…15,* *Heat wave…16, Cold wave…17, Disease/insect…18,Others…19* (Write in order codes of maximum 5 incidences)			

Module 6.2: Information on Temperature

Temperature	Temperature compared to 25 years before	F08. Duration					
		25 years before			Now		
F06. Summer	Increased =1 Decreased=2 Stayed the same=3		Month	Week		Month	Week
		Start date:			Start date:		
F07.Winter	Increased =1 Decreased=2 Stayed the same=3		Month	Week		Month	Week
		Start date:			Start date:		

Module 6.3: Information on Rainfall

Rainfall	Rainfall volume compared to 25 years before	F11. Duration					
		25 years before			Now		
F09. Monsoon	Increased =1 Decreased=2 Stayed the same=3		Month	Week		Month	Week
		Start date:			Start date:		
F10. Winter Rain	Increased =1 Decreased=2 Stayed the same=3	Start date:			Start date:		

Module 6.4: Information about Impact of Climate Change

S.N.	Natural disasters or events due to climate change (first identify the main disaster events of the locality)	Have you ever experienced the change in the following events in this area over the past 25 years? Yes…1 No…2,next column Not applicable…3, next column	If yes, how has it changed over the past 25 years Increased …. 1 Decreased … 2	To what extent these events have impacted/affected you or your family over the past 25 years? Very low …1, Low … 2, Moderate … 3, High ….4, Very high … 5	What could be the main reasons for the occurrence of following events over the past 25 years? (write the codes of main three reasons in priority)*		
F12	**F13**	**F14**	**F15**	**F16**	**F17**		
1.	Drought						
2.	Fire (in forest)						
3.	Fire (in community)						
4.	Flood						
5.	Inundation						
6.	Windstorm						
7.	Thunderstorm						
8.	Hailstorm						
9.	Heavy rain						
10.	Sporadic rain						
11.	Erosion						
12.	Landslide						
13.	Snowstorm						
14.	Avalanche						
15.	GLOF						
16.	Heat wave						
17.	Cold wave						
18.	Disease/insect						
19.	Others						

*Low rainfall..1, Heavy rain..2, Increase in temperature..3, Decrease in temperature..4, Road construction..5, Urbanization..6, Deforestation..7, Over withdrawal of water..8, Earthquake.. 9, Population increase ..10, Others ..11

Module 7: Impact of Natural Disasters or Events

7.1: Impact on Daily Life

S.N.	Type of Natural disaster or events (please only ask question based on identified disaster in 6.4)	When were you or your family affected by the following disasters in past five years? Mention in BS	Had you or your family member(s) been affected due to damage in physical infrastructures (road, irrigation schemes, etc.) due to following disaster(s) over the past 5 years? Affected..1 Seen but not affected ..2 no disaster..3	How many days on average you or your household members were not able to work/ unemployed due to the following disasters in past 5 years? (days)	Did you and members of your household have food shortage due to impact of the following disaster(s) over the past 5 years? Yes ..1 No..2	Did any of the family member(s) die due to the impact of following disaster(s) over the past 5 years? Yes...1 No...2	Death of family members over the past 5 years due to the following disaster(s)				
							Death number across age groups			Death record as per sex	
							0-18 years	19-59 years	60 years or above	Male	Female
G01	**G02**	**G03**	**G04**	**G05**	**G06**	**G07**	**G08**	**G09**	**G10**	**G11**	**G12**
1.	Drought										
2.	Fire (in forest)										
3.	Fire (in community)										
4.	Flood										
5.	Inundation										
6.	Windstorm										
7.	Thunderstorm										
8.	Hailstorm										
9.	Heavy rain										
10.	Sporadic rain										
11.	Erosion										
12.	Landslide										
13.	Snowstorm										
14.	Avalanche										
15.	GLOF										
16.	Heat wave										
17.	Cold wave										
18.	Disease/insect										
19.	Others										

7.2: Impact on Household and Business

Value of loss NRs000

SN	Natural Disaster or events (please only ask question based on identified disaster in 6.4)	In past 5 years did you or any of your family member(s) bear any loss? Yes....1 No.....2 (go to next row)	Cereals & cash crops	Vegetables	Fruits	Livestock	Orchard/ nursery land	Cultivable land	Affected/Damaged residence (house, land and cow shed)	Other loss in non-agricultural businesses
G13	**G14**	**G15**	**G16**	**G17**	**G18**	**G19**	**G20**	**G21**	**G22**	**G23**
01.	Drought									
02.	Fire (in forest)									
03.	Fire (in community)									
04.	Flood									
05.	Inundation									
06.	Windstorm									
07.	Thunderstorm									
08.	Hailstorm									
09.	Heavy rain									
10.	Sporadic rain									
11.	Erosion									
12.	Landslide									
13.	Snowstorm									
14.	Avalanche									
15.	GLOF									
16.	Heat wave									
17.	Cold wave									
18.	Disease/insect									
19.	Others									

Module 8: Disease and Health Impacts

8.1. Impact on crops and livestock

H01. Have you noticed new Disease in the crops over the past 25 years?	Yes …… 1 No …… 2 (If no go to H03)	
H02. If yes, please provide the name of new Disease in crops?	1. ……	2. ……
	3. ……	4. ……
H03. Have you noticed increased incidence of insects in crops over the past 25 years?	Yes=1, No=2 (if no go to H05)	
H04. If yes, please provide name of new insects or parasites in the crops?	1. ……	2. ……
	3. ……	4. ……
H05. Have you noticed new Disease or parasites in the livestock over the past 25 years?	Yes=1 No=2 (If no go to H07)	
H06. If yes, please provide the name of new Disease in Livestock?	1. ……	2. ……
	3. ……	4. ……

8.2: Impact on human health

H07. Has the incidence of illness due to any Disease increased in your family over the past 25 years?	Yes=1 No=2(if no go to H09)	
H08. Which new Disease are most prevalent in humans compared to 25 years ago? (write the disease codes from below) *	1. ……	2. ……
	3. ……	4. ……
	5. ……	6. ……
H09. Has the incidence of vector borne Disease increased in your family over last25 years before?	Yes …1No … 2	
H10.Has the incidence of water borne or food borne Disease increased in your family over the past 25 years?	Yes …1 No … 2	
*Disease Codes: Diarrhea – 01, Dysentery – 02, Malaria – 03, Skin Disease – 04, Cold/Cough – 05, Fever – 06, Typhoid – 07, Asthma – 08, Jaundice – 09, Malnutrition related – 10, Dengue – 11, Mental Disorder – 12, Chicken Pox – 13, Cholera – 14, Respiratory Disease=15, Viral Encephalitis=16,Kalazar= 17, Water borne& food borne Disease= 18, Others (specify) – 19, mention name of Disease in the box		

Module 9: Impact of Climate Change on Water Resources (over the past 25 years)

9.1.: Current State of Water Resources

Description	Possible answer	Code
I01. What changes have you observed in amount of water in streams, rivers, rivulets and springs?	Increased...1 Decreased...2 No changes..3 Do not know..4 Not applicable..5	
I02. Have you noticed water quality deterioration in streams, rivers, rivulets and springs?	Yes. ...1 No.. ..2 Do not know .. 3 Not applicable ..4	
I03.What changes have you observed in water level in wells and ponds?	Increased...1 Decreased...2 No changes..3 Do not know..4 Not applicable..5	
I04.Have you noticed water quality deterioration in wells and ponds?	Yes. ...1 No.. ..2 Do not know .. 3 Not applicable ..4	
I05.Have any streams, rivers, rivulets, or springs dried up?	Yes. ...1 No.. ..2 Do not know .. 3 Not applicable ..4	
I06. Are any tube wells, wells or hand pumps in state of drying up?	Yes. ...1 No.. ..2 Do not know .. 3 Not applicable ..4	
I07.Have any of the wells, tube wells, or ponds dried up?	Yes. ...1 No.. ..2 Do not know .. 3 Not applicable ..4	
I08.What changes have you observed in amount of water in spouts?	Increased...1 Decreased...2 No changes..3 Do not know..4 Not applicable..5	
I09. Have any spouts dried up?	Yes. ...1 No.. ..2 Do not know .. 3 Not applicable ..4	
I10. Has there been any changes in the duration of water flow in piped water that you have been using on daily basis?	Increased...1 Decreased...2 No changes..3 Do not know..4 Not applicable..5	

Module 9.2: Reasons of Changes on Water Resources

Description	***Code***	
I11. Have you noticed changes in the water sources over the past 25 years? *Yes ... 1 No ... 2*		*If no go to module 10*
I12. If yes, what are the main reasons of changes in the water sources? (Write three main reasons in priority) *1. Inadequate rainfalls* *2. Adequate rainfalls* *3. Increase in temperature* *4. Decrease in temperature* *5. Road construction* *6. Landslide/erosion* *7. Urbanization* *8. Deforestation* *9. Over withdrawal of water* *10. Mining and excavation* *11. Population increase* *12. Earthquake* *13. Others*		

Module 10: Impact of Climate Change on Bio-diversity Over the Past 25 Years

10.1: Changes in the Various Species

S. N	Description	Changes in the life species *Have changed=1* *No changes=2* *Do not know=3* *Not applicable=4*	Name of declining species (maximum three)	Name of increasing species (maximum three)	Name of species that have extinct	Name of new species
J01	**J02**	**J03**	**J04**	**J05**	**J06**	**J07**
1	Trees		1. …… 2. …… 3. ……	1. …… 2. …… 3. ……	1. …… 2. …… 3. ……	1. …… 2. …… 3. ……
2	Shrubs		1. …… 2. …… 3. ……	1. …… 2. …… 3. ……	1. …… 2. …… 3. ……	1. …… 2. …… 3. ……
3	Medicinal and non-timber forest products		1. …… 2. …… 3. ……	1. …… 2. …… 3. ……	1. …… 2. …… 3. ……	1. …… 2. …… 3. ……
4	Grass/Fodder		1. …… 2. …… 3. ……	1. …… 2. …… 3. ……	1. …… 2. …… 3. ……	1. …… 2. …… 3. ……
5	Aquatic animals		1. …… 2. …… 3. ……	1. …… 2. …… 3. ……	1. …… 2. …… 3. ……	1. …… 2. …… 3. ……

6	Aquatic plants		1. …… 2. …… 3. ……	1. …… 2. …… 3. ……	1. …….. 2. …… 3. ……	1. …….... 2. …… 3. ……
7	Wild life		1. …… 2. …… 3. ……	1. …… 2. …… 3. ……	1. …….. 2. …… 3. ……	1. ……... 2. …… 3. ……
8	Birds		1. …… 2. …… 3. ……	1. …… 2. …… 3. ……	1. …….. 2. …… 3. ……	1. …….... 2. …… 3. ……
9	Insects		1. …… 2. …… 3. ……	1. …… 2. …… 3. ……	1. …….. 2. …… 3. ……	1. …… 2. …… 3. ……

Module 10.2: Infestation Over the Past 25 Years

S.N	Type of Vegetation	New invasive species have appeared over the past 20 years Yes=1 No=2 (if no go to next row)	Name of new invasive species	Location of infestation Forest=1 Pasture=2 Agriculture=3	What is the main cause of infestation Naturally spread=1 Human Introduced=2 Don't know=3	What are the three main impacts of infestation in your daily life? Income reduction=1Loss of timber=2 Loss of fodder=3Loss of firewood=4 Loss of bedding materials (sottar)=5 Loss of animal bed materials=6 Loss of edible species of human or wildlife=7 No impact=8 (Choose 3 options based on priority)

J08	J09	J10	J11	J12	J13	J14		
1	Shrub		1.					
			2.					
			3.					
3	Climber		1.					
			2.					
			3.					
4	Creeper		1.					
			2.					
			3.					

10.3: Changes in the Floristic Behavior Over the Past 25 Years

Description	Possible response	Code
J15. Early Flowering/fruiting in some of the tree species	Yes.... 1 No .... 2 Do not know .... 3Not applicable 4	
J16. Late Flowering/fruiting in some of the tree species	Yes.... 1 No .... 2 Do not know .... 3 Not applicable 4	
J17. Early Flowering/fruiting in some of the shrub species	Yes.... 1 No .... 2 Do not know .... 3 Not applicable 4	
J18. Late Flowering/fruiting in some of the shrub species	Yes.... 1 No .... 2 Do not know .... 3 Not applicable 4	
J19. Early Flowering/fruiting in some of the fruit species	Yes.... 1 No .... 2 Do not know .... 3 Not applicable 4	
J20. Late Flowering/fruiting in some of the fruit species	Yes.... 1 No .... 2 Do not know .... 3 Not applicable 4	
J21. Early Flowering/fruiting in some of the herb or medicinal species	Yes.... 1 No .... 2 Do not know .... 3 Not applicable 4	
J22. Late Flowering/fruiting in some of the herb or medicinal species	Yes.... 1 No .... 2 Do not know .... 3 Not applicable 4	
J23. Changes in the size of flower /fruit	No Change .. 1 Decrease in Size .. 2, Increase in Size .. 3, Not applicable .. 4	

Module 11: Impact of Climate Change on Tourism Over the Past 25 Years

K01. Does this VDC/Municipality has touristic importance places?	Yes=1, No=2 , if no go to module 12
K02. If yes, what is the change in the number of tourist visiting in this area?	Increased .... 1, Decreased.... 2, Same.... 3, Do not know.... 4
K03. If decreased in number, what are the main reasons? (maximum three main reasons)	1.
	2.
	3.
K04.What is the change in the length of stay of tourist?	Increased .... 1, Decreased.... 2, Same.... 3, Do not know.... 4
K05. If length of stay decreased, what are the main reasons? *(maximum three main reasons)*	**1.**
	2.
	3.

Module 12: Farm Based Coping Strategies/Action Adopted by Households Due to Impact of Climate Change Over the Past 25 Years

12.1.: Farm Based

Description	Possible response	Code
L01.Received farm based skill development training by you or any member of your family over the past 25 years to cope with the impact of climate change	Yes.....1 No.....2 Not applicable.....3	
L02. Changed in cropping pattern (change in crop rotation, intercropping,) over the past 25 years	Yes.....1 No.....2 Not applicable.....3	
L03.Left land fallow	Yes.....1 No.....2 Not applicable.....3	
L04. Reared livestock of the different breedthan the earlier one over the past 25 years	Yes.....1 No.....2 Not applicable.....3	
L05. Provided supplemental irrigation over the past 25 years	Yes.....1 No.....2 Not applicable.....3	
L06. Invested in ponds for irrigation over the past 25 years	Yes.....1 No.....2 Not applicable.....3	
L07. Adoptedimproved seeds over the past 25 years (improved, drought resilient, water resilient varieties, etc.)	Yes.....1 No.....2 Not applicable.....3	
L08. Change in planting date(Seedling, etc.) over the past 25 years	Yes.....1 No.....2 Not applicable.....3	
L09. Used increased amount of inorganic fertilizers in the field over the past 25 years	Yes.....1 No.....2 Not applicable.....3	
L10. Used increased amount of organic fertilizer over the past 25 years	Yes.....1 No.....2 Not applicable.....3	
L11. New crops grown over the past 25 years	Yes.....1 No.....2 Not applicable.....3	

L12. Raised new livestock over the past 25 years	Yes……..1 No……..2 Not applicable……3	
L13. Investment in livestock pests and Disease over the past 25 years	Yes……..1 No……..2 Not applicable……3	
L14. Insurance of Livestock doneduring past 25 years	Yes……..1 No……..2 Not applicable……3	
L15. Insurance of Crops done over the past 25 years	Yes……..1 No……..2 Not applicable……3	
L16. Started farming livestock only over the past 25 years	Yes……..1 No……..2 Not applicable……3	
L17. Started farming crops only over the past 25 years	Yes……..1 No……..2 Not applicable……3	
L18. Started farming both crops and livestock only over the past 25 years	Yes……..1 No……..2 Not applicable……3	
L19. Started agro-forestry over the past 25 years	Yes……..1 No……..2 Not applicable……3	
L20. Practiced compatible cropping (e.g. millet and marigold)over the past 25 years	Yes……..1 No……..2 Not applicable……3	
L21. Have you started tunnel farming over the past 25 years	Yes……..1 No……..2 Not applicable……3	

L22. Stored food/grains in cold storage over the past 25 years	Yes.....1 No.....2 Not applicable.....3	
L23. Started preserving local seeds (seed bank) for more disease resistant over the past 25 years	Yes.....1 No.....2 Not applicable.....3	
L24. Contributed in soil and water conservation over the past 25 years	Yes.....1 No.....2 Not applicable.....3	
L25. Visited offices with your concerns regarding the impact of climate change over the past 25 years	Yes.....1 No.....2 Not applicable.....3	

Module 12.2: Off-farm Based

Description	Possible response	Code
L25. Changed the food consumption habit over the past 25 years	Yes.....1 No.....2 Not applicable.....3	
L26. Started more off-farm activities over the past 25 years	Yes.....1 No.....2 Not applicable.....3	
L27. Shifted to off-farm employment over the past 25 years	Yes.....1 No.....2 Not applicable.....3	
L28. Family member(s) temporarily migrated from this place over the past 25 years	Yes.....1 No.....2 Not applicable.....3	

L29. Participated in flood/landslide risk reduction and water management practices over the past 25 years?	Yes.....1 No.....2 Not applicable.....3	
L30. Participated in road and infrastructure improvement to protect from flood and landslide over the past 25 years	Yes.....1 No.....2 Not applicable.....3	
L31. Participated in community based natural resource management activities over the past 25 years?	Yes.....1 No.....2 Not applicable.....3	

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