NATIONAL CLIMATE CHANGE SURVEY 2022

GOVERNMENT OF NEPAL
OFFICE OF THE PRIME MINISTER AND COUNCIL OF MINISTERS
NATIONAL STATISTICS OFFICE

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Preface

It is my pleasure to introduce the Second Climate Change Survey 2022, which has significantly enhanced our understanding on climate-related issues of the nation. This survey brings added value by investigating the insights into impacts of climate change on different thematic sectors, viz. agriculture, water resource, energy, biodiversity and human health. The survey has also carried comprehensive evaluation of scenario and impacts of climate-induced disasters, including loss and damage caused by such events. The survey has also discoursed different adaptation measures and climate initiatives practiced by Nepalese households to combat climate change impacts. It has strengthened each sector by incorporating pertinent issues and discoursed the initiatives for the evidence-based policy making and planning across all levels of government in the context of pressing challenges generated by climate change. Additionally, the findings of this survey will contribute to the review and monitoring of Sustainable Development Goals (SDGs), reporting of the Sendai Framework on Disaster Risk Reduction, and the implementation of the National Adaptation Plan (NAP).

I would like to express my appreciation to Deputy Chief Statisticians for their overall guidance and supervision of this survey. Special thanks to Directors of the Environment Statistics Section, for their hard work in accomplishing the survey tasks and ensuring the timely publication of this report. I also want to acknowledge the contributions of Computer Officer, Statistical Officers and Statistical Assistant for their sincere efforts during different phases of the survey operations and publication of the work. I am also grateful to the Technical Committee members and experts who played a crucial role by providing invaluable inputs throughout the survey process. I am also thankful to all the members of the data collection teams and other personnel from NSO. This survey would not have been possible without the generous response of the respondents, who spend their time and share their intimate information with our survey team, they are part of my sincere gratitude. I wish to convey my sincere appreciation for the invaluable technical assistance extended by UNDP Nepal, which significantly contributed to the preparation of the final report and its publication. I express my gratitude for the technical support provided by UNESCAP and WWF Nepal. I would like to request all users to provide valuable suggestions and comments that would be useful for further improvement of the publications of these kinds in future.

April, 2024

Arjun Prasad Pokharel
Chief Statistician (Secretary)

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ABBREVIATIONS AND ACRONYMS

CBS	Central Bureau of Statistics
NSO	National Statistics Office
EA	Enumeration Areas
EFLG	Environment-Friendly Local Governance
GDP	Gross Domestic Product
GLOF	Glacial Lake Outburst Flood
Ha.	Hectare
HHs	Households
IPCC	Intergovernmental Panel on Climate Change
IAS	Invasive Alien Species
km	Kilometre
LPG	Liquefied Petroleum Gas
LAPA	Local Adaptation Plans for Action
MToT	Master Training of Trainers
NA	Not Applicable
NAP	National Adaptation Plan
NAPA	National Adaptation Programme of Action
NCCS	National Climate Change Survey
NRREP	National Rural Renewable Energy Programme
NTFPs	Non Timber Forest Products
NRM	Natural Resource Management
NRs	Nepalese Rupees
PPS	Probability Proportionate to Size
Pr.	Probability
PSUs	Primary Sampling Units
SDGs	Sustainable Development Goals
SLC	School Leaving Certificate
SMS	Short Message Service
SO	Statistics Office
TDC	Tole Development Committee
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change

EXECUTIVE SUMMARY

Climate change has far-reaching consequences, impacting communities, transportation, water resources, biodiversity, agriculture, health, and the economy. The intensification of climate extremes like extreme temperatures, heavy rainfall, drought, landslides, floods, and wildfires have made predictions of impacts more challenging. Data availability plays important role in knowing about impacts of climate change and reducing their impacts, however are limited in Nepal. To address the data needs of government agencies, the NSO conducted the NCCS-II Survey. This initiative aims to furnish evidence for adaptation plans and secure funding by gathering information on awareness, perceptions, attitudes, climate impacts, vulnerability, adaptation, and demographics. The survey provides insights for planning, developing communication strategies, and deepen the understanding of climate change impacts across diverse sectors and communities. The thematic coverage of the survey includes water resources, energy, agriculture, forests and biodiversity, health, disasters, gender, rural, and urban areas.

In this survey, chapter one focuses on introduction of the climate change and major components considered in the survey. Chapter two focuses on methodological framework used in the survey. The survey applied the IPCC risk framework, assessing risk based on hazard, exposure, and vulnerability. Conducted through face-to-face interviews among 6,508 households in 326 primary sampling units, encompassing all seven provinces. Respondents were required to be at least 45 years old and to have lived in the survey area for 25 years, forming the sampling frame that included households meeting these criteria across Nepal.

Chapter three presents a comprehensive view of household demographics and socio-economic aspects. It highlights variations in education levels, household sizes, and marital status across different domains. Predominant occupations such as agriculture, forestry, and fishery are outlined, alongside differences in housing, cooking fuel, and lighting preferences between urban and rural areas. Notably, a rise in remittance-receiving households with decreasing landholding size is observed. The study also covers affiliations with financial services, revealing substantial reliance on informal money lenders. It emphasizes the role of credit in agriculture while detailing travel distances to access essential services. Furthermore, it discusses income disparities between urban and rural areas, elucidating the contributions from diverse sources for households' annual earnings.

Chapter four findings stress the importance of diverse communication channels for climate change education and regional-specific strategies. Understanding communities' perceptions of climate change aids tailored resilience initiatives, considering varied beliefs on causes. Disaster occurrences in Nepal vary by region, emphasizing the need for customized preparedness plans. Differences in early-warning access across regions require multi-channel approaches. Household preparedness measures vary, necessitating comprehensive disaster plans encompassing physical, financial, and strategic actions. Perceptions of changing temperatures and rainfall patterns inform local climate strategies, crucial for adaptation and water resource management. The link between climate change and increased disasters underlines the need for adaptable strategies. Diverse climate-induced disasters demand comprehensive mitigation and adaptation plans, acknowledging varying impacts and household approaches to prevention.

Chapter five provides a comprehensive insight into the effects of climate-induced disasters on households, focusing on infrastructure damage and disruptions to work patterns. Floods, landslides, and inundation significantly impacted physical infrastructure, highlighting the urgency for resilience-building measures. Across ecological belts, floods, heavy rain, and landslides impact all regions, necessitating tailored mitigation strategies. Avalanches cause the most substantial average loss of working days, while reported resilience to glacial lake outburst floods

suggests potential adaptive measures. Drought affects households across ecological belts, notably impacting mountainous regions, while specific challenges in the Terai region emphasize the need for targeted mitigation strategies. Food scarcity complexities due to climate-induced disasters require tailored interventions matching diverse causes and regional contexts. Settlements face heightened vulnerability and economic losses from landslides, floods, and fires, demanding urgent resilience-building initiatives. These insights stress the importance of understanding and mitigating economic ramifications, urging targeted interventions to enhance community resilience against diverse challenges posed by environmental disruptions.

Chapter six elucidates the emergence of new crop diseases and pests, with 53.9% of households reporting such occurrences over the past 25 years, signifying widespread agricultural challenges. It also details varied experiences in new livestock diseases among households, shedding light on evolving challenges faced by livestock owners. Additionally, it highlights escalating vector-borne and waterborne diseases, more prevalent in urban areas, revealing cough and fever as common ailments affecting 43.4% and 32.7% of households, respectively. This comprehensive analysis informs tailored public health interventions and planning strategies for Nepal, recognizing regional disparities and health variations across different ecological contexts.

Chapter seven reveals significant changes in water sources across regions, especially in the Terai facing impacts on hand-pumps, tube-wells, and wells, while hilly areas experience alterations in spring water availability. Rivers, rivulets, and streams show decreased water levels, attributed to drought and insufficient rainfall in the last 25 years. The results emphasize region-specific water challenges, offering insights for targeted interventions amidst changing climate patterns. Regarding household energy use, the survey shows a mix of traditional and modern stove utilization, with a notable shift towards LPG stoves. Many households use multiple stove types simultaneously, indicating diverse energy usage patterns. Challenges faced by households using induction cook stoves, such as electricity interruptions, highlight infrastructural constraints needing attention for a smoother transition to sustainable cooking technologies.

Chapter eight highlights significant climate-induced impacts on biodiversity, affecting tree species, birds, wild animals, insects, and grass species. These changes vary across rural-urban areas and ecological zones, with provincial distinctions. However, many households reported no change or lacked awareness of these shifts. Invasive species were perceived to increase, especially in agricultural and forest regions, causing decreased income and loss of fodder. Control measures varied widely, including cutting and chemical destruction. Changes in flowering and fruiting behaviors affected trees, shrubs, and fruiting plants, leading to reduced production and altered taste, while breeding period shifts were reported by approximately 10% of households. These findings emphasize the need for targeted interventions and increased awareness regarding climate-induced ecological changes.

Chapter nine describes about the adaptation strategies practiced by the households. Over the last 5 years, numerous households have actively adopted diverse agricultural adaptation strategies, including adjusting crop timings, using improved seeds and fertilizers, practicing mixed agriculture, and controlling invasive species. However, challenges persist in implementing certain measures like water and land conservation, minimizing climate risks, and adopting livestock and crop insurance, agro-forestry, and relevant skills. Notably, livestock insurance uptake surpasses crop insurance. Limited access to cold storage and agricultural services highlights areas requiring support for enhanced agricultural adaptability. Off-farm adaptations such as changing food consumption, engaging in non-agricultural businesses, off-farm employment, and temporary migration indicate proactive responses to economic and environmental shifts. However, some measures like water management, reducing flood risks, natural resource management, and disaster risk reduction show low household engagement, suggesting potential areas for targeted interventions to bolster community resilience amidst evolving challenges.

CHAPTER I

INTRODUCTION

Background

Climate change is exerting substantial and far-reaching effects in Nepal, showing its influence across various dimensions of the nation's society, economy and environment. Key impacts include rising temperatures, shifts in monsoon, depletion of water resources, changes in agricultural practices, biodiversity depletion, glacier retreat, occurrences of landslides and flooding, heightened social and economic vulnerability, and the deterioration of infrastructure. These pose pressing challenges in communities, infrastructure networks, transportation systems, agricultural setbacks leading to food insecurity, health concerns for susceptible populations, loss of lives, impacts on agriculture and hydropower generation, constraints on access to clean drinking water, disruptions to ecosystems and native species, hindrances to biodiversity conservation efforts, economic development setbacks, and complexities in recovery endeavors.

Extreme temperatures, heavy rainfall, drought, landslides, floods, and wildfires have become increasingly frequent, intense, and challenging to predict in Nepal. However, it is important to note that climate impact information remains limited and often underestimates the true extent of the challenges faced by underdeveloped countries like Nepal.

Nepal faces particular challenges in obtaining the national-level information needed to adapt to climate change and assess losses and damages. Landscape complexity conditions effects data availability from remote areas which further complicates the acquisition of such vital information. In an effort to bridge this gap and provide reliable data and insights for ongoing planning processes, the National Statistics Office (NSO) of Government of Nepal conducted the Second National Climate Change Survey (NCCS-II) from July to March 2023. This data is anticipated to serve as a significant milestone in the integration of climate change initiatives into the national development program, the formulation of evidence-based adaptation plans, and financing mechanisms to adaptation programs. The climate change survey was also designed to collect data and information related to various aspects of climate change with an aim to increase public awareness, perceptions, and attitudes towards climate change, as well as to gather data on the impacts of climate change on different sectors of society and the environment.

The ***main components*** of the climate change survey include:

Awareness and Perceptions: Climate change survey aims to gauge how aware individuals are of climate change issues and how they perceive the causes and consequences of climate change. This includes questions about the role of human activities, such as carbon emissions, in driving climate change.

Attitudes and Behaviors: Survey explores about people's attitudes toward climate change mitigation and adaptation measures. This includes questions about support for policies like renewable energy adoption, and conservation efforts.

Climate Impacts: The survey focuses on collecting data about the observed and perceived impacts of climate change on communities, ecosystems, and specific sectors like agriculture, water resources, or health.

Vulnerability and Adaptation: The survey assesses the vulnerability of individuals or households to climate change and gather information on the adaptation strategies they are employing or considering.

Demographics: Data collected in climate change survey include demographic information, such as age, gender, education, income, and geographic location. This information helps analyze how different demographic groups perceive and respond to climate change.

Climate change survey has been conducted through in-person interviews. The results of this survey are valuable for policymakers, scientists, and organizations working to address climate change. They provide insights into public sentiment, inform the design of climate policies and communication strategies, and contribute to the understanding of climate change impacts on different communities and sectors.

Thematic Coverage

Major economic sectors and essential services (e.g., health, education, etc.) in Nepal have felt the repercussions of extreme weather events linked to climate change. In alignment with the Climate Change Policy of 2019 and the climate-related priorities outlined by the Government of Nepal in its periodic and annual plans and policies, NCCS-II has taken into account the following thematic sectors that exhibit high sensitivity to climate:

Water Resources: Climate change has a significant impact on water sources in Nepal, which relies heavily on its freshwater resources for various purposes, including drinking water, agriculture, hydropower generation, and ecosystem services.

Energy: Climate change has a significant impact on the ongoing global energy transition, which involves shifting from fossil fuels to cleaner and more sustainable energy sources. The energy transition is a critical component of efforts to mitigate climate change and reduce greenhouse gas emissions. Climate change has notable implications for the energy transition in Nepal, a country that is actively pursuing a shift from conventional fossil fuels to renewable and sustainable energy sources. climate change is reinforcing the urgency of Nepal's energy transition towards cleaner, more resilient energy sources. While it presents challenges, it also creates opportunities to accelerate the adoption of renewable energy, enhance energy efficiency, and build a more climate-resilient energy infrastructure. Adapting to the changing climate is crucial to ensuring the sustainability and reliability of Nepal's energy supply as it transitions to a low-carbon future.

Agriculture: Climate change has significant and far-reaching impacts on agriculture in Nepal, which is a predominantly agrarian country with a large portion of its population engaged in farming. These impacts affect crop yields, food security, and the livelihoods of millions of people.

Forest and Biodiversity: Climate change has significant and wide-ranging impacts on biodiversity in Nepal, a country known for its rich and diverse ecosystems, including the Himalayan mountains, tropical forests, and wetlands. Some of the key impact of climate change on biodiversity in Nepal are: shifts in species distribution, habitat loss & fragmentation, altered breeding & migration patterns, invasive species, loss of endemic species, biodiversity conservation challenges, and human-wildlife conflict.

Health: Climate change has significant and multifaceted impacts on public health in Nepal. The country is vulnerable to various climate-related challenges, and these impacts have far-reaching consequences for the well-being of its population. Some of the key ways in which climate change affects health in Nepal are: increased temperature related illnesses, vector-borne diseases, water-borne diseases, malnutrition & food insecurity, air quality & respiratory illnesses, mental health

impacts, injuries & deaths from extreme weather events, displacement & vulnerable population, impact on health infrastructure, water scarcity and hygiene.

Disaster: Climate change has a profound impact on the frequency, intensity, and patterns of various natural disasters around the world. These climate-related disasters have wide-ranging consequences for communities, ecosystems, and economies. Nepal, a country highly vulnerable to climate change due to its geographical location in the Himalayas, is experiencing a range of climate-related impacts on disasters.

Gender: Climate change has gender-specific impacts in Nepal, affecting men and women differently due to existing gender inequalities, roles, and responsibilities within society. Here are some of the key ways in which climate change affects gender dynamics in Nepal: increased workload for women, food insecurity, health risks, increased vulnerability during disasters, water & sanitation, economic impact, education, migration, participation in decision making, and gender-based violence.

Rural-Urban: Climate change affects both rural and urban communities in Nepal, but the impacts and challenges they face can differ due to differences in vulnerability, resources, and adaptation capacity.

Users of Survey Report and Data

Climate change survey data are valuable resources that can be utilized by various stakeholders and users to understand the impacts of climate change, assess vulnerabilities, and inform climate-related policies and actions. Here are some key users of climate change survey data:

Government Agencies: Government departments and ministries responsible for climate change adaptation, mitigation, and environmental policy use survey data to inform policy development, monitor progress toward climate goals, and allocate resources for climate-related programs.

Climate Scientists and Researchers: Climate scientists and researchers use survey data to study the impact of climate change on ecosystems and communities, and develop climate models and projections.

Environmental and Conservation Organizations: NGOs and environmental organizations use survey data to advocate for environmental protection, conservation efforts, and climate action. They also use data to assess the impact of climate change on ecosystems and biodiversity.

International Organizations: Organizations like the INGOs, United Nations, and World Bank use climate survey data to assess climate-related risks, and provide guidance on climate policies and actions.

Climate Policy Advocates: Advocacy groups and think tanks use survey data to support their climate-related policy positions, shape public opinion, and influence decision-makers. They may conduct surveys to gauge public support for climate policies.

Businesses and Corporations: Companies use climate survey data to assess climate-related risks and opportunities, develop sustainable business strategies, and meet environmental reporting requirements. Investors also use such data to assess investment risks.

Urban and Regional Planners: City and regional planners use survey data to assess vulnerabilities to climate change, plan for infrastructure resilience, and develop climate adaptation strategies.

Farmers and Agricultural Stakeholders: Farmers and agricultural organizations use climate survey

data to adapt farming practices, optimize crop choices, and implement sustainable agricultural strategies in response to changing climate conditions.

Healthcare Professionals: Healthcare providers and public health agencies use climate survey data to assess and prepare for climate-related health risks, such as heatwaves, vector-borne diseases, and air quality impacts.

Educators and Students: Climate survey data serve as educational resources for teaching and learning about climate change, its impacts, and mitigation and adaptation strategies.

Community and Indigenous Groups: Local communities, indigenous peoples, and grassroots organizations use survey data to assess the impact of climate change on their livelihoods, culture, and traditional practices. This information can inform community-led climate resilience initiatives.

Journalists and Media: Journalists and media outlets use climate survey data to report on climate change-related topics, conduct investigative journalism, and raise awareness among the general public.

International Development Agencies: Organizations engaged in international development use climate survey data to design and implement climate resilience and adaptation projects in vulnerable countries and communities.

Disaster Management and Emergency Response Agencies: Climate survey data help disaster management agencies prepare for and respond to climate-related disasters, such as floods, droughts, and hurricanes.

General Public: Members of the public may access and use climate survey data to stay informed about climate change, advocate for climate action, and make informed decisions related to their personal and community resilience.

Effective communication and data sharing mechanisms are crucial to ensure that survey data related to climate change reach and benefit a diverse range of users and stakeholders, ultimately contributing to informed decision-making and climate resilience.

Organization of Report

This survey report is divided into nine chapters. This First Chapter is introductory chapter, Chapter Two provides a detailed explanation of the methodology employed. Chapter Three provides information about demographic and socioeconomic characteristics, including information on age, gender, occupation, household services, landholding, and access to socioeconomic services of the households.

Chapter Four focuses on perceptions, knowledge, and responses to climate change and its impacts. It presents survey results regarding respondents' awareness of climate change and the sources of their information. Similarly, Chapter Five presents survey results related to climate-induced disasters and their impacts. Chapter Six examines the impacts of climate change on health, crop, and livestock sectors. Chapter Seven and Eight offer insights into the effects on water sources and energy, and biodiversity and invasive species, respectively. Chapter Nine, depicts the various adaptation measures, both on-farm and off-farm adopted by the households to address induced climate change induced challenges.

CHAPTER 2

METHODOLOGY

The survey applied the climate change risk framework, as illustrated in Figure 2.1. This framework demonstrates that risk results from the interaction of vulnerability within the affected system, it's exposure over time to the climate-related hazard, the hazard itself, and the likelihood of its occurrence. The following step-by-step processes were adopted to design the climate change survey:

- Defining the objectives
- Identifying the target audience
- Sample design
- Survey framework and topics to include in the questionnaire
- Questionnaire design
- Pilot testing
- Development of survey manual
- Data collection
- Data analysis
- Report and dissemination

Survey Objective

The National Statistics Office (NSO) conducted NCCS II with an objective to meet the data needs on climate change impact on various sectors, and adaptation measures at household level. Its aims to gather valuable insights into the perceptions, attitudes, knowledge of respondents, and practices in response to climate change. The scope of the survey are followings:

- Extreme weather impacts due to climate change at various levels (e.g., mountain, hills, and terai) and sectors (e.g., energy, health, agriculture, etc.).
- Loss and damage.
- Knowledge on agriculture and biodiversity loss, impacts on water resources, food and human security.
- Information on adaptation measures.

Survey Framework

The climate change survey is grounded in a comprehensive framework designed to encompass various facets of climate change. This framework is built upon the conceptual model of climate risk, which takes into accounts hazard, exposure, and vulnerability, as defined by the IPCC SREX (Figure 2.1). In the following sections, detailed descriptions of hazard, exposure, vulnerability, and their constituent elements are provided. These components served as the foundation for shaping the survey questionnaire.

Hazard: A climate hazard refers to a natural or human-induced environmental phenomenon or event that has the potential to cause harm or damage to ecosystems, human communities, and their assets. Climate hazards are often associated with changes in weather patterns and are

linked to climate variability and climate change. These hazards can manifest in various forms and have different impacts on the environment and society. Examples of climate hazard include: extreme weather events (e.g. severe thunderstorms, and heatwaves), floods, droughts, wildfires, landslides, inundation, and glacial lake outburst floods among others.

Climate hazards are a growing concern because climate change is altering the frequency, intensity, and distribution of these events. As a result, there is an increased emphasis on understanding and mitigating the risks associated with climate hazards to protect communities and ecosystems. This involves implementing adaptation measures to reduce vulnerability and emissions reduction strategies to mitigate the underlying causes of climate change.

Exposure: Climate exposure refers to the degree to which a system, such as a human community, an ecosystem, or an infrastructure project, is susceptible to the impacts of climate change. It is a measure of how much a particular system is at risk of being affected by climate-related hazards or changes in climatic conditions. Climate exposure encompasses various aspects, including physical, social, and economic factors, and it can vary greatly depending on location and vulnerability factors.

Table 2.1 Different Types of Climate Exposures

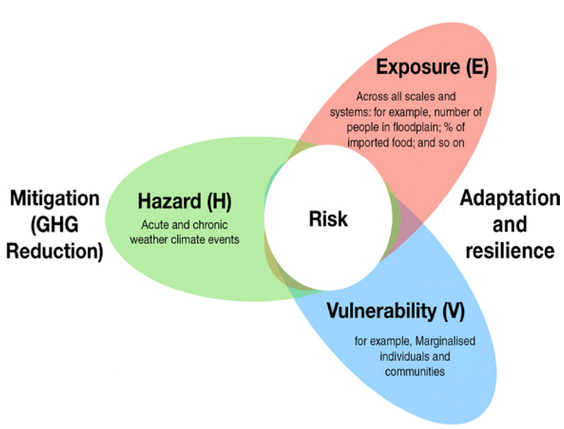
Physical Exposure	It includes aspects like proximity to rivers (exposure to flooding areas and inundation areas), elevation (exposure to flooding or landslides), and climate patterns (exposure to extreme temperatures, droughts, or heavy rainfall).
Economic Exposure	Economic exposure assesses the potential economic losses and impacts that climate change can have on businesses, industries, and infrastructure. For example, areas heavily dependent on agriculture may be economically exposed to changes in precipitation patterns.
Social Exposure	It takes into account factors like population density, access to healthcare, education, and social safety nets. Communities with limited resources and social infrastructure may be more socially exposed to climate risks.
Ecological Exposure	It includes factors such as habitat fragmentation, species migration patterns, and sensitivity to changes in temperature and precipitation.
Infrastructure Exposure	Susceptibility of built infrastructure (e.g., buildings, roads, bridges, and utilities) to climate-related damage. Older, poorly designed, or inadequately maintained infrastructure may be more exposed to climate risks.
Cultural and Heritage Exposure	Areas with historical significance or cultural importance may be exposed to climate hazards like sea-level rise or extreme weather events

Vulnerability: Climate vulnerability refers to the degree to which a system, such as a community, a region, or an ecosystem, is susceptible to harm or negative impacts resulting from climate change. Vulnerability is influenced by a combination of factors, including a system's exposure to climate hazards, its sensitivity to those hazards, and its adaptive capacity to cope with and recover from the impacts.

Table 2.2 Factors Required for Determining Vulnerability

Exposure	Exposure is the extent to which a system is likely to be exposed to climate-related hazards or changes such as, physical exposure (proximity to rivers, elevation, and climate patterns), economic exposure (dependence on climate-sensitive industries), social exposure (vulnerability of human populations), ecological exposure (sensitivity of ecosystems), and infrastructure exposure (vulnerability of built assets).
Sensitivity	It considers factors like the fragility of ecosystems, the health and well-being of communities, or the susceptibility of infrastructure to damage. High sensitivity means that even small changes in climate conditions can have significant adverse impacts.
Adaptive Capacity	It refers to factors such as access to resources, financial resources, infrastructure, technology, governance, and the ability to implement effective policies and strategies to mitigate climate risks.
Social Vulnerability	It includes the socioeconomic factors that make individuals and communities more susceptible to climate impacts. Factors such as poverty, limited access to healthcare, inadequate housing, and unequal distribution of resources can increase social vulnerability.
Economic Vulnerability	It refers to susceptibility of economic systems, industries, and livelihoods to climate change impacts. It considers factors like dependence on agriculture, fisheries, tourism, or other climate-sensitive sectors.
Environmental Vulnerability	It is sensitivity of ecosystems and biodiversity to climate change. This includes the risk of species extinction, habitat loss, and disruptions to ecosystem services
Cultural Vulnerability	Potential impacts of climate change on cultural heritage, traditional knowledge, and indigenous communities.

Figure 2.1: A conceptual representation climate risk as a function of hazard, exposure and vulnerability based upon the IPCC SREX definition of risk[1]



Survey Scope

The survey provides valuable insights into the effects and ramifications of climate change, considering a multitude of dimensions. The data spans a broad spectrum of topics, encompassing demographics, household income, educational level, awareness and attitudes regarding climate change, the socio-economic repercussions of climate-induced disasters, shifts in natural resources and biodiversity (including alterations in flora and fauna behavior, water resource changes, and the presence of invasive species), the interface of climate change with human and animal health, and the adaptation strategies adopted by households to confront the challenges arising from a shifting climate.

1 https://rmets.onlinelibrary.wiley.com/doi/full/10.1002/asl.958

Statistical Unit

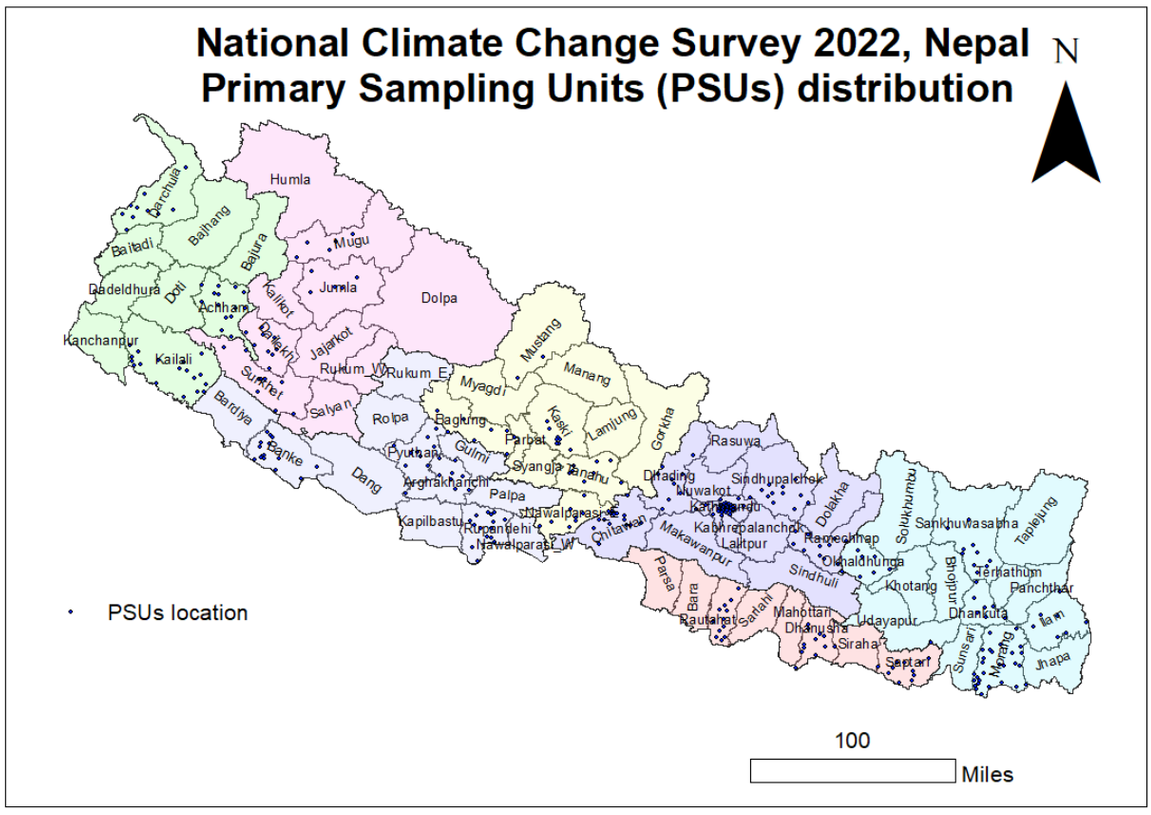
The statistical unit or the enumeration unit of the survey is the basic entity for which the required data items are covered. Climate change survey of Nepal is basically a household survey and its enumeration unit is the household. The definition of a household for the survey is primarily adopted from the guidelines laid down by the United Nations in its "Principles and Recommendations for Population and Housing Censuses, Rev 2" (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 living". 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 or unrelated or may constitute a combination of persons both related and unrelated.

Coverage

The survey in principle covers the whole country, including both rural and urban areas. A brief description of the geographical and administrative division of the country follows. The country is divided into 7 provinces and 77 administrative districts. These 77 districts are grouped into three ecological zone running from north to south – the mountains, the hills and the Terai.

The NCCS II is a unique study that necessitates gathering data spanning an extended period. As a result, not all households across the country were deemed eligible for inclusion in the survey. Only households meeting the criteria of having a respondent aged 45 or older and residing in the same locality for at least 25 years were considered eligible. The determination of household membership was based on individuals' usual place of residence. The survey conducted enumeration on a total of 6,520 sample households across 326 primary sampling units (PSUs) spanning over all seven provinces (Figure 2.2).

Figure 2.2: Distribution of primary sampling units (PSUs).



Sample Design

This section outlines the sample design strategy adopted in the 2022 NCCS II. The household questionnaire survey was responded by the household head on behalf of the household. In general, the same sampling design as used in previous Climate Change Impact Survey from 2016 has been used. The following sections outlines the various stages of sample design.

Population of Interest and Data Used

The population of interest for the NCCS II is the entire population, which has been included in the sample frame. The information regarding the population was taken from the latest population census 2021, which by the time sampling took place was in the final stages of being completed. The sampling was done using the total number of households from the population census excluding households registered in institutions. In total 66,66,937 individual households were included in the frame.

Level of Interest

Since 2017, Nepal is divided into seven provinces or federal states. To produce reliable results for these provinces, as well as three ecological belts – Terai, Mountain and Hill, information on provinces and ecological belts were combined, resulting in 17 spatial sub-groups of interest. This was somewhat different from the previous Climate Change Impact Survey from 2016, when the country was divided into 5 development regions and corresponding ecological belts, or 15 sub-groups of interest.

Table 2.3: Spatial Sub-groups of Interest for the National Climate Change Survey

1) Koshi - Hill	10) Province 4 Gandaki - Terai
2) Koshi - Mountain	11) Province 5 Lumbini - Hill
3) Koshi - Terai	12) Province 5 Lumbini - Terai
4) Province 2 - Terai	13) Province 6 Karnali - Hill
5) Province 3 Bagamati - Hill	14) Province 6 Karnali - Mountain
6) Province 3 Bagamati - Mountain	15) Province 7 Sudurpaschim - Hill
7) Province 3 Bagamati - Terai	16) Province 7 Sudurpaschim - Mountain
8) Province 4 Gandaki – Hill	17) Province 7 Sudurpaschim – Terai
9) Province 4 Gandaki - Mountain	

Sample Size and Allocation

Many factors impact the sample size required for a survey, including the size of the population of interest, the number of sub-populations results required, the accuracy, and the sample selection procedures adopted. Cost constraints also become a major factor for many surveys however, and it was anticipated that sufficient funds were available for an estimated 6,520 households across Nepal. This resulted in a similar proportion of households being sampled compared to earlier study.

To ensure suitable levels of accuracy for each domain of interest, the smaller domains (with respect to the number of households) received a higher sample fraction than the larger domains. This was achieved by allocating the 6,520 samples proportional to the square root of the population (non-response was less than 0.5%). Twenty households were selected per primary sampling units (PSUs) in the survey.

Sample Selection

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

Stage 1: Selection of Districts

Stage 2: Selection of PSUs

Stage 3: Selection of Households

The process was applied for each of the 17 domains independently.

Weights

As addressed in the above coverage section, not all households of Nepal were considered in scope of the survey. The survey was restricted to only those households which had an occupant that met both of 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 are only those households which met these criteria, and as such, weights were generated to reflect this population only. Similarly, the computational procedure adopted for calculating the household weights.

Weighting Procedure for NCCS II

Base Weights

The sample design of this survey uses a three stages sampling design in a similar way as the first climate change impact survey. The selection is done in the following way: in the first stage districts are being selected, in the second stage EA (enumeration areas) are being selected and in the third stage households are being selected. The probability of a household being selected is hence calculated by multiplying the probabilities of the three different stages such as:

Pr(HH selection) = Pr (selection at stage 1) * Pr(EA selection at stage 2) *Pr(HH selection at stage 3).

The base weight is then calculated as the inverse of this probability:

Base weight= 1/Pr (HH selection).

Adjustments

To account for the fact the population of interest is only those households which had a member aged 45 years and above, and lived in the area for at least 25 years, the base weights are adjusted with an adjustment factor. The adjustment factor is calculated at the EA level in the following way:

estimated number of households in scope in each EA / total number of households in EA

This adjustment factor is then multiplied with the base weight, such as:

Base weight x Adjustment factor.

To account for differences between the preliminary population data used in the sampling frame and the final population as well as other potential problems (such as large non-respondents), additional adjustment might be needed.

Pre Survey Activities

Intensive stakeholders workshop: In order to reach consensus on reliable and improvised provision of data generation on vulnerability, and finalize the theme-based questionnaire survey team conducted the one-day intensive workshop with thematic experts. Feedback and comments from the workshops were reflected in finalizing the questionnaire. Intensive stakeholder workshop was conducted at Dhulikhel and Kavrepalanchok to review first survey report, discuss on the prior survey methodology, and finalize methodology for the second round of survey.

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 finalize the questionnaire.

Pretest of the questionnaire: The questionnaire was pre-tested to examine its overall performance. Pretest examined the time required to complete the interview. It also tested the reliability examining whether the questionnaire captured the desired information as well as consistency to check whether the collected information serve the purpose of the survey. The pre-test was also utilized to assess the logistics required for such survey.

Likewise, 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.

Finalization of the questionnaire: Following the pre-tests and the feedback obtained from potential data users, and subject experts the questionnaire was placed before the Technical Committee for approval. The Committee provided final observations and opinions, which were subsequently addressed and questionnaire was finalized.

Manual Preparation

Manual as one of the major survey instruments at the field work was drafted at the time of pre-test. Manual aimed at clarifying concept, content and terms used in the questionnaire for the understanding of the enumerators, supervisor, and respondent including all the survey team. The Manual was modified after the feedback of the pre-test and finalized when the questionnaire was endorsed by the Technical Committee.

Field Work Organization

Training program: The Master Training of Trainers (MTOT) took place in Kakani, Nuwakot, spanning from the 18th to the 22nd of the eighth month in the year 2079. The primary objective was to facilitate discussions and consensus-building among the resource persons actively involved in delivering the training program. A total of 32 enumerators received training for the survey, including 20 students of the Central Department of Environmental Science, Tribhuvan University. The comprehensive 7-day training occurred in Dhulikhel, Kavrepalanchok districts, from the 10^{th} to the 16^{th} of the tenth month in 2079, utilizing various training methods such as reflective exercises on the questionnaire and reference manual, classroom sessions, practical exercises, mock interviews, field visits, and discussion sessions.

Total enumerators were divided into fifteen field teams each comprising two enumerators, covering 15 to 20 Primary Sampling Units (PSUs). The teams, equipped with two Tablets, power packs, and necessary logistics, operated under reservations, and each team was assigned a specific area of the country. The teams were stationed in the relevant Statistics Office (SO) of the National Statistics Office (NSO).

Data collection and supervision commenced after the training program, involving 15 field teams/groups, consisting of enumerators from Statistics Offices and students from the Central Department of Environmental Science, Tribhuvan University. Throughout the survey period, fieldwork received continuous supervision and monitoring from core team members at two levels. The Environment Statistics Section of the NSO formed the central supervision team, while the chief of the Statistics Offices served as the field supervisor. A supervision form was developed for field supervision, and a set of instructions was prepared for central supervision.

Enumeration areas were assigned to enumerators in three phases, with a two-day mid-term review conducted after the first phase. This review aimed to ensure quality control, address field challenges, and prepare for the subsequent phases, proving to be highly effective.

Data Editing and Coding

Data collection was done in Tablet. Qualitative information was coded before analysis.

Data Processing and Analysis

The data processing work was done at NSO. After all data was captured from the server it was edited. The data analysis was done in SPSS and STATA software.

Data Validation

The data entry program was developed for controlling the data and to avoid the error of the data collection. Two days workshop for the data validation was conducted. The central core team and experts of the climate chage were present during data validation workshop. The data manager developed the required table and it was throughly discussed.

Tabulation Plan

The tabulation plan was developed at the survey design phase. Tables were developed from each thematic area. The tables required for the report writing was finalized by the meeting conduted with central core team, consultant and other thematic experts.

CHAPTER 3

HOUSEHOLD AND POPULATION CHARACTERISTICS

Introduction

This chapter describes the household characteristics within the surveyed population, with detail analysis across different analytical domains. It examines key features such as the level of education, duration of residence in the current location, household size, marital status, and access to various services, providing valuable insights into the demographic and socioeconomic dimensions of the surveyed population. Additionally, chapter presents annual income with focus on the economic aspects of the households.

Household Characteristics

Table 3.1 provides an overview of the distribution of households based on the education levels of respondents across various analytical domains. The data shows significant levels of illiteracy among respondents, with higher rates observed in the Karnali, Madhesh, and Lumbini provinces. The majority of respondents at national level have beginner, informal, or primary education levels, with 14.3% and 17.7% falling within the beginners/informal and primary education categories. The table further breaks down the educational distribution in municipalities (urban and rural), ecological zones (Mountain, Hill, Terai), province-ecological zone combinations, and at the national level.

Table 3.1: Distribution of Households by Level of Education of Respondent

Analytical domain	Education Level of Respondents (%)										
	Beginners/ Informal Edu.	Primary (1-5)	Lower Sec. (6-8)	Secondary (9-10)	SLC/SEE	Class 12	Bachelor	Master and above	Others	Illiterate	Total
Municipality											
Urban	13.6	16.6	9.9	7.1	9.8	5.6	4.1	2.3	1.2	29.9	100
Rural	15.3	19.3	9.3	5.4	4.8	2.9	0.9	0.4	1.4	40.5	100
Ecological zone											
Mountain	17.4	21.2	11.3	7.2	4.6	3.4	1.6	0.6	0.9	31.7	100
Hill	16.1	18.9	8.6	6.0	7.4	4.6	3.2	2.1	1.6	31.4	100
Terai	12.0	15.8	10.4	6.6	8.5	4.5	2.4	0.9	0.9	37.9	100
Province ecological zone											
Koshi-Mountain	23.5	19.0	11.5	10.5	5.6	4.6	2.5	0.9	0.5	21.3	100
Koshi-Hill	16.0	24.4	11.2	8.3	5.2	4.1	2.1	0.6	0.7	27.4	100
Koshi-Terai	9.7	23.9	11.2	7.0	8.0	4.3	1.3	0.3	0.9	33.3	100
Madhesh-Terai	11.3	9.0	9.1	6.0	11.7	5.6	3.4	1.1	0.4	42.4	100
Bagmati-Mountain	25.2	21.8	6.4	2.3	5.3	1.7	0.9		0.5	35.9	100

Analytical domain	Education Level of Respondents (%)										
	Beginners/ Informal Edu.	Primary (1-5)	Lower Sec. (6-8)	Secondary (9-10)	SLC/SEE	Class 12	Bachelor	Master and above	Others	Illiterate	Total
Bagmati-Hill	13.3	14.9	6.3	7.4	7.3	5.5	5.1	4.4	3.9	31.8	100
Bagmati-Terai	12.9	14.4	10.3	6.6	11.0	5.8	2.8	3.0	2.3	30.7	100
Gandaki-Mountain	25.2	37.6	9.8	9.8	2.4				2.6	12.6	100
Gandaki-Hill	17.2	18.1	11.9	5.9	10.9	4.8	4.0	1.4		25.7	100
Gandaki-Terai	10.3	18.3	7.9	8.1	6.5	4.8	1.8	1.7	6.1	34.5	100
Lumbini-Hill	14.6	20.3	10.1	2.9	8.8	5.1	0.6	0.3	0.4	36.9	100
Lumbini-Terai	12.2	15.8	11.9	6.8	4.4	3.5	2.3	0.8	0.6	41.8	100
Karnali-Mountain	12.8	14.2	11.5	4.7	7.2	2.9				46.8	100
Karnali-Hill	15.2	18.2	7.9	4.5	7.0	3.1	1.0	0.3		42.8	100
Sudurpaschim-Mountain	5.9	25.2	16.3	10.8	1.8	4.6	2.7	1.4	2.2	29.1	100
Sudurpaschim-Hill	32.1	30.1	3.8	0.5	1.4	1.1	0.4		0.3	30.4	100
Sudurpaschim-Terai	22.1	27.3	11.3	7.1	4.7	1.5	1.1	1.1	2.6	21.1	100
Nepal	**14.3**	**17.7**	**9.6**	**6.4**	**7.7**	**4.5**	**2.7**	**1.4**	**1.3**	**34.4**	**100**

Table 3.2 outlines the distribution of households based on the number of years respondents have been living in their current location, providing valuable insights into the demographics of different analytical domains in Nepal.

The distribution of households across all analytical domains shows a significant portion of population within the (45-54) and (55-64) age categories, collectively accounting for 35% and 23.5% of respondents, respectively. Notably, these age groups constitute the largest proportions of households in terms of the number of years respondents have been living in their current locations. Furthermore, the (25-34), (65-74), and (35-44) categories represent the third, fourth, and fifth largest proportions, indicating a diverse demographic composition. This finding highlights the importance of considering the specific age distribution within different regions when formulating policies and plans, understanding the needs and perspectives of households across different life stages.

Table 3.2: Distribution of Households by Years of Living in the Current Location

Analytical domain	Age Distribution (%)							
	25-34	35-44	45-54	55-64	65-74	75-84	85+	Total
Municipality								
Urban	15.5	11.0	33.4	22.2	14.0	3.5	0.4	100
Rural	8.0	6.6	37.1	25.2	17.7	4.8	0.5	100
Ecological zone								
Mountain	3.2	2.8	35.6	33.3	19.1	5.3	0.7	100
Hill	12.1	6.8	32.8	24.7	17.6	5.3	0.7	100
Terai	14.1	12.7	37.1	20.4	12.9	2.6	0.2	100
Province ecological zone								

Analytical domain	Age Distribution (%)							
	25-34	35-44	45-54	55-64	65-74	75-84	85+	Total
Koshi-Mountain	5.6	2.7	39.2	30.9	15.1	5.0	1.5	100
Koshi-Hill	10.7	5.3	34.3	27.9	14.3	6.7	0.8	100
Koshi-Terai	18.7	12.5	34.2	20.8	12.0	1.5	0.2	100
Madhesh-Terai	5.5	6.6	42.1	25.0	17.0	3.6	0.3	100
Bagmati-Mountain	3.1	2.8	26.6	34.6	25.3	6.6	1.0	100
Bagmati-Hill	14.1	7.5	37.4	20.7	15.9	3.7	0.8	100
Bagmati-Terai	31.0	15.3	22.2	24.4	7.1			100
Gandaki-Mountain	2.6		47.4	19.8	10.2	17.6	2.4	100
Gandaki-Hill	13.1	7.3	27.5	25.8	19.9	6.1	0.3	100
Gandaki-Terai	19.1	24.2	32.9	14.3	6.9	2.7		100
Lumbini-Hill	11.0	5.7	23.0	30.7	20.0	8.9	0.7	100
Lumbini-Terai	15.6	18.7	36.8	14.7	10.7	3.2	0.3	100
Karnali-Mountain	4.2	5.6	33.7	35.5	16.1	4.9		100
Karnali-Hill	13.8	9.9	30.3	23.9	16.8	5.3		100
Sudurpaschim-Mountain	0.6	1.6	42.9	33.4	17.7	3.8		100
Sudurpaschim-Hill	1.5	2.5	38.0	28.2	25.6	2.4	1.7	100
Sudurpaschim-Terai	30.3	22.2	30.4	11.3	5.8			100
Nepal	**12.3**	**9.1**	**35.0**	**23.5**	**15.6**	**4.0**	**0.5**	**100**

Table 3. 3 presents data on household size distribution across various analytical domains in Nepal. This table includes percentages of households with varying numbers of occupants and offers additional statistical estimates such as the mean and standard deviation for household sizes within each domain.

Within each analytical domain, the provided percentages represent the proportion of households lies into specific size categories. For instance, in urban municipalities, 20.1% of households have 1-2 persons, while 32.1% have 3-4 persons, and so forth. The data reveals that in urban municipalities, the mean household size is 4.7, with a standard deviation of 2.5, indicating the degree of variation in mean household size.

Across different domains, different households' size is clearly seen. For example, in the mountain ecological zone, a higher percentage of households 29.1% consist of 1-2 persons, while in the Terai, a greater proportion 33.8% have 5-6 persons. The finding also presents valuable insights into the distribution of household sizes in relation to climate risk. In areas categorized as having "very high" climate risk, there is a relatively higher mean household size (5.2) along with a higher standard deviation, indicating greater variability in household size within these areas.

In total, 32.4% of households fall within the (3-4) person category, and 28.8% have 5-6 persons. The overall average household size for Nepal is 4.6, with a standard deviation of 2.5, signifying the variability in household sizes within the entire dataset.

Table 3.3: Distribution of Households by Number of Family Members

Analytical domain	Household Composition (%)						
	1-2 persons	3-4 persons	5-6 persons	7 and more	Total	Mean (HHs)	Standard deviation
Municipality							
Urban	20.1	32.1	29.9	17.9	100	4.7	2.5
Rural	23.8	32.9	27.3	16.0	100	4.4	2.4
Ecological zone							
Mountain	29.1	32.7	26.5	11.8	100	4.1	2.1
Hill	28.2	37.1	24.4	10.4	100	4.0	2.0
Terai	13.8	27.5	33.8	25.0	100	5.3	2.7
Province-ecological zone							
Koshi-Mountain	23.7	43.9	25.6	6.8	100	3.9	1.7
Koshi-Hill	25.2	38.2	25.1	11.4	100	4.1	2.0
Koshi-Terai	16.9	34.7	32.3	16.2	100	4.7	2.2
Madhesh-Terai	8.2	21.2	36.9	33.7	100	5.9	2.9
Bagmati-Mountain	42.4	34.7	18.2	4.8	100	3.3	1.7
Bagmati-Hill	26.4	40.0	24.5	9.1	100	4.0	1.9
Bagmati-Terai	15.7	38.6	31.4	14.3	100	4.5	2.0
Gandaki-Mountain	40.7	27.6	22.1	9.5	100	3.7	1.8
Gandaki-Hill	33.0	34.2	24.0	8.9	100	3.9	2.0
Gandaki-Terai	29.2	27.0	33.9	9.8	100	4.2	2.1
Lumbini-Hill	30.0	38.3	23.2	8.5	100	3.8	2.0
Lumbini-Terai	15.9	27.9	31.4	24.8	100	5.2	2.8
Karnali-Mountain	19.8	29.2	33.1	17.8	100	4.6	2.2
Karnali-Hill	25.3	29.0	27.8	17.9	100	4.4	2.2
Sudurpaschim-Mountain	23.0	23.3	33.1	20.6	100	4.8	2.5
Sudurpaschim-Hill	32.1	35.8	19.9	12.2	100	3.9	2.1
Sudurpaschim-Terai	21.5	32.5	29.6	16.4	100	4.5	2.3
Altitude (meter)							
Below 120	11.2	24.9	35.1	28.7	100	5.6	2.8
120- 350	18.1	31.7	32.2	18.0	100	4.7	2.3
350- 1000	27.9	37.2	24.3	10.6	100	4.0	2.0
1000- 1300	28.5	36.2	24.0	11.3	100	4.0	2.1
1300- 1500	26.6	38.1	25.3	10.0	100	4.0	2.0
1500- 2000	27.4	37.2	25.0	10.4	100	4.1	2.1
2000 and above	31.4	28.2	25.8	14.6	100	4.1	2.2
Climate risk							
Very Low	21.5	32.6	28.6	17.3	100	4.6	2.5
Low	25.3	30.6	27.2	16.9	100	4.4	2.4
Moderate	18.2	35.1	32.1	14.6	100	4.6	2.4
High	26.8	28.2	27.7	17.3	100	4.5	2.5
Very High	14.4	32.4	30.5	22.7	100	5.2	2.6
Nepal	**21.7**	**32.4**	**28.8**	**17.1**	**100**	**4.6**	**2.5**

Table 3.4 presents the distribution of the population aged 10 years and above based on marital status across various analytical domains. The majority of respondents in Nepal are reported as married, constituting 66.8% of the population, followed by single individuals at 26.7%. The widowed or widower category comprises 6.2%, while divorced and separated individuals make up smaller percentages. The data consist distribution of marital status across different ecological zones, provinces, altitudes, and climate risk categories. Urban and rural areas show similar patterns, with married individuals is the largest group. This overview of marital status distribution provides valuable insights into the demographic landscape of Nepal, supporting informed decision-making for policies and programs that serve to the diverse needs of individuals based on their marital status.

Table 3.4: Distribution of Population Aged 10 Years and Above by Marital Status

Analytical domain	Marital Status (%)					
	Single (Unmarried)	Married	Widow / widower	Divorced	Separated	Total
Municipality						
Urban	26.1	67.5	6.0	0.2	0.2	100
Rural	27.4	65.8	6.5	0.1	0.2	100
Ecological zone						
Mountain	25.8	66.8	7.0	0.1	0.3	100
Hill	25.9	66.6	7.2	0.2	0.2	100
Terai	27.4	67.0	5.3	0.1	0.2	100
Province ecological zone						
Koshi-Mountain	30.3	61.4	7.9	0.3	0.2	100
Koshi-Hill	26.9	66.8	6.0	0.2	0.1	100
Koshi-Terai	26.5	67.9	5.2	0.1	0.3	100
Madhesh-Terai	28.0	66.8	5.2	0.1	0.1	100
Bagmati-Mountain	16.8	74.6	7.9		0.8	100
Bagmati-Hill	26.9	65.9	6.9	0.2	0.2	100
Bagmati-Terai	22.6	71.2	5.5	0.4	0.3	100
Gandaki-Mountain	23.4	67.4	9.2			100
Gandaki-Hill	22.9	68.2	8.2	0.4	0.3	100
Gandaki-Terai	21.4	73.5	4.6	0.1	0.4	100
Lumbini-Hill	24.6	65.5	9.6	0.2	0.1	100
Lumbini-Terai	28.8	64.9	5.7	0.1	0.5	100
Karnali-Mountain	24.6	67.5	7.1	0.4	0.3	100
Karnali-Hill	27.9	64.7	6.8	0.2	0.5	100
Sudurpaschim-Mountain	30.4	64.2	5.5			100
Sudurpaschim-Hill	25.1	69.4	5.5			100
Sudurpaschim-Terai	26.4	68.8	4.3	0.2	0.3	100
Altitude (meter)						
Below 120	28.2	66.5	5.2	0.1	0.2	100
120- 350	25.8	68.2	5.5	0.2	0.4	100
350- 1000	25.4	67.0	7.1	0.3	0.2	100
1000- 1300	24.6	67.7	7.6	0.1	0.1	100
1300- 1500	26.7	66.3	6.7	0.1	0.3	100

Analytical domain	Marital Status (%)					
	Single (Unmarried)	Married	Widow / widower	Divorced	Separated	Total
1500- 2000	27.6	65.1	7.0	0.1	0.3	100
2000 and above	26.4	66.2	6.6	0.3	0.5	100
Climate risk						
Very Low	26.7	66.5	6.5	0.2	0.2	100
Low	26.0	67.7	6.0	0.1	0.3	100
Moderate	28.6	66.0	5.2	0.2	0.2	100
High	18.5	74.1	7.1		0.3	100
Very High	27.7	66.4	5.5	0.1	0.3	100
Nepal	**26.7**	**66.8**	**6.2**	**0.2**	**0.2**	**100**

Table 3.5 present the distribution of household heads by occupation across various analytical domains. In general, urban areas has the higher percentage of household heads engaged in professional, and service sector roles compared to their rural counterparts. Conversely, rural areas consist greater proportion of household heads involved in agriculture, forestry, and fishery occupations. The most prevalent occupations across all analytical domains include agriculture, forestry, and fishery; the service sector; and elementary wage labor. However, there is a significant variation in the percentage of household heads engaged in agriculture, forestry, and fishery occupations among the analytical domains. Overall, the primary occupations of household heads follow this order: agriculture, forestry, and fishery 51.5%, the service sector 7.6%, and elementary wage 6.1%.

Table 3.5: Distribution of Households Head by Occupation

Analytical domain	Occupation (%)												
	Armed forces occupations	Managers	Professional	Technician	Clerical worker	Service sector worker workers	Agriculture, forest & fishery	Craft and related technical	Plant and machine operators and assemblers	Elementary wage	No work	Not Stated	Total
Municipality													
Urban	0.4	2.4	4.1	1.5	1.2	9.5	43.5	2.7	1.7	6.3	26.2	0.6	100
Rural	0.1	1.5	2.7	0.7	0.8	5.1	62.3	3.2	1.6	5.9	15.6	0.3	100
Ecological zone													
Mountain		0.8	4.5	0.9	0.4	8.1	62.8	3.6	0.4	3.2	14.7	0.5	100
Hill	0.3	1.9	3.6	1.3	0.8	7.0	52.8	2.2	0.8	4.1	24.6	0.5	100
Terai	0.2	2.3	3.2	1.0	1.3	8.2	48.0	3.6	2.8	8.8	20.0	0.4	100
Province ecological zone													
Koshi-Mountain		0.4	5.1	1.0	1.0	5.2	67.8	2.9	0.4	3.1	12.1	1.1	100
Koshi-Hill	0.2	1.9	1.8		1.9	4.5	76.3	2.1	0.3	1.8	9.1		100
Koshi-Terai	0.3	2.6	1.1	0.8	2.0	8.6	48.8	3.5	3.7	11.0	17.5	0.1	100
Madhesh-Terai	0.2	1.0	3.5	1.7	0.9	7.9	47.6	3.5	1.6	9.3	22.6	0.2	100
Bagmati-Mountain		0.8	1.4	1.3		6.2	61.8	4.0	0.4	3.0	21.0		100
Bagmati-Hill	0.6	1.4	5.6	2.5	1.0	10.2	43.3	2.2	1.4	4.6	26.5	0.6	100
Bagmati-Terai	0.4	3.1	5.6	1.2	1.4	6.4	49.0	3.3	1.6	5.5	20.0	2.4	100
Gandaki-Mountain		2.6	5.0			2.6	65.2			7.1	17.4		100
Gandaki-Hill	0.3	1.9	2.9	0.5	0.1	7.8	50.8	1.0	0.2	2.9	30.7	0.8	100
Gandaki-Terai	0.4	2.1	10.1	0.4	0.4	4.1	56.0	1.8	0.3	2.9	21.4		100
Lumbini-Hill		4.5	2.0	1.0		0.8	47.3	0.8	0.6	5.1	37.7	0.2	100
Lumbini-Terai	0.1	4.8	2.2	0.4	1.7	9.8	44.1	5.0	4.8	5.5	20.7	0.8	100
Karnali-Mountain		0.9	3.6			6.9	62.7	2.9		3.1	19.8		100
Karnali-Hill		1.5	3.9	1.5	1.5	5.3	51.4	7.0	0.4	6.3	21.2		100
Sudurpaschim-Mountain		1.1	7.9	1.0	0.6	13.5	59.6	4.3	0.5	3.4	7.3	0.9	100
Sudurpaschim-Hill		1.3	1.3	0.4		4.5	68.5	0.4	1.5	4.9	16.6	0.6	100
Sudurpaschim-Terai	0.3	0.7	7.8	0.4		6.1	56.3	1.2	2.4	12.8	11.5	0.5	100
Nepal	**0.2**	**2.0**	**3.5**	**1.1**	**1.0**	**7.6**	**51.5**	**2.9**	**1.7**	**6.1**	**21.7**	**0.5**	**100**

Table 3.6 provides a distribution of households based on the type of house across various analytical domains. The urban areas consist of permanent houses, constituting 53.7% of the total, while rural areas have a mix of permanent 35.9% and semi-permanent 35.3% structures. The ecological zone and province-wise breakdown present variations, with mountainous regions having a higher percentage of semi-permanent and temporary structures. The altitude-based analysis shows differences in housing types, with lower altitudes favoring permanent structures. Additionally, the distribution by climate risk and per capita income shows diverse housing patterns across different risk levels and income groups.

Table 3.6: Distribution of Households by Type of House

Analytical domain	House Types (%)				
	Permanent	Semi-permanent	Temporary	Others	Total
Municipality					
Urban	53.7	25.7	20.6		100
Rural	35.9	35.3	28.9		100
Ecological zone					
Mountain	23.9	54.3	21.7	0.1	100
Hill	47.3	31.6	21.1		100
Terai	48.9	23.5	27.6		100
Province ecological zone					
Koshi-Mountain	22.3	59.0	18.7		100
Koshi-Hill	28.4	38.5	33.1		100
Koshi-Terai	30.4	20.8	48.7		100
Madhesh-Terai	45.3	30.5	24.1	0.1	100
Bagmati-Mountain	33.6	43.9	22.4		100
Bagmati-Hill	59.9	32.3	7.9		100
Bagmati-Terai	76.4	17.8	5.8		100
Gandaki-Mountain	10.5	31.4	58.1		100
Gandaki-Hill	58.9	28.7	12.4		100
Gandaki-Terai	60.1	36.7	3.2		100
Lumbini-Hill	64.6	34.6	0.8		100
Lumbini-Terai	74.2	13.1	12.7		100
Karnali-Mountain	9.1	36.1	54.3	0.5	100
Karnali-Hill	15.0	27.4	57.6		100
Sudurpaschim-Mountain	22.7	72.4	4.8		100
Sudurpaschim-Hill	4.4	20.7	74.9		100
Sudurpaschim-Terai	30.5	23.8	45.7		100
Altitude (meter)					
Below 120	48.2	24.4	27.4	0.1	100
120- 350	53.5	23.8	22.7		100
350- 1000	45.6	32.2	22.1		100
1000- 1300	43.9	30.6	25.6		100
1300- 1500	54.0	24.9	21.1		100
1500- 2000	34.4	46.1	19.6		100
2000 and above	24.6	46.9	28.4	0.1	100

Analytical domain	House Types (%)				
	Permanent	Semi-permanent	Temporary	Others	Total
Climate risk					
Very Low	47.6	30.8	21.6		100
Low	39.0	29.6	31.4		100
Moderate	43.4	31.0	25.7		100
High	33.4	30.0	36.6		100
Very High	69.9	10.9	19.2		100
Income quintile					
1st Quintile	34.1	32.7	33.2		100
2nd Quintile	32.3	34.7	32.9	0.1	100
3rd Quintile	43.7	30.3	25.9		100
4th Quintile	54.4	29.6	16.1		100
5th Quintile	70.4	20.2	9.5		100
Nepal	**46.10**	**29.76**	**24.12**	**0.02**	**100**

Table 3.7 outlines the distribution of households based on the first priority for cooking fuel across various analytical domains. In urban areas, Liquefied Petroleum Gas (LPG) emerge as the major choice (44.88%), while firewood as a major source (49.71%). Rural regions, highly based on firewood, constituting 77.97%, indicates sharp urban-rural differences. Across the ecological-zone present distinct source of energy used, in mountainous areas people have to base on firewood (88.07%), while people of Terai use mix energy. Altitude-wise analysis shows energy source choice, people of lower altitude mostly use LPG. Similarly, climate risk and per capita income analyses highlight patterns influenced by socio-economic factors and infrastructure assess. Overall, data presents the diverse source of energy used for cooking across different regions.

Table 3.7: Distribution of Households by Usually used Cooking Fuel

Analytical domain	Cooking Fuel (%)						
	Firewood	LPG	Electricity	Dung cake (Guitha)	Bio-gas	Others	Total
Municipality							
Urban	49.71	44.88	0.48	3.85	0.77	0.32	100
Rural	77.97	13.80	0.07	7.13	0.86	0.17	100
Ecological zone							
Mountain	88.07	10.77	0.10			1.06	100
Hill	68.35	30.73	0.37	0.03	0.34	0.18	100
Terai	50.19	36.39	0.28	11.54	1.43	0.18	100
Province ecological zone							
Koshi-Mountain	91.01	8.59	0.41				100
Koshi-Hill	87.32	12.47				0.21	100
Koshi-Terai	50.09	37.78	0.43	9.01	2.55	0.15	100
Madhesh-Terai	57.08	27.52	0.17	14.97		0.26	100
Bagmati-Mountain	85.60	14.40					100
Bagmati-Hill	47.62	51.07	0.85		0.22	0.24	100
Bagmati-Terai	24.04	73.30	0.29		2.37		100

Analytical domain	Cooking Fuel (%)						
	Firewood	LPG	Electricity	Dung cake (Guitha)	Bio-gas	Others	Total
Gandaki-Mountain	84.77	15.23					100
Gandaki-Hill	64.14	34.23	0.25		1.27	0.11	100
Gandaki-Terai	49.07	49.36			1.58		100
Lumbini-Hill	85.36	14.40		0.23			100
Lumbini-Terai	38.32	44.42	0.43	15.21	1.52	0.10	100
Karnali-Mountain	86.32	7.69				5.98	100
Karnali-Hill	87.23	12.25			0.10	0.41	100
Sudurpaschim-Mountain	89.43	9.97				0.61	100
Sudurpaschim-Hill	98.29	1.71					100
Sudurpaschim-Terai	64.04	30.87			4.81	0.28	100
Altitude (meter)							
Below 120	49.77	32.80	0.27	15.92	0.99	0.25	100
120- 350	46.31	46.62	0.32	4.11	2.58	0.06	100
350- 1000	66.57	31.99	0.18	0.30	0.77	0.19	100
1000- 1300	68.55	30.73	0.61			0.10	100
1300- 1500	57.30	41.49	0.56		0.16	0.48	100
1500- 2000	91.98	8.02					100
2000 and above	90.89	7.46				1.66	100
Climate risk							
Very Low	63.02	31.49	0.35	4.44	0.36	0.34	100
Low	67.95	24.15	0.13	6.65	1.08	0.05	100
Moderate	52.51	38.85	0.23	5.40	2.84	0.18	100
High	56.85	28.88		12.74	1.54		100
Very High	39.24	51.97	0.76	7.41	0.37	0.25	100
Income Quintile							
1st Quintile	74.46	17.36	0.06	7.45	0.57	0.09	100
2nd Quintile	77.86	14.67		6.40	0.83	0.24	100
3rd Quintile	62.65	28.90	0.20	7.23	0.70	0.31	100
4th Quintile	50.95	44.17	0.10	3.57	0.90	0.31	100
5th Quintile	37.93	58.58	1.26	0.83	1.07	0.33	100
Nepal	**61.73**	**31.66**	**0.31**	**5.24**	**0.81**	**0.25**	**100**

Table 3.8 presents the distribution of households based on their usual source of lighting across diverse analytical domains. Urban areas mainly based on electricity for lighting, constituting 97.49%, while rural regions show a significant dependence on electricity at 89.69%. The ecological zone breakdown reveals variations, with the Terai region relying heavily on electricity (98.49%), whereas mountainous areas show more diverse, including electricity, solar and very low amount in kerosene usage. Province-wise patterns show that Madhesh-Terai has 100% dependence on electricity.

Table 3.8: Distribution of Households by Usually used Lighting Source

Analytical domain	Lighting Source (%)				
	Electricity	Solar	Kerosene	Others	Total
Urban/ Rural					
Urban	97.49	2.30	0.05	0.16	100
Rural	89.69	9.76	0.16	0.39	100
Ecological zone					
Mountain	81.33	17.60	0.44	0.63	100
Hill	92.23	7.33	0.03	0.41	100
Terai	98.49	1.38	0.09	0.04	100
Province ecological zone					
Koshi-Mountain	93.92	4.45	0.47	1.15	100
Koshi-Hill	92.06	7.38		0.56	100
Koshi-Terai	99.07	0.68	0.24		100
Madhesh-Terai	100				100
Bagmati-Mountain	99.55	0.45			100
Bagmati-Hill	100				100
Bagmati-Terai	99.55	0.45			100
Gandaki-Mountain	100				100
Gandaki-Hill	98.69	1.07		0.24	100
Gandaki-Terai	100				100
Lumbini-Hill	97.31	2.69			100
Lumbini-Terai	95.79	3.88	0.16	0.17	100
Karnali-Mountain	57.19	41.29		1.52	100
Karnali-Hill	47.95	50.07	0.34	1.64	100
Sudurpaschim-Mountain	62.36	36.02	1.14	0.48	100
Sudurpaschim-Hill	83.50	14.71		1.79	100
Sudurpaschim-Terai	95.55	4.45			100
Altitude (meters)					
Below 120	99.07	0.84	0.09		100
120- 350	98.38	1.39	0.11	0.12	100
350- 1000	94.24	5.54	0.06	0.16	100
1000- 1300	92.81	6.51	0.08	0.60	100
1300- 1500	90.50	8.75	0.13	0.62	100
1500- 2000	91.12	8.15	0.14	0.58	100
2000 and above	68.39	31.61			100
Climate risk					
Very Low	92.11	7.54	0.08	0.26	100
Low	96.17	3.38	0.13	0.32	100
Moderate	99.42	0.33	0.14	0.11	100
High	100				100
Very High	99.56			0.44	100
Income quintile					

Analytical domain	Lighting Source (%)				
	Electricity	Solar	Kerosene	Others	Total
1st Quintile	92.73	6.60	0.26	0.40	100
2nd Quintile	91.63	7.87	0.18	0.32	100
3rd Quintile	93.57	6.04		0.39	100
4th Quintile	96.73	3.13		0.14	100
5th Quintile	96.95	3.05			100
Nepal	**94.17**	**5.47**	**0.09**	**0.26**	**100**

Table 3.9 provides the distribution of households categorized by the type of toilet used across various analytical domains. In urban areas, mainly flush toilets are connected to public sewage network (65%), whereas rural areas consist a lower reliance on septic tank-connected flush toilets (60.9%). In ecological-zone, mountainous regions highly consist of ordinary toilets and hills, septic tank-connected flush toilets. Altitude analysis shows the prevalence of septic tank-connected flush toilets in lower altitudes and the dominance of ordinary toilets at higher elevations. Overall, the data shows that toilet used by the public varies across regions.

Table 3.9: Distribution of Households by Type of Toilet Used

Analytical domain	Toilet Used (%)					
	Flush toilet (Public sewerage)	Flush toilet (Septic tank)	Ordinary	Community toilet	No toilet	Total
Municipality						
Urban	11.0	65.0	21.4	0.1	2.5	100
Rural	2.6	60.9	33.1	0.4	2.9	100
Ecological zone						
Mountain	4.7	51.2	43.0	0.1	1.0	100
Hill	14.1	61.3	23.7	0.3	0.6	100
Terai	1.0	67.4	26.1	0.3	5.2	100
Province ecological zone						
Koshi-Mountain		34.9	64.2	0.5	0.5	100
Koshi-Hill	0.3	54.2	45.3		0.3	100
Koshi-Terai	0.1	52.8	45.7	0.4	1.1	100
Madhesh-Terai	0.5	74.8	15.9	0.4	8.5	100
Bagmati-Mountain	15.0	67.0	18.0			100
Bagmati-Hill	27.8	65.3	6.6	0.0	0.2	100
Bagmati-Terai		90.8	8.6		0.7	100
Gandaki-Mountain		65.0	32.6		2.4	100
Gandaki-Hill	3.2	78.1	17.6	0.5	0.5	100
Gandaki-Terai	2.2	60.0	37.3	0.4		100
Lumbini-Hill		65.0	35.0			100
Lumbini-Terai	3.4	79.6	12.2		4.8	100
Karnali-Mountain		49.2	46.9		3.9	100

Analytical domain	Toilet Used (%)					
	Flush toilet (Public sewerage)	Flush toilet (Septic tank)	Ordinary	Community toilet	No toilet	Total
Karnali-Hill	1.0	42.5	54.1		2.5	100
Sudurpaschim-Mountain		47.5	51.4		1.0	100
Sudurpaschim-Hill	42.6	27.1	25.6	2.7	1.9	100
Sudurpaschim-Terai		26.0	68.6		5.4	100
Altitude (meter)						
Below 120	0.7	68.0	25.5	0.3	5.4	100
120- 350	3.0	69.7	23.0	0.1	4.3	100
350- 1000	2.6	77.2	19.1	0.1	1.0	100
1000- 1300	20.6	49.0	29.3	0.5	0.7	100
1300- 1500	26.8	48.8	23.7	0.1	0.6	100
1500- 2000	4.2	53.3	41.6	0.3	0.6	100
2000 and above		65.2	31.0	1.3	2.5	100
Climate risk						
Very Low	10.4	62.0	24.4	0.1	3.0	100
Low	1.0	65.4	30.7	0.9	2.0	100
Moderate	2.4	57.9	36.5		3.2	100
High	1.0	71.0	27.9			100
Very High	8.3	84.0	6.8		0.9	100
Income quintile						
1st Quintile	8.8	53.7	33.2	0.2	4.1	100
2nd Quintile	2.5	57.3	35.6	0.7	3.9	100
3rd Quintile	3.1	66.0	27.7	0.1	3.1	100
4th Quintile	7.7	69.4	21.4	0.1	1.3	100
5th Quintile	16.2	71.8	11.2	0.1	0.6	100
Nepal	**7.42**	**63.25**	**26.38**	**0.26**	**2.70**	**100**

Table 3.10 provides valuable information into the distribution of households-based remittances receive across analytical domains. Municipality-wise, 24.3% of urban households receive remittances compared to rural areas (22%). The ecological-zone wise shows, higher percentage of remittance-receiving households in the Terai region compared to mountain areas. In province-wise, Lumbini Hill 35.4%, Bagmati Terai 35.3%, and Madhesh-Terai consists 30.5% who receives remittances. Altitude analysis shows a consistent trend of around 23-24%. Income quintiles shows correlation between income levels and remittance receipt, with higher quintiles having a greater percentage of remittance-receipt.

Table 3.10: Distribution of Households by Remittance Received

Analytical domain	Remittance Received (%)		
	Yes	No	Total
Municipality			
Urban	24.3	75.7	100
Rural	22.0	78.0	100
Ecological zone			
Mountain	18.1	81.9	100
Hill	23.5	76.5	100
Terai	24.2	75.8	100
Province ecological zone			
Koshi-Mountain	18.7	81.3	100
Koshi-Hill	21.6	78.4	100
Koshi-Terai	17.3	82.7	100
Madhesh-Terai	30.5	69.5	100
Bagmati-Mountain	20.6	79.4	100
Bagmati-Hill	17.8	82.2	100
Bagmati-Terai	35.3	64.7	100
Gandaki-Mountain	20.2	79.8	100
Gandaki-Hill	29.9	70.1	100
Gandaki-Terai	26.9	73.1	100
Lumbini-Hill	35.4	64.6	100
Lumbini-Terai	19.0	81.0	100
Karnali-Mountain	11.9	88.1	100
Karnali-Hill	19.6	80.4	100
Sudurpaschim-Mountain	17.8	82.2	100
Sudurpaschim-Hill	26.5	73.5	100
Sudurpaschim-Terai	20.1	79.9	100
Altitude (meter)			
Below 120	23.4	76.6	100
120- Below 350	24.5	75.5	100
350- Below 1000	23.9	76.1	100
1000- Below 1300	22.8	77.2	100
1300- Below 1500	22.4	77.6	100
1500- Below 2000	24.0	76.0	100
2000+	19.5	80.5	100
Income quintile			
1st Quintile	26.4	73.6	100
2nd Quintile	20.1	79.9	100
3rd Quintile	17.2	82.8	100
4th Quintile	23.1	76.9	100
5th Quintile	30.8	69.2	100
Area of owned land in 2079 (ha.)			

Analytical domain	Remittance Received (%)		
	Yes	No	Total
No land	22.9	77.1	100
Upto 0.10 ha.	24.2	75.8	100
0.10 - 0.50 ha.	23.1	76.9	100
0.50 - 1.00 ha.	22.9	77.1	100
1.00 - 5.00 ha.	24.0	76.0	100
5.00 - 10.00 ha.	14.1	85.9	100
More than 10.00 ha.	5.8	94.2	100
Nepal	**23.4**	**76.6**	**100**

Table 3.11 provides landownership trends among households, comparing data from the years 2074 BS to 2079 BS across various analytical domains. Both urban and rural areas experienced a marginal decrease in the average landholding size, with urban households owning 0.52 hectares in 2079 compared to 0.53 hectares in 2074, and rural households owning 0.64 hectares in 2079 compared to 0.65 hectares in 2074. Across ecological-zone, Terai region has larger landholdings compared to mountainous and hilly areas. Province-wise analysis shows, notable decreases in landownership size in provinces like Bagmati-Terai and Koshi-Hill. The influence of induced climate risk on landownership shows, as areas with higher climate risk, like those categorized as “High” witnessed a substantial decrease in landholding size from 0.78 hectares in 2074 to 0.61 hectares in 2079. Additionally, the data shows gender disparity in landownership, with male respondents consistently owning larger plots than female respondents.

Table 3.11 Average Land Holding (hectare) by Household

Analytical domain	Land Holding (Ha.) (%)	
	2074 B.S.	2079 B.S.
Municipality		
Urban	0.53	0.52
Rural	0.65	0.64
Ecological zone		
Mountain	0.63	0.64
Hill	0.48	0.47
Terai	0.70	0.67
Province-ecological zone		
Koshi-Mountain	0.65	0.66
Koshi-Hill	0.93	0.89
Koshi-Terai	0.65	0.61
Madhesh-Terai	0.82	0.79
Bagmati-Mountain	0.49	0.49
Bagmati-Hill	0.34	0.34
Bagmati-Terai	0.53	0.48
Gandaki-Mountain	0.76	0.80
Gandaki-Hill	0.51	0.52
Gandaki-Terai	0.51	0.47
Lumbini-Hill	0.41	0.43

Analytical domain	Land Holding (Ha.) (%)	
	2074 B.S.	2079 B.S.
Lumbini-Terai	0.64	0.63
Karnali-Mountain	0.51	0.54
Karnali-Hill	0.45	0.45
Sudurpaschim-Mountain	0.80	0.84
Sudurpaschim-Hill	0.29	0.28
Sudurpaschim-Terai	0.51	0.49
Climate risk		
Very Low	0.58	0.57
Low	0.62	0.61
Moderate	0.53	0.53
High	0.78	0.61
Very High	0.50	0.49
Sex of the respondent		
Male	0.64	0.63
Female	0.39	0.39
Nepal	**0.58**	**0.57**

Access to Social and Economic Services

Table 3.12 presents households affiliations or memberships to various financial and community-based services. The data shows that a significant portion of households have memberships in co-operatives or small saving groups, only (58.17%) indicating affiliation, while 41.83% do not. Similarly, 57.22% of households reported regular savings in co-operatives or small saving groups. Moreover, 65.05% of households involve in regular savings in financial institutions or banks, indicats a substantial reliance on formal banking channels. Interestingly, 45.49% of households have taken loans from money lenders, saving groups, or co-operatives, reflecting diverse financial strategies within the population. The table also highlights community engagement, 26.88% of households have at least one member affiliated with a cooperative or community group. However, participation in disaster risk reduction committees at the community, ward, or municipality levels is relatively low, with only 2.77% of households indicating involvement. Additionally, 20.59% of households are affiliated with Tole Development Committees (TDC). This data provides valuable information into the financial and community-oriented households, offering a foundation for specific interventions and policy planning.

Table 3.12 Households' Affiliation or Membership to Various Services

Access	Membership in Co-operative and Saving Groups (%)		
	Yes	No	Total
Have membership in co-operative/small saving groups	58.17	41.83	100
Have regular saving in co-operatives/small saving groups	57.22	42.78	100
Regular saving in financial institute/Bank	65.05	34.95	100
Loan taken from money lender, saving groups, co-operatives	45.49	54.51	100

Access	Membership in Co-operative and Saving Groups (%)		
	Yes	No	Total
Any household member is a member of cooperative or any community groups	26.88	73.12	100
Participation in community/ Ward/ Palika level disaster risk reduction committee	2.77	97.23	100
Affiliation in Tole Development Committee	20.59	79.41	100

Table 3.13 outlines the diverse sources from which households access loans. The data shows substantial portion of households, accounting (33.6%), relies on individual money lenders for loans, indicating a significant informal financial sector presence. Savings groups also play a role, 15.7% of households accessing loans through this community-based financial mechanism. Co-operatives represent another major source, providing loans to 29.9% of households, importance of cooperative institutions in facilitating financial access. Microfinance institutions are utilized by 13.1% of households, this shows microfinance is fulfilling the financial needs of a specific demographic. Meanwhile, commercial banks and development banks collectively contribute to 26.6% of households for accessing loans. The data also highlights limited reliance on finance companies, representing 1.5%, and other sources contribute 1.1%. This table provides valuable insights for financial institutions and policymakers to formulate specific strategies to the specific segments of the population.

Table 3.13 Percentage of Households' Accessing Loans

Sources of loan	Percent
Individual/Money lender	33.6
Savings Group	15.7
Co-operative	29.9
Microfinance	13.1
Finance Company	1.5
Development Bank	10.1
Commercial Bank	16.5
Others	1.1

Table 3.14 presents the purposes of access loans, and also provide insights of financial priorities and needs of the households. Notably, 19.9% of households utilize loans for agricultural purposes, highlights the major role of credit for sustaining and enhancing agricultural activities. Animal husbandry follows closely, with 10.3%, highlights the importance of financial support in livestock-related sectors. Furthermore, 18.6% of households use loans for non-agricultural businesses, highlights the role in entering entrepreneurship beyond the agricultural sector. Acquiring property, including houses, lands, and real estate, requires for loan acquisition, with 19.4% of households securing loans for this purpose. In another interesting aspect is 12.6% of households accessing loans to facilitate international migration to their children, indicating the role of financing migration-related expenses. Additionally, loans for education 9.5%, medical treatment 13.3%, and other unspecified purposes 19.7% shows the diverse range in financial landscape.

Table 3.14 Percentage of Households' Acquiring Loans for Various Purposes

Purpose	Percent
For agriculture	19.9
For animal husbandry	10.3
Do non-agricultural business	18.6
Buy house/land/land	19.4
Go abroad	12.6
Education	9.5
Treatment	13.3
Others	19.7

Table 3.15 provides the average distance's households must traverse to access various essential institutions and services (geographical distribution of key facilities). The average distance to the ward office is recorded at 2.28 kilometers, shows the closeness of local governance services to the surveyed households. In terms of transportation infrastructure, the average distance to a motorable road is 0.92 kilometers, shows relatively convenient accessibility of road networks. Health services are reasonably accessible, with an average distance of 2.12 kilometers, ensuring that households have relatively access to medical facilities. The average distance to the nearest basic school is 1.22 kilometers, reflecting the accessibility of educational services. However, nearest local market is situated at a greater distance, with an average of 5.59 kilometers, potentially impact the access to commercial activities. Overall, this information provides service accessibility and insights to policymakers in addressing infrastructure planning for enhanced community.

Table 3.15 Average Distance to Reach Various Institutions and Services

Access	Average (km)
Distance to ward office	2.28
Distance to motor able road	0.92
Distance to nearest health institution	2.12
Distance to nearest basic school	1.22
Distance to nearest local market	5.59

Table 3.16 presents annual income across various analytical domains. In urban areas, the average total annual income stands at Rs. 442,374.00, with major contributions from crops (Rs. 83,927.95), livestock (Rs. 58,538.53), other agricultural and forest activities (Rs. 27,429.25), and non-agricultural sources (Rs. 457,103.11). Rural areas have lower average total annual income Rs. 230,447.51, with significant contributions from crops (Rs. 56,732.70), livestock (Rs. 43,864.81), other agricultural and forest activities (Rs. 24,688.60), and non-agricultural sources (Rs. 240,881.26). Further insights are derived from ecological zones, with mountain regions have an average total annual income of Rs. 261,264.76, hills Rs. 360,651.16, and Terai Rs. 360,772.05. These figure highlights variations in economic conditions across different zones. Similarly, the province-ecological zone breakdown offers specific details, such as the Koshi-Mountain province's average total annual income of Rs. 206,918.68, Koshi-Hill province's Rs. 244,648.59, and Koshi-Terai province's Rs. 353,212.47.

Into the altitude groups, average income levels based differ with altitude. For instance, areas below 120 meters have an average total annual income of Rs. 351,086.24, while those above 2000 meters have an average income of Rs. 216,882.62. Moreover, climate risk and gender-related inequalities in income. In summary, Table 3. 16 provides detail information of annual

income patterns, these valuable insights help to policymakers and researchers to understand and address economic inequalities across various region.

Table 3.16 Annual Average Income of Households

Analytical domain	Total annual income	Crops income (Rs.)	Livestock income (Rs.)	Other agri. and forest (Rs.)	Non-agri. income of last 12 months (Rs.)
	Average (Rs.)	Average (Rs.)	Average (Rs.)	Average (Rs.)	Average (Rs.)
Municipality					
Urban	442374	83928	58539	27429	457103
Rural	230448	56733	43865	24689	240881
Ecological zone					
Mountain	261265	59484	48507	23368	276220
Hill	360651	52037	45752	48225	412631
Terai	360772	89647	58751	24052	349232
Province-ecological zone					
Koshi-Mountain	206919	89267	45291	47710	228557
Koshi-Hill	244649	96051	52902	54631	253174
Koshi-Terai	353212	96263	56158	11397	346480
Madhesh-Terai	366950	103940	52191	27093	327123
Bagmati-Mountain	381177	39270	94444	6251	434690
Bagmati-Hill	460188	54295	55843	72203	509230
Bagmati-Terai	547062	95663	150529	20942	559754
Gandaki-Mountain	454265	191198	94863	.	571156
Gandaki-Hill	470462	61433	53289	12382	560694
Gandaki-Terai	971206	82496	77379	9908	1118448
Lumbini-Hill	212342	25791	13873	1500	236548
Lumbini-Terai	320831	54760	58714	17013	327229
Karnali-Mountain	233746	63024	72090	25150	220990
Karnali-Hill	259085	37919	48426	26224	250302
Sudurpaschim-Mountain	189432	42962	17789	22666	174455
Sudurpaschim-Hill	94797	17334	25879	4000	148811
Sudurpaschim-Terai	195577	63732	27748	9203	207504
Altitude Group (meters)					
Below 120	351086	90960	45743	22172	332365
120- Below 350	402967	88732	83935	34500	398575
350- Below 1000	285586	61007	38541	19438	314943
1000- Below 1300	433843	59026	49909	32470	487985
1300- Below 1500	437071	50877	79549	54716	485865
1500- Below 2000	243726	43898	33092	41820	292751
2000+	216883	48014	46104	25608	239916
Climate Risk					
Very Low	356570	70208	50990	28497	378114
Low	319253	66179	50711	18900	342147

Moderate	320756	73391	48156	19659	330534
High	349635	114011	47310	40393	320765
Very High	536160	74732	112847	5071	533304
Sex of Respondent					
Male	355871	74107	53534	26876	375671
Female	341216	54703	43865	25558	361347
Sex of Household Head					
Male	364060	73927	54778	27319	382772
Female	289177	46247	32120	19273	316303
Land area owned in 2079 BS (ha.)					
No land	199291	57943	33666	15658	189362
Upto 0.10 ha.	462106	50354	51064	23811	480786
0.10 - 0.50 ha.	290617	46915	41922	22839	316852
0.50 - 1.00 ha.	346223	63999	58719	24642	402650
1.00 - 5.00 ha.	439511	121648	60598	34595	418010
5.00 - 10.00 ha.	583198	189892	478577	39510	261386
More than 10.00 ha.	925770	567176	30324	40000	625104
Nepal	**352491**	**70518**	**51597**	**26699**	**372170**

Conclusion

This chapter highlights the distribution of households based on the education levels of respondents, portray variations across different domain. Chapter indicates the largest proportions of households based on the number of years respondents have been living in their current locations. Marital status distribution is consistent across ecological zones, provinces, altitudes, and climate risk categories. The primary occupations of household heads are mainly agriculture, forestry, and fishery. The type of housing varies between urban and rural areas, with urban areas featuring more permanent houses. Preferences of energy source for cooking differ in urban and rural areas, LPG and firewood being major choices. Lighting sources also varies in urban areas and rural areas, urban people mostly relying on electricity. An interesting finding, as increase in remittance-receipt households landholding size have been decreased. The trends in landownership among households are explored, showing a marginal decrease in average landholding size from 2074 BS to 2079 BS in both urban and rural areas. Similarly, the information includes households' affiliations and memberships to various financial and community-based services. A significant portion of households is affiliated with co-operatives or small saving groups, while nearly half of respondents are not engaged. The diverse sources from which households access loans, mainly on individual money lenders, indicating a substantial presence of the informal financial sector. And the purposes for which households access loans for sustaining agricultural activities. The average distance households must travel to access essential institutions and services, shows the geographical distribution of key services. For instance, the average distance to the ward office is 2.28 kilometers, indicating the closeness of local governance services. Additionally, the detailed overview of annual income across various analytical domains shows that urban areas have a higher average total annual income compared to rural areas.

CHAPTER 4

PERCEPTION, KNOWLEDGE AND RESPONSE

Introduction

This chapter explores key aspects of climate change and presents valuable insight for climate-related information, access to early warning information, and initiatives taken by households to mitigate impact arise by climate-induced disaster. This chapter provides perception of local communities on impact of climate change in seasons (six seasons unique to Nepal). Additionally, includes the adaptation strategies adapted by households to minimize the impact of climate induced disaster in building climate resilience communities. This chapter also highlights the challenges and responses imposed by the climate change through holistic exploration in different analytical domains.

Summary of Findings

Out of the total households, 35.8% were aware about climate change. Across all three geographical domain, the number of households unaware of climate change is significantly high, with highest number being in Mountain (70.9%). The sex disaggregated data indicate that the majority of both male (61.3%) and female (74.0%) respondents were unaware of climate change impacts, which indicates that greater action needs to be considered in this regard, especially for women. Based on the municipality households; urban households (42.8 %) were more aware than of rural (26.3%) household. In comparison between households of different ecological zone; household belonging to hilly region (37.4 %) were more aware than households of Terai (35.3%) and Mountain (29.1).

Figure 4.1: Percentage of Households (Municipal, Ecological Zone, Sex) having Knowledge on Climate Change

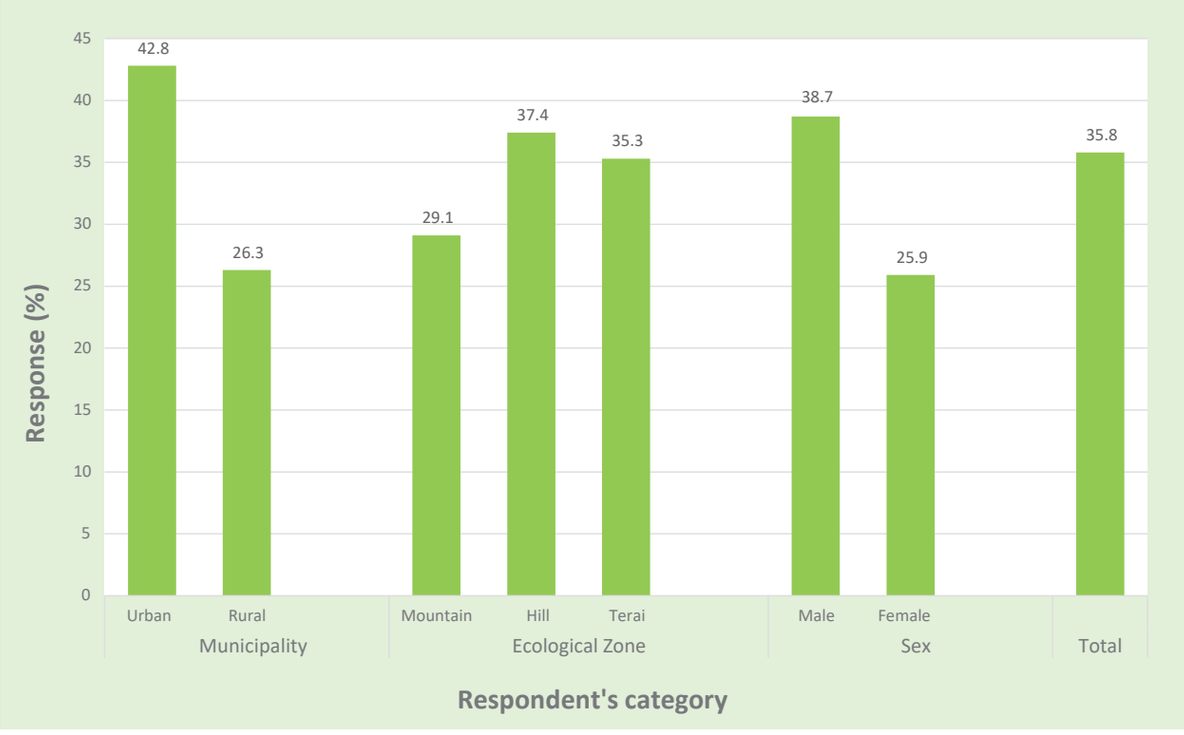
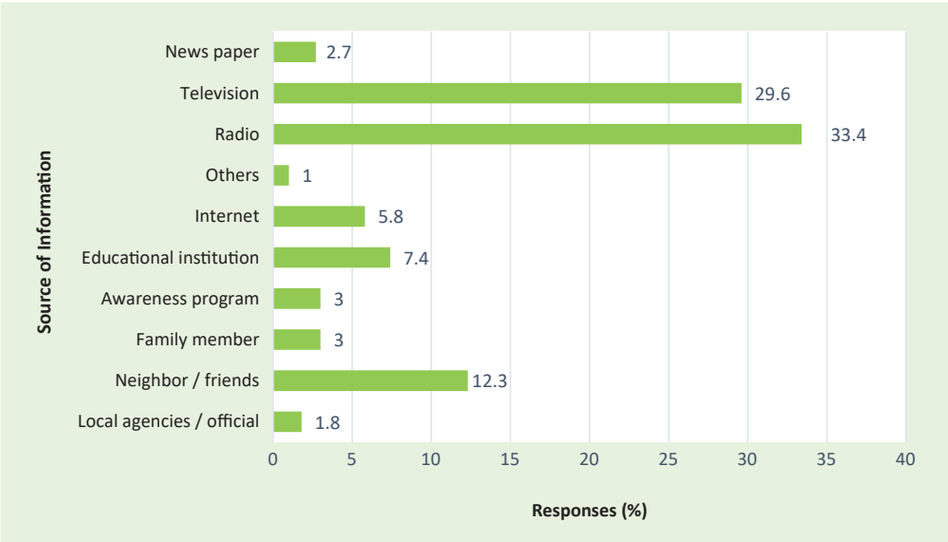
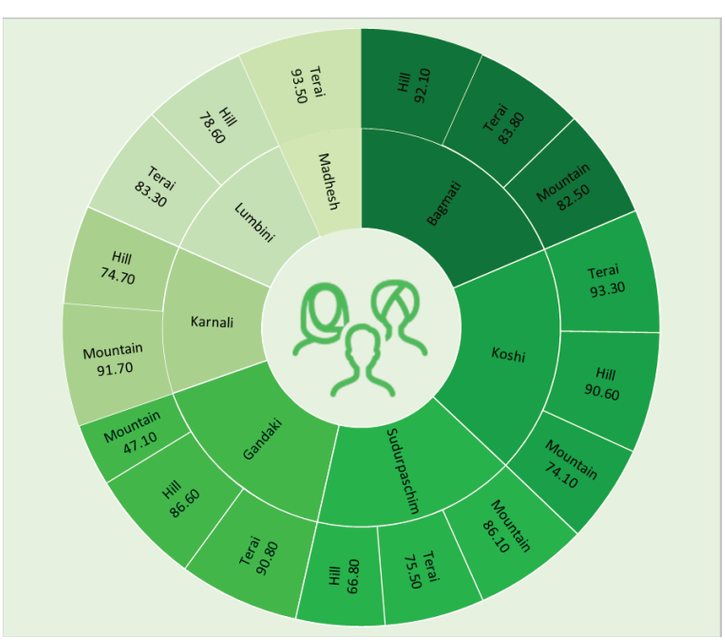


Figure 4.2: Main Source of Information About Climate Change



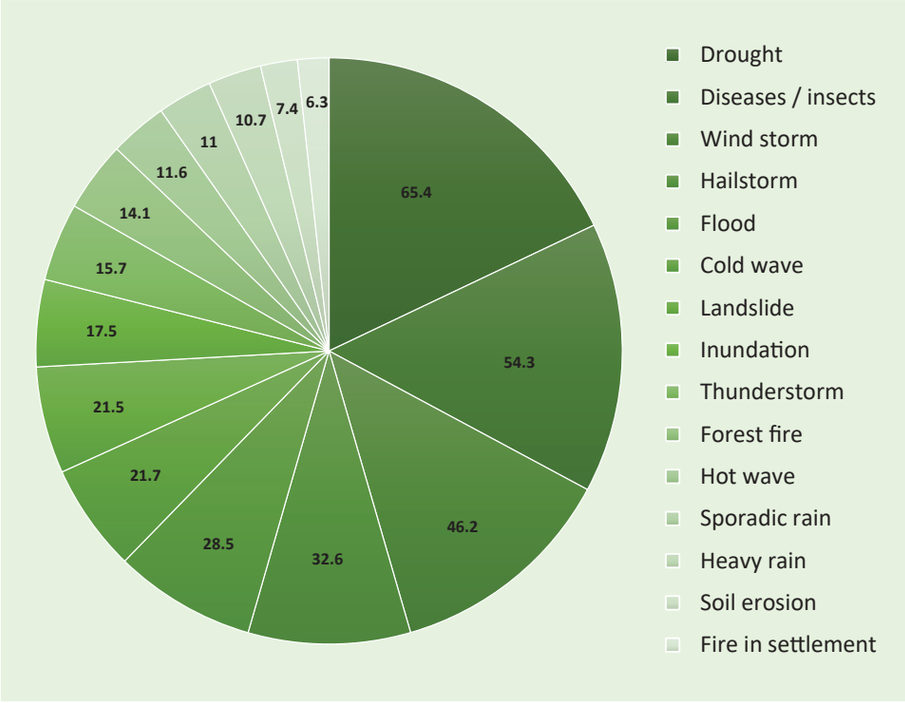
The source of information about climate change were through different medium. Figure 4.2 indicates that a significant portion of households were getting information about climate change through radio (33.4%) followed by television (29.6%). Information about climate change among people were passed very rarely through concerned local agencies/official (1.8%).

Figure 4.3: Households' Perception on Climate Change (Province-ecological zone) Compared to Last 25 Years



Over the last 25 years, households across various provinces has markedly observed shift in climate change (Figure 4. 3). Every province has distinct responses based on geographical locations. Notably, households in the Hill area of Bagmati Province reported the highest recognition of climate change impacts (92.1%) followed by the Mountain area in Karnali Province (91.7%). Conversely, in the Gandaki Province, specifically in the Mountain area (47.1%) of households experienced least impact from climate change.

Figure 4.4: Potential Results of Climate Change



Households' exhibit varying perspectives on the effect of climate change, like drought (65.4%), disease/insects (54.3%), windstorms (46.2%), hailstorms (32.6%), floods (28.5%), cold wave (21.7%), landslides (21.5%). While people experiencing to others climate induced disasters (inundation, thunderstorms, forest fires, hot wave, sporadic rain, heavy rain, soil erosion, fire in settlement) was low (Figure 4.4).

General Perception on Climate Change

Climate Related Incidence

Survey result shows that 35.8% of the household were unaware about climate change in Nepal (Table 4.1). Majority of households in mountain regions (70.9%), Sudurpaschim-Hill (91.2%), and among female respondents (74.1%) were unaware about climate change. Correlational analysis between awareness and educational level shows, only those respondents who had completed masters and above (91.6%) were conscious about climate change. Additionally, households with income exceeding 60,000 have more knowledge of climate change (49.8%) than people having income below 15,000 (24.5%). These finding highlights difference in awareness levels across geographical regions, gender, education, and income levels, focus the need for targeted awareness campaigns and education initiatives to ensure the understanding of climate change among diverse demographics.

Table 4.1: Households Aware about Climate Change

Analytical domain	Response (%)		
	Yes	No	Total
Municipality			
Urban	42.8	57.2	100
Rural	26.3	73.7	100
Ecological zone			
Mountain	29.1	70.9	100

Analytical domain	Response (%)		
	Yes	No	Total
Hill	37.4	62.6	100
Terai	35.3	64.7	100
Province-ecological zone			
Koshi-Mountain	23.8	76.2	100
Koshi-Hill	41.5	58.5	100
Koshi-Terai	50.5	49.5	100
Madhesh-Terai	35.6	64.4	100
Bagmati-Mountain	28.6	71.4	100
Bagmati-Hill	44.4	55.6	100
Bagmati-Terai	46.0	54.0	100
Gandaki-Mountain	15.0	85.0	100
Gandaki-Hill	38.4	61.6	100
Gandaki-Terai	42.5	57.5	100
Lumbini-Hill	34.9	65.1	100
Lumbini-Terai	22.5	77.5	100
Karnali-Mountain	23.8	76.2	100
Karnali-Hill	23.6	76.4	100
Sudurpaschim-Mountain	37.6	62.4	100
Sudurpaschim-Hill	8.8	91.2	100
Sudurpaschim-Terai	16.3	83.7	100
Altitude (meters)			
Below 120	33.6	66.4	100
120- Below 350	39.3	60.7	100
350- Below 1000	37.7	62.3	100
1000- Below 1300	39.6	60.4	100
1300- Below 1500	37.3	62.7	100
1500- Below 2000	31.3	68.7	100
2000+	25.8	74.2	100
Climate risk			
Very Low	35.3	64.7	100
Low	36.7	63.3	100
Moderate	33.8	66.2	100
High	32.4	67.6	100
Very High	47.0	53.0	100
Sex of Respondent			
Male	38.7	61.3	100
Female	25.9	74.1	100
Age Group of Respondent			
45-54 Yrs.	38.8	61.2	100
55-64 Yrs.	35.5	64.5	100
65-74 Yrs.	33.3	66.7	100
75+ Yrs.	29.4	70.6	100
Education Level of Respondent			

Analytical domain	Response (%)		
	Yes	No	Total
Beginners/Informal education.	29.2	70.8	100
Primary (1-5)	32.3	67.7	100
Lower Sec. (6-8)	44.4	55.6	100
Secondary (9-10)	53.2	46.8	100
SLC/SEE	63.4	36.6	100
Class 12	79.9	20.1	100
Bachelor	85.3	14.7	100
Master and above	91.6	8.4	100
Others	19.3	80.7	100
Illiterate	17.1	82.9	100
Years of living			
25-34 Yrs.	42.5	57.5	100
35-44 Yrs.	40.6	59.4	100
45-54 Yrs.	37.1	62.9	100
55-64 Yrs.	32.7	67.3	100
65-74 Yrs.	32.1	67.9	100
75-84 Yrs.	27.2	72.8	100
85+ Yrs.	24.2	75.8	100
Income (Yearly)			
Below 15,000	24.5	75.5	100
15,001-30,000	26.1	73.9	100
30,001-45,000	32.1	67.9	100
45,001-60,000	33.3	66.7	100
More than 60,000	49.8	50.2	100
Not Stated	16.5	83.5	100
Nepal	**35.8**	**64.2**	**100**

Table 4.2 shows the primary source of information about climate change for respondents. Most primary means of communication to communicate information about climate change among people is radio (33.4%), followed by television (29.6%), social networks (12.3%), educational institutions (7.4%), internet (5.8%). Especially households belonging to remote areas or economically backward were mostly getting information through radio rather than educational institutions/internet. This finding shows the diverse range of channels through which individuals can acquire knowledge about climate change, highlighting the importance of utilizing multiple platforms for effective communication and education on this critical issue this will help in understanding the varied sources of information which guides targeted awareness campaigns, ensuring coverage and engagement across different segments.

Table 4.2: Major Source of Information about Climate Change

Analytical domain	Response (%)										
	Radio	Television	Newspaper	Awareness program	Educational institution	Local agencies / official	Neighbor / friends	Family member	Internet	Others	Total
Municipality											
Urban	29.3	33.1	3.5	2.9	7.5	1.5	10.5	3.1	7.3	1.3	100
Rural	42.6	21.9	0.8	3.2	7.0	2.5	16.3	2.7	2.6	0.4	100
Ecological zone											
Mountain	48.7	27.4	0.7	2.9	11.7	3.2	3.2	0.2	0.9	1.1	100
Hill	30.7	34.4	2.5	2.0	10.3	2.0	9.2	1.8	6.0	1.1	100
Terai	34.1	24.6	3.2	4.0	3.6	1.4	17.2	4.7	6.4	0.9	100
Province- ecological zone											
Koshi-Mountain	40.6	17.7	1.7	4.2	24.6	4.2	2.3		4.8		100
Koshi-Hill	39.7	11.7	0.7	0.9	3.7	1.2	30.1	5.6	6.5		100
Koshi-Terai	32.8	19.1	2.8	0.8		0.4	32.4	4.0	7.8		100
Madhesh-Terai	47.3	18.0	2.3	5.4	2.3	1.8	8.1	6.0	7.9	0.8	100
Bagmati-Mountain	36.1	33.9	1.3	1.3	13.9	5.2	7.7	0.6			100
Bagmati-Hill	24.6	43.3	4.1	2.1	11.9	1.7	3.3	0.9	6.8	1.3	100
Bagmati-Terai	19.4	34.2	5.0	4.7	12.8	1.8	9.4	6.7	4.3	1.7	100
Gandaki-Mountain		50.8		15.9	33.3						100
Gandaki-Hill	28.7	46.6	1.7	0.4	9.3	0.7	2.5		8.7	1.3	100
Gandaki-Terai	6.6	28.3	12.5	10.1	16.1	5.1	12.6	5.0	2.8	0.9	100
Lumbini-Hill	37.3	30.5	1.1	3.5	10.2	0.9	15.1	0.9	0.6		100
Lumbini-Terai	12.5	54.4	4.4	4.8	6.0	1.6	11.4	2.1	1.3	1.4	100
Karnali-Mountain	73.4			4.8	13.0	3.5	3.6			1.8	100
Karnali-Hill	37.5	9.2	0.2	7.2	20.9	12.6	4.3	3.1		5.0	100
Sudurpaschim-Mountain	56.3	35.5		2.6	2.3	0.9				2.3	100
Sudurpaschim-Hill	62.2		3.3	3.7	11.4	3.5	7.3	8.6			100
Sudurpaschim-Terai	27.9	14.6	1.4	10.2	17.5	1.9	16.0	2.0	1.8	6.6	100
Climate risk											
Very Low	34.1	29.1	2.9	3.3	7.6	2.2	9.4	3.2	6.8	1.4	100
Low	36.7	24.1	2.3	1.4	7.5	1.4	19.3	2.6	4.4	0.4	100
Moderate	32.4	37.3	1.8	4.2	5.0	1.2	10.2	1.5	5.7	0.6	100
High	35.8	26.5	3.2		3.2		25.0	3.1	3.1		100
Very High	14.2	41.1	3.2	3.8	9.9	1.0	22.0	4.5	0.4		100
Age group of respondents											
45-54 Yrs.	34.8	28.0	2.8	2.5	8.2	1.7	10.3	2.4	7.8	1.5	100
55-64 Yrs.	33.9	28.8	3.0	3.4	7.0	1.6	13.3	3.3	4.8	1.0	100
65-74 Yrs.	30.4	34.3	1.4	2.9	6.8	2.8	14.5	3.2	3.4	0.4	100
75+ Yrs.	32.2	27.8	4.7	4.4	5.8	0.4	14.4	4.1	6.1		100
Education level of respondent											
Beginners/Informal Edu.	41.1	21.5	2.2	3.7	4.0	3.9	18.1	3.0	1.7	0.9	100
Primary (1-5)	38.3	22.7	1.1	2.4	3.6	1.6	19.9	5.0	4.2	1.1	100

Analytical domain	Response (%)										
	Radio	Television	Newspaper	Awareness program	Educational institution	Local agencies / official	Neighbor / friends	Family member	Internet	Others	Total
Lower sec. (6-8)	40.0	28.4	2.2	3.0	4.3	1.9	10.6	2.1	6.1	1.5	100
Secondary (9-10)	29.9	39.7	1.0	2.0	5.0	1.4	8.2	3.7	8.5	0.7	100
SLC/SEE	30.3	34.9	4.4	3.3	7.1	2.6	6.8	1.1	8.2	1.3	100
Class 12	22.6	40.4	2.5	2.5	14.9	2.0	5.4	1.3	7.3	1.1	100
Bachelor	19.8	38.1	10.3	2.1	16.1	0.1	2.0	1.1	8.5	1.9	100
Master and above	8.0	33.5	6.0	1.5	33.8				15.7	1.4	100
Others	25.6	36.1	2.8	14.6	2.2		12.3		6.4		100
Illiterate	41.1	21.4	0.8	3.8	3.6	1.0	20.2	5.3	2.5	0.2	100
Sex of household head											
Male	34.2	29.1	2.7	3.0	7.5	1.5	12.0	2.7	6.0	1.1	100
Female	27.5	32.7	2.3	3.0	6.3	4.3	14.7	4.7	4.6	0.2	100
Income (Yearly)											
Below 15,000	52.0	17.2	0.7	5.9	5.6	1.0	9.9	3.6	2.8	1.3	100
15,001-30,000	51.7	24.4	0.5	4.3	2.6	4.1	8.6	1.6	1.7	0.4	100
30,001-45,000	35.5	28.0	0.9	2.8	5.3	0.2	14.5	5.5	6.5	0.8	100
45,001-60,000	32.6	28.4	2.5	0.6	2.2	2.2	20.5	4.1	6.3	0.6	100
More than 60,000	24.0	34.6	4.0	2.4	10.2	1.8	12.0	2.5	7.3	1.2	100
Not Stated	45.2	21.5	3.3	3.0	5.1	1.0	13.7	1.2	6.0		100
Nepal	**33.4**	**29.6**	**2.7**	**3.0**	**7.4**	**1.8**	**12.3**	**3.0**	**5.8**	**1.0**	100

87.22% of household experiences climate change over the past 25 years (Table 4.3). Notably, the response varied based on ecological zones and provinces. In the Terai ecological zone, 89.36% of households reported experiencing significant climate change, highlights its impact on the Southern Lowland Region. Furthermore, in the Bagmati Province, 92.1% of households recognized a noticeable change in climate patterns over the same period. These regional variations highlight the localized nature of climate change impacts and the need for favorable strategies and interventions to address the challenges observed in different geographical regions. Result provides valuable insights in communities perception, convey the understanding of their regional and targets the initiatives for climate resilience and adaptation.

Table 4.3: Households' (%) Perception on Change in Climate Compared to Last 25 Years.

Analytical domain	Yes	No	Don't know	Total
Municipality				
Urban	89.5	7.6	2.9	100
Rural	84.1	11.7	4.2	100
Ecological Zone				
Mountain	82.4	11.4	6.3	100
Hill	86.0	11.4	2.6	100
Terai	89.4	6.9	3.8	100
Province-ecological zone				
Koshi-Mountain	74.1	12.5	13.3	100
Koshi-Hill	90.6	7.2	2.2	100
Koshi-Terai	93.3	4.7	2.0	100
Madhesh-Terai	93.5	4.3	2.2	100
Bagmati-Mountain	82.5	12.6	5.0	100
Bagmati-Hill	92.1	6.7	1.2	100
Bagmati-Terai	83.8	11.8	4.4	100
Gandaki-Mountain	47.1	17.6	35.2	100
Gandaki-Hill	86.6	12.8	0.6	100
Gandaki-Terai	90.8	4.7	4.6	100
Lumbini-Hill	78.6	20.0	1.4	100
Lumbini-Terai	83.3	13.3	3.4	100
Karnali-Mountain	91.7	4.1	4.2	100
Karnali-Hill	74.7	21.9	3.3	100
Sudurpaschim-Mountain	86.1	12.5	1.3	100
Sudurpaschim-Hill	66.8	15.0	18.3	100
Sudurpaschim-Terai	75.5	6.4	18.1	100
Sex of respondent				
Male	88.7	8.2	3.1	100
Female	82.4	13.2	4.5	100
Nepal	87.2	9.3	3.4	100

Table 4.4 shows the diverse perceptions regarding the reasons of climate change among households. 25.2% of respondents finds deforestation as a major contributing factor, followed by natural causes (15.5%) and industrialization at 4.7%. In urban municipalities, deforestation (28.4%) and urbanization (13.4%) while in rural areas, deforestation (20.6%) and natural causes (16.7%) were identified as major contributing factor for climate change. In ecological zone analysis respondents observed, mountain region through natural causes (30.8%) and earth-related factors were more contributors, while in the Terai, deforestation (32.9%) is taken as the major factor of change in climate. Province-wise variation shows different perspectives, in Koshi-Mountain, Gandaki-Mountain, and Sudurpaschim-Mountain regions. The table below provides the diverse perspectives of climate change causes across different analytical domains, highlights the need for specific interventions based on respondents' perceptions.

Table: 4.4: Households' Perception for the Causes of Climate Change

Analytical domain	Response (%)											
	Deforestation	Natural cause	Industrialization	Urbanization	Human intervention	God's will	Earthquake	Increase vehicle number	Improper mgmt. of waste	Others	Don't know	Total
Municipality												
Urban	28.4	14.7	5.3	13.4	7.0	2.6	0.7	6.3	4.4	2.5	14.6	100
Rural	20.6	16.7	3.9	6.6	5.3	3.1	2.3	6.5	2.7	2.4	29.8	100
Ecological zone												
Mountain	15.6	30.8	5.0	5.0	7.8	2.1	1.6	4.7	1.5	2.1	23.7	100
Hill	19.0	14.8	3.1	11.4	7.9	2.6	2.2	7.4	4.7	2.9	24.0	100
Terai	32.9	13.6	6.3	10.8	4.5	3.2	0.5	5.7	3.1	2.1	17.3	100
Province ecological zones												
Koshi-Mountain	1.9	24.2	7.6	7.1	15.7	0.7	0.7	3.4	0.8	1.5	36.4	100
Koshi-Hill	23.7	17.0	3.2	2.8	2.3	1.8	5.3	8.5	1.1	1.1	33.0	100
Koshi-Terai	27.2	16.6	7.3	10.1	4.0	1.0	0.7	3.2	3.5	1.2	25.2	100
Madhesh-Terai	43.8	9.9	5.5	2.7	3.4	5.7	0.1	4.9	3.2	2.7	17.9	100
Bagmati-Mountain	2.7	36.5	1.6	3.1	6.1	3.3	2.0	4.3	1.1	5.0	34.2	100
Bagmati-Hill	13.8	13.5	4.6	18.0	9.8	3.4	2.7	6.6	3.0	3.8	21.0	100
Bagmati-Terai	18.7	14.3	6.6	16.8	6.4	3.1		5.2	4.3	4.5	20.3	100
Gandaki-Mountain	5.1	5.1	5.1		37.9					5.6	41.4	100
Gandaki-Hill	10.5	17.2	2.1	11.2	13.4	2.6		8.2	6.7	2.6	25.4	100
Gandaki-Terai	24.2	14.3	4.8	13.4	7.3	1.7	0.3	1.2	3.7	5.6	23.4	100
Lumbini-Hill	36.7	4.8	1.8	5.7	2.4	0.4		10.5	19.6	4.2	13.8	100
Lumbini-Terai	21.0	11.2	8.1	28.0	7.5	1.5	1.2	12.3	2.8	0.6	5.7	100
Karnali-Mountain	32.9	14.3	1.5	7.5	4.4	0.8		14.7	5.1	1.2	17.6	100
Karnali-Hill	27.9	20.8	1.0	9.0	7.1	3.2	0.5	5.1	1.0	2.1	22.3	100
Sudurpaschim-Mountain	29.8	39.4	8.5	4.2	4.9	2.8	2.7	0.7	0.5		6.6	100
Sudurpaschim-Hill	29.1	19.3		3.2	1.9	1.9	2.8	3.9		1.9	36.0	100
Sudurpaschim-Terai	33.6	33.9	2.6	6.0	1.7	0.7	0.4	0.2	1.2	3.3	16.3	100
Altitude (meters)												
Below 120	31.1	13.7	7.4	10.4	4.4	3.8	0.4	6.2	3.0	2.1	17.6	100
120- Below 350	32.9	13.1	3.8	13.3	5.7	1.9	0.6	4.8	4.0	2.4	17.4	100
350- Below 1000	22.2	18.5	5.0	10.4	8.1	2.3	1.2	7.6	5.5	2.2	17.2	100
1000- Below 1300	18.7	19.1	2.2	9.0	8.0	3.0	1.7	6.6	3.9	3.2	24.5	100
1300- Below 1500	17.2	14.7	3.4	17.9	8.2	2.3	2.8	6.2	3.9	3.6	19.9	100
1500- Below 2000	20.8	14.3	3.3	5.7	6.2	2.2	3.7	7.0	3.8	2.1	31.0	100
2000+	21.0	18.1	3.4	2.8	4.6	3.3	0.7	6.6	0.5	2.7	36.4	100
Climate risk												
Very Low	26.5	14.3	4.5	10.2	6.6	3.3	1.6	6.5	3.4	2.5	20.6	100
Low	22.7	19.4	4.5	9.5	4.5	1.8	1.0	4.8	2.5	3.1	26.3	100
Moderate	25.3	15.4	6.7	15.6	5.3	1.0	1.1	7.7	5.4	1.5	15.1	100
High	33.1	27.3	7.3	7.8		1.7	1.2	1.2	5.4	1.2	13.6	100
Very High	13.9	11.1	3.4	11.3	15.9	5.2		9.8	9.9	2.5	16.9	100
Nepal	**25.2**	**15.5**	**4.7**	**10.6**	**6.3**	**2.8**	**1.3**	**6.4**	**3.7**	**2.5**	**20.8**	**100**

Table 4.5 provides the distribution of natural and environmental hazards across different analytical domains. The percentages represent the prevalence of each hazard category within urban and rural municipalities, as well as ecological zones and respective provinces.

Over the past 25 years, Nepal is suffering from various range of natural disasters, shows insignificant patterns in disaster incidence. Drought has emerged as a major disaster, affecting 44.87% of households, and flood, with 13.87%. Storms, has affected 9.9% of households, while landslide has affected 7.81% of households. Drought has been seen as a major emerged disaster and imposed extensive impact on communities in national wide. However, exception case was seen in the Gandaki mountain region, where 36.40% of households reported landslides as the major observed disaster.

The incidence of flood was significant observed in rural areas and the Terai region. Storms has imposed a substantial threat, affecting 9.9% of households in national wide. In addition, other observed disasters are; inundation (4.22%), hailstorms (3.5%), and diseases (3.46%). This shows the diverse and region-specific nature of disaster occur across the nation. This result highlights need of specific disaster preparedness and response strategies to address the different challenges faced at communities' level.

Table 4.5: Households (%) Reporting Major Climate Induced Incidences During Past 25 Years

Analytical domain	Drought	Forest fire	Fire in settlement	Flood	Inundation	Wind storm	Thunderstorm	Hailstorm	Heavy rain	Sporadic rain	Soil erosion	Land slide	Snowstorm	Avalanche	Heat wave (Loo)	Cold wave	Diseases / insect	Others	Total
Municipality																			
Urban	47.0	1.7	0.7	12.4	4.5	9.6	0.7	3.8	0.8	0.2	0.3	4.5			1.9	2.2	4.2	5.6	100
Rural	41.8	1.5	1.2	16.0	3.9	10.3	1.8	3.1	0.5	0.0	0.2	12.6	0.0	0.3	0.1	1.7	2.3	2.5	100
Ecological zone																			
Mountain	40.3	1.3	0.1	13.5		14.9	0.5	3.4	0.8	0.2	0.3	12.1	0.2	1.7			6.8	3.7	100
Hill	49.4	2.5	0.2	4.3		12.2	1.9	4.5	1.0	0.2	0.4	12.9					2.7	7.8	100
Terai	41.1	0.8	1.7	23.4	9.1	6.8	0.5	2.5	0.3	0.0	0.2	2.1			2.5	4.3	3.7	1.0	100
Province -ecological zone																			
Koshi-Mountain	75.5	0.6		3.5		0.6		1.3		0.7		4.0					12.3	1.4	100
Koshi-Hill	71.6	4.1		3.9		7.8	0.4	0.7			0.6	7.8					3.0		100
Koshi-Terai	21.1	0.3	0.9	46.9	10.7	10.2	0.4	0.5				5.0				0.9	2.8	0.2	100
Madhesh-Terai	51.1	1.2	3.0	14.1	4.2	6.5	0.2	5.4	0.1		0.1				4.6	4.0	5.1	0.2	100
Bagmati-Mountain	50.9	2.9		4.9		7.2	0.6	2.7			1.0	11.7					12.8	5.4	100
Bagmati-Hill	53.0	1.8	0.4	1.5		11.0	2.1	2.8	1.4	0.4	0.3	9.6					3.8	12.0	100
Bagmati-Terai	51.3	1.1	0.6	16.4	3.2	15.9	0.6	2.3	2.2	0.2					0.4	1.5	2.7	1.5	100
Gandaki-Mountain						15.7		15.2	11.1	5.1		36.4					11.1	5.6	100
Gandaki-Hill	42.4	0.2		7.1		21.9	2.8	14.9	1.5		0.3	5.7					1.5	1.7	100
Gandaki-Terai	26.4	2.3		32.7	5.3	1.4	1.9		2.6			21.8					2.6	2.9	100
Lumbini-Hill	7.7	3.5		4.6		5.8	4.5		1.4	0.4	0.3	46.1						25.7	100
Lumbini-Terai	48.7	0.4	0.7	15.1	15.6	1.6	1.1		0.5			0.8			2.7	10.9	0.4	1.6	100
Karnali-Mountain	22.7	0.5	0.7	36.1		8.6		1.1	4.4			23.0					0.5	2.4	100
Karnali-Hill	54.9	8.5	0.1	5.8		9.7		3.1	0.4			14.6					2.9		100
Sudurpaschim-Moun-tain	15.0	0.6		17.8		36.8	1.1	6.5				11.7	0.7	5.7				4.1	100
Sudurpaschim-Hill	49.2	0.5		13.5		15.1		1.9	0.5	0.5	1.6	14.8					2.1	0.5	100
Sudurpaschim-Terai	26.5	0.3	0.7	22.4	18.8	9.6	0.4	0.4	0.4		1.5	2.8				0.7	9.7	5.8	100
Nepal	**44.87**	**1.62**	**0.88**	**13.87**	**4.22**	**9.90**	**1.14**	**3.50**	**0.70**	**0.12**	**0.29**	**7.81**	**0.02**	**0.13**	**1.16**	**1.99**	**3.46**	**4.31**	**100**

Early Warning

Table 4.6 presents accessibility of information received by the respondents regarding induced climate disaster across different analytical domain. In urban municipalities, 16.3% of households received Early-warning information, while 83.7% of the respondents do not receive any information regarding a disaster occurring in near future.

Over the last five years, the nationwide provision of Early-warning information to households across the country has been reported (12.91%), which is a relatively very low access of information. Notably, within the climate risk index categories, municipalities with a very high climate risk index experience the highest percentage; 21.4% of households receiving Early-warning information. Altitude-wise, households situated in low-altitude regions have been received more Early-warning information as compared to higher-altitude regions. Additionally, across other analytical domains, there were a consistent trend where a higher percentage of households residing in the Terai region received Early-warning information. This suggests the need of strategies improvement in preparedness and flow of information.

Table 4.6: Households (%) assess to Early-warning Information on Climate Induced Disasters over Last 5 Years

Analytical domain	Yes	No	Total
Municipality			
Urban	16.3	83.7	100
Rural	8.3	91.7	100
Ecological zone			
Mountain	3.0	97.0	100
Hill	5.3	94.7	100
Terai	22.5	77.5	100
Province ecological zones			
Koshi-Mountain	3.5	96.5	100
Koshi-Hill	13.5	86.5	100
Koshi-Terai	39.3	60.7	100
Madhesh-Terai	16.4	83.6	100
Bagmati-Mountain	1.9	98.1	100
Bagmati-Hill	3.9	96.1	100
Bagmati-Terai	24.1	75.9	100
Gandaki-Mountain	2.6	97.4	100
Gandaki-Hill	5.4	94.6	100
Gandaki-Terai	31.2	68.8	100
Lumbini-Hill	4.9	95.1	100
Lumbini-Terai	6.4	93.6	100
Karnali-Mountain	0.7	99.3	100
Karnali-Hill	0.4	99.6	100
Sudurpaschim-Mountain	5.1	94.9	100
Sudurpaschim-Hill	1.3	98.7	100
Sudurpaschim-Terai	47.4	52.6	100
Altitude (meters)			
Below 120	20.5	79.5	100
120- Below 350	25.8	74.2	100

Analytical domain	Yes	No	Total
350- Below 1000	6.5	93.5	100
1000- Below 1300	6.6	93.4	100
1300- Below 1500	4.6	95.4	100
1500- Below 2000	5.7	94.3	100
2000+	2.4	97.6	100
Climate risk			
Very Low	9.7	90.3	100
Low	16.6	83.4	100
Moderate	20.6	79.4	100
High	17.6	82.4	100
Very High	21.4	78.6	100
Nepal	**12.91**	**87.09**	**100**

Table 4.7 shows the primary means of Early-warning information across different analytical domains. The national landscape of Early-warning information sources in Nepal was mobile based Short Message Service (SMS); 37% of households reported it as their primary source. Radio also playing major role, reported assess to 22.7% of households. Television is another impressive source, reported by 11.3% of households. Social media and community-based sources contributed significantly as well, with 9.5% and 9% of households, respectively, relying on these channels for Early-warning information. This diversified communication assets are very essential for the effective information flow.

Table 4.7: Households (%) Reporting Main Source of Early-warning Information

Analytical domain	Radio	Television	Miking	Community	Local level	SMS	Siren	Social media /Internet	Others	Total
Municipality										
Urban	24.4	12.7	6.2	7.1	1.2	35.0	0.6	12.3	0.6	100
Rural	18.2	7.7	0.5	14.1	5.2	42.6	7.4	2.3	1.9	100
Ecological zone										
Mountain	25.6	16.9	45.6		3.3	3.3		5.4		100
Hill	26.7	33.8	0.4	3.9	3.2	17.7	1.2	12.2	1.0	100
Terai	21.6	5.8	4.7	10.5	2.1	42.5	2.8	9.0	1.0	100
Province ecological zones										
Koshi-Mountain	42.3	42.5						15.2		100
Koshi-Hill	31.3	14.3		3.4	5.8	39.4		4.2	1.5	100
Koshi-Terai	15.2	7.8	0.2	17.4	3.4	50.4		3.9	1.7	100
Madhesh-Terai	44.9	4.1	8.5	8.5	1.8	11.8		20.4		100
Bagmati-Mountain	72.6	27.4								100
Bagmati-Hill	17.4	66.8			3.0	2.2		10.6		100
Bagmati-Terai	17.8	19.9	1.5	8.8		35.7		11.7	4.6	100
Gandaki-Mountain								100.0		100
Gandaki-Hill	24.3	25.9	2.0	5.0			6.2	36.6		100
Gandaki-Terai	19.8	3.5	4.8	8.5		43.9		18.4	1.2	100

Analytical domain	Radio	Television	Miking	Community	Local level	SMS	Siren	Social media /Internet	Others	Total
Lumbini-Hill	37.6	43.6		6.2		9.2			3.4	100
Lumbini-Terai	2.9	4.2	27.7		2.9	19.7	42.6			100
Karnali-Mountain					100.0					100
Karnali-Hill	100.0									100
Sudurpaschim-Mountain			93.3			6.7				100
Sudurpaschim-Hill				53.4		19.9		26.7		100
Sudurpaschim-Terai	4.0	1.0	0.7	1.2		90.5	0.6	1.7	0.3	100
Altitude (meters)										
Below 120	24.9	6.6	5.5	12.5	1.6	34.6	1.5	12.5	0.3	100
120- Below 350	13.6	4.5	3.7	6.5	1.0	59.6	5.3	5.0	0.8	100
350- Below 1000	23.5	22.4	11.1	11.0	7.4	16.2	2.8	5.3	0.4	100
1000- Below 1300	46.7	19.1	1.7	2.2	1.9	10.9		17.0	0.4	100
1300- Below 1500	24.0	52.3		3.0	4.1	3.0		10.6	3.0	100
1500- Below 2000	20.4	33.4		4.4	1.4	31.5			8.9	100
2000+	5.5	20.0	7.7		37.5			29.4		100
Climate risk										
Very Low	31.2	15.8	8.9	6.7	3.5	23.6	0.3	9.1	0.8	100
Low	18.0	6.9	0.8	6.2		60.7	0.3	4.8	2.3	100
Moderate	16.0	11.5	0.8	17.1	1.9	30.3	0.7	21.8		100
High	8.0			40.2		51.8				100
Very High	2.2		1.2	2.1	4.4	57.9	32.2			100
Nepal	**22.7**	**11.3**	**4.7**	**9.0**	**2.3**	**37.0**	**2.5**	**9.5**	**1.0**	**100**

Table 4.8 highlights preparatory measures adopted by households across different analytical domains to protect themselves from climatic induced disasters. Nationally, 35.7% of households reported respondents are engaging in preparatory work, while 64.3% are beyond of these initiatives. Notably, rural areas respondents mainly focused on preparatory measures (45.1%).

Table 4.8: Households (%) Reporting Preparatory Activities Performed after Receiving Early-warning Information to Minimize Loss from Disaster

Analytical domain	Yes	No	Total
Municipality			
Urban	32.1	67.9	100
Rural	45.1	54.9	100
Ecological zone			
Mountain	40.5	59.5	100
Hill	25.4	74.6	100
Terai	38.1	61.9	100
Province - ecological zone			
Koshi-Mountain	13.4	86.6	100

Analytical domain	Yes	No	Total
Koshi-Hill	44.3	55.7	100
Koshi-Terai	44.4	55.6	100
Madhesh-Terai	22.2	77.8	100
Bagmati-Mountain	72.6	27.4	100
Bagmati-Hill	8.9	91.1	100
Bagmati-Terai	32.2	67.8	100
Gandaki-Mountain		100.0	100
Gandaki-Hill	10.2	89.8	100
Gandaki-Terai	49.2	50.8	100
Lumbini-Hill	22.7	77.3	100
Lumbini-Terai	67.1	32.9	100
Karnali-Mountain		100.0	100
Karnali-Hill		100.0	100
Sudurpaschim-Mountain	46.7	53.3	100
Sudurpaschim-Hill	46.6	53.4	100
Sudurpaschim-Terai	38.7	61.3	100
Altitude (meters)			100
Below 120	34.4	65.6	100
120- Below 350	38.9	61.1	100
350- Below 1000	32.7	67.3	100
1000- Below 1300	47.3	52.7	100
1300- Below 1500	16.1	83.9	100
1500- Below 2000	31.6	68.4	100
2000+	32.4	67.6	100
Climate risk			
Very Low	35.8	64.2	100
Low	32.3	67.7	100
Moderate	37.2	62.8	100
High	32.2	67.8	100
Very High	44.8	55.2	100
Nepal	**35.7**	**64.3**	**100**

Table 4.9 overview the preparatory measures adopted by households across various analytical domains to protect themselves from disasters.

In response to early-warning information 45.6% of households reported relocating to a safe place, introducing anticipatory approach to disaster preparedness. Additionally, 24% of households took measures to protect livestock by moving them to safe zone. The importance of securing food supplies was recognized by 9.6% of households. 5.2% of households were financially prepared, managing the necessary funds to address emergency situations. However, 6.5% of households were unable to undertake any preparatory work.

This finding provides the diverse measures adopted by households to safeguard themselves, their assets, and resources. These diverse response highlights the importance preparedness efforts

that encompass both physical actions (relocation and livestock management), as well as strategic measures (financial planning) need to address through the respective government institution.

Table 4.9: Households (%) Reporting Major Preparatory Activities Performed after Receiving Early Warning Information

Analytical domain	Moving to a safe place	Managing required money	Moving livestock in the safe place	Safe storage of food	Received support	Others	Not stated	Total
Municipality								
Urban	33.2	7.1	24.1	12.9	0.6	13.0	9.1	100
Rural	69.1	1.5	23.9	3.4		0.5	1.6	100
Ecological zone								
Mountain	32.2	16.1	22.1	8.0		8.5	13.1	100
Hill	21.0		63.4	4.6		4.5	6.5	100
Terai	50.0	5.7	17.7	10.5	0.4	9.4	6.4	100
Province - ecological zone								
Koshi-Mountain			100.0					100
Koshi-Hill	8.9		88.5				2.6	100
Koshi-Terai	55.1	1.2	28.4	3.9		3.2	8.2	100
Madhesh-Terai	10.2	7.6	13.8	24.6	2.5	32.3	8.9	100
Bagmati-Mountain			37.8			24.4	37.8	100
Bagmati-Hill	29.8			29.8		19.9	20.4	100
Bagmati-Terai	43.8	8.7	5.1	9.8		28.9	3.7	100
Gandaki-Hill	100.0							100
Gandaki-Terai	52.5	12.6		19.2		8.6	7.1	100
Lumbini-Hill	43.6					27.4	28.9	100
Lumbini-Terai	77.2	16.8	4.0	2.0				100
Sudurpaschim-Mountain	57.1	28.6		14.3				100
Sudurpaschim-Hill			42.7	57.3				100
Sudurpaschim-Terai	58.6	6.7	7.4	18.8		5.5	3.0	100
Altitude(meters)								
Below 120	36.9	4.7	25.2	10.9	0.8	14.0	7.5	65,583
120- Below 350	61.7	8.5	9.8	10.7		5.2	4.2	47,735
350- Below 1000	62.2	2.3	11.9	8.2		5.6	9.7	11,129
1000- Below 1300	23.3		59.0	4.1		4.5	9.1	14,681
1300- Below 1500	22.6		39.4	22.6			15.4	2,610
1500- Below 2000	42.2		57.8					6,067
2000+	76.2	23.8						1,095
Climate risk								
Very Low	33.7	7.9	24.7	14.3	0.8	12.1	6.5	71,311
Low	44.2	2.1	25.3	5.4		12.7	10.4	33,785
Moderate	58.2	4.7	23.5	8.2			5.5	28,329

Analytical domain	Moving to a safe place	Managing required money	Moving livestock in the safe place	Safe storage of food	Received support	Others	Not stated	Total
High	25.0		75.0					3,204
Very High	95.4		4.6					12,269
Nepal	**45.6**	**5.2**	**24.0**	**9.6**	**0.4**	**8.7**	**6.5**	**148,899**

Changes in Seasons and Incidence of Climate Induced Disaster

Table 4.10 provides the perceptions of temperature changes over the past 25 years in different seasons among respondents. Overall, a substantial percentage (88.1%) of respondents reported experiencing changes in temperature, with the highest responses was observed in Spring season (Chaitra, Baisakh), followed by Autumn (Jestha, Asar) 87.6%, and the Rainy season (Shrawan, Bhadra) 85.5%. Conversely, the lowest response for Winter (Mangsir, Poush) 83.7%.

This conformes the change in the seasonal temperature, the majority reported an increase. Specifically, in the Autumn season 94.1% noted an increase, followed by Spring season (92.2%), Rainy season (92.4%), Autumn (Ashoj, Kartik) (89.8%), Winter (80.5%), and Spring (82.4%). The percentage of respondents reporting a decrease in temperature is very low, ranging from 5.4% to 18.5 % in order to increase in temperature.

Perception among respondents of changing temperature patterns over the years conforms the increase across various seasons. Such insights are valuable for local government during climate change adaptation and mitigation program installation.

Table 4.10: Perception of Households (%) on Temperature Change with Seasons, and type of Change in the Past 25 Years

Category	Yes	No	Don't know	Total	Increased	Decreased	No change	Total
Basant (Chaitra, Baisakh)	88.1	10.2	1.7	100	92.2	7.1	0.7	100
Grisma (Jestha, Asar)	87.6	10.8	1.6	100	94.1	5.4	0.4	100
Barsha (Shrawan, Bhadra)	85.5	12.6	1.9	100	92.4	7.2	0.5	100
Sarad (Ashoj, Kartik)	77.7	20.2	2.1	100	89.8	9.2	1.0	100
Hemant (Mangsir, Poush)	83.7	14.5	1.8	100	80.5	18.5	1.0	100
Shisir (Magh, Falgun)	85.4	12.8	1.8	100	82.4	16.9	0.7	100

Table 4.11 presents the changes in precipitation patter compared to 25 years ago across different seasons as reported by respondents. The overall trend shows majority of respondents have observed changes in rainfall pattern in each season. In the Spring/*Basant* season (Chaitra, Baisakh), 89.5% of respondents reported experienced change in rainfall, with only 8.8% stating no change. Similarly, in the Autumn/*Grisma* season (Jestha, Asar), 90.1% reported changes, while 8.3% did not perceive any change. The Rainy/*Barsa* season (Shrawan, Bhadra) saw 89.8% of respondents experienced changes, and 8.6% reported no change.

The pattern of precipitation was slightly lower in the Autumn/*Sarad* season (Ashoj, Kartik), where 80.3% of respondents experienced changes, and 17.7% did not experienced any change. For the

Winter/*Hemant* season (Mangsir, Poush), 85.6% experienced changes, and 12.4% did not. In the Spring/*Shisir* season (Magh, Falgun), 87.4% reported changes, while 10.6% reported no change in precipitation pattern.

This finding suggests a significant proportion of respondents experienced alterations in rainfall pattern. Respondents perceptions are very necessary to understanding local climate dynamics, for climate change adaptation, and water resource management strategies in regional prospective.

Table 4.11: Perception of households (%) on rainfall pattern change with seasons in the past 25 years

Category	Yes	No	No change	Total
Basant (Chaitra, Baisakh)	89.5	8.8	1.7	100
Grisma (Jestha, Asar)	90.1	8.3	1.6	100
Barsha (Shrawan, Bhadra)	89.8	8.6	1.5	100
Sarad (Ashoj, Kartik)	80.3	17.7	2.0	100
Hemant (Mangsir, Poush)	85.6	12.4	2.0	100
Shisir (Magh, Falgun)	87.4	10.6	2.0	100

Table 4.12 shows that the majority of respondents across all seasons experienced an increase in climate-induced disasters over the last 25 years, with the highest percentage reported during the Rainy/*Barsa* season (61.4%) and respondent experienced slight increase is in the Winter/*Hemant* season. Responses indicating a decrease and no change vary across seasons but generally constitute a smaller percentage compared to those reporting an increase. These finding highlights respondents perception that climate change had contributed to a rise in disasters throughout different seasons and necessity for specific strategies to address and mitigate the climate change impacts.

Table 4.12: Households (%) Reporting Change in Incidences of Climate Induced Disasters by Seasons in the Past 25 Years

Category	Increased	Decreased	No change	Total
Basant (Chaitra, Baisakh)	57.6	34.5	7.9	100
Grisma (Jestha, Asar)	57.8	34.1	8.1	100
Barsha (Shrawan, Bhadra)	61.4	31.3	7.3	100
Sarad (Ashoj, Kartik)	59.2	31.2	9.6	100
Hemant (Mangsir, Poush)	52.6	36.9	10.5	100
Shisir (Magh, Falgun)	55.0	35.5	9.4	100

Impact of Disasters and Initiatives Taken During Past 25 Years

Table 4.13 provides information on the percentage of affected households from various climate-induced disasters over the last 25 years. Drought is reported as the major disaster, affecting 65.4% of households, followed by diseases/insects 54.3%, storms 46.2%, hailstorm 32.6%, flood 28.5% cold wave 21.7%, landslide 21.5%, and inundation 17.5%. Thunderstorm impact 15.7% of households, while other disasters such as avalanches, GLOFs, and snowstorms has relatively experience lower than others. The data reflects the various pattern of climate-induced disasters that individual households faced, and need inclusive strategies to mitigate and cope with those challenges.

Table 4.13: Households' Affected from Climate Induced Disasters (%) in the Past 25 Years

Disaster	Yes	No	Not Applicable	Total
Drought	65.4	33.6	1.0	100
Forest fire	14.1	75.5	10.4	100
Fire in settlement	6.3	90.9	2.8	100
Flood	28.5	66.1	5.4	100
Inundation	17.5	26.5	56.0	100
Wind storm	46.2	50.1	3.7	100
Thunderstorm	15.7	81.7	2.6	100
Hailstorm	32.6	65.3	2.1	100
Heavy rain	10.7	82.8	6.5	100
Sporadic rain	11.0	80.0	9.0	100
Soil erosion	7.4	70.8	21.8	100
Landslide	21.5	47.5	31.0	100
Snowstorm	0.1	5.5	94.4	100
Avalanche	0.2	5.5	94.3	100
GLOF	0.1	5.6	94.4	100
Hot wave	11.6	19.9	68.5	100
Cold wave	21.7	18.5	59.9	100
Diseases / insects	54.3	36.4	9.3	100
Others	0.2	89.6	10.3	100

Table 4.14 presents the level of impact from various climate-induced disasters over the past 25 years, categorized into different impact severity levels. Drought have been the significant and recurring disaster, with different degrees of impact, 33.3% of households experiencing a very low impact, while 4.0% reported a very high impact. Fire in settlements and forest fires have been experienced other two major impact, substantial percentage of households experiencing low in the degree of impact. Flood have been observed with highest degree of severity impact (5.2). Diseases and insect-related disasters imposed more distributed showing 31.0% a moderate impact. Landslides and Glacial Lake Outburst Floods (GLOFs) were reported from high to very high impacts on households. The data highlights the need for individual mitigation and adaptation strategies, considering the varying impact levels across different climate-induced disasters.

Table 4.14: Level of Impact from the Climate Induced Disaster over the Past 25 Years

Impact Severity (%)						
Disaster	**Very low**	**Low**	**Moderate**	**High**	**Very high**	**Total**
Drought	33.3	18.1	27.4	17.3	4.0	100
Forest fire	53.9	20.2	12.9	11.1	1.9	100
Fire in settlement	60.7	22.3	7.8	4.1	5.1	100
Flood	26.1	23.0	20.3	25.3	5.2	100
Inundation	22.1	30.1	28.7	15.5	3.6	100
Wind storm	29.6	28.7	27.7	11.4	2.6	100
Thunderstorm	53.8	19.9	10.4	10.9	5.0	100
Hailstorm	23.3	34.9	25.1	12.3	4.3	100
Heavy rain	39.1	21.6	25.5	10.1	3.7	100
Sporadic rain	53.7	16.6	13.7	14.2	1.9	100
Soil erosion	18.6	30.3	26.4	16.2	8.5	100
Landslide	25.9	17.1	23.2	26.2	7.6	100
Snowstorm	18.4	34.1	22.2	25.2		100
Avalanche		14.3	35.7	50.0		100
GLOF	13.9	14.9	14.9	42.6	13.9	100
Hot wave	40.4	30.3	24.1	4.4	0.9	100
Cold wave	31.9	34.3	21.5	9.5	2.8	100
Diseases / insects	14.0	20.4	31.0	26.4	8.1	100
Others	35.3	14.7	10.6	23.9	15.5	100

Table 4.15 shows the initiatives taken by households to prevent or minimize the impact from various disaster incidents over the past 25 years and range of strategies adopted by households in response to specific disaster types. 89.4% households are not taking any preventive measures in case of drought, while a small percentage engaged in activities such as training and public awareness programs (0.6%) and tree plantation (1.8%). In case of, Forest fires, initiatives included training and awareness programs (4.0%), tree plantation (0.3%), and maintenance of houses/sheds (7.3%). Flood-affected households took different actions, including land management (4.4%), tree plantation (2.9%), and construction of retaining walls (10.7%). Notably, for certain disasters like snowstorms, avalanches, and GLOF, households reported a lack of specific preventive measures.

Table 4.15: Major Initiatives to Prevent/Minimize Disaster Incidences Practiced by the Households (%) in Last 25 Years

Disaster	Participation on trainings and public awareness programs	Land management	Afforestation	Maintenance of houses / sheds	Management of rain water	Construction of retaining wall	Pruning tree branches	Management of dry leaves and litter	Maintenance, wiring and earthing activities	Others	None of the activities	Total
Drought	0.6	0.3	1.8	0.0	0.2			0.1	0.0	7.6	89.4	100
Forest fire	4.0	0.2	0.3			0.1	0.8	7.3	0.1	10.0	77.1	100
Fire in settlement	4.2		0.5	13.7	0.1			0.7	2.1	13.6	65.2	100
Flood	0.9	4.4	2.9	2.6	5.7	10.7				4.3	68.5	100
Inundation	1.1	5.1	0.9	3.8	15.4	1.5	0.0			1.0	71.1	100
Wind storm	0.4	0.1	0.4	18.5	0.0	0.0	1.7	0.0	1.5	1.2	76.1	100
Thunderstorm	0.7			1.0			0.2	0.1	7.9	2.0	88.1	100
Hailstorm	0.1			4.8					0.5	1.0	93.7	100
Heavy rain	0.4	3.5	0.9	2.3	7.5	0.7				1.0	83.8	100
Sporadic rain	0.4	0.2	0.8		0.2				0.0	1.9	96.5	100
Soil erosion	0.4	24.6	4.5	0.7	3.8	4.9				0.8	60.4	100
Landslide	1.2	4.7	7.3	2.5	1.7	4.9	0.2	0.1	0.3	1.1	75.9	100
Snow storm											100.0	100
Avalanche											100.0	100
GLOF											100.0	100
Hot wave	0.4		3.3		0.3					19.1	77.0	100
Cold wave	0.3	0.0		0.7			0.1			25.9	73.0	100
Diseases / insects	3.2	0.0	0.1	0.0	0.0		0.0	0.4		31.6	64.6	100
Others	14.7		19.8							3.7	61.7	100

Conclusion

The findings provide an importance of multiple channels for acquiring knowledge about climate change, effective communication and education across different platforms. Level of impact varies across regional variance which highlights the necessitating specific strategies for geographical challenges. The survey reflected valuable insights into communities' perception towards climate change, understanding of regional and informing targeted initiatives for climate resilience. And display diverse understanding of climate change causes, highlights the need for specific interventions based on perceptions. Inequality access to Early-warning information across diverse regions and altitude, and varied reliance on different communication assets highlights the necessity of adopting different approach for effective and widespread flow of information. This chapter provides insights into the diverse preparatory measures adopted by households and importance of implementing extensive disaster preparedness efforts, incorporating both physical actions (such as relocation and livestock management), and strategic measures (financial planning).

The finding highlights perception among respondents of changing temperature patterns, with increases noted across various seasons. These insights are valuable for understanding local climate perceptions, providing essential information for the development of climate change adaptation and mitigation strategies in the region. Additionally, a significant proportion of respondents' experience alterations in precipitation patterns across different seasons provides essential information for understanding local climate dynamics and guiding climate change adaptation and water resource management strategies. The observed variations in perceptions across seasons emphasize the different nature of climate understanding among respondents. Furthermore, the widespread perception linking climate change to an increase in disasters across different seasons highlights the need for extensive strategies to address to mitigate the impacts of change in climate. Similarly, the diverse range of climate-induced disasters, highlights the necessity for specific strategies to mitigate and adaptation of impact through induced disaster.

CHAPTER 5

IMPACTS OF CLIMATE INDUCED DISASTER

Introduction

This chapter explores the impact of climate-induced disasters on various aspects, including physical infrastructure, food security, and economic losses. It examines the impacts on infrastructure such as roads, irrigation systems, and buildings by the impact of climate change. The analysis includes 18 different types of disasters, ensuring a thorough exploration of the diverse challenges imposed by each. The results are estimated and presented separately for different analytical domains, allowing for in depth understanding of the specific vulnerabilities and implications faced in different analytical domains, focusing on the effects of disasters on both tangible assets and critical sectors such as food security and the economy. This chapter also contributes valuable insights to the broader understanding of disaster management and resilience planning.

Summary of Findings

In Nepal, over last five years, climate induced disasters such as flood (50.2%), landslides (43.3%) and inundation (36.2%), soil erosion (31%) affected household damaging physical infrastructure. Impact of heavy rain (30.9%), avalanche (13.7%), windstorm (11.7%), fire in settlement (10.5%), thunderstorm (10.2%) was moderate. Impact of GLOF, cold wave, heat wave, disease/insects' impact, hailstorm, drought, sporadic rain, forest fire was significantly low (Figure 5.1).

Figure 5.1: Households (%) Reporting Physical Infrastructure Damage due to Climate Induced Disaster Over Last 5 Years

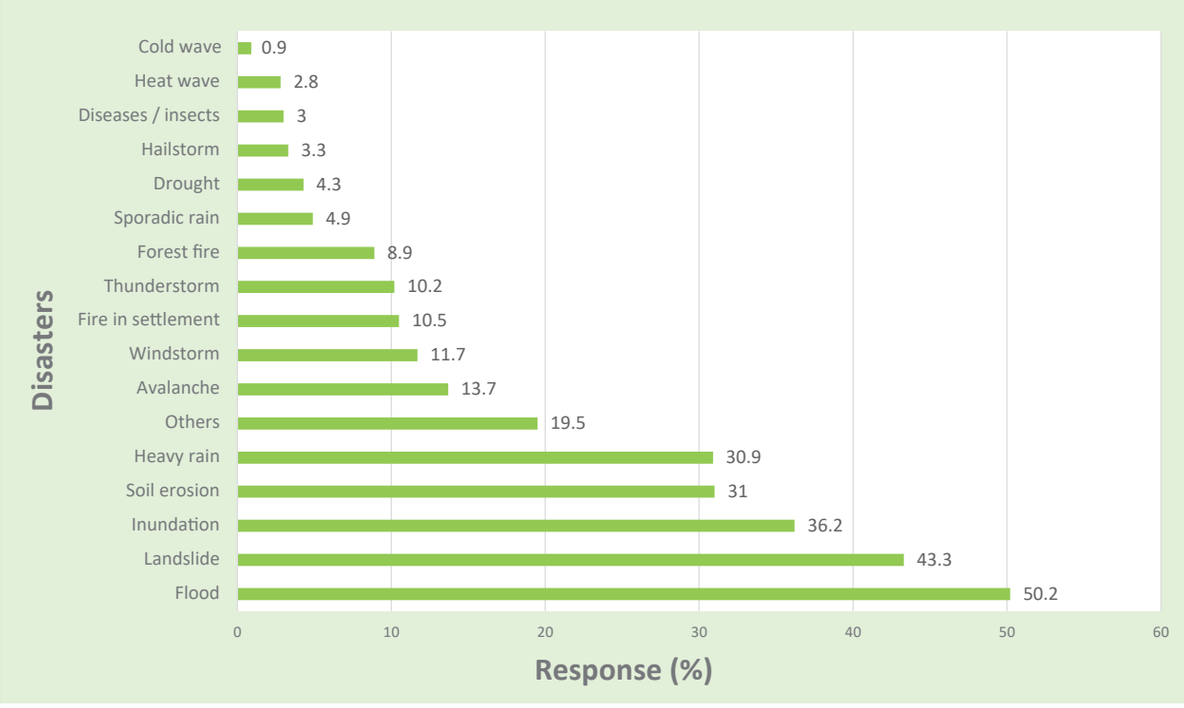
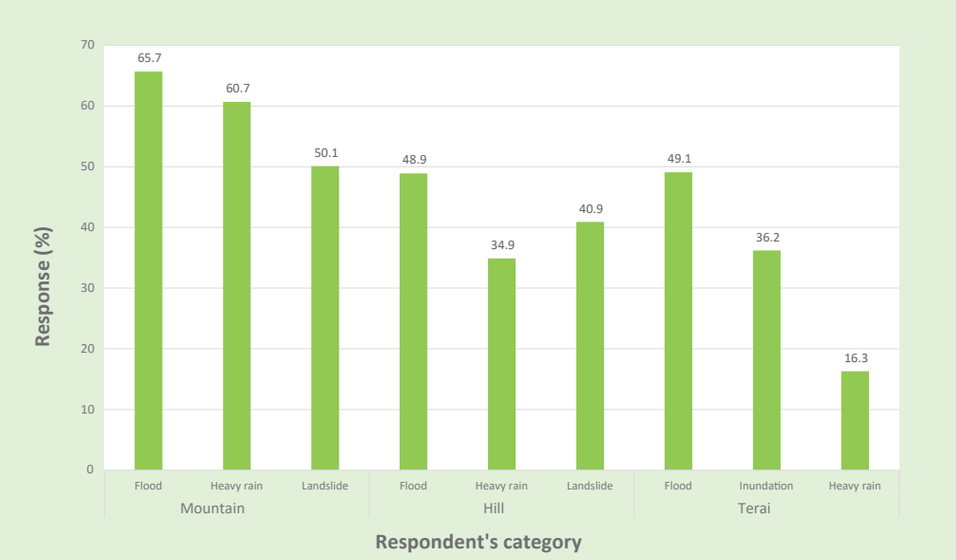
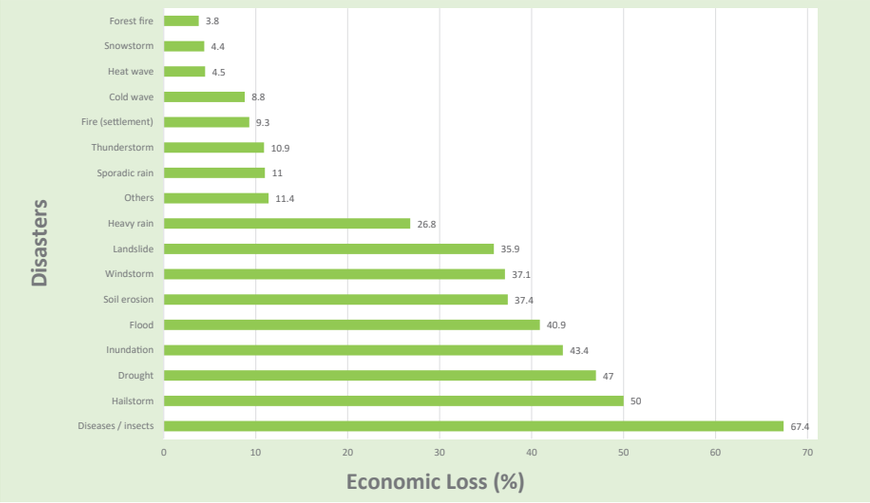


Figure 5.2: Households (%) Reporting Physical Infrastructure Damage due to Climate Induced Disaster Over Last 5 Years (Ecological zone)



Mountain region experienced flood as a major impact (65.7%), followed by heavy rain (60.7%), and landslides (50.1%) damaging physical infrastructure. In the Hilly region, households were affected by floods (48.9%), followed by landslides (40.9%). Similarly, households in the Terai region were significantly impacted by floods (49.1%), with inundation affecting 36.2% of households (Figure 5. 2).

Figure 5. 3: Households Facing Economic Loss due to Climate Induced Disasters in the Last Five Years



Over the last five years, households observed the impact of climate-induced disasters on various aspects of their livelihoods such as disease/insects, hailstorms, drought, inundation, flood, soil erosion, windstorm, landslides, heavy rain and so on. Households have been facing disruptions in their food security, workdays, infrastructure damage and economic loss due to these disasters. Around 67.4% economic loss was reported due to diseases and insects in agriculture and animal husbandry, while economic loss from hailstorms (50%), droughts (47%), inundation (43.4%), and floods (40.9%) was recorded. However, less than 10% of households reported impact from economic loss due to impact from climate induced disaster such as forest fires, snowstorms, heatwaves, cold waves, and settlement fires (Figure 5. 3).

Damage to Physical Infrastructure

Table 5.1 shows households affected by damage to physical infrastructure, including roads, irrigation systems, buildings, and more, over the past five years. Flood affected 50.2% of the households followed by landslide (43.3%), inundation (36.2%). Over the last five years, impact of GLOFs was not observed; impact of cold wave, disease/Insects, heatwave, hailstorm, drought was minimal. This shows the prevalence of climate-induced disasters, particularly flood and landslide, and signifies their substantial impact on the resilience of physical infrastructure within communities. (Note: The reason behind no observation of GLOF impact might be due to sampling units not being covered in the most GLOF affected areas such as Solukhumbu and Sankhuwasabha).

Table 5.1: Households (%) Reporting Physical Infrastructure Damage due to Climate Induced Disaster Over Last 5 Years

Analytical domain	Disasters	Affected	Not affected	Total
Nepal	Drought	4.3	95.7	100
	Forest fire	8.9	91.1	100
	Fire in settlement	10.5	89.5	100
	Flood	50.2	49.8	100
	Inundation	36.2	63.8	100
	Windstorm	11.7	88.3	100
	Thunderstorm	10.2	89.8	100
	Hailstorm	3.3	96.7	100
	Heavy rain	30.9	69.1	100
	Sporadic rain	4.9	95.1	100
	Soil erosion	31.0	69.0	100
	Landslide	43.3	56.7	100
	Avalanche	13.7	86.3	100
	GLOF	-	100.0	100
	Heat wave	2.8	97.2	100
	Cold wave	0.9	99.1	100
	Diseases / insects	3.0	97.0	100
	Others	19.5	80.5	100

Table 5.2 provides an overview of households affected by damage to physical infrastructure, such as roads, irrigation systems, and buildings, over the last five years, categorized by ecological belts (Mountain, Hilly, Terai). Flood, heavy rainfall, and landslide were found to be prominent climate-induced disasters resulting damage in infrastructure. Additionally, in the Terai region, inundation is emerged as another significant factor resulting destruction of infrastructures. This reflects the widespread impact of climate induced disasters on various ecological belts, highlighting the need for targeted mitigation and adaptation strategies to enhance the resilience of communities facing these challenges.

Table 5.2: Households (%) Reporting Physical Infrastructure Damage in Ecological-zone due to Climate Induced Disaster Over Last 5 Years

Analytical domain	Disasters	Yes	No	Total
Mountain	Drought	3.7	96.3	100
	Forest fire	1.0	99.0	100
	Fire (settlement)		100.0	100
	Flood	65.7	34.3	100
	Windstorm	9.5	90.5	100
	Thunderstorm		100.0	100
	Hailstorm	1.3	98.7	100
	Heavy rain	60.7	39.3	100
	Sporadic rain		100.0	100
	Soil erosion	18.3	81.7	100
	Landslide	50.1	49.9	100
	Avalanche	13.7	86.3	100
	GLOF		100.0	100
	Diseases / insects	0.8	99.2	100
	Others	40.1	59.9	100
Hill	Drought	3.9	96.1	100
	Forest fire	9.3	90.7	100
	Fire (settlement)	20.1	79.9	100
	Flood	48.9	51.1	100
	Windstorm	10.2	89.8	100
	Thunderstorm	9.6	90.4	100
	Hailstorm	2.9	97.1	100
	Heavy rain	34.9	65.1	100
	Sporadic rain	5.6	94.4	100
	Soil erosion	33.0	67.0	100
	Landslide	40.9	59.1	100
	Diseases / insects	3.0	97.0	100
	Others		100.0	100
Terai	Drought	5.0	95.0	100
	Forest fire	10.5	89.5	100
	Fire (settlement)	11.5	88.5	100
	Flood	49.1	50.9	100
	Inundation	36.2	63.8	100
	Windstorm	15.5	84.5	100
	Thunderstorm	14.3	85.7	100
	Hailstorm	4.8	95.2	100
	Heavy rain	16.3	83.7	100
	Sporadic rain	3.7	96.3	100
	Soil erosion	33.2	66.8	100
	Landslide	53.6	46.4	100
	Heat wave	2.8	97.2	100
	Cold wave	0.9	99.1	100
	Diseases / insects	3.5	96.5	100
	Others	17.4	82.6	100

Table 5.3 outlines the percentage households that were isolated/unable to work due to disturbances and obstacle caused due to climate induced disasters over the past five years. On average, households missed 12.3 working days due to avalanches. in this regard avalanches considered as the impactful disaster followed by diseases and insects (missed 11.7 working days) drought (missed 5.2 working days). Conversely, households experienced less than one average working day of disruption due to forest fires, windstorms, and soil erosion. This finding provided valuable insights into the varied impacts of different climate-induced disasters on the working patterns of households, highlighting the need for targeted interventions to address specific challenges.

Table 5.3: Working Days Missed by Households (%) due to Climate Induced Disasters in Last 5 Years

Analytical domain	Disasters	Not missed	Upto 1 week	1-2 week	2-3 week	3 weeks-1 month	1-3 months	3-6 months	More than 6 months	Average days missed	Total
Nepal	Drought	87.2	1.1	1.0	2.7	4.4	2.7	0.8	0.2	5.2	100
	Forest fire	89.6	9.8	0.3		0.3				0.4	100
	Fire (settlement)	75.7	19.9	1.5		2.9				1.7	100
	Flood	55.3	28.3	4.8	5.3	3.9	2.1	0.3	0.1	5.4	100
	Inundation	58.5	29.3	3.9	4.0	2.2	2.1			3.9	100
	Windstorm	91.4	6.9	0.8	0.2	0.4	0.3			0.6	100
	Thunderstorm	92.5	5.5	0.1	0.4	0.2	1.3			1.2	100
	Hailstorm	89.6	10.2		0.2		0.0			0.3	100
	Heavy rain	70.8	19.7	3.6	4.2	0.7	1.0			2.8	100
	Sporadic rain	91.5	4.1		1.0	1.4	2.1			2.0	100
	Soil erosion	98.0	1.0	0.3	0.2	0.5				0.2	100
	Landslide	77.2	14.7	1.9	2.6	1.8	1.5	0.0	0.3	5.0	100
	Avalanche	86.3				6.8		6.8		12.3	100
	GLOF	100.0								0.0	100
	Heat wave	93.7	3.4	0.9	0.5	0.7	0.8			1.0	100
	Cold wave	80.1	12.0	2.5	2.4	1.8	1.2			2.4	100
	Diseases / insects	76.0	3.2	2.2	3.1	2.4	10.3	2.4	0.4	11.7	100
	Others	61.9	8.6		24.7	4.8				5.3	100

Table 5.4 highlights the average distribution of households who missed their working days due to climate-induced disasters across ecological belts over the last five years. Higher severity of drought (21.2 working days) impact was found in mountainous region followed by avalanches (12.3 working days). Furthermore, households in the Terai region reported an average of 23.1working days missed due to diseases and insects. This finding highlights the impact of climate-induced disasters on the livelihoods varies depending on the region and need for specific strategies in each ecological belt to address the challenges imposed by these induced disasters.

Table 5.4: Working Days Missed by Households (%) due to Climate Induced Disasters in Last 5 Years (Ecological-zone)

Analytical domain	Disasters	Not missed	Up to 1 week	1-2 weeks	2-3 weeks	3 weeks-1 month	1-3 months	3-6 months	More than 6 months	Average days missed	Total
Mountain	Drought	68.2	0.2	0.8	5.0	9.7	10.3	4.7	1.1	21.2	100
	Forest fire	90.4	7.3			2.3				0.8	100
	Fire (settlement)	73.6	26.4							0.6	100
	Flood	53.9	18.2	9.8	6.9	6.8	3.2	0.3	0.8	9.6	100
	Windstorm	90.8	6.5	0.9	0.7	0.4	0.7			0.9	100
	Thunderstorm	95.8	2.0			2.2				0.7	100
	Hailstorm	87.7	10.9		1.2		0.2			0.5	100
	Heavy rain	35.3	24	21.4	8.1	4.6	6.7			9.7	100
	Sporadic rain	100								0.0	100
	Soil erosion	94.8	1.7	2.6		0.9				0.5	100
	Landslide	70.7	12.1	3.7	4.2	5.5	2.9	0.2	0.7	8.1	100
	Avalanche	86.3				6.8		6.8		12.3	100
	GLOF	100								0.0	100
	Diseases / insects	94.8	3.7	0.5	0.5	0.5				0.4	100
	Others	31.3	44.3			24.4				8.2	100
Hill	Drought	86.7	1.3	1.0	2.8	5.1	2.6	0.5	0.1	4.9	100
	Forest fire	89.6	10.2			0.1				0.3	100
	Fire (settlement)	100								0.0	100
	Flood	75.9	20.7	1.6	0.3	1.2	0.3			1.4	100
	Windstorm	93.3	5.8	0.8		0.1				0.3	100
	Thunderstorm	92.8	4.6		0.6		2.0			1.6	100
	Hailstorm	88.9	11.0		0.1					0.2	100
	Heavy rain	72.9	25.0	1.6	0.5					1.5	100
	Sporadic rain	93.3	2.2			1.6	2.8			2.3	100
	Soil erosion	98.7	1.0			0.3				0.1	100
	Landslide	80.2	15.9	1.5	1.0	0.5	0.6		0.2	3.9	100
	Diseases / insects	94.0	2.1	0.7	0.9	0.7	0.5	0.7	0.4	3.3	100
	Others	100								0.0	100
Terai	Drought	92.3	1.1	1.0	2.0	2.1	1.3	0.3		2.2	100
	Forest fire	89.2	7.5	3.3						0.5	100
	Fire (settlement)	73.7	20.7	2.0		3.7				2.1	100
	Flood	49.6	31.5	5.2	6.5	4.4	2.5	0.3		6.2	100
	Inundation	58.5	29.3	3.9	4.0	2.2	2.1			3.9	100
	Windstorm	88.1	9.2	0.7	0.5	0.9	0.6			1.1	100
	Thunderstorm	90.9	8.9	0.3						0.2	100
	Hailstorm	91.3	8.6		0.1					0.3	100
	Heavy rain	80.0	11.9	0.2	7.3	0.2	0.4			2.1	100
	Sporadic rain	86.2	8.9		3.4	1.0	0.5			1.4	100
	Soil erosion	94.6			2.7	2.7				1.2	100
	Landslide	61.0	7.3	2.3	14.9	6.6	7.8			9.3	100
	Heat wave	93.7	3.4	0.9	0.5	0.7	0.8			1.0	100
	Cold wave	80.1	12.0	2.5	2.4	1.8	1.2			2.4	100
	Diseases / insects	52.9	4.4	4.2	6.1	4.5	22.9	4.7	0.4	23.1	100
	Others	63.4			36.6					5.5	100

Food Scarcity

Table 5.5 outlines the percentage distribution of households facing food scarcity due to climate-induced disasters over the past five years. 25.2 % of households faced food scarcity due to diseases and insects followed by inundation (23.8%). Flood and drought caused food scarcity at 18.7% and 18.1%, respectively. Notably, respondents reported that they have not experienced food scarcity due to glacial lake outburst floods (GLOF). This finding highlights the diverse challenges faced by households in securing food resources due to climate-induced disasters, need for targeted interventions to address specific vulnerabilities associated with different types of environmental disaster.

Table 5.5: Households (%) Facing Food Scarcity due to Climate Induced Disasters in the Last 5 Years

Analytical domain	Disasters	Yes	No	Total
Nepal	Drought	18.1	81.9	100
	Forest fire	0.5	99.5	100
	Fire (settlement)	16.8	83.2	100
	Flood	18.7	81.3	100
	Inundation	23.8	76.2	100
	Windstorm	7.3	92.7	100
	Thunderstorm	0.4	99.6	100
	Hailstorm	17.9	82.1	100
	Heavy rain	16.5	83.5	100
	Sporadic rain	5.9	94.1	100
	Soil erosion	5.2	94.8	100
	Landslide	13.0	87.0	100
	Avalanche	13.7	86.3	100
	GLOF		100.0	100
	Heat wave	0.4	99.6	100
	Cold wave	3.6	96.4	100
	Diseases / insects	25.2	74.8	100
	Others	29.5	70.5	100

Table 5.6 provides the percentage distribution of households experiencing food scarcity across ecological belt over the last five years. In the mountainous region, households have identified diseases and insects as the primary cause for food scarcity, 28.7%, followed by drought (27.6%) and floods (18.7%). In hilly areas, the major disaster for food scarcity were considered diseases and insects (25.9%), hailstorms (25.1%), and drought (21.9%). Conversely, in the Terai region, landslide-induced food scarcity (28.8%), followed by inundation (23.8%), and diseases and insects (23.6%). These finding highlights the varied impact of ecological and climatic factors on food security across different regions, need for region-specific strategies to address the distinct challenges caused by climate-induced disasters.

Table 5.6: Households (%) Facing Food Scarcity by Ecological-zone in Last 5 Years

Analytical domain	Disasters	Yes	No	Total
Mountain	Drought	27.6	72.4	100
	Forest fire	1.7	98.3	100
	Fire (settlement)	3.2	96.8	100
	Flood	19.6	80.4	100
	Windstorm	6.0	94.0	100
	Thunderstorm		100.0	100
	Hailstorm	13.5	86.5	100
	Heavy rain	12.9	87.1	100
	Sporadic rain		100.0	100
	Soil erosion	3.2	96.8	100
	Landslide	16.0	84.0	100
	Avalanche	13.7	86.3	100
	GLOF		100.0	100
	Diseases / insects	28.7	71.3	100
	Others	24.4	75.6	100
Hill	Drought	21.9	78.1	100
	Forest fire	0.4	99.6	100
	Fire (settlement)	9.7	90.3	100
	Flood	10.5	89.5	100
	Windstorm	9.3	90.7	100
	Thunderstorm	0.6	99.4	100
	Hailstorm	25.1	74.9	100
	Heavy rain	17.7	82.3	100
	Sporadic rain	5.5	94.5	100
	Soil erosion	5.9	94.1	100
	Landslide	10.9	89.1	100
	Diseases / insects	25.9	74.1	100
	Others		100.0	100
Terai	Drought	10.0	90.0	100
	Forest fire	1.0	99.0	100
	Fire (settlement)	20.2	79.8	100
	Flood	20.9	79.1	100
	Inundation	23.8	76.2	100
	Windstorm	4.2	95.8	100
	Thunderstorm	0.3	99.7	100
	Hailstorm	6.2	93.8	100
	Heavy rain	16.2	83.8	100
	Sporadic rain	7.4	92.6	100
	Soil erosion		100.0	100
	Landslide	28.8	71.2	100
	Heat wave	0.4	99.6	100
	Cold wave	3.6	96.4	100
	Diseases / insects	23.8	76.2	100
	Others	36.6	63.4	100

Economic Loss due to Climate Induced Disaster

Table 5.3 outlines the percentage of households that were isolated/unable to work due to disturbances and obstacle caused by climate induced disasters over the past five years. On average, households missed 12.3 working days due to avalanches. In this regard avalanches considered as the impactful disaster followed by diseases and insects (missed 11.7 working days) drought (missed 5.2 working days). Conversely, households experienced less than one average working day of disruption due to forest fires, windstorms, and soil erosion. This finding provided valuable insights into the varied impacts of different climate-induced disasters on the working patterns of households, highlighting the need for targeted interventions to address specific challenges.

Table 5.7: Households (%) Facing Economic Loss due to Climate Induced Disasters in last 5 Years

Analytical domain	Disasters	Yes	No	Total
Nepal	Drought	47.0	53.0	100
	Forest fire	3.8	96.2	100
	Fire (settlement)	9.3	90.7	100
	Flood	40.9	59.1	100
	Inundation	43.4	56.6	100
	Windstorm	37.1	62.9	100
	Thunderstorm	10.9	89.1	100
	Hailstorm	50.0	50.0	100
	Heavy rain	26.8	73.2	100
	Sporadic rain	11.0	89.0	100
	Soil erosion	37.4	62.6	100
	Landslide	35.9	64.1	100
	Snowstorm	4.4	95.6	100
	Avalanche		100.0	100
	GLOF		100.0	100
	Heat wave	4.5	95.5	100
	Cold wave	8.8	91.2	100
	Diseases / insects	67.4	32.6	100
	Others	11.4	88.6	100

Table 5.8 shows the percentage distribution of households facing economic losses within different monetary brackets, categorized by specific disasters in Nepal over the last five years is presented. The economic impact of various climate-induced disasters on households over the last five years observed a distinct pattern. The majority of households experienced economic losses below NPR 15,000 as the outcomes of events; drought, forest fires, windstorms, thunderstorms, hailstorms, heavy rain, sporadic rain, soil erosion, heatwaves, cold waves, and diseases/insects. Conversely, fire in settlements, floods, inundations, and landslides emerged as catastrophic, leading to economic losses exceeding NPR 60,000 for a significant majority of households. The magnitude of economic impact between these two categories highlights the urgency for adaptive interventions and resilient measures, especially for communities facing the highest economic loss.

The economic impact on households in Nepal is clearly illustrated by the prevalence of various climate-induced disasters. The most substantial economic losses were reported by diseases and insects, affecting a staggering 1,183,018 households. Drought affected 992,547 households, and also imposed water scarcity. Windstorms also emerged as a significant contributor, impacting 553,916 households, followed by hailstorms affecting 527,266 households. Flood, affected

376,708 households experiencing economic loss. Landslide, affected 248,743 households, and inundation, 245,286 households, further highlights the diverse range of environmental threats leading to economic challenges in households. This data emphasized the need of adaptive interventions and strategies to mitigate the economic impact to specific climate-induced disasters across the nation.

Table 5.8: Households with Economic Loss due to Climate Induced Disasters in Last 5 Years

Analytical domain	Disasters	Loss below 15,000 (NPR)	Loss 15,001 - 30,000 (NPR)	Loss 30,001 - 45,000 (NPR)	Loss 45,001 - 60,000 (NPR)	Loss more than 60,000 (NPR)	Total
Nepal	Drought	31.9	22.0	9.2	10.5	26.4	100
	Forest fire	67.3	14.8	1.8	10.1	6.0	100
	Fire (settlement)	14.9	26.0	3.7	14.4	41.0	100
	Flood	18.2	19.2	10.1	8.9	43.6	100
	Inundation	23.3	20.1	10.4	12.8	33.4	100
	Windstorm	40.4	24.6	7.6	10.9	16.5	100
	Thunderstorm	54.4	15.5	1.1	6.7	22.3	100
	Hailstorm	42.1	21.0	9.4	8.4	19.1	100
	Heavy rain	54.5	21.1	7.0	9.1	8.3	100
	Sporadic rain	71.4	18.7	4.3	0.4	5.2	100
	Soil erosion	43.4	22.4	7.4	9.7	17.2	100
	Landslide	12.8	14.5	7.4	13.3	52.1	100
	Snowstorm					100.0	100
	Heat wave	52.2	15.8	12.9	6.5	12.7	100
	Cold wave	46.6	23.4	9.4	4.8	15.8	100
	Diseases / insects	33.2	17.4	9.2	10.9	29.3	100
	Others			68.2		31.8	100

Table 5.9 shows the distribution of economic losses in Nepal over the last five years due to climate-induced disasters, presenting data across various analytical domains. The overall economic loss for the country is 415,440,534,095 NPR, combining the impacts across all analytical domains.

- Urban municipalities incurred higher economic losses compared to rural areas.
- The hill ecological zone faced the highest economic losses, while the mountain zone had the lowest.
- Among provincial ecological zones, Bagmati-Hill reported the highest losses.

Economic losses in **urban** areas were higher than in rural areas. The ecological-zone shows variations in the magnitude of losses, with the **hill region** being the most affected. There are substantial differences in economic losses among the provincial, ecological zones, with **Bagmati-hill** standing out with the highest losses.

The result highlights the diverse impact of climate-induced disasters across different analytical domains, need for adopted strategies to address the specific challenges faced by the respondent.

Table 5.9: Distribution of Loss in Last 5 Years due to Climate Induced Disasters

Analytical domain		Total amount in NPR
Municipality	Urban	**218,823,556,670**
	Rural	196,616,977,425
Ecological zone	Mountain	69,335,823,825
	Hill	**184,860,342,958**
	Terai	161,244,367,312
Province ecological zone	Koshi-Mountain	16,066,028,818
	Koshi-Hill	32,635,095,478
	Koshi-Terai	27,468,373,311
	Madhesh-Terai	90,883,537,023
	Bagmati-Mountain	30,359,195,662
	Bagmati-Hill	**93,514,108,652**
	Bagmati-Terai	3,216,399,379
	Gandaki-Mountain	1,942,264,069
	Gandaki-Hill	28,850,981,003
	Gandaki-Terai	2,891,278,525
	Lumbini-Hill	5,384,064,906
	Lumbini-Terai	10,874,658,180
	Karnali-Mountain	14,610,553,172
	Karnali-Hill	19,274,312,672
	Sudurpaschim-Mountain	6,357,782,104
	Sudurpaschim-Hill	5,201,780,249
	Sudurpaschim-Terai	25,910,120,893
Nepal		**415,440,534,095**

Conclusion

This chapter overview the impacts due to climate-induced disasters across two aspects; physical infrastructure damage and disruptions to working days/patterns. Floods, landslides, and inundation had imposed significant effect in physical infrastructure over last five years. Analysis to different ecological belts, emphasize the extensive impact of floods, heavy rain, and landslides across all regions highlights the need for resilience-building measures to safeguard communities.

Considering the working days/patterns of households, different climate-induced disasters has imposed various impacts, avalanches is caused impact in average working days loss. Drought has been affecting across all ecological belts and a higher severity observed in mountain region. Additionally, the substantial average of 23.1 working days missed in the Terai region due to diseases and insects highlighted the need for adopted strategies to mitigate challenges in specific areas. These findings highlight the diverse range of disaster and nature of impact varies according to the analytical domain.

The complexity of food scarcity issues arising from climate-induced disasters varies with the analytical domain. Decision makers should understand the level of impact and adaptive interventions to specific causes in regional contexts. Similarly, chapter highlights vulnerability and substantial impact on economic losses caused by landslides, floods, and fires in settlements. And highlights the urgent need of adaptive strategies and resilience-building initiatives to address the specific challenges imposed by specific climate disasters.

CHAPTER 6

CLIMATE CHANGE IMPACTS ON CROPS, LIVESTOCK, AND HUMAN HEALTH

Introduction

This chapter explores impact of climate induced disasters on agriculture, livestock, and human health. The analysis encompasses the emergence of novel diseases and the spread of insects and pests affecting on both crops and livestock. Additionally, increase of vector-borne and water-borne suffering in human examined over the past 25 years.

Summary of Findings

Over the past 25 years, approximately 50% of households reported the emergence of new diseases in their crops, 53.9% observed the presence of new insects or pests affecting their crops and 29.8% of households noted the appearance of new diseases in their livestock (Figure 6. 1). This shows the significant impact on agricultural and livestock, posing new threats to both crops and animals in various communities due to changing climatic condition.

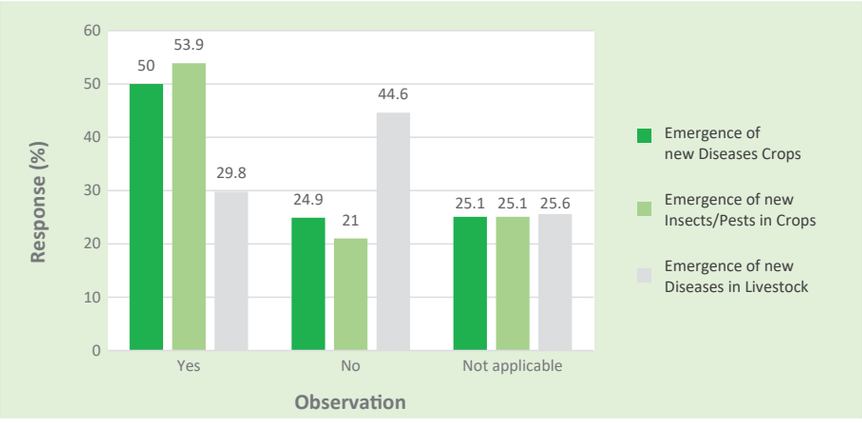


Figure 6.1: Households (%) Reporting Climate Change Impact on Crops and Livestock in Last 25 Years

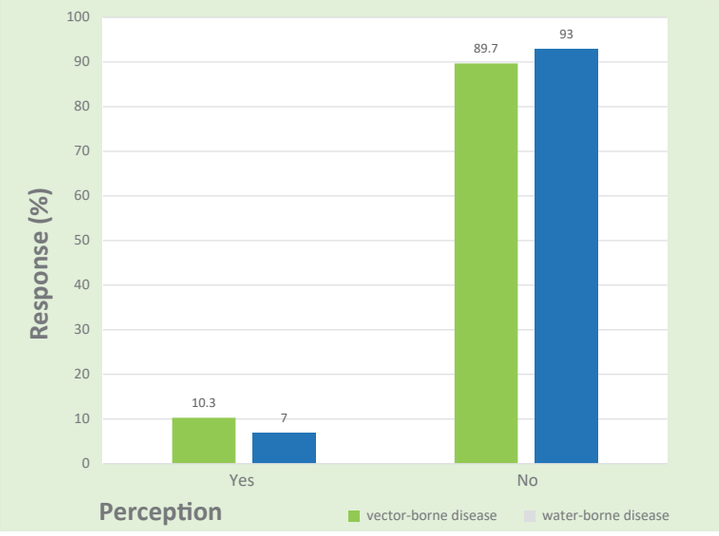


Figure 6.2: Households (%) Reporting Climate Change Impacts on Human Health in Last 25 Years

Households were experiencing impact in human health due to change in climate over the last 25 years. 36.2% of households had reported an increase in the incidence of diseases affecting human health (Table 6.4). Furthermore, 10.3% of households observed increasing trend of vector-borne diseases and 7% has reported a similar trend for waterborne diseases (Figure 6. 2). These findings highlight the growing concerned within communities regarding the changing patterns of diseases linked to climate variations and emphasize the need for proactive measures to address these health challenges.

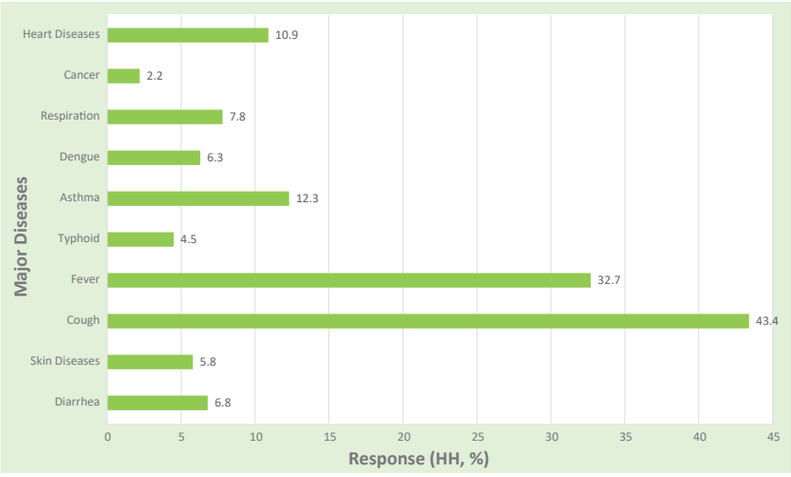


Figure 6.3: Major Disease and Frequency of Increment in Last 25 Years

Figure 6. 3, illustrate that households are observing an increasing in the frequency of 10 different types of diseases out of the 22 identified and listed in questionnaire. Specifically, 43.4% of households observed an increase in cough over the last 25 years. Followed by fever (32.7%), and an increase in asthma (12.3%). These findings overwhelm the health challenges highlighting respective institution needs to emphasize targeted interventions and work on public health strategies to address the increasing prevalence of diseases.

Impact on Crops

Table 6.1 provides overview of households' responses to the occurrence of new crop diseases over the past 25 years. 50% of the household reported the emergence of new crop diseases and 24.94% have not observe such incidents. Rural area experienced the impact of new diseases in crops (55.9%) than Urban areas (45.6%). Mountain region (68.7%), Hill region (50.3%), Terai region (46.3%) experienced impact in crops due to introduction of new disease. Sudurpaschim Hill exhibited highest percentage (86.0%) of households witnessing new crop diseases. In contrast, the Terai region of Koshi Province reported a lower incidence (33.01%) of households experiencing the emergence of crop diseases. Interestingly, households in areas with a very high climate risk (43.4%) were less likely to report new crop diseases compared to those in areas with a very low climate risk (51.9%). Households located between 1500-2000 meters reported the emergence of new crop diseases (60.2%) over last 25 years. This shows diverse factors influence the prevalence of crop diseases across diverse geographical and climatic domains.

Table 6.1: Emergence of New Crop Diseases (%) in Last 25 Years

Analytical Domains	Yes	No	Not Applicable	Total
Municipality				
Urban	45.6	18.9	35.5	100
Rural	55.9	33.1	11.1	100
Ecological Zone				
Mountain	68.7	21.2	10.1	100
Hill	50.3	26.0	23.7	100
Terai	46.3	24.5	29.3	100

Analytical Domains	Yes	No	Not Applicable	Total
Province-Ecological Zone				
Koshi-Mountain	69.5	24.6	5.9	100
Koshi-Hill	56.5	35.3	8.2	100
Koshi-Terai	33.1	34.5	32.4	100
Madhesh-Terai	56.7	13.2	30.1	100
Bagmati-Mountain	79.2	4.3	16.5	100
Bagmati-Hill	36.1	26.0	37.9	100
Bagmati-Terai	44.0	27.6	28.3	100
Gandaki-Mountain	44.8	52.9	2.4	100
Gandaki-Hill	59.9	17.1	23.0	100
Gandaki-Terai	46.6	26.9	26.5	100
Lumbini-Hill	43.1	48.5	8.5	100
Lumbini-Terai	38.1	34.6	27.4	100
Karnali-Mountain	69.3	16.6	14.1	100
Karnali-Hill	59.5	14.4	26.1	100
Sudurpaschim-Mountain	57.5	37.6	5.0	100
Sudurpaschim-Hill	86.0	10.0	4.0	100
Sudurpaschim-Terai	57.3	20.9	21.8	100
Altitude (meter)				
Below 120	45.2	25.4	29.4	100
120 - 350	48.1	21.3	30.6	100
350 - 1000	59.0	23.7	17.3	100
1000 - 1300	48.7	23.4	27.9	100
1300 - 1500	40.8	22.2	37.0	100
1500 - 2000	60.2	32.9	7.0	100
2000 and above	56.3	31.6	12.0	100
Climate Risk				
Very Low	51.9	21.7	26.3	100
Low	47.4	38.3	14.3	100
Moderate	42.9	23.8	33.3	100
High	67.6	14.1	18.3	100
Very High	43.4	18.2	38.4	100
Nepal	**50**	**24.9**	**25.1**	**100**

Table 6.2 presents a detail analysis of the percentage distribution of households reporting new insects or pests in their crops over the past 25 years. 53.9% of households have been suffering from new insects or pests and 21% did not experienced new insects and pests. Notably, households of rural areas have experienced higher incidence new insects or pests in their crops (63.3%), compared to urban areas (46.9%). 87.9% of households in Sudurpaschim-Hill reported the appearance of new insects or pests which is comparatively high than other domains. Households located at altitudes between 1500 to 2000 meters have experienced the emergence of new insects or pests (72.9%) in their crops comparatively more than households belonging to other regions over the past 25 years. This information provided valuable insights into the prevalence of agricultural challenges across different geographical and ecological domains, contributing to a more impact of pests on crop cultivation.

Table 6.2: Households (%) Reporting Emergence of New Insects/Pests in Crops in the Last 25 Years

Analytical Domain	Yes	No	Not Applicable	Total
Municipality				
Urban	46.9	17.6	35.5	100
Rural	63.3	25.6	11.1	100
Ecological zone				
Mountain	73.3	16.6	10.1	100
Hill	61.2	15.1	23.7	100
Terai	42.9	27.8	29.3	100
Province-ecological zone				
Koshi-Mountain	76.9	17.2	5.9	100
Koshi-Hill	63.4	28.4	8.2	100
Koshi-Terai	31.1	36.4	32.4	100
Madhesh-Terai	52.4	17.5	30.1	100
Bagmati-Mountain	80.1	3.4	16.5	100
Bagmati-Hill	52.2	9.8	37.9	100
Bagmati-Terai	49.1	22.6	28.3	100
Gandaki-Mountain	39.5	58.1	2.4	100
Gandaki-Hill	56.3	20.7	23.0	100
Gandaki-Terai	45.4	28.1	26.5	100
Lumbini-Hill	72.3	19.2	8.5	100
Lumbini-Terai	31.6	41.1	27.4	100
Karnali-Mountain	79.6	6.3	14.1	100
Karnali-Hill	71.2	2.7	26.1	100
Sudurpaschim-Mountain	61.4	33.7	5.0	100
Sudurpaschim-Hill	87.9	8.1	4.0	100
Sudurpaschim-Terai	59.2	18.9	21.8	100
Altitude (meters)				
Below 120	40.1	30.5	29.4	100
120 - 350	49.0	20.3	30.6	100
350 - 1000	67.1	15.7	17.3	100
1000 - 1300	56.0	16.1	27.9	100
1300 - 1500	52.3	10.7	37.0	100
1500 - 2000	72.9	20.2	7.0	100
2000 and above	64.1	23.9	12.0	100
Climate risk				
Very Low	55.4	18.3	26.3	100
Low	56.2	29.4	14.3	100
Moderate	45.2	21.4	33.3	100
High	59.4	22.3	18.3	100
Very High	41.2	20.4	38.4	100
Nepal	**53.9**	**21.0**	**25.1**	**100**

Table 6.3 provides an overview of the percentage distribution of households experienced of new diseases in livestock over the past 25 years. 29.8% of households reported new diseases in their livestock and 44.6% reported absence of such occurrences during the specified period. Notably, over half of households (50.7%) mountain region reported suffering from new diseases in their cattle. Households located at an altitude of 350 meters or above observed a consistent percentage of responses (in between 35-37%) regarding the experience of new diseases in livestock over the last 25 years. Moreover, there is a sharp difference in the incidence experience of new livestock diseases based on climate risk zones, with 13.1% of households in very high climate risk zones reporting new diseases, compared to 31.2% in low climate risk zones. Various experiences of respondents in different geographical and climate context, provides valuable insights into the challenges faced by livestock owners particularly from new diseases.

Table 6.3: Emergence of New Diseases (%) in Livestock in Last 25 Years

Analytical Domain	Yes	No	Not Applicable	Total
Municipality				
Urban	24.6	39.2	36.2	100
Rural	36.8	51.9	11.2	100
Ecological zone				
Mountain	50.7	39.4	9.8	100
Hill	34.2	41.6	24.2	100
Terai	21.5	48.6	29.9	100
Province-ecological zone				
Koshi-Mountain	49.3	44.6	6.1	100
Koshi-Hill	52.1	39.5	8.4	100
Koshi-Terai	19.4	48.5	32.2	100
Madhesh-Terai	30.6	38.6	30.8	100
Bagmati-Mountain	54.2	28.5	17.3	100
Bagmati-Hill	27.6	34.1	38.3	100
Bagmati-Terai	26.6	41.5	31.9	100
Gandaki-Mountain	2.6	95.0	2.4	100
Gandaki-Hill	20.4	54.7	24.9	100
Gandaki-Terai	11.1	63.9	25.0	100
Lumbini-Hill	16.2	76.0	7.8	100
Lumbini-Terai	11.2	60.2	28.6	100
Karnali-Mountain	48.9	39.8	11.3	100
Karnali-Hill	52.8	23.1	24.2	100
Sudurpaschim-Mountain	51.7	44.0	4.4	100
Sudurpaschim-Hill	72.6	20.6	6.8	100
Sudurpaschim-Terai	10.7	67.3	22.1	100
Altitude (meters)				
Below 120	21.5	48.4	30.1	100
120 - 350	22.0	46.9	31.1	100
350 - 1000	35.8	46.0	18.1	100
1000 - 1300	36.7	35.2	28.1	100
1300 - 1500	33.2	29.6	37.2	100
1500 - 2000	38.0	55.3	6.7	100

Analytical Domain	Yes	No	Not Applicable	Total
2000 and above	37.1	49.7	13.1	100
Climate risk				
Very Low	31.2	41.9	26.8	100
Low	33.5	50.9	15.6	100
Moderate	20.6	46.9	32.5	100
High	34.1	50.5	15.5	100
Very High	13.1	47.0	39.9	100
Nepal	**29.8**	**44.6**	**25.6**	**100**

Impact on Human Health

Table 6.4 presents the percentage distribution of households across municipality, ecological region, provincial-ecological region, different altitudes, and regions of climatic risk. Households across all ecological regions have provided similar responses regarding the increased incidence of diseases among their members over the past 25 years.

In the regions of Koshi-Hill, Bagmati-Mountain, Karnali-Mountain, and Karnali-Hill, over half of the households has experienced a rise of diseases among their household members over the past 25 years. The prevalence of households in each ecological region experiencing rise in disease incidence closely symmetrical with the national average i.e., 36.2%. The percentage of households (37.9%) in areas with very low climatic risk has experienced an increase in illness among household members, contrasting with the responses of households (15.8%) in areas with a very high-risk rating over the same period. This variations in health outcomes experienced by households across different ecological and climatic contexts, highlights the importance of considering regional factors in public health planning and interventions.

Table 6.4: Increase in Incidence of Disease (%) in Last 25 Years

Analytical Domain	Yes	No	Total
Municipality			
Urban	37.0	63.0	100
Rural	35.1	64.9	100
Ecological zone			
Mountain	38.0	62.0	100
Hill	38.9	61.1	100
Terai	33.1	66.9	100
Province-ecological zone			
Koshi-Mountain	39.3	60.7	100
Koshi-Hill	50.1	49.9	100
Koshi-Terai	42.3	57.7	100
Madhesh-Terai	37.6	62.4	100
Bagmati-Mountain	54.2	45.8	100
Bagmati-Hill	40.6	59.4	100
Bagmati-Terai	23.2	76.8	100
Gandaki-Mountain	29.5	70.5	100

Analytical Domain	Yes	No	Total
Gandaki-Hill	35.8	64.2	100
Gandaki-Terai	25.5	74.5	100
Lumbini-Hill	10.4	89.6	100
Lumbini-Terai	18.7	81.3	100
Karnali-Mountain	50.9	49.1	100
Karnali-Hill	52.2	47.8	100
Sudurpaschim-Mountain	13.2	86.8	100
Sudurpaschim-Hill	40.8	59.2	100
Sudurpaschim-Terai	31.1	68.9	100
Altitude (meters)			
Below 120	32.5	67.5	100
120 - 350	32.2	67.8	100
350 - 1000	30.6	69.4	100
1000 - 1300	49.5	50.5	100
1300 - 1500	44.1	55.9	100
1500 - 2000	33.4	66.6	100
2000 and above	38.3	61.7	100
Climate risk			
Very Low	37.9	62.1	100
Low	37.1	62.9	100
Moderate	30.1	69.9	100
High	51.9	48.1	100
Very High	15.8	84.2	100
Nepal	**36.2**	**63.8**	**100**

Table 6.8, provides overview of disease prevalence within Nepalese households over the past 25 years. Cough and fever stand out as the most widespread diseases, affecting 43.4% and 32.7% of households, respectively. In contrast, infection of cholera and viral was noted lower incidence rates, merely 0.1%. Sudurpaschim-Mountain reported highest incidence rates of diseases such as diarrhea, skin diseases, cough, and fever. Conversely, the respondents of Gandaki-Mountain belt are highly suffering from typhoid and asthma. This pattern extends to urban and rural areas, where cough (43.1%) and fever (32.6%) in urban regions and 43.7% and 32.9% in rural, respectively. The finding highlights the diverse health landscapes across geographical and demographic strata in Nepal.

When considering ecological zones, the Terai region have been suffering highest disease incidence, particularly noting cough (49.2%) and fever (41.7%). The Hill and Mountain zones experienced unique disease pattern reflective of their distinct environmental contexts. Simultaneously, when examining altitude ranges, households located below 120 meters experienced the highest incidence of cough (53.4%) and fever (46.5%), shows altitude as a significant factor for suffering of disease prevalence. This finding highlights the diverse relationship between geographical factors and health outcomes, emphasized the varying diseases landscapes within different ecological and altitude zones.

Table 6.8: Increase in Incidence of Diseases in Last 25 Years

Analytic Domain	Types of Disease Observed (HHs, %)																					
	Diarrhea	Dysentery	Malaria	Skin diseases	Cough	Fever	Typhoid	Asthma	Jaundice	Malnutrition	Dengue	Psychological	Chicken Pox	Cholera	Respiration	Viral infection	Kala-jar	Water/Food borne diseases	Cancer	Heart Diseases	Tuberculosis	Others
Municipality																						
Urban	6.2		1.2	5.8	43.1	32.6	2.8	10.8	1.2	0.8	10.2	2.5	0.4	0.2	7.8	0.1	0.1	0.2	2.7	11.5	0.8	44.8
Rural	7.7	0.7	1.3	5.9	43.7	32.9	7.0	14.4	2.4		0.9	3.2		0.1	7.7	0.1	0.4	0.9	1.6	10.0	2.5	41.2
Ecological zone																						
Mountain	6.2			4.5	35.0	22.1	6.2	20.1	1.4		0.4	1.7		0.4	10.7		0.3	0.6	2.1	12.2	0.4	42.7
Hill	1.4	0.2	0.1	4.8	40.0	27.1	1.9	11.6	0.4	0.2	10.3	2.4	0.1	0.0	8.7	0.1		0.0	2.4	8.1	0.6	45.8
Terai	13.5	0.5	2.8	7.4	49.2	41.7	7.3	11.4	3.3	0.9	2.8	3.5	0.4	0.2	6.0	0.2	0.5	1.0	2.0	14.0	2.8	40.4
Province-ecological zone																						
Koshi-Mountain	3.6			5.2	42.1	39.0	21.9	17.6				2.5			4.2			2.5	2.4	14.7		46.7
Koshi-Hill	1.5	0.9		5.4	55.1	43.0	6.3	11.1	1.2			3.8			2.8	0.4			2.0	5.9	0.6	42.0
Koshi-Terai	3.4	0.7	0.6	11.3	36.4	18.8	1.4	15.1	2.3	0.6	1.1	7.2	1.4	0.5	6.8	0.1		2.4	5.2	7.9	1.1	51.0
Madhesh-Terai	11.9		1.1	6.3	68.6	63.9	10.2	11.0	4.5	1.3	1.9	0.8			4.3		1.1	0.2		20.0	4.9	29.8
Bagmati-Mountain	4.5			2.5	13.3	1.5		19.9			0.9	2.2			13.1					11.9	0.7	56.7
Bagmati-Hill	1.4			4.2	44.5	28.5	1.3	10.1	0.2	0.5	23.6	1.4		0.1	7.0				2.1	5.8	0.3	46.6
Bagmati-Terai	10.4				22.2	8.2		2.9	0.7		19.1	3.1			10.9				4.3	6.7	1.6	59.8
Gandaki-Mountain	8.1			8.1	41.1	58.1	25.8	33.9				8.9			16.9				25.8	32.3		8.1
Gandaki-Hill	1.5		0.8	4.2	50.0	36.2		5.3			5.0	0.4			12.4			0.2	1.5	11.4	1.6	45.9
Gandaki-Terai	1.8		1.5	1.7	5.0	8.0		5.8			8.2	1.5			12.8				1.5	8.7	2.6	73.2
Lumbini-Hill				2.3				23.0				9.0			6.2				8.9	19.5		52.5
Lumbini-Terai	15.9	2.0	0.8	2.7	11.5	14.7	3.7	6.3	2.2		3.5	5.0			9.1	1.0		0.8	0.3	11.5		56.8

Analytic Domain	Types of Disease Observed (HHs, %)																				
	Diarrhea	Dysentery	Malaria	Skin diseases	Cough	Fever	Typhoid	Asthma	Jaundice	Malnutrition	Dengue	Psychological	Chicken Pox	Cholera	Respiration	Viral infection	Kala-jar	Water/Food borne diseases	Cancer	Heart Diseases	Tuberculosis	Others
Karnali-Mountain	3.9			2.8	54.7	23.3	0.6	23.3							16.5		1.3		3.6	12.4	0.6	18.3
Karnali-Hill	1.9			5.3	11.3	3.8	0.6	18.3			0.6	5.1			10.5				3.3	6.1	0.6	53.7
Sudurpaschim-Mountain	24.2			14.5	74.8	66.6	4.6	19.7	13.6					3.8	3.8				4.8	4.8		21.7
Sudurpaschim-Hill				8.5	14.2	3.1	0.8	20.8	0.6		1.0	1.2	1.8		24.0				3.5	16.8		35.1
Sudurpaschim-Terai	67.5		28.4	11.1	67.8	66.3	25.9	12.4	3.9	1.1	5.9	3.6			4.2			1.6	4.0	9.5	1.2	17.7
Altitude (meter)																						
Below 120	9.2	0.4	0.9	8.2	53.4	46.5	8.1	11.8	4.5	1.2	2.1	4.4	0.7	0.3	6.1	0.1	0.3	0.7	2.4	15.6	4.0	37.4
120 - 350	20.8		7.1	5.8	37.0	30.2	6.4	8.7	1.7		5.6	1.6			6.3	0.4	0.9	0.7	1.9	11.3	0.8	47.7
350 - 1000	4.4			5.3	43.6	30.2	2.9	10.0		0.2	3.2	3.8			10.1			0.6	2.4	11.1	0.1	44.8
1000 - 1300	2.1	0.2	0.4	4.3	42.2	25.9	2.4	13.8	0.7		13.2	2.5		0.2	7.6			0.4	2.9	7.7	0.6	41.9
1300 - 1500	2.0	1.0		7.4	36.3	23.1	4.5	14.1	0.8	0.7	14.4	2.2		0.2	7.3	0.3		0.4	0.9	6.1	0.5	47.9
1500 - 2000	2.2			3.3	33.9	28.7	1.0	13.6	0.7		0.9	1.4	0.7		9.8		0.2		2.4	10.2	0.3	50.0
2000 and above	5.0			1.6	49.1	35.1	0.8	16.6				0.2			12.0				2.2	11.0	3.0	38.5
Climate risk																						
Very Low	6.8	0.1	0.9	5.0	45.6	35.3	4.1	11.5	1.0	0.5	8.1	1.5	0.1	0.1	7.8	0.1	0.3	0.2	1.9	10.4	0.9	43.4
Low	4.7	0.4	0.8	7.7	37.1	26.9	7.2	16.7	4.0	0.5	1.6	6.0	0.8		6.4			0.8	2.1	12.3	3.8	44.5
Moderate	13.5	1.1	5.2	8.9	49.1	32.7	3.6	10.9	2.2		4.2	3.0	0.2	0.7	10.5	0.2		2.0	4.7	12.4	1.0	36.4
High				5.4	40.2	30.9		7.9			3.0	10.2			6.9	2.0				6.0	3.0	43.9
Very High	4.3				4.3	4.3	3.0	2.9			9.3	4.7			7.9				7.6	11.7		62.2
Nepal	**6.8**	**0.3**	**1.2**	**5.8**	**43.4**	**32.7**	**4.5**	**12.3**	**1.7**	**0.5**	**6.3**	**2.8**	**0.2**	**0.1**	**7.8**	**0.1**	**0.2**	**0.5**	**2.2**	**10.9**	**1.5**	**43.3**

Table 6.9 provides an overview of the increasing incidence of vector-borne diseases in Nepal over the last 25 years. Nationally, 10.3% of households reported an increase in such diseases. Notably, urban municipalities are highly suffering from vector-borne disease (14.3%), while rural areas are comparatively low (4.9%). Across ecological zones, the Terai region have highest incidence (13.7%), only 4.6% respondents of mountain zone are suffering. Province-ecological zone showed, Sudurpaschim-Terai were more prevailed with vector-borne disease (22.9%), with a sharp contrast to Koshi-Hill with only 0.2%. Furthermore, when considering climate risk ratings, areas categorized as "High" risk displayed the lowest incidence (1.5%), while areas rated as "Very Low" risk recorded a higher rate of 12.7%. This finding highlights the diverse nature of vector-borne diseases, and seems spread of vector borne-diseases will varies by altitudinal and geographical location.

Table 6.9: Increase in Incidence of Vector-borne Diseases (%) in Last 25 Years

Analytical Domains	Yes	No	Total
Municipality			
Urban	14.3	85.7	100
Rural	4.9	95.1	100
Ecological zone			
Mountain	4.6	95.4	100
Hill	8.0	92.0	100
Terai	13.7	86.3	100
Province-ecological zone			
Koshi-Mountain	2.5	97.5	100
Koshi-Hill	0.2	99.8	100
Koshi-Terai	3.4	96.6	100
Madhesh-Terai	22.0	78.0	100
Bagmati-Mountain	2.9	97.1	100
Bagmati-Hill	16.7	83.3	100
Bagmati-Terai	16.6	83.4	100
Gandaki-Mountain		100.0	100
Gandaki-Hill	4.3	95.7	100
Gandaki-Terai	14.1	85.9	100
Lumbini-Hill	0.5	99.5	100
Lumbini-Terai	6.1	93.9	100
Karnali-Mountain	10.5	89.5	100
Karnali-Hill	7.5	92.5	100
Sudurpaschim-Mountain	5.6	94.4	100
Sudurpaschim-Hill	0.6	99.4	100
Sudurpaschim-Terai	22.9	77.1	100
Altitude (meter)			
Below 120	12.9	87.1	100
120 - 350	14.4	85.6	100
350 - 1000	5.3	94.7	100
1000 - 1300	12.2	87.8	100

Analytical Domains	Yes	No	Total
1300 - 1500	13.5	86.5	100
1500 - 2000	2.2	97.8	100
2000 and above	3.3	96.7	100
Climate Risk			
Very Low	12.7	87.3	100
Low	5.6	94.4	100
Moderate	8.9	91.1	100
High	1.5	98.5	100
Very High	3.3	96.7	100
Nepal	**10.3**	**89.7**	**100**

Table 6.10 display the percentage of households with the incidence of water-borne diseases in Nepal over the past 25 years. Nationally, 7.0% of households reported occurrences of water-borne diseases. In municipalities, urban areas witnessed higher incidence 7.5%, compared to 6.3% in rural municipalities. Among ecological zones, the Mountain zone experienced increased in incidence (9.0%) than before, while the Hill and Terai zones reported lower rates 5.6% and 7.9%, respectively. Province-ecological zone combinations result; the Karnali-Hill had 30.1% affected, in sharp variation to Sudurpaschim-Hill, Gandaki-Terai, and Lumbini-Hill, which reported remarkably low incidences 0.3%. Additionally, considering climate risk ratings, areas classified as "High" risk zone is suffering low encountered 1.5%, while "Low" risk regions experienced a higher rate of 5.7%. This finding highlights the diverse landscape of water-borne diseases, influenced by factors ranging from urbanization to ecological zones and also effect by climatic factors.

Table 6.10: Increase in Incidence of Water-borne Diseases in Last 25 Years

Analytic Domain	Increased Incidence of Water-Borne Diseases (HHs, %)		
	Yes	No	Total
Municipality			
Urban	7.5	92.5	100
Rural	6.3	93.7	100
Ecological zone			
Mountain	9.0	91.0	100
Hill	5.6	94.4	100
Terai	7.9	92.1	100
Province-ecological zone			
Koshi-Mountain	2.8	97.2	100
Koshi-Hill	1.5	98.5	100
Koshi-Terai	3.7	96.3	100
Madhesh-Terai	9.3	90.7	100
Bagmati-Mountain	15.5	84.5	100
Bagmati-Hill	4.8	95.2	100
Bagmati-Terai	7.2	92.8	100
Gandaki-Mountain	2.6	97.4	100
Gandaki-Hill	3.8	96.2	100
Gandaki-Terai	0.3	99.7	100
Lumbini-Hill	0.3	99.7	100

Analytic Domain	Increased Incidence of Water-Borne Diseases (HHs, %)		
	Yes	No	Total
Lumbini-Terai	4.8	95.2	100
Karnali-Mountain	17.7	82.3	100
Karnali-Hill	30.1	69.9	100
Sudurpaschim-Mountain	2.9	97.1	100
Sudurpaschim-Hill	0.3	99.7	100
Sudurpaschim-Terai	26.5	73.5	100
Altitude (meters)			
Below 120	6.4	93.6	100
120 - 350	9.7	90.3	100
350 - 1000	4.6	95.4	100
1000 - 1300	10.4	89.6	100
1300 - 1500	7.1	92.9	100
1500 - 2000	2.8	97.2	100
2000 and above	8.6	91.4	100
Climate risk			
Very Low	7.4	92.6	100
Low	5.7	94.3	100
Moderate	7.4	92.6	100
High	1.5	98.5	100
Very High	7.4	92.6	100
Nepal	**7.0**	**93.0**	**100**

Conclusion

The chapter highlights the emergence of new crop diseases over last 25 years. The percentage distribution of households experienced new insects or pests in crops over the past 25 years was relatively high. This information provides valuable insights into the widespread of diseases in agricultural imposed challenges. Percentage distribution of new diseases in livestock over 25 years have varied experiences in different geographical and climate contexts; it related to the challenges faced by livestock owners in response to the spread new diseases.

The overview incidence of vector-borne and water borne diseases over last 25 years across different analytical domains found that urban municipalities are suffering with higher figures than in rural areas. Variations in health outcomes across different ecological and climatic contexts, cough and fever as the most widespread disease in Nepal. Furthermore, the increased incidence of water-borne diseases, revealing urban areas are more suffered compared to rural municipalities. This detail analysis contributes valuable insights for specific public health interventions and planning strategies in overall.

CHAPTER 7

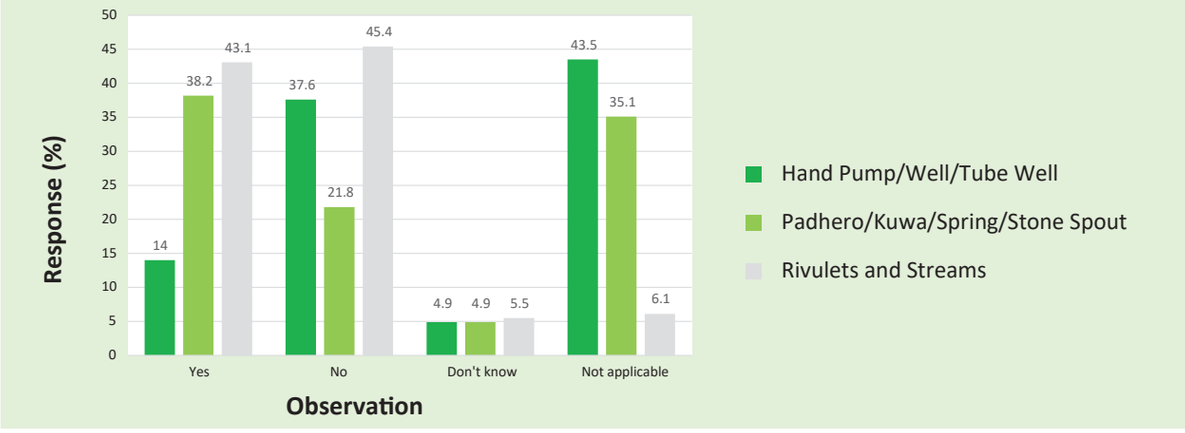
CLIMATE CHANGE IMPACTS ON WATER AND ENERGY

Introduction

This chapter describes the impact of climate change on various water sources and the reasons behind the changes experienced by households, and examines the responses of households concerning alterations in the quantity and drying up of different water sources, including hand pumps, water wells, tube-wells, springs, stone spouts, rivers, rivulets, and tap water and also explore the factors contributing to these alterations. Additionally, the chapter deals with the energy consumption pattern of households over last 25 years and the types of cooking stoves employed by households, deals with prevailing cooking technologies. Furthermore, chapter explores challenges faced by households while using electric cooking stoves, providing insights complications in adopting e-cooking practices. Lastly, the survey assesses shift in the use of firewood, trend in energy choice within households. These findings offer detail understanding of the recent issues in water sources and energy consumption, provide assets to policies maker and tailored interventions.

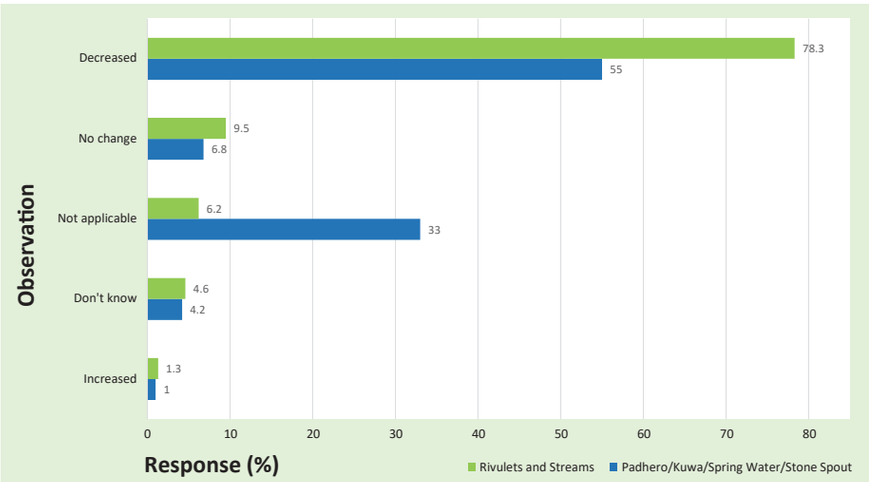
Summary of Finding

Figure 7.1: Households (%) Reporting Water Resources Dried-up in Last 25 Years



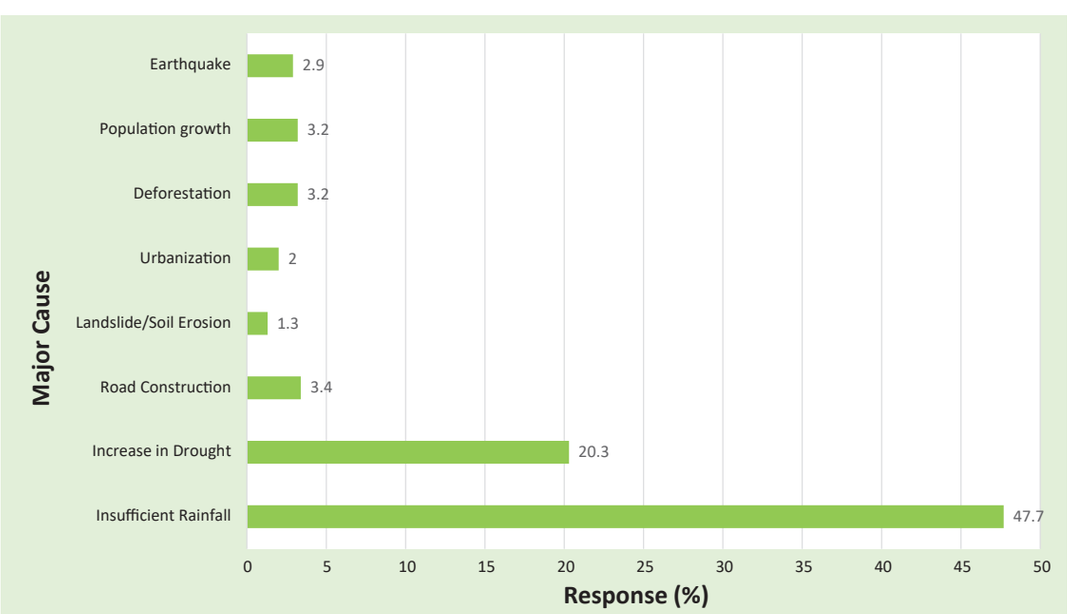
Approximately 14% of respondents observed impact on Hand Pump/Well/Tube Well water sources due to climate induced disaster. 38.2% of respondents reported changes on *Padhero*/*Kuwa*/spring /stone spout. The survey highlighted 43.1% of respondents noted changes in Rivulets and Streams, substantial influence of climate change on the nature of water bodies. In essence, the findings underscore the widespread and diverse impact of climate change on different water sources across the country.

Figure 7.2: Households (%) Reporting Observed Changes on Water Resources in Last 25 Years



78.3% of households observed decline in rivulets and streams and 55% of households observed decrease in *Padhero/ Kuwa*/spring/stone spout (Figure 7.2). In the other hand only 1.3% observed increased in Rivulets and Streams and 1% observed increased in *Padhero/ Kuwa/* spring/stone spout. This suggests a significant impact on water resources. However, there might be other secondary effects that exhibit impacts on ecosystems, agriculture, and various aspects of livelihoods. This result emphasized the need for attention and potential mitigation measures.

Figure 7. 3: Households (%) Reporting Causes of Changes in Water Resources in Last 25 Years



47.7% observed changed in water resources is due to insufficient rainfall, followed by increase in drought (20.3%), road construction (3.4%), deforestation and urbanization (3.2%). In contrast minimal respondent observed change due to population growth, earthquake and landslides/soil erosion over the last 25 years (Figure 7.3).

Impact on Water Resources

The survey result shows a significant impact of climate change on water resources in Nepal over the last 25 years. A significant number of households reported adverse changes and noted their water resources dried up. This phenomenon was observed across all domains and indicates a nationwide decrease in water availability. Respondence experienced worth reduction in both ground and surface water, primarily attributed to insufficient rainfall and an increase in drought incidents.

Table 7.1 deals with the status of responses concerning the dried up of hand pumps/wells/tube wells. Urban region (19.3%) experienced dry up water resources (hand pump/well/tube well) more in comparison to rural area (6.8%). 23.8% of households in the Terai region reported complete dry up, with Sudurpaschim-Terai recording the highest incidence 49.5%, followed by Madhesh-Terai 28.8%. Households belonging to altitude 125-350 m have faced more issues (28.1%) on hand pump than in others. This finding illustrates the concerning impact of climate-induced water scarcity, particularly in specific geographical zones, necessitating a focused and region-specific approach to address the growing challenge of water resources decrease.

Table 7.1: Households (%) Observed Water Dried-up in Hand pump/Well/Tube well Over Last 25 Years

Analytical domain	Yes	No	Don't know	Not applicable	Total
Municipality					
Urban	19.3	42.0	4.2	34.5	100
Rural	6.8	31.8	5.9	55.6	100
Ecological zone					
Mountain	0.5	9.2	1.8	88.5	100
Hill	6.8	14.6	8.2	70.5	100
Terai	23.8	66.4	2.2	7.7	100
Province-ecological zone					
Koshi-Mountain	0.5	1.9	2.4	95.2	100
Koshi-Hill	2.5	2.0	7.9	87.5	100
Koshi-Terai	9.8	68.1	4.5	17.6	100
Madhesh-Terai	28.8	70.0	0.2	1.1	100
Bagmati-Mountain	0.9	14.4	2.6	82.1	100
Bagmati-Hill	13.0	25.5	10.2	51.3	100
Bagmati-Terai	20.8	51.9	5.0	22.4	100
Gandaki-Mountain			2.4	97.6	100
Gandaki-Hill	0.4	12.7	11.2	75.7	100
Gandaki-Terai	13.0	70.9		16.1	100
Lumbini-Hill	6.2	18.4	6.2	69.1	100
Lumbini-Terai	22.5	67.2	3.6	6.8	100
Karnali-Mountain	0.7	4.8	0.7	93.9	100
Karnali-Hill	6.4	0.4	2.3	90.9	100
Sudurpaschim-Mountain		12.2	1.1	86.7	100
Sudurpaschim-Hill	1.1	1.4	0.4	97.1	100
Sudurpaschim-Terai	49.5	45.6	0.6	4.4	100
Altitude (meter)					
Below 120	22.3	73.2	1.7	2.9	100
120 - 350	28.1	55.6	3.1	13.2	100
350 -1000	5.0	16.1	5.9	73.0	100
1000 - 1300	6.7	15.9	7.4	70.1	100
1300 -1500	11.0	19.5	6.6	62.8	100
1500 - 2000	3.6	10.1	7.8	78.6	100

Analytical domain	Yes	No	Don't know	Not applicable	Total
2000 and above	1.1	5.6	9.8	83.5	100
Climate risk					
Very Low	14.8	34.8	4.2	46.2	100
Low	7.3	39.5	6.2	46.9	100
Moderate	20.0	43.3	2.4	34.4	100
High	11.8	36.1	4.2	47.9	100
Very High	17.2	57.2	18.1	7.5	100
Nepal	**14**	**37.6**	**4.9**	**43.5**	**100**

Table 7.2 provides a detail status of hand pump/well/tube well drying up over the past 25 years in Nepal. 23.7% of households reported decrease in water supply from these sources. Parallel to the situation of completely dried up hand pump/well/tube well, a significant portion of households in the Terai region (43.4%), experienced their handpump/well/tube well drying up. Notably, Sudurpaschim-Terai recorded the highest incidence at 58.1%, closely followed by Madhesh-Terai at 55.5%. This statistic portrays the wide challenges faced by households in these regions regarding the diminishing water supply, highlights the critical need for targeted interventions and sustainable water management strategies to address the specific issue of water scarcity in the various geographical contexts.

Table 7.2: Households Observing (%) Water Depletion in Hand pump/Well/ Tube well Over Last 25 Years.

Analytical domain	Yes	No	Don't know	Not applicable	Total
Municipality					
Urban	31.4	29.7	4.3	34.6	100
Rural	13.4	24.9	5.9	55.8	100
Ecological zone					
Mountain	0.7	9.2	2.0	88.2	100
Hill	8.6	12.3	8.2	70.9	100
Terai	43.4	46.7	2.2	7.6	100
Province-ecological zone					
Koshi-Mountain	0.5	2.4	2.4	94.7	100
Koshi-Hill	3.3	1.4	7.8	87.6	100
Koshi-Terai	24.2	54.5	4.2	17.1	100
Madhesh-Terai	55.5	43.1	0.2	1.2	100
Bagmati-Mountain	0.8	14.9	3.5	80.8	100
Bagmati-Hill	17.5	19.6	10.3	52.6	100
Bagmati-Terai	30.1	41.3	5.5	23.1	100
Gandaki-Mountain		2.6	5.0	92.4	100
Gandaki-Hill	0.7	12.3	11.2	75.7	100
Gandaki-Terai	17.8	65.7	0.5	16.1	100
Lumbini-Hill	5.0	20.1	5.8	69.1	100
Lumbini-Terai	42.2	47.2	3.8	6.8	100
Karnali-Mountain	2.0	4.8	0.7	92.6	100

Analytical domain	Yes	No	Don't know	Not applicable	Total
Karnali-Hill	6.8	0.4	2.7	90.2	100
Sudurpaschim-Mountain		11.2	0.4	88.3	100
Sudurpaschim-Hill	2.3	0.8	0.4	96.5	100
Sudurpaschim-Terai	58.1	37.0	0.7	4.2	100
Altitude (meter)					
Below 120	42.4	53.3	1.6	2.7	100
120 - 350	46.3	37.1	3.4	13.1	100
350 -1000	7.8	13.5	5.6	73.1	100
1000 - 1300	9.6	12.9	7.6	69.8	100
1300 -1500	14.2	14.9	6.7	64.2	100
1500 - 2000	4.1	8.8	7.9	79.2	100
2000 and above	1.5	5.1	10.2	83.2	100
Climate risk					
Very Low	25.3	23.9	4.3	46.5	100
Low	15.5	31.9	6.0	46.7	100
Moderate	25.7	37.6	2.2	34.4	100
High	19.7	26.8	5.7	47.9	100
Very High	35.7	38.0	18.9	7.5	100
Nepal	**23.7**	**27.7**	**5.0**	**43.6**	**100**

Table 7.3 shows the percentage distribution of households experiencing change in the amount of water in *Padhero*/*Kuwa*/spring water/stone spout over the past 25 years. In total, 50% of households reported sharp decrease, while less than one percent of households experienced an increase in the amount of water from these resources. The impact is particularly observed in the Mountain region, where a substantial 81.5% of households experienced reduction, followed by the Hill region (79.6%). Examining the ecological belt, Koshi-Hill and Karnali-Hill stand out, with 93.8% and 92.8% of households, respectively, reporting a decrease in the amount of water. This finding presents the widespread challenges imposed by decrease in water resources throughout the ecological zones, necessitating a focused and region-specific approach to address the growing issue of water scarcity in the across geographical contexts.

Table 7.3: Households (%) Observing Change in Amount of Padhero/Kuwa/ Spring water/Stone spout Water Over Last 25 Years.

Analytical domain	Decreased	Increased	No change	Don't know	Not applicable	Total
Municipality						
Urban	49.9	0.9	6.5	5.3	37.4	100
Rural	62.1	1.0	7.3	2.7	27.0	100
Ecological zone						
Mountain	81.5	1.4	8.6	1.3	7.2	100
Hill	79.6	1.2	7.4	5.0	6.8	100
Terai	25.1	0.7	5.9	4.0	64.4	100
Province-ecological zone						
Koshi-Mountain	91.0		6.6	1.4	1.0	100
Koshi-Hill	93.8	0.6	1.0	3.1	1.5	100

Analytical domain	Decreased	Increased	No change	Don't know	Not applicable	Total
Koshi-Terai	11.4	0.5	3.2	2.0	82.9	100
Madhesh-Terai	32.8	0.6	4.8	3.1	58.6	100
Bagmati-Mountain	89.6	0.5	9.1	0.2	0.6	100
Bagmati-Hill	73.0	2.2	4.7	6.1	14.0	100
Bagmati-Terai	10.7	1.1	10.0	2.4	75.8	100
Gandaki-Mountain	25.2	2.4	67.1	5.2		100
Gandaki-Hill	68.0	0.5	17.5	9.2	4.7	100
Gandaki-Terai	48.4	3.7	5.6	1.4	40.9	100
Lumbini-Hill	89.9	1.4	7.8	0.7	0.2	100
Lumbini-Terai	30.1	0.7	10.2	8.3	50.7	100
Karnali-Mountain	95.4	1.3	2.0	1.3		100
Karnali-Hill	92.8	0.1	4.8	1.0	1.3	100
Sudurpaschim-Mountain	60.7	3.4	10.0	2.3	23.6	100
Sudurpaschim-Hill	82.2		11.2	2.8	3.7	100
Sudurpaschim-Terai	11.2		4.8	3.5	80.4	100
Altitude (meter)						
Below 120	22.1	0.7	4.3	3.7	69.2	100
120 - 350	28.2	0.7	7.8	4.7	58.6	100
350 -1000	76.3	1.2	6.8	4.4	11.3	100
1000 - 1300	79.5	1.1	5.5	5.0	8.9	100
1300 -1500	78.4	0.9	8.4	6.0	6.4	100
1500 - 2000	83.2	1.9	9.6	2.4	2.8	100
2000 and above	77.0	0.1	13.8	2.6	6.6	100
Climate risk						
Very Low	59.7	1.1	6.8	3.4	29.0	100
Low	50.8	0.7	5.6	4.7	38.3	100
Moderate	42.8	1.0	5.7	3.7	46.9	100
High	59.3		6.5		34.1	100
Very High	35.3		16.8	18.0	30.0	100
Nepal	**55.0**	**1.0**	**6.8**	**4.2**	**33.0**	**100**

Table 7.4 provides insights into the percentage of households that witnessed complete drying up of *Padhero*/*Kuwa*/spring water/stone spout over the last 25 years. The data portray a significant concern, 38.2% of households across the country experienced the complete dry up of these essential water sources. Within the ecological zones, hill households reported the highest incidence at 57.8%, highlights the severity of water scarcity in these regions. Breaking it down by province-ecological zone, Koshi-Hill emerges as the most affected, with 79.88% of households experiencing the complete drying up of *Padhero*/*Kuwa*/spring water/stone spout. Followed by Karnali-Hill (75.9%) and Sudurpaschim-Hill (75.4%). This finding presents the critical issue of water source depletion in specific ecological and provincial contexts, emphasizing the urgent need for adapted interventions and sustainable water management strategies to address the increasing challenge of water scarcity.

Table 7.4: Households (%) Observed Water Dried-up in Padhero/Kuwa/Spring water/Stone spout Over Last 25 Years

Analytical domain	Yes	No	Don't know	Not applicable	Total
Municipality					
Urban	34.5	18.6	6.3	40.6	100
Rural	43.1	26.1	3.1	27.7	100
Ecological Zone					
Mountain	48.5	43.0	1.8	6.7	100
Hill	57.8	30.3	5.3	6.6	100
Terai	16.2	9.2	5.1	69.5	100
Province-Ecological Zone					
Koshi-Mountain	35.5	60.7	2.9	0.9	100
Koshi-Hill	79.9	15.3	3.7	1.2	100
Koshi-Terai	9.1	3.1	1.5	86.3	100
Madhesh-Terai	22.6	8.1	3.1	66.2	100
Bagmati-Mountain	65.4	34.4	0.2		100
Bagmati-Hill	44.4	34.8	6.7	14.1	100
Bagmati-Terai	7.2	11.6	4.0	77.3	100
Gandaki-Mountain	2.6	87.6	9.8		100
Gandaki-Hill	41.7	45.1	9.2	4.0	100
Gandaki-Terai	19.3	38.5	1.7	40.6	100
Lumbini-Hill	74.5	24.5		0.9	100
Lumbini-Terai	17.1	14.8	12.9	55.2	100
Karnali-Mountain	73.3	25.4	1.3		100
Karnali-Hill	75.9	21.5	1.7	0.9	100
Sudurpaschim-Mountain	30.2	44.3	2.7	22.8	100
Sudurpaschim-Hill	75.4	19.4	3.4	1.8	100
Sudurpaschim-Terai	4.9	6.5	6.0	82.6	100
Altitude (meter)					
Below 120	14.8	6.1	4.2	74.9	100
120 - 350	15.3	14.5	7.0	63.2	100
350 -1000	49.4	35.0	4.5	11.2	100
1000 - 1300	62.7	22.8	6.0	8.5	100
1300 -1500	56.0	31.0	6.5	6.6	100
1500 - 2000	57.0	38.1	2.8	2.0	100
2000 and above	56.5	35.4	2.1	5.9	100
Climate risk					
Very Low	41.7	23.1	4.6	30.7	100
Low	36.9	19.6	4.5	39.0	100
Moderate	27.4	15.9	2.8	53.9	100
High	46.1	16.3		37.6	100
Very High	16.4	31.4	20.3	31.9	100
Nepal	**38.2**	**21.8**	**4.9**	**35.1**	**100**

Table 7.5 provides overview of the distribution of households observed changes in the discharge of rivulets and streams over last 25 years in Nepal. 78.3 % of households reported decrease in the discharge of these water sources. This change was particularly experienced in the Mountain region, where 89.7% of households noted a decrease, closely followed by the Hill region 88.1%. In Province-ecological zone, 97.4% of household in Karnali-Hill experienced decrease in the amount of water in rivulets and streams followed by Karnali-Mountain (96.7%). Water resources in rural areas decreased more in urban areas. This finding displays the widespread challenges associated with declining water resources in specific domains, highlighting the urgent need for adoptive interventions and sustainable water management practices to address the increasing issue of water scarcity.

Table 7.5: Households (%) Reporting Observed Changes in Amounts of Rivulets and Streams water Over Last 25 Years

Analytical domain	Decreased	Increased	No change	Don't know	Not applicable	Total
Municipality						
Urban	76.3	1.5	8.5	5.3	8.4	100
Rural	81.1	1.1	11.0	3.6	3.2	100
Ecological zone						
Mountain	89.7	2.0	6.0	1.6	0.7	100
Hill	88.1	0.9	5.4	3.5	2.1	100
Terai	66.3	1.6	14.4	6.3	11.4	100
Province-ecological zone						
Koshi-Mountain	83.9	0.5	6.9	5.7	3.0	100
Koshi-Hill	93.9	0.6	1.1	3.3	1.1	100
Koshi-Terai	63.6	1.9	24.9	3.5	6.1	100
Madhesh-Terai	70.7	2.0	13.3	4.5	9.5	100
Bagmati-Mountain	95.8		4.2			100
Bagmati-Hill	87.2	1.1	3.3	4.5	3.9	100
Bagmati-Terai	26.0		19.1	5.3	49.6	100
Gandaki-Mountain	25.2	2.4	70.0	2.4		100
Gandaki-Hill	80.2	1.0	12.2	4.9	1.7	100
Gandaki-Terai	56.0	2.1	9.4	2.0	30.5	100
Lumbini-Hill	89.2	1.8	7.5	0.6	0.9	100
Lumbini-Terai	64.5	0.6	6.4	13.6	14.9	100
Karnali-Mountain	96.7	0.7	0.9	1.7		100
Karnali-Hill	97.4		2.0	0.6		100
Sudurpaschim-Mountain	87.6	6.2	6.2			100
Sudurpaschim-Hill	88.0	0.3	8.9	2.8		100
Sudurpaschim-Terai	81.9	3.0	11.1	3.8	0.2	100
Altitude (meter)						
Below 120	64.3	1.8	16.3	5.8	11.7	100
120 - 350	67.7	1.4	10.9	7.7	12.3	100
350 -1000	90.0	1.1	5.8	2.4	0.7	100

Analytical domain	Decreased	Increased	No change	Don't know	Not applicable	Total
1000 - 1300	90.8	1.2	3.0	3.3	1.7	100
1300 -1500	84.3	0.6	5.0	5.9	4.3	100
1500 - 2000	88.6	1.1	6.8	2.0	1.6	100
2000 and above	82.4	2.1	14.1	1.3	0.1	100
Climate risk						
Very Low	78.9	1.6	7.7	5.0	6.8	100
Low	82.2	0.5	10.2	2.4	4.7	100
Moderate	71.2	2.1	13.8	5.1	7.8	100
High	76.7		21.2		2.1	100
Very High	72.2	1.1	17.6	9.2	1.0	100
Nepal	**78.3**	**1.3**	**9.5**	**4.6**	**6.2**	**100**

Table 7.6 is the percentage of households that witnessed the complete dried up of rivulets and streams in last 25 years in Nepal. 43% of households observed these water sources completely dried up. 56.8% of the households in the hill region experienced water resources dried up. Among province-ecological zone, Sudurpaschim-Hill households affected the most; (77.6%) of households reported the complete drying up of rivulets and streams during this period followed by Karnali-Hill (68.4%). The severity of water source depletion in specific domains.

Table 7.6: Household (%) Observed Water Dried-up in Rivulets and Streams Over Last 25 Years

Analytical domain	Yes	No	Don't know	Not applicable	Total
Municipality					
Urban	42.2	43.1	6.3	8.3	100
Rural	44.2	48.5	4.3	3.0	100
Ecological Zone					
Mountain	39.8	57.2	2.4	0.6	100
Hill	56.8	36.9	4.1	2.2	100
Terai	29.6	51.9	7.4	11.1	100
Province-Ecological Zone					
Koshi-Mountain	28.7	60.3	8.5	2.5	100
Koshi-Hill	75.5	19.2	3.7	1.6	100
Koshi-Terai	30.4	56.6	8.3	4.7	100
Madhesh-Terai	30.9	56.3	3.5	9.2	100
Bagmati-Mountain	59.2	40.8			100
Bagmati-Hill	42.4	47.9	5.9	3.8	100
Bagmati-Terai	16.4	27.7	6.6	49.3	100
Gandaki-Mountain	2.6	92.6	4.8		100
Gandaki-Hill	47.1	46.7	4.3	1.9	100
Gandaki-Terai	16.3	49.2	3.3	31.2	100
Lumbini-Hill	73.9	23.5	2.0	0.7	100
Lumbini-Terai	30.3	39.5	14.9	15.3	100
Karnali-Mountain	41.0	57.3	1.7		100
Karnali-Hill	68.4	30.6	0.9	0.2	100

Sudurpaschim-Mountain	29.0	70.7	0.3		100
Sudurpaschim-Hill	77.6	19.3	3.1		100
Sudurpaschim-Terai	29.7	65.2	4.6	0.6	100
Altitude (meter)					
Below 120	24.9	57.2	6.9	11.1	100
120 - 350	36.4	42.5	8.8	12.4	100
350 -1000	51.3	44.7	3.1	1.0	100
1000 - 1300	64.9	29.1	4.2	1.8	100
1300 -1500	45.6	42.6	7.5	4.3	100
1500 - 2000	56.1	40.3	2.0	1.5	100
2000 and above	45.0	53.1	1.4	0.6	100
Climate risk					
Very Low	43.4	44.4	5.4	6.9	100
Low	44.5	48.2	2.9	4.4	100
Moderate	39.2	44.9	9.2	6.7	100
High	67.3	29.8	2.8		100
Very High	31.9	55.9	10.2	2.1	100
Nepal	**43.1**	**45.4**	**5.5**	**6.1**	**100**

Table 7.7 shows the distribution of households, observed changes in the duration of tap water supply in last 25 years in Nepal. 47.5% of households reported decrease in the duration of tap water supply, while only 5.8% reported an increase, and 21.2% reported no change. This reflects concerning trend towards reduced access to tap water. Province-ecological zone; Lumbini-Hill affected the most; 85.1% of households reporting decrease in the duration of tap water supply followed by Koshi-Mountain 83.3% and Sudurpaschim-Hill 80.4%. The growing challenge of water scarcity and insufficient water supply infrastructure in specific ecological zones and provinces, underscores the urgent need for targeted interventions and sustainable water management practices to ensure reliable access to clean water for households across Nepal.

Table 7.7: Households (%) Reporting Observed Change in Duration of Tap Water Supply Over Last 25 Years

Analytical domain	Decreased	Increased	No change	Stopped supply	Not applicable	Total
Municipality						
Urban	44.7	6.3	22.3	0.7	26.0	100
Rural	51.3	5.2	19.7	0.4	23.5	100
Ecological zone						
Mountain	70.0	9.3	18.3	0.4	2.0	100
Hill	65.0	8.8	21.9	0.7	3.6	100
Terai	25.6	2.1	21.0	0.4	50.9	100
Province-ecological zone						
Koshi-Mountain	83.3	1.4	8.1	0.5	6.7	100
Koshi-Hill	78.0	2.2	7.1	1.2	11.5	100
Koshi-Terai	10.3	1.2	19.0		69.5	100
Madhesh-Terai	34.1	0.3	12.2	0.8	52.6	100
Bagmati-Mountain	70.9	6.2	21.6		1.3	100

Analytical domain	Decreased	Increased	No change	Stopped supply	Not applicable	Total
Bagmati-Hill	64.4	18.9	12.7	0.5	3.4	100
Bagmati-Terai	21.2	0.9	51.6		26.3	100
Gandaki-Mountain	30.0		70.0			100
Gandaki-Hill	38.4	3.7	56.7	1.0	0.2	100
Gandaki-Terai	35.2	14.2	34.3		16.3	100
Lumbini-Hill	85.1	5.3	9.1		0.5	100
Lumbini-Terai	24.8	4.0	30.6	0.3	40.3	100
Karnali-Mountain	56.8	6.0	35.2	2.1		100
Karnali-Hill	65.6	0.2	28.8	1.0	4.4	100
Sudurpaschim-Mountain	66.9	21.3	11.8			100
Sudurpaschim-Hill	80.4	0.3	18.4	0.9		100
Sudurpaschim-Terai	29.2	5.8	23.9	0.1	41.1	100
Altitude (meter)						
Below 120	21.0	1.1	15.6	0.3	62.1	100
120 - 350	31.6	3.8	29.9	0.6	34.1	100
350 -1000	59.1	8.5	26.6	1.1	4.6	100
1000 - 1300	70.2	7.9	19.0	0.2	2.6	100
1300 -1500	66.1	11.1	17.9	0.6	4.4	100
1500 - 2000	69.0	8.4	19.5	0.4	2.6	100
2000 and above	60.1	7.9	27.5	1.1	3.4	100
Climate risk						
Very Low	52.7	6.3	21.1	0.6	19.3	100
Low	41.0	5.5	21.4	0.2	31.9	100
Moderate	37.2	5.9	18.7	0.3	38.0	100
High	36.5	4.6	21.5		37.4	100
Very High	31.6	0.5	27.9	1.6	38.5	100
Nepal	**47.5**	**5.8**	**21.2**	**0.5**	**24.9**	**100**

Table 7.8 is detailed breakdown of the various reasons behind the decreased water sources observed in last 25 years in Nepal. 47.7% experienced insufficient rainfall as the primary reason for decrease water resources and followed by drought (20.3%).

Table 7.8: Household (%) Reporting Reasons for Depletion in Water Sources Over Last 25 Years

S.N.	Reasons	1st priority	2nd priority	3rd priority
1	Insufficient rainfall	47.7	6.9	1.1
2	Increased drought	20.3	25.2	2.2
3	Road construction	3.4	7.7	5.4
4	Land slide / soil erosion	1.3	1.7	1.7
5	Urbanization	2.0	2.5	2.5
6	Deforestation	3.2	4.3	5.0
7	Heavy extraction of underground water	1.0	1.1	0.8

S.N.	Reasons	1st priority	2nd priority	3rd priority
8	Mine and excavation	0.1	0.4	1.8
9	Increased population	3.2	3.4	4.0
10	Earthquake	2.9	2.7	2.1
11	Change in land use	0.1	0.5	1.1
12	Others	14.8	0.3	0.5
13	Not reported	0.0	43.3	71.8
	Total	**100**	**100**	**100**

55.1% of households in the Terai region identified insufficient rainfall as a major contributing factor to reduced water sources. In contrast, in the Hill-region, 42.2% of households attributed the decline in water sources due to insufficient rainfall. This reflects the critical role of climate-related factors, particularly inadequate precipitation, in driving the burning issue of water scarcity across different ecological zones in Nepal. Recognizing and addressing these primary causes is essential for developing effective strategies and interventions to ensure sustainable water management in the face of changing climate patterns.

Table 7.9: Households (%) Reporting Major Reason for Depletion in Water Sources Over Last 25 Years

Analytical domain	Major Reason for Decrease in Water Sources (%)												
	Insufficient rainfall	Increase in drought	Road construction	Landslide/ soil erosion	Urbanization	Deforestation	Over extraction of ground water	Excavation	Population growth	Earthquake	Change in land use	Others	Total
Ecological zone													
Mountain	37.7	30.3	1.0	3.2	0.1	3.3	0.0	0.1	1.1	14.0	0.1	9.0	100
Hill	42.2	25.7	5.5	1.9	2.6	4.2	0.7	0.1	4.1	3.7	0.1	9.2	100
Terai	55.1	12.9	1.7	0.3	1.7	2.2	1.5	0.1	2.8	0.0	0.1	21.6	100
Nepal	**47.7**	**20.3**	**3.4**	**1.3**	**2.0**	**3.2**	**1.0**	**0.1**	**3.2**	**2.9**	**0.1**	**14.8**	**100**

Impacts on Energy

Table 7.10 describes the status of energy sources and the types of stoves used by households. Strikingly, the data shows households in Nepal primarily use traditional stoves, with LPG/Gas stoves being the next most common choice. Notably, the survey highlights that a significant majority of rural households, comprising 92.3%, rely on traditional stoves. Respondents were given the option to select multiple stove types, with at least three choices prioritized. The distribution by municipality indicates that 75.7% of households use LPG/Gas stoves, while in rural areas 51.0%. Interestingly, the utilization of electric/induction cookers is considerably higher in urban areas 6.8% compared to less than one percent in rural households. The prevalent reliance on traditional cooking methods, particularly in rural areas, and shows the diverse adoption of modern cooking technologies between urban and rural households in Nepal.

Table 7.10: Households (%) by Types of Cooking Stoves Used

Analytical domain	Traditional	Improved	LPG	Solar	Electric/ induction	Others
Municipality						
Urban	69.8	2.4	75.7	0.1	6.8	1.2
Rural	92.3	6.5	51.0		0.7	1.4
Ecological zone						
Mountain	85.1	14.8	43.3		0.7	0.2
Hill	76.0	4.5	63.3		7.1	0.6
Terai	81.8	1.8	71.1	0.2	1.9	2.1
Province-ecological zone						
Koshi-Mountain	94.0	6.4	39.9		0.5	
Koshi-Hill	87.6	10.5	50.3		0.5	0.4
Koshi-Terai	86.7	0.8	66.5		1.2	2.1
Madhesh-Terai	84.6	2.2	71.0	0.3	1.1	0.4
Bagmati-Mountain	97.6	1.3	55.8		1.7	
Bagmati-Hill	58.1	3.6	78.5		10.4	
Bagmati-Terai	58.4	6.1	92.5	0.3	8.8	2.4
Gandaki-Mountain	72.4	35.0	55.0		2.4	
Gandaki-Hill	74.9	4.8	73.0		14.9	2.8
Gandaki-Terai	76.0	0.7	83.7		1.7	3.1
Lumbini-Hill	93.1	2.2	65.4		1.3	0.2
Lumbini-Terai	74.8	1.5	74.8	0.2	2.8	1.5
Karnali-Mountain	23.8	75.0	29.4			
Karnali-Hill	93.3	2.1	38.7		0.1	0.1
Sudurpaschim-Mountain	96.2	4.5	38.7			0.6
Sudurpaschim-Hill	100.0	1.1	12.0			
Sudurpaschim-Terai	87.7	2.3	58.8		2.0	13.2
Nepal	**79.4**	**4.1**	**65.2**	**0.1**	**4.2**	**1.3**

Note: This table is based on multiple responses (maximum three responses)

Table 7.11 provides specific challenges faced by households in Nepal when using electric/ induction stoves. 30.7% of households reported frequent interruptions in electricity supply as a major problem. This challenge has particularly displaying the Hill regions, with a notable focus in Koshi-Hill (100%) and Karnali-Hill (100%), where every household reported encountering the issue of interrupted electricity supply. The significant hurdle due to unreliable electricity access in certain geographical areas, particularly in hilly regions, obstacle in the effective use of electric/ induction stoves. Addressed these challenges and improving the reliability of electricity supply is crucial to develop strategies for widespread adoption of more efficient and sustainable cooking technologies in Nepal.

Table 7.11: Households (%) Reporting Major Problems Encountered by the Households in Using Electric/induction Stove

Analytical domain	Interrupted electricity supply	Expensive cooking pots/utensils	Unavailable maintenance services	Costly electricity	Limited knowledge for using induction stoves	Uncomfortable using induction stove	Inappropriate for large cooking pots/ utensils	No problem	Total
Municipality									
Urban	30.7	1.7	2.7	6.2	0.2	0.4	2.4	55.8	100
Rural	26.0	0.0	4.3	8.6	0.0	6.4	0.0	54.7	100
Ecological zone									
Mountain	0.0	0.0	0.0	5.4	0.0	0.0	0.0	94.6	100
Hill	32.2	0.9	2.3	5.5	0.2	0.5	1.2	57.3	100
Terai	25.4	4.2	4.9	9.5	0.0	2.2	6.4	47.5	100
Province-ecological zone									
Koshi-Mountain	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	100
Koshi-Hill	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100
Koshi-Terai	18.1	21.9	0.0	15.5	0.0	0.0	0.0	44.4	100
Madhesh-Terai	26.3	0.0	0.0	11.1	0.0	0.0	10.6	51.9	100
Bagmati-Mountain	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	100
Bagmati-Hill	18.4	1.6	4.1	7.1	0.3	0.8	2.1	65.5	100
Bagmati-Terai	46.5	0.0	3.7	16.7	0.0	0.0	7.1	26.0	100
Gandaki-Mountain	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	100
Gandaki-Hill	50.5	0.0	0.0	3.8	0.0	0.0	0.0	45.7	100
Gandaki-Terai	0.0	0.0	0.0	13.8	0.0	0.0	0.0	86.2	100
Lumbini-Hill	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	100
Lumbini-Terai	19.1	0.0	6.4	0.0	0.0	0.0	7.9	66.6	100
Karnali-Hill	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100
Sudurpaschim-Terai	19.2	11.2	27.3	13.9	0.0	28.4	0.0	0.0	100
Nepal	**30.4**	**1.6**	**2.8**	**6.3**	**0.1**	**0.8**	**2.3**	**55.7**	**100**

Table 7.12 shows changing trends in the use of firewood by households over the last 25 years. Strikingly, a significant decrease in the use on firewood was observed nationwide (66.7%). 73.1% of households in the Terai region experienced a reduction in firewood use, while only 5.8% reported an increase. Additionally, 17.8% of households noted no change in their use of firewood over the specified period. This finding indicates a positive shift towards alternative energy sources or more efficient cooking technologies, potentially contributing to reduced deforestation and environmental impact. The decrease in firewood usage is indicative of evolving energy practices within households, reflecting a broader trend towards sustainable and environmentally friendly choices in Nepal.

Table 7.12: Households (%) Observing Change in use of Firewood Over Last 25 Years

Analytical domain	Increased	Decreased	No change	Not applicable	Total
Municipality					
Urban	4.9	68.8	18.2	8.2	100
Rural	7.9	63.9	27.5	0.7	100
Ecological zone					
Mountain	4.6	66.9	28.2	0.4	100
Hill	6.7	60.4	25.3	7.5	100
Terai	5.8	73.1	17.8	3.2	100
Province-ecological zone					
Koshi-Mountain	10.5	54.2	33.9	1.4	100
Koshi-Hill	17.0	56.1	24.4	2.5	100
Koshi-Terai	8.0	64.7	20.6	6.6	100
Madhesh-Terai	7.7	72.2	18.4	1.7	100
Bagmati-Mountain	3.0	82.3	14.7		100
Bagmati-Hill	2.1	68.0	12.8	17.1	100
Bagmati-Terai	6.0	82.7	8.1	3.2	100
Gandaki-Mountain		75.2	22.4	2.4	100
Gandaki-Hill	8.5	59.5	30.6	1.4	100
Gandaki-Terai	4.4	70.1	17.6	8.0	100
Lumbini-Hill	3.0	67.7	26.8	2.6	100
Lumbini-Terai	1.9	80.9	14.6	2.7	100
Karnali-Mountain	3.8	41.9	54.3		100
Karnali-Hill	2.5	50.2	46.7	0.6	100
Sudurpaschim-Mountain	2.1	72.8	25.2		100
Sudurpaschim-Hill	15.8	32.9	50.7	0.7	100
Sudurpaschim-Terai	1.7	76.9	20.5	0.9	100
Nepal	**6.2**	**66.7**	**22.1**	**5.0**	**100**

Conclusion

The survey finding highlights substantial changes in water sources across different domains. Terai region experiences significant impacts on hand-pumps, tube-wells, and wells. In the hilly regions, spring water faces are drying up or complete dry up. Furthermore, there is a sharp decrease in the water levels of rivers and rivulets across all regions. Many households have reported the complete drying up of water in streams and rivulets. Simultaneously, the duration of water in tap has consistently been reported decrease. The reasons behind these changes are predominantly attributed to drought and insufficient rainfall in last 25 years. The diverse and region-specific challenges faced by households in accessing water sources, providing valuable insights for specific interventions and adaptive measures in the context of changing climate patterns.

The survey finding on household energy use and the shift towards renewable sources present interesting insights. The majority of households primarily use traditional cooking stoves, along with a significant utilization of LPG stoves for cooking. Notably, households exhibit a fuel stacking behavior, employing two or more types of cooking stoves concurrently. This mix approach to cooking methods indicates a diverse energy usage pattern among households. Additionally, the

survey explored challenges faced by households using electric cook stoves, with the majority claiming interruptions in electricity supply as a major problem. This highlights the importance of addressing infrastructural constraints to ensure a coherent transition towards more sustainable and modern cooking technologies in households.

CHAPTER 8

CLIMATE CHANGE IMPACT ON BIODIVERSITY AND INVASIVE SPECIES

Introduction

This chapter includes wide understanding and effects of climate change on biodiversity; the rise of Invasive Alien Species (IAS), and the altering timing of flowering and fruiting in plant species. The study explains various analytical domains, evaluating changes over the last 25 years among flora and fauna (terrestrial and aquatic). Households reported both decline and increment in native species, as well as the introduction of IAS also extinction of certain species. This chapter minutely examines the positive and negative impacts.

Additionally, this chapter explains introduction of IAS plants (shrubs, creeping plants on tree, creeping plants on land, and aquatic plants) in the forest, grazing lands, agriculture, and other areas. And explore the reasons behind extinction of native species and introduction of invasive species; their impact on household livelihoods and adaptation strategies adapted by households for controlling these IAS.

Also, this chapter documents flowering and fruiting of different species, shifts in timing and their impact on livelihood. Shifting of flowering and fruiting has imposed impact on fruit size and fruits quality (less juicy fruits), as well as reduction in production. The impact of climate change has been observed on the reproductive viability of livestock such as; on newborns being underweight, difficulties in fertilization, increased mortality rate, or diminished in milk production. And highlights complex interplay of environmental changes due to induced climate change and their wide impacts on both flora and fauna.

Summary of Finding

Majority of households (68.7%) observed changes of trees species and 19.1% reported no change. Shrub species has balanced distribution, 24.6% reported changes in species and 40.6% claiming no change. Interestingly, herbal and non-timber forest products (NTFPs) had a diverse set of responses, only 17% changes, 25.4% remaining unchanged, and 46.1% uncertainty. Grasslands species has a relatively equal split between changed (32%) and unchanged (34.4%) perceptions. Aquatic animals (27.8%) and wild animals (57.9%) has considerable proportions reporting changes while birds (59.6%) and insects (39.8%) has higher percentages indicating changes (Figure 8. 1). Varied perceptions of environmental changes across different ecological categories, reflects the complex and multifaceted nature of ecological dynamics due to the impact of climate change.

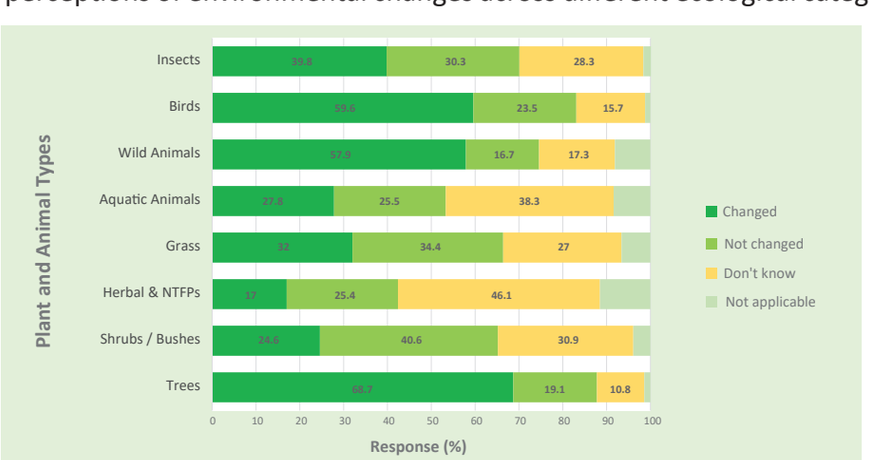
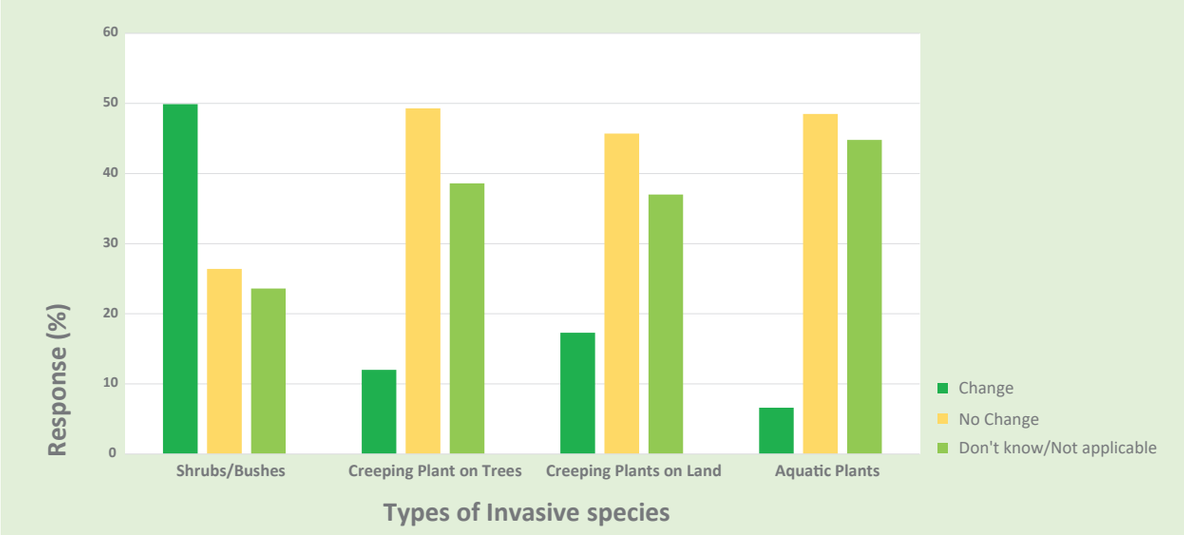


Figure 8.1: Households (%) Reporting Changes in the Status of Animal and Plant Species in Last 25 Years

In the context of shrubs species 49.9% reported change, 26.4% observed no change, and 23.6% were uncertain with the situation. 12% household noted change in species composition among creeping plants on trees, 49.3% indicated no change, and 38.6% reported uncertainty. For creeping plants on land, 17.3% of reported change, 45.7% observed no change, and 37% were uncertain. Among all, aquatic plants diversity and abundance was lowest in change; 6.6% change, 48.5% no change, and 44.8% uncertainty. The variability in responses across different vegetation categories could be attributed to environmental changes that are context-specific. The higher percentage of "Don't know/Not applicable" responses by respondent may be because of lack of awareness. Additionally, the relatively low percentage of reported changes in aquatic plants may because respondents perceive these species as more stable or less prone to alterations compared to other species (Figure 8. 2).

Figure 8.2: Appearance of Invasive Alien Species in Last 25 Years



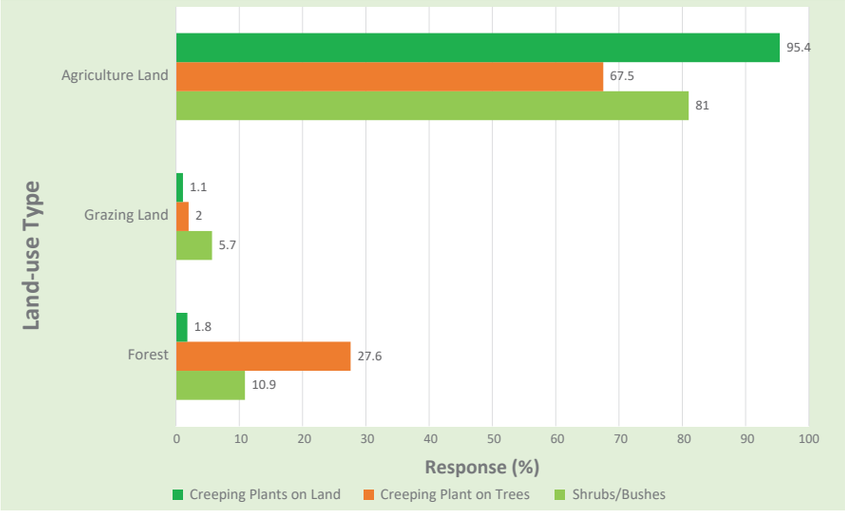
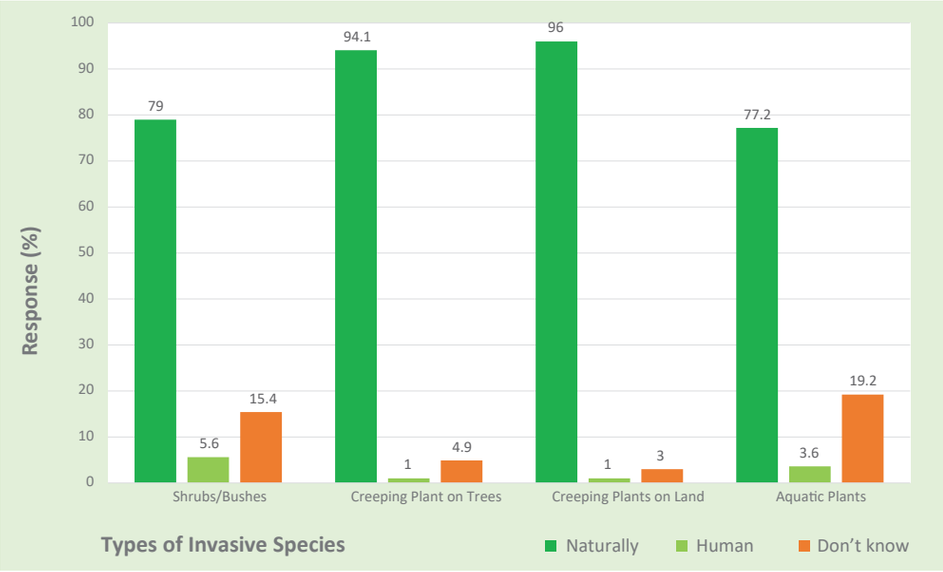


Figure 8.3: Cause for Appearance of New Invasive Species in Last 25 Years

Figure 8. 3 represents percentage distribution of vegetation types across forest, grazing land, and agriculture land. The vegetation is further classified into three sub-categories, namely shrubs/bushes, creeping plant on trees, and creeping plants on land. In the Forest, 10.9% were shrubs/bushes, 27.6% creeping plant on trees, and 1.8% creeping plants on land, with the remaining 59.7% likely comprising other types of vegetation. In Grazing Land, 5.7% were shrubs/bushes, 2% creeping plant on trees, and 1.1% creeping plants, 91.2% for other vegetation. Agriculture land was predominantly characterized by shrubs (81%), 67.5% creeping plant on trees, and 95.4% creeping plants, it means prevalence of ground-covering vegetation in agricultural areas. The distinct vegetation patterns in each land category, highlights the importance of understanding and managing specific plant types.

In Figure 8.4, IAS is categorized into four subgroups, namely shrubs/bushes, creeping plant on trees, creeping plants (land), and aquatic plants and the mode of spread of IAS are considered natural and anthropogenic. In the recent 25 years, 79% of IAS (shrubs/bushes) were introduced which is because of natural cause, human influence by 5.6%. Invasive creeping plant (trees), 94.1% reported it as a natural occurrence, 1% by human influence. Invasive creeping plants on land were introduced 96% through natural processes, human influence (1%). Invasive aquatic plants were recorded naturally by 77.2% of households, 3.6% by human influence.

Figure 8.4: Cause for Appearance of New Invasive Species in Last 25 Years



Impacts on Biodiversity

Table 8.1 highlights the impact of climate change on biodiversity in Nepal over the past 25 years which shows significant impact in distribution of floral and faunal species. 68.7% of households recorded change in abundance of tree species, followed by birds 59.6%, other wild animals 57.9%, insect species 39.8%, and grass species 32.0%. High influence of climate change was seen on both flora and fauna. 28.3% of households were unaware regarding the impact of climate change on biodiversity, this emphasized the need for increased awareness and education on micro climatic variation and the diverse ecosystems enhance biodiversity of Nepal's.

Table 8.1: Households Reporting Change in Status of Biodiversity

Category	Observed Change (%)				
	Changed	Not changed	Don't know	Not applicable	Total
Trees	68.7	19.1	10.8	1.4	100
Shrubs/ bushes	24.6	40.6	30.9	3.9	100
Herbal plants / NTFPs	17	25.4	46.1	11.5	100
Grass	32	34.4	27	6.6	100
Aquatic animals	27.8	25.5	38.3	8.4	100
Wild animals	57.9	16.7	17.3	8.1	100
Birds	59.6	23.5	15.7	1.2	100
Insects	39.8	30.3	28.3	1.7	100

Table 8.2, shows patterns of biodiversity distribution in Nepal. In rural areas, households reported change in diversity and abundance of tree species (65.7%), wild animals (63.7%) and birds

(57.4%). Respondence of urban areas experienced slightly differ in the diversity and abundance of species; tree species (70.9%), birds (61.3%), wild animals (53.6%). This finding explains variability in climate change impacts in different settings of landscapes, with urban areas changes in tree species comparatively more than rural areas, may be attributed to urbanization and alterations in green spaces, while rural areas exhibit a more balanced awareness of changes across multiple facets of biodiversity.

Table 8.2: Households Reporting Status of Biodiversity Change

Analytical Domain/Category	Observed Change (%)				
	Changed	Not changed	Don't know	Not applicable	Total
Municipality					
Urban					
Trees	70.9	15.4	11.3	2.4	100
Shrubs/ bushes	24.1	36	34.2	5.7	100
Herbal plants / NTFPs	14.1	23.4	48.8	13.7	100
Grass	30	30.1	31.3	8.6	100
Aquatic animals	29.2	22.9	38	9.9	100
Wild animals	53.6	15.8	20.7	9.9	100
Birds	61.3	20.8	16	1.9	100
Insects	41	26.4	30.2	2.5	100
Rural					
Trees	65.7	24.2	10	0.1	100
Shrubs / bushes	25.2	46.9	26.3	1.6	100
Herbal plants / NTFPs	20.8	28.2	42.5	8.5	100
Grass	34.6	40.2	21.2	4	100
Aquatic animals	25.8	29	38.7	6.5	100
Wild animals	63.7	17.8	12.8	5.7	100
Birds	57.4	27	15.2	0.3	100
Insects	38.1	35.6	25.7	0.6	100

In mountain areas, 75.4% of households reported change in the abundance of wild animals, followed by trees (70.9%), and birds (55.5%). Similarly, in the hills, 68.7% of households reported change in number of wild animal, followed by trees (65.2%), and birds (51.8%). Terai region 71.9% of households reported change in tree abundance, followed by birds (68.4%), insects (43.7%), and wild animals (43.6%). This finding highlights the various impact of climate change on biodiversity across different analytical domain in Nepal, the importance of region-specific conservation strategies and the complex interplay between environmental factors and human perceptions of biodiversity changes.

Table 8.3: Households Reporting Status of Biodiversity Change

Analytical domain/ Category	Observed Change (%)				
	Changed	Not changed	Don't know	Not applicable	Total
Ecological belt					
Mountain					
Trees	70.9	21.8	7.2	0.1	100
Shrubs / bushes	37.7	45.8	16.4	0.1	100
Herbal plants / NTFPs	28	30.3	39.5	2.3	100
Grass	38.9	47.1	13.9	0.2	100
Aquatic animals	21.9	33.3	42.2	2.5	100
Wild animals	75.4	12.8	11.7	0.1	100
Birds	55.5	26.3	18.1	0.1	100
Insects	37.3	41	21.6	0.1	100
Hill					
Trees	65.2	26.5	7.5	0.9	100
Shrubs/ bushes	29.4	50.1	19.1	1.5	100
Herbal plants / NTFPs	20.3	31.9	42.6	5.3	100
Grass	39.1	39.9	16.9	4.2	100
Aquatic animals	20.2	32.8	40.5	6.6	100
Wild animals	68.7	16.6	12.5	2.2	100
Birds	51.8	33.4	14.2	0.6	100
Insects	36.3	39.1	23.7	0.8	100
Terai					
Trees	71.9	11.1	14.8	2.3	100
Shrubs / bushes	17.2	30	45.6	7.2	100
Herbal plants / NTFPs	11.6	18	50.9	19.5	100
Grass	23.5	26.5	39.7	10.3	100
Aquatic animals	36.6	16.6	35.4	11.4	100
Wild animals	43.6	17.4	23.3	15.7	100
Birds	68.4	12.8	16.8	2	100
Insects	43.7	19.3	34.1	2.8	100

In the Koshi-Mountain area, 55.9% of households reported change in the abundance of wild animals, and 52.2% change in tree abundance. In Koshi-Hill, 94.2% of households experienced changes in the abundance of wild animal, trees (90%) and birds (81.7%). Likewise, in Koshi-Terai, 88.6% of households observed changes in tree abundance, bird species 86.8% and wild animals 71.4%. In Madesh-Terai 85.8% of households reported change in tree abundance and 82.5% in bird abundance. In Bagmati-Mountain 85.6% of household reported change in abundance of wild animals, trees (73.4%). In Bagmati Hill, 61.4% of households observed change in the abundance of wild animals, trees (57.6%). Similarly, in Bagmati-Terai, 63.6% of households observed change in tree abundance, bird species (53.4%). In Gandaki-Mountain, less than 50.0% reported change across all biodiversity categories. However, in Gandaki-Hill, 73.1% of households experienced change in tree abundance, wild animals (68.2%). In Gandaki-Terai, 50.9% of households observed change in tree abundance. Lumbini-Hill reported changes in wild animals by 66.9%; in Lumbini-Terai 45.7% reported change in in tree abundance, birds 44.9%. In Karnali-Mountain, 96.8% of households observed change in tree abundance, followed by wild animals (90.7%) and birds (83.5%). In Karnali-Hill, 85.1% of households experienced change in tree abundance, followed by wild animals (80.5%). Sudurpaschim-Mountain experienced change in wild animals by 75.8%, followed by trees (72.4%). In Sudurpaschim-Hill and Sudurpaschim-Terai, less than 50% reported change in biodiversity across all categories. These broad findings provide detailed information on impacts of climate change on biodiversity abundance within different analytical domain in Nepal.

Table 8.4: Households (%) Reporting Status of Biodiversity Change as per-Provincial Ecological Zone

Analytical domain/ category	Observed Change (%)				
	Changed	Not changed	Don't know	Not applicable	Total
Koshi-Mountain					
Trees	52.2	30.5	16.8	0.5	100
Shrubs / bushes	5	68.2	26.4	0.5	100
Herbal plants / NTFPs	8.9	36.1	46.2	8.9	100
Grass	29.3	51.6	18.7	0.5	100
Aquatic animals	13.7	34.7	45	6.6	100
Wild animals	55.9	11.4	32.1	0.5	100
Birds	39	31.7	28.7	0.5	100
Insects	28.8	37.9	32.8	0.5	100
Koshi-Hill					
Trees	90	8.7	1.2		100
Shrubs / bushes	60	27.4	12.6		100
Herbal plants / NTFPs	54	19.5	26.5		100
Grass	70.9	23.7	5.5		100
Aquatic animals	35.7	18.4	37.9	8	100
Wild animals	94.2	2.4	3.4		100
Birds	81.7	13.2	5.1		100
Insects	64.1	12.6	23	0.3	100
Koshi-Terai					
Trees	88.6	2.4	6.4	2.6	100
Shrubs / bushes	31.8	15.9	47.8	4.5	100
Herbal plants / NTFPs	32.3	16.4	45.9	5.4	100
Grass	44.7	13.8	35.4	6.1	100
Aquatic animals	64.1	2.8	26.1	7	100
Wild animals	71.4	4.7	19.8	4.1	100
Birds	86.8	3.1	8.4	1.7	100
Insects	50.7	7	38.9	3.3	100
Madhesh-Terai					
Trees	85.8	7.7	5.5	1	100
Shrubs / bushes	17	30.6	42.9	9.6	100
Herbal plants / NTFPs	3.4	19.9	63.3	13.5	100
Grass	20.6	35.2	37.7	6.5	100
Aquatic animals	42.8	25.2	25.9	6.1	100
Wild animals	44.9	22.9	12.8	19.4	100
Birds	82.5	10.6	5.6	1.3	100
Insects	59.8	19	20.1	1.1	100
Bagmati-Mountain					
Trees	73.4	18.7	7.9		100
Shrubs / bushes	58.6	21.8	19.6		100
Herbal plant / NTFPs	32.7	11.4	55.4	0.5	100
Grass	59.2	23.6	17.3		100
Aquatic animals	28.3	17.5	51.5	2.7	100
Wild animals	85.6	6.4	8		100
Birds	55.1	25.6	19.3		100
Insects	51.8	22.8	25.4		100
Bagmati-Hill					
Trees	57.6	29.5	10.7	2.3	100
Shrubs / bushes	20.2	52	24.2	3.6	100
Herbal plants / NTFPs	10.1	29.6	49.6	10.7	100

Analytical domain/ category	Observed Change (%)				
	Changed	Not changed	Don't know	Not applicable	Total
Grass	20.9	43.5	25.3	10.2	100
Aquatic animals	17.8	34.1	43.5	4.6	100
Wild animals	61.4	16.4	17.4	4.9	100
Birds	49.1	31	18.4	1.5	100
Insects	32.8	43.1	22.3	1.8	100
Bagmati-Terai					
Trees	63.6	20.2	15.5	0.7	100
Shrubs / bushes	19.9	49.7	29.8	0.6	100
Herbal plants / NTFPs	9.2	22.8	27.2	40.9	100
Grass	29.8	37.2	26.8	6.2	100
Aquatic animals	4	32.5	30.7	32.9	100
Wild animals	46	23.7	22.3	7.9	100
Birds	53.4	25	19.8	1.8	100
Insects	29.5	42.6	26.4	1.5	100
Gandaki-Mountain					
Trees	30.5	37.1	32.4		100
Shrubs / bushes		57.4	42.6		100
Herbal plants / NTFPs	10.2	17.1	72.6		100
Grass	5.2	52.4	42.4		100
Aquatic animals	2.4	35	62.6		100
Wild animals	14.8	30.2	55		100
Birds	10.2	19.5	70.2		100
Insects	18.1	17.4	64.5		100
Gandaki-Hill					
Trees	73.1	23.9	3	0.1	100
Shrubs / bushes	28.3	54.5	16.8	0.4	100
Herbal plants / NTFPs	21.4	41	32.4	5.1	100
Grass	41.2	43	14.9	0.9	100
Aquatic animals	15.4	38.7	35.5	10.4	100
Wild animals	68.2	18	12.7	1.1	100
Birds	52.7	34.8	12.6		100
Insects	23.6	45.7	30.6	0.1	100
Gandaki-Terai					
Trees	50.9	24.2	23.6	1.3	100
Shrubs / bushes	22.1	33.6	42.9	1.3	100
Herbal plants / NTFPs	20.4	25.7	51.1	2.8	100
Grass	37.4	28.7	28.6	5.3	100
Aquatic animals	19	18.3	62	0.8	100
Wild animals	39.7	19.8	40	0.4	100
Birds	25.2	29.1	45.7		100
Insects	35.3	19.3	45.3		100
Lumbini-Hill					
Trees	43.2	50.2	6.7		100
Shrubs / bushes	4.4	80.5	14.8	0.3	100
Herbal plants / NTFPs	3.8	46.2	49.2	0.9	100
Grass	35.4	51.9	11.7	1	100
Aquatic animals	0.8	50.6	38	10.6	100
Wild animals	66.9	21.4	11.7		100
Birds	16.6	66.6	16.6	0.2	100
Insects	5.3	72.6	22	0.1	100
Lumbini-Terai					
Trees	45.7	16.3	33.1	4.8	329,410

Analytical domain/ category	Observed Change (%)				
	Changed	Not changed	Don't know	Not applicable	Total
Shrubs / bushes	5.7	33.5	51.4	9.4	100
Herbal plants / NTFPs	6.9	12.8	40	40.3	100
Grass	5.6	18.1	51.6	24.6	100
Aquatic animals	10.5	10.6	53.2	25.7	100
Wild animals	21.8	16.7	32.7	28.8	100
Birds	44.9	17.6	33.3	4.1	100
Insects	15.3	24.2	54.3	6.2	100
Karnali-Mountain					
Trees	96.8	2.3	0.9		100
Shrubs / bushes	33.3	56.6	10.2		100
Herbal plants / NTFPs	56.1	34.2	9.7		100
Grass	36.1	57.3	6.1	0.5	100
Aquatic animals	37.7	36.3	25.6	0.4	100
Wild animals	90.7	6.2	3		100
Birds	83.5	10.1	6.4		100
Insects	50.4	33.2	16.4		100
Karnali-Hill					
Trees	85.1	3.7	11.2		100
Shrubs / bushes	61.1	24.9	14		100
Herbal plants / NTFPs	27.7	25.5	46.1	0.7	100
Grass	72.5	15.7	11.8		100
Aquatic animals	41.7	17.5	38.3	2.5	100
Wild animals	80.5	11.2	7.9	0.4	100
Birds	67.5	19.5	13		100
Insects	64.3	20	15.4	0.4	100
Sudurpaschim-Mountain					
Trees	72.4	27.1	0.5		100
Shrubs / bushes	46.1	47.5	6.4		100
Herbal plants / NTFPs	25.1	44.9	30		100
Grass	27.8	63.5	8.7		100
Aquatic animals	14.8	47.9	37.3		100
Wild animals	75.8	23.4	0.9		100
Birds	57.4	31.4	11.2		100
Insects	22.8	68.7	8.4		100
Sudurpaschim-Hill					
Trees	35.7	51.5	12.9		100
Shrubs / bushes	9.7	65	25.3		100
Herbal plants / NTFPs	11.9	32.3	55.2	0.6	100
Grass	19.7	62.3	17.4	0.6	100
Aquatic animals	12.5	34.6	50.5	2.4	100
Wild animals	38.9	46.7	13.1	1.3	100
Birds	30.5	55.4	14.1		100
Insects	39.6	32	28.4		100
Sudurpaschim-Terai					
Trees	34.1	31.9	32.5	1.5	100
Shrubs / bushes	3.9	49	45.3	1.7	100
Herbal plants / NTFPs	3.2	22.8	46.3	27.8	100
Grass	18.6	37.8	39.2	4.4	100
Aquatic animals	19.9	22.5	55.9	1.7	100
Wild animals	14.8	25.5	57.9	1.7	100
Birds	27.6	27.8	43.1	1.5	100
Insects	31.3	32.4	34.2	2.1	100

Changes in Invasive Alien Species

Table 8.5 highlights the perceptions of households regarding IAS. 49.9% of households experienced an increase in the abundance of invasive shrubs/bushes in their respective regions. In contrast, many households did not experience noticeable increase in the abundance of creepers in their locality. Additionally, the results indicate that households generally lack familiarity with the abundance and distribution of IAS. This suggests need for increased awareness and education regarding the identification and impact of invasive plant species and emphasize the importance of community engagement in addressing and mitigating the proliferation of these species in the local environment.

Table 8.5: Households Reporting Increase in Abundance of Invasive Alien Species in Last 25 Years

Category	Observed Change (%)			
	Yes	No	Don't know/Not applicable	Total
Shrubs / bushes	49.9	26.4	23.6	100
Creeping plants on tree	12.0	49.3	38.6	100
Creeping plants on land	17.3	45.7	37	100
Aquatic plants	6.6	48.5	44.8	100

Table 8.6 presents IAS in forest, grazing/pasture land, agriculture land. It shows agricultural land was significantly impacted than others. Households reported both shrubs/bushes (81%) and creeping types of invasive species (67.5% in tree & 95.4% in land) in agricultural land followed by forest land (creeping plants were seen more than others 27.6%). Additionally, aquatic invasive alien species were reported in the lakes, ponds, rivers, and other aquatic ecosystems.

Table 8.6: Households Reporting Location of Higher Abundance of Invasive Alien Species in Last 25 Years

Category	Impact Observed (%)				
	Forest	Grazing/ Pasture Land	Agriculture	Others	Total
Shrubs / bushes	10.9	5.7	81	2.5	100
Creeping plants on tree	27.6	2	67.5	2.9	100
Creeping plants on land	1.8	1.1	95.4	1.7	100
Aquatic plants	7.3	0.4	30.7	61.5	100

Majority (79%) of households experienced the spread of IAS due to natural causes (Table 8.7). Only few households reported anthropogenic causes as contributing to the increase in invasive plant species in their areas. This finding highlights the need for adoptive conservation efforts in agricultural and forested area to mitigate the impact of IAS, the importance of addressing factors related to natural causes in order to effectively manage the spread of invasive species across various ecosystems.

Table 8.7: Households Reporting Cause of Increase in Invasive Alien Species in Last 25 Years

Category	Spread Observed (%)			
	Naturally spread	Spread by human	Don’t know	Total
Shrubs / bushes	79	5.6	15.4	100
Creeping plants on tree	94.1	1	4.9	100
Creeping plants on land	96	1	3	100
Aquatic plants	77.2	3.6	19.2	100

Table 8.8 highlights the impact of IAS on the annual income of households, which showed encroachment of agricultural land by IAS contributed to reduction in the supply of resources essential for households, leading to decreased agricultural production. 71% of households reported a decrease in income linked to the spread of creeping plants on their fertile lands. Furthermore, households expressed the adverse effects of invasive species on their livelihoods, including a reduction in the amount of grass collected and the loss of *Sottar* (a material used for bedding livestock). The management of such invasions also incurs additional time and resources for households. These finding highlights the wide challenges imposed by IAS, emphasizing the need for comprehensive strategies to mitigate their economic impact on households and the agricultural landscape.

Table 8.8: Households Reporting Major Impacts due to IAS in Last 25 Years

Impact category	Impact Observed (%)			
	Shrubs/ bushes	Creeping plants on tree	Creeping plants on land	Aquatic plants
Decreased Income	52.9	48.5	71	38
Loss in timber	1.4	5	0.6	
Loss in grass	24.1	8.4	2.8	0.7
Loss in firewood	0.1	0.2	0.1	
Sottar loss (leaves and litter)	4.2	15	11.6	5.8
Food grass loss	6.9	1.7	6.3	0.8
Human and livestock's health problem	1	0.8	0.2	0.7
No any affect	9.3	20.3	7.4	54
Total	**100**	**100**	**100**	**100**

Table 8.9 highlights adaptive strategies that are adapted by households to manage and control IAS. In average >50% of the households preferred "cut and destroy" approach which involves the physical removal of invasive species. In average >9% of the household preferred to burn invasive plants. >25% of the households did not took any specific activities for the control of invasive species. This diversity in approaches highlights the complexity of invasive species management and reflects the adaptability of households in employing methods best suited to their local conditions. The finding provides a detailed understanding of the challenges imposed by invasive species and emphasize the importance of adoptive control measures to the specific characteristics of the invasive plants and the communities affected.

Table 8.9: Households Reporting Activities to Control/Manage IAS in Last 25 Years

Effort category	Managing (%)			
	Shrubs/bushes	Creeping plants on tree)	Creeping plants on land	Aquatic plants
Fire	19.3	7.8	8.5	2.7
Cut and destroy	90.7	73.7	91.4	50.1
Destroyed using drugs/chemicals	8.3	5.3	8.4	6
Used to make briquettes/bio-char	0.2		0.1	
Other	8.4	3.3	11.5	5.9
Don't do anything	15.3	28.6	10.7	48.7
(This table is based on multiple response)				

In urban areas, 41.1% of households reported an increase in the abundance of shrubs/bushes type invasive species in their surroundings. Interestingly, similar to their rural counterparts, households in urban areas demonstrated a limited familiarity with the abundance and distribution of invasive alien plant species. In contrast, 61.5% reported rise in the abundance IAS (Table 8.10).

Households in rural areas were unaware concerning the abundance and distribution of IAS. These findings emphasize the need of awareness and education initiatives, even in urban areas, to enhance community understanding on the presence and impact of invasive species.

Table 8.10: Households Reporting Increase in Abundance of IAS plants in Last 25 Years

Analytical domain/ category	Observed Change (%)			
	Yes	No	Don't know/Not applicable	Total
Municipality				
Urban				
Shrubs / bushes	41.4	27.5	31.1	100
Creeping plants on tree	11.4	45.2	43.4	100
Creeping plants on land	16.7	41.3	42	100
Aquatic plants	6.3	44.7	49	100
Rural				
Shrubs / bushes	61.5	25	13.6	100
Creeping plants on tree	12.8	55	32.2	100
Creeping plants on land	18	51.6	30.4	100
Aquatic plants	7	53.8	39.2	100

More than 67% of the households in the urban areas reported agricultural land as the primary location experiencing a high abundance of IAS. Within these agricultural lands, both shrubs/ bushes (83%) and creeping types (67%) of invasive species were notably covered and followed by forest lands (39% in average) among urban households (Table 8.11). Additionally, aquatic invasive alien plant species were experienced in lakes, ponds, rivers, and other aquatic ecosystems, with agricultural land also experiencing invasion in urban areas. In rural areas the impact of invasive species on various land use categories was observed. The results highlight the importance of considering diverse environments and land use patterns when developing strategies to control of invasive alien plant species in both urban and rural areas.

Table 8.11: Households Reporting Location of Higher Abundance of IAS Plants as per Rural and Urban Areas

Category	Impact Observed (%)				
	Forest	Grazing	Agriculture	Other	Total
Urban					
Shrubs / bushes	10	3.6	83	3.4	100
Creeping plants on tree	26.1	3.2	67.3	3.4	100
Creeping plants on land	1.1	1.6	94.7	2.6	100
Aquatic plants	9.2	0.7	27.7	62.4	100
Rural					
Shrubs / bushes	11.7	7.5	79.2	1.6	100
Creeping plants on trees	29.4	0.5	67.8	2.3	100
Creeping plants on land	2.7	0.5	96.2	0.5	100
Aquatic plants	5.1	-	34.3	60.5	100

Table 8.12 shows a consistent trend among households in both rural and urban areas regarding the major causes of IAS spread. More than 50% of the households in both urban and rural areas reported that the spread of IAS due to natural causes. These natural causes may include factors such as wind, water currents, and the natural dispersal mechanisms of plant species. Less than 10% of households reported anthropogenic causes as contributing to the dispersal of IAS in their areas.

Table 8.12: Households Reporting Reasons of Appearance of IAS in Rural and Urban Areas

Category	Spread Observed (%)			
	Naturally spread	Spread by human	Don't know	Total
Urban				
Shrubs / bushes	79.6	6.7	13.7	100
Creeping plants on trees	94	0.6	5.3	100
Creeping plants on land	96.7	0.8	2.5	100
Aquatic plants	87.8	3.2	9	100
Rural				
Shrubs / bushes	78.4	4.6	17	100
Creeping plants on trees	94.2	1.5	4.3	100
Creeping plants on land	95.1	1.2	3.7	100
Aquatic plants	64.4	4.1	31.5	100

Table 8.13 highlights the perspective of households inhabit in mountain, hilly and terai areas regarding IAS. 67.8% of households reported increase in the abundance of invasive shrubs/ bushes in mountainous region. Besides households of three ecological regions mountainous region, hilly region and terai region were with the distribution of invasive species. This emphasized the importance of awareness and education initiatives to minimize the challenges imposed by invasive plant species.

Table 8.13: Increase in Abundance of IAS Plants as per Ecological Zones in Last 25 Years

Analytical domain/category	Increased observed (%)			
	Yes	No	Don't know/Not applicable	Total
Mountain				
Shrubs / bushes	67.8	22.2	10	100
Creeping plants on trees	4.7	65.4	29.9	100
Creeping plants on land	16.5	58.5	25	100
Aquatic plants	0.7	65.4	33.9	100
Hill				
Shrubs / bushes	64.9	13.8	21.3	100
Creeping plants on trees	13.8	47.2	39.1	100
Creeping plants on land	19.2	43.8	37	100
Aquatic plants	2.1	50	47.9	100
Terai				
Shrubs / bushes	31.4	40.1	28.5	100
Creeping plants on trees	11.5	48.7	39.8	100
Creeping plants on land	15.5	45.3	39.2	100
Aquatic plants	12.4	43.9	43.7	100

Table 8.14 shows into the distribution of invasive alien plant species according to ecological zones in Nepal. In all ecological zone; respondents experienced highest distribution of invasive species on agricultural land. This may be attributed to that invasive species have found favorable conditions for spread in cultivated areas. Creeping plants on trees occurred higher in forest land. In the hills and terai regions, creeping plants (trees and lands) were reported abundant in agricultural lands. This suggests the need for management strategies to minimize the spread and impacts of IAS in Nepal.

Table 8.14: Place of Higher Abundance of IAS Plants as per Ecological Zone

Analytical domain/ category	Observed (%)				
	Forest	Grazing / Pasture land	Agri culture	Others	Total
Mountain					
Shrubs / bushes	11.5	3.5	83.2	1.8	100
Creeping plants on trees	63.3		36.7		100
Creeping plants on land	4	2.3	91.2	2.5	100
Aquatic plants	82.4			17.6	100
Hill					
Shrubs / bushes	14.5	7.6	76.1	1.8	100
Creeping plants on trees	36.5	0.2	61.4	1.9	100
Creeping plants on land	2	0.1	97.6	0.3	100
Aquatic plants	40.4		37.6	21.9	100
Terai					
Shrubs / bushes	2.9	2.4	90.5	4.2	100
Creeping plants on trees	14.1	4.2	77.3	4.4	100
Creeping plants on land	1.2	2.2	93.4	3.2	100
Aquatic plants	0.9	0.5	29.8	68.8	100

All the ecological zones reported appearance of IAS due to natural cause. Households experienced natural cause as wind, water currents, and other environmental processes; primary reasons for the introduction and spread of invasive alien plant species. Respondent across all ecological zones were observed lack of awareness regarding the specific dispersal mechanisms of IAS. It suggests the importance of education and awareness campaigns to enhance community understanding of the factors contributing to the spread of invasive plants.

Table 8.15: Reason for Appearing IAS Plants as per Ecological-belt

Analytical domain/ category	Spread Observed (%)			
	Naturally spread	Spread by human	Don't know	Total
Mountain				
Shrubs / bushes	80.3	5.6	14.1	100
Creeping plants on tree	77	6.4	16.5	100
Creeping plants on land	98.4		1.6	100
Aquatic plants	100			100
Hill				
Shrubs / bushes	78.5	6.5	14.9	100
Creeping plants on tree	93.8	0.9	5.3	100
Creeping plants on land	96.9	0.6	2.4	100
Aquatic plants	90.5		9.5	100
Terai				
Shrubs / bushes	79.4	3.6	17	100
Creeping plants climb on tree	95.8	0.8	3.4	100
Creeping plants on land	94.3	1.6	4.1	100
Aquatic plants	74.7	4.3	21	100

Koshi-mountain area, households reported that shrubs and bushes, as well as creeping invasive species, were more abundant in agricultural land and creeping on plants and trees recorded higher in forest lands. Koshi-terai, Madhesh-terai, Bagmati-mountain, Bagmati-hill, and Lumbini-terai household experienced invasive species abundant in agricultural land. Likewise, in other ecological zones, creeping plants on trees observed abundant in forest land and grazing lands (Table 8.16). The diverse distribution of invasive species highlights the need for targeted management strategies that consider the specific characteristics of each ecological zone to effectively address and mitigate the impact of invasive alien plant species in Nepal.

Table 8.16: Location of IAS Plants as per Ecological-belt

Analytical domain/ category	Observed (%)				
	Forest	Grazing/ Pasture Land	Agriculture	Other	Total
Koshi-Mountain					
Shrubs / bushes	21.7	1.8	76.5		100
Creeping plants on trees	100				100
Creeping plants land	26.7	5.7	67.6		100
Koshi-Hill					
Shrubs / bushes	14.6	7.3	78.1		100
Creeping plants on trees	21.6		77.5	0.9	100
Creeping plants on land	0.8		99.2		100
Aquatic plants			50	50	100
Koshi-Terai					
Shrubs / bushes	1	0.8	97.7	0.5	100
Creeping plants on trees	8	2	87.8	2.3	100
Creeping plants on land	0.8	0.4	98.5	0.2	100
Aquatic plants	2.2		47.5	50.3	100
Madhesh-Terai					
Shrubs / bushes		3.3	93.1	3.6	100
Creeping plants on trees	19.2	16.7	49.7	14.4	100
Creeping plants on land		8.8	77.0	14.2	100
Aquatic plants		0.8	21.4	77.8	100
Bagmati-Mountain					
Shrubs / bushes	11.6		84.3	4.1	100
Creeping plants on trees			100		100
Creeping plants on land	0.9	2.5	92.8	3.8	100
Bagmati-Hill					
Shrubs / bushes	15.6	7.3	74.1	2.9	100
Creeping plants on trees	26		66.5	7.5	100
Creeping plants on land			95.2	4.8	100
Aquatic plants			100		100
Bagmati-Terai					
Shrubs / bushes	12.6	1.3	81.6	4.5	100
Creeping plants on trees	62.3		37.7		100
Creeping plants on land	25.1	1.6	73.3		100
Aquatic plants			28	72	100
Gandaki-Hill					
Shrubs / bushes	18.9	1.2	79.9		100
Creeping plants on trees	53.4		46.6		100
Creeping plants on land	1.8		98.2		100
Aquatic plants				100	100
Gandaki-Terai					
Shrubs / bushes	17.2	9	71.8	2	100
Creeping plants on trees	51.7		36.5	11.8	100
Creeping plants on land		2.3	93.9	3.7	100
Aquatic plants	9.7		53.9	36.4	100
Lumbini-Hill					
Shrubs / bushes	15.2	28.2	56.6		100
Creeping plants on trees		100			100
Creeping plants on land	8.3		91.7		100

Analytical domain/ category	Observed (%)				
	Forest	Grazing/ Pasture Land	Agriculture	Other	Total
Lumbini-Terai					
Shrubs / bushes	1.8	0.6	93.6	4	100
Creeping plants on trees	34.9		65.1		100
Creeping plants on land			100		100
Aquatic plants			5.6	94.4	100
Karnali-Mountain					
Shrubs / bushes	1.8	1.3	97		100
Creeping plants on trees	80.8		19.2		100
Creeping plants on land	2.8		97.2		100
Aquatic plants	82.4			17.6	100
Karnali-Hill					
Shrubs / bushes	6.1	4.4	85	4.5	100
Creeping plants on tree	82.1		13.4	4.6	100
Creeping plants on land	3.6	0.5	95.1	0.8	100
Aquatic plants	52		26.8	21.2	100
Sudurpaschim-Mountain					
Shrubs / bushes	11.3	10.7	77.2	0.8	100
Creeping plants on trees	100				100
Sudurpaschim-Hill					
Shrubs / bushes	8.3	2.1	84.1	5.4	100
Creeping plants on trees				100	100
Sudurpaschim-Terai					
Shrubs / bushes	7.7	6.4	57.4	28.4	100
Creeping plants on trees	22.2		69.3	8.5	100
Creeping plants on land	100				100

Households across the provinces consistently identified natural cause (wind dispersal, water currents, and other environmental processes) for the appearance of invasive alien plant species in all ecological zones (Table 8.17). This emphasized the need of educational initiatives and awareness campaigns to enhance understanding among communities about the ecological dynamics driving the spread of invasive species and highlights the importance of formulating management strategies that account for the unique ecological features of each zone to effectively address the challenge of IAS plants in the respective provinces.

Table 8.17: Reason for Appearing IAS Plants as per Ecological-zones in the Provinces of Nepal

Analytical domain/ category	Spread Observed (%)			
	Naturally spread	Spread by human	Don't know	Total
Koshi-Mountain				
Shrubs / bushes	80.2	8.6	11.2	100
Creeping plants on tree	54.9	25.8	19.4	100
Creeping plants on land	94.3		5.7	100
Koshi-Hill				
Shrubs / bushes	98	1.4	0.6	100
Creeping plants on tree	99.2		0.8	100
Creeping plants on land	100			100
Aquatic plants	100			100
Koshi-Terai				
Shrubs / bushes	98.5		1.5	100

Analytical domain/ category	Spread Observed (%)			
	Naturally spread	Spread by human	Don't know	Total
Creeping plants on tree	99.2		0.8	100
Creeping plants on land	98.2	0.3	1.5	100
Aquatic plants	91		9	100
Madesh-Terai				
Shrubs / bushes	77.4	4	18.6	100
Creeping plants on tree	89.9		10.1	100
Creeping plants on land	82.9	5.9	11.2	100
Aquatic plants	72.8	7.1	20.1	100
Bagmati-Mountain				
Shrubs / bushes	92.9	2	5.1	100
Creeping plants on tree	100			100
Creeping plants on land	98.6		1.4	100
Bagmati-Hill				
Shrubs / bushes	51.3	8.8	39.9	100
Creeping plants on tree	26.9		73.1	100
Creeping plants on land	32.8		67.2	100
Aquatic plants	35.4		64.6	100
Bagmati-Terai				
Shrubs / bushes	76.1	13.3	10.6	100
Creeping plants on tree	81.8	12.3	5.9	100
Creeping plants on land	100			100
Aquatic plants	100			100
Gandaki-Hill				
Shrubs / bushes	75	16.2	8.7	100
Creeping plants on trees	86.5	5.7	7.8	100
Creeping plants on land	92.6	3.6	3.8	100
Aquatic plants	100			100
Gandaki-Terai				
Shrubs / bushes	78.0	5.7	16.3	100
Creeping plants on trees	56.6	2.3	41	100
Creeping plants on land	56	8.4	35.6	100
Aquatic plants	52.7	7.8	39.6	100
Lumbini-Hill				
Shrubs / bushes	99.6		0.4	100
Creeping plants on tree	100			100
Creeping plants on land	100			100
Lumbini-Terai				
Shrubs / bushes	64	2.6	33.4	100
Creeping plants on tree	91.3	8.7		100
Creeping plants on land	100			100
Aquatic plants	2.7		97.3	100
Karnali-Mountain				
Shrubs / bushes	100			100
Creeping plants on tree	100			100
Creeping plants on land	100			100
Aquatic plants	100			100
Karnali-Hill				
Shrubs / bushes	99.7		0.3	100

Analytical domain/ category	Spread Observed (%)			
	Naturally spread	Spread by human	Don't know	Total
Creeping plants on tree	100			100
Creeping plants on land	100			100
Aquatic plants	100			100
Sudurpaschim-Mountain				
Shrubs / bushes	51.6	11.9	36.5	100
Creeping plants on tree	25		75	100
Sudurpaschim-Hill				
Shrubs / bushes	87.7	0.9	11.3	100
Creeping plants on tree	100			100
Sudurpaschim-Terai				
Shrubs / bushes	79.4	1.4	19.3	100
Creeping plants on tree	100			100
Creeping plants on land			100	100

Impacts on Flowering and Fruiting Time

Tables 8.18 and 8.19 presents the percentage distribution of households observing changes in the flowering and fruiting patterns/time of tree species over the last 25 years. 24.6% of the household observed early flowering or fruiting and 19.2% observed delayed in these processes for tree species over the last 25 years. 26.7% of households were unaware in the flowering and fruiting time of tree species. The findings emphasized the diverse nature of induced climatic changes imposed shifting of flowering and fruiting time.

Table 8.18: Early Flowering/Fruiting Time in Tree Species in Last 25 Years

Analytical domain	Impact Observed (%)				
	Yes	No	Don't know	Not applicable	Total
Municipality					
Urban	24.3	35.6	25.1	15.1	100
Rural	25	43.4	29.2	2.5	100
Ecological zone					
Mountain	43.9	39.9	13.8	2.4	100
Hill	21.5	42.3	25.1	11.1	100
Terai	24.2	35.2	30.9	9.7	100
Province-ecological zone					
Koshi-Mountain	40.1	33.6	22.9	3.4	100
Koshi-Hill	20.5	46.7	31.2	1.6	100
Koshi-Terai	21.7	34.1	34.9	9.3	100
Madhesh-Terai	31.2	38	21.1	9.7	100
Bagmati-Mountain	30.5	51.8	14.4	3.3	100
Bagmati-Hill	19.1	33.5	28.5	18.9	100
Bagmati-Terai	21.7	40	32.8	5.5	100
Gandaki-Mountain	26.9	50.7	15	7.4	100
Gandaki-Hill	23.1	39.4	21.1	16.4	100
Gandaki-Terai	8.1	42.2	38.2	11.5	100
Lumbini-Hill	24.8	57.6	17.5		100
Lumbini-Terai	10.5	32.3	45.6	11.6	100
Karnali-Mountain	29.9	58.6	8.4	3.2	100
Karnali-Hill	36.4	39.3	19.5	4.8	100
Sudurpaschim-Mountain	69.8	22	8.3		100

Analytical domain	Impact Observed (%)				
	Yes	No	Don't know	Not applicable	Total
Sudurpaschim-Hill	6.2	68.7	24.3	0.8	100
Sudurpaschim-Terai	42.7	27.2	23.5	6.6	100
Altitude (meter)					
Below 120	22.7	36	30.9	10.4	100
120 - 350	24.2	35.4	31	9.4	100
350 - 1000	24.1	45.2	22.4	8.2	100
1000 - 1300	21.1	37.9	26.6	14.5	100
1300 - 1500	22.5	37.6	24.2	15.6	100
1500 - 2000	34.5	41.5	22.9	1.1	100
2000 and above	32.3	46.6	19.5	1.6	100
Nepal	**24.6**	**38.9**	**26.8**	**9.7**	**100**

Table 8.19: Delay in Flowering/Fruiting Time in Tree Species in the Last 25 Years

Analytical domain	Impact Observed (%)				
	Yes	No	Don't know	Not applicable	Total
Municipality					
Urban	21	39	25.2	14.8	100
Rural	16.8	52.4	28.7	2.1	100
Ecological zone					
Mountain	31.4	53.5	13.1	2	100
Hill	12	51.7	25.6	10.7	100
Terai	24.4	36	30.3	9.4	100
Province-ecological zone					
Koshi-Mountain	12.2	61.4	24.5	1.9	100
Koshi-Hill	19.7	47.8	31.5	1	100
Koshi-Terai	16	40.9	33.1	10	100
Madhesh-Terai	39.6	30.8	20.5	9.2	100
Bagmati-Mountain	21.6	60.5	14.9	3	100
Bagmati-Hill	18	34.1	29.4	18.4	100
Bagmati-Terai	6.2	55.6	33.8	4.5	100
Gandaki-Mountain	7.6	70	15	7.4	100
Gandaki-Hill	6.2	54.6	23.6	15.6	100
Gandaki-Terai	9.3	40.1	39.7	10.8	100
Lumbini-Hill	4.2	82	13.8		100
Lumbini-Terai	9.5	34.3	45.2	11	100
Karnali-Mountain	3.4	85.7	7.7	3.2	100
Karnali-Hill	1.4	73.7	19.9	4.9	100
Sudurpaschim-Mountain	73.8	21.8	4.4		100
Sudurpaschim-Hill	4.1	71.2	24	0.8	100
Sudurpaschim-Terai	28.3	41.6	23.9	6.3	100
Altitude (meter)					
Below 120	24.6	35.3	29.7	10.4	100
120 - 350	21.9	38.2	31.3	8.6	100
350 - 1000	20.6	49.8	21.6	8	100
1000 - 1300	10.5	48.3	27.4	13.8	100
1300 - 1500	12.9	46.3	25.6	15.2	100
1500 - 2000	17.5	58.7	22.8	0.9	100
2000 and above	18	60.6	20.3	1.1	100
Nepal	**19.2**	**44.7**	**26.7**	**9.4**	**100**

Table 8.20 and Table 8.21 presents the percentage distribution of households observing changes in the flowering or fruiting patterns of fruit species over last 25 years. 18.2% of households observed early flowering or fruiting in fruit species during this period, and 14.5% reported a delay. 39.4% have not observed any early flowering or fruiting in fruit species, and 42.5% observed delay in flowering and fruiting time. This finding provides valuable insights into the temporal shifts in the flowering and fruiting pattern which is critical for assessing the potential impacts of climate alteration on fruit-bearing plants and informing strategies for sustainable agriculture.

Table 8.20: Early Flowering/Fruiting Time in Fruit Species

Analytical domain	Impact Observed (%)				
	Yes	No	Don't know	Not applicable	Total
Municipality					
Urban	17.7	36.4	29.7	16.1	100
Rural	18.9	43.4	33.3	4.4	100
Ecological zone					
Mountain	34.3	41	22.8	2	100
Hill	15	45	29.4	10.6	100
Terai	18.6	33.3	34.7	13.3	100
Province-ecological zone					
Koshi-Mountain	24.9	35	38.2	1.9	100
Koshi-Hill	16.5	46.4	36.1	1	100
Koshi-Terai	17.8	35.7	36	10.6	100
Madhesh-Terai	23.4	36.4	28	12.3	100
Bagmati-Mountain	19.4	47.1	30.5	3	100
Bagmati-Hill	15.2	36.3	30.2	18.3	100
Bagmati-Terai	5.9	48.9	41.2	4	100
Gandaki-Mountain	26.9	50.7	15	7.4	100
Gandaki-Hill	8.3	48.5	28	15.2	100
Gandaki-Terai	1.7	43.8	43.3	11.1	100
Lumbini-Hill	19.8	61	19.2	-	100
Lumbini-Terai	9.7	21.9	45.9	22.4	100
Karnali-Mountain	24.4	62.4	10	3.2	100
Karnali-Hill	28.7	42.3	23.4	5.6	100
Sudurpaschim-Mountain	63.7	27.7	8.6		100
Sudurpaschim-Hill	2.7	57.5	38.6	1.1	100
Sudurpaschim-Terai	35.1	32	26.6	6.3	100
Altitude (m)					
Below 120	17.6	32.8	33.8	15.7	100
120 - 350	19.2	34.2	36.1	10.4	100
350 - 1000	17.4	48.8	25.9	7.9	100
1000 - 1300	15.7	39.1	31.5	13.7	100
1300 - 1500	16.4	38	30.6	15.1	100
1500 - 2000	23.7	46.7	28.5	1.1	100
2000 and above	21.5	51.5	25.8	1.1	100
Nepal	**18.2**	**39.4**	**31.3**	**11.1**	**100**

Table 8.21: Delay in Flowering/Fruiting time in Fruit Species

Analytical domain	Impact Observed (%)				
	Yes	No	Don't know	Not applicable	Total
Municipality					
Urban	15.5	38.1	30.2	16.2	100
Rural	13.1	48.4	33.7	4.8	100

Ecological zone					
Mountain	24.6	50.5	23	1.9	100
Hill	8.8	50.6	30	10.6	100
Terai	18.4	32.8	35	13.8	100
Province-ecological zone					
Koshi-Mountain	1.7	57	39.3	1.9	100
Koshi-Hill	15.3	47	36.7	1	100
Koshi-Terai	11.1	42.1	36.3	10.5	100
Madhesh-Terai	29.3	29	29	12.6	100
Bagmati-Mountain	14.5	51.5	31.4	2.7	100
Bagmati-Hill	15	36.1	30.7	18.2	100
Bagmati-Terai	3.8	51.8	40.2	4.2	100
Gandaki-Mountain	7.6	70	15	7.4	100
Gandaki-Hill	1.2	54	29.4	15.4	100
Gandaki-Terai	6.4	40.7	41.2	11.7	100
Lumbini-Hill	1.6	79.2	18.9	0.2	100
Lumbini-Terai	9.6	21.3	45.5	23.6	100
Karnali-Mountain	1.9	84.5	10.5	3.2	100
Karnali-Hill	1.8	69.2	23.4	5.6	100
Sudurpaschim-Mountain	67.1	25.5	7.4		100
Sudurpaschim-Hill	3	57.3	38.6	1.1	100
Sudurpaschim-Terai	21.6	45.3	26.3	6.8	100
Altitude (meter)					
Below 120	18.8	30.9	34	16.2	100
120 - 350	16.4	35.8	37	10.8	100
350 - 1000	16.1	49.8	26.1	8	100
1000 - 1300	6.6	47.5	32.2	13.6	100
1300 - 1500	11	43.3	30.4	15.3	100
1500 - 2000	13.1	56.7	29.4	0.9	100
2000 and above	11.8	61.5	25.7	1.1	100
Nepal	**14.5**	**42.5**	**31.7**	**11.3**	**100**

Table 8.22 and Table 8.23 presents the percentage distribution of households who observed changes in the flowering and fruiting pattern of shrub/bush species over last 25 years. 28.1% of households observed early flowering or fruiting in shrub/bush species during this period and 23.8% observed delay flowering or fruiting time. 37.4%, did not observe any early flowering or fruiting in shrub/bush species, and 41.9% observed there is no impact in flowering or fruiting time due to climatic variation. These findings provide valuable information on the temporal shifts fruiting and flowering pattern of shrub/bush species. Understanding such critical change for assessing the potential impacts of climate variations on these plant species and guiding conservation efforts and land management strategies to promote ecological resilience.

Table 8.22: Early Flowering/Fruiting Time in Shrubs/Bushes Species

Analytical domain	Impact Observed (%)				
	Yes	No	Don't know	Not applicable	Total
Municipality					
Urban	25.7	36	23	15.3	100
Rural	31.5	39.3	24.4	4.8	100
Ecological zone					
Mountain	52.9	31.1	14.1	1.9	100
Hill	26.1	39.8	23.4	10.7	100

Analytical domain	Impact Observed (%)				
	Yes	No	Don't know	Not applicable	Total
Terai	25.7	36.1	25.6	12.6	100
Province-ecological zone					
Koshi-Mountain	40.9	31.5	25.7	1.9	100
Koshi-Hill	21.6	43.7	33.8	0.8	100
Koshi-Terai	20.6	34.7	33.5	11.2	100
Madhesh-Terai	30.6	41.9	18	9.5	100
Bagmati-Mountain	40.4	41.7	15.2	2.7	100
Bagmati-Hill	30.1	27.6	24.2	18	100
Bagmati-Terai	21.4	39	33.8	5.8	100
Gandaki-Mountain	26.9	50.7	15	7.4	100
Gandaki-Hill	20.5	40.2	24.6	14.7	100
Gandaki-Terai	12.5	43.3	32.1	12	100
Lumbini-Hill	24.7	62.2	12.4	0.7	100
Lumbini-Terai	18.9	29	29.3	22.8	100
Karnali-Mountain	54.2	33.3	9.3	3.2	100
Karnali-Hill	39.9	38.9	13.4	7.8	100
Sudurpaschim-Mountain	77.3	17	5.8		100
Sudurpaschim-Hill	13.9	62.7	22.2	1.2	100
Sudurpaschim-Terai	42.8	26.5	23.9	6.8	100
Altitude (meter)					
Below 120	23.4	36.6	25.4	14.6	100
120 - 350	27.9	36.2	25.6	10.3	100
350 - 1000	30.3	41.2	20.2	8.3	100
1000 - 1300	26.8	34	25.6	13.6	100
1300 - 1500	25.7	36.4	22.9	15	100
1500 - 2000	37.3	40.8	21	0.9	100
2000 and above	40.7	38.7	19.2	1.4	100
Nepal	**28.1**	**37.4**	**23.6**	**10.8**	**100**

Table 8.23: Delay in Flowering/Fruiting Time in Shrubs/Bushes Species

Analytical domain	Impact Observed (%)				
	Yes	No	Don't know	Not applicable	Total
Municipality					
Urban	25	36.9	23	15.1	100
Rural	22.1	48.6	24.4	4.8	100
Ecological zone					
Mountain	34.3	50.1	13.7	1.9	100
Hill	15.5	50.2	23.7	10.6	100
Terai	30.4	31.9	25.3	12.4	100
Province-ecological zone					
Koshi-Mountain	12.2	59.6	26.2	1.9	100
Koshi-Hill	20.7	45.3	33.1	0.8	100
Koshi-Terai	14.8	40	34.2	11	100
Madhesh-Terai	51.7	22.3	16.8	9.3	100
Bagmati-Mountain	25	57.2	15.1	2.7	100
Bagmati-Hill	28.3	30.6	23	18.1	100
Bagmati-Terai	7.6	52.7	33.8	5.8	100
Gandaki-Mountain	7.6	70	15	7.4	100

Analytical domain	Impact Observed (%)				
	Yes	No	Don't know	Not applicable	Total
Gandaki-Hill	4.1	53.2	28	14.7	100
Gandaki-Terai	17.3	43.5	28	11.2	100
Lumbini-Hill	2.8	83	14	0.2	100
Lumbini-Terai	14.8	32.2	30	23	100
Karnali-Mountain	4.3	81.7	10.9	3.2	100
Karnali-Hill	2.1	76.5	13.6	7.8	100
Sudurpaschim-Mountain	79.7	17.3	3		100
Sudurpaschim-Hill	3.7	72.8	22.2	1.2	100
Sudurpaschim-Terai	28.5	41.7	23.9	5.9	100
Altitude (meter)					
Below 120	30.7	29.6	25.4	14.3	100
120 - 350	27.3	37.5	24.9	10.4	100
350 - 1000	26.1	45.4	20.3	8.2	100
1000 - 1300	12.9	48.2	25.4	13.5	100
1300 - 1500	17.4	44.7	22.9	15.1	100
1500 - 2000	18.8	59.1	21.3	0.9	100
2000 and above	21.6	55.8	21.1	1.4	100
Nepal	**23.8**	**41.9**	**23.6**	**10.7**	**100**

Table 8.24 and Table 8.25 provides an overview of the percentage distribution of households who observed changes in the flowering or fruiting patterns of medicinal plant species over the past 25 years. 10.5% of households observed early flowering or fruiting in medicinal plants and 8.8% witnessed a delay. 47.5% observed uncertainty about whether early flowering or fruiting occurs delay in medicinal plant species. This finding highlights the complexity and variability in the observations related to medicinal plant species, reflecting the diverse perceptions within communities.

Table 8.24: Early Flowering/Fruiting Time in Medicinal Plants

Analytical domain	Impact Observed (%)				
	Yes	No	Don't know	Not applicable	Total
Municipality					
Urban	10.2	23.4	45	21.5	100
Rural	10.9	28.2	50.9	10	100
Ecological zone					
Mountain	19.9	28.9	46.9	4.2	100
Hill	7.2	28	52.5	12.3	100
Terai	12.2	22.2	42.5	23.2	100
Province-ecological zone					
Koshi-Mountain	11.6	25.6	50.9	11.9	100
Koshi-Hill	7.0	32.8	58.9	1.3	100
Koshi-Terai	10.3	28.2	49.6	12	100
Madhesh-Terai	18.3	20.5	41.2	20	100
Bagmati-Mountain	12.8	34.7	49.9	2.7	100
Bagmati-Hill	10	24.5	46.3	19.1	100
Bagmati-Terai	1.5	38	43.1	17.4	100
Gandaki-Mountain	4.8	40.5	47.6	7.1	100
Gandaki-Hill	0.4	28.8	54.4	16.3	100
Gandaki-Terai	3.3	40.7	45.9	10.1	100
Lumbini-Hill	14.6	25.4	57.7	2.3	100

Analytical domain	Impact Observed (%)				
	Yes	No	Don't know	Not applicable	Total
Lumbini-Terai	2.2	16.3	42.4	39	100
Karnali-Mountain	19.4	44.5	33	3.2	100
Karnali-Hill	5.1	21.2	58.2	15.4	100
Sudurpaschim-Mountain	35.7	16.8	47.4	-	100
Sudurpaschim-Hill	1.4	47.7	50.1	0.8	100
Sudurpaschim-Terai	23.9	15.7	25.3	35.1	100
Altitude (meter)					
Below 120	11.7	21.4	42.8	24.2	100
120 - 350	10.6	23.4	42.3	23.7	100
350 - 1000	10.1	29.7	48.7	11.5	100
1000 - 1300	6.7	26.9	51.3	15.1	100
1300 - 1500	8.4	21.9	52.1	17.6	100
1500 - 2000	13.7	31.1	54.1	1.1	100
2000 and above	13.7	34.1	51.1	1.1	100
Nepal	**10.5**	**25.4**	**47.5**	**16.6**	**100**

Table 8.25: Delay in Flowering/Fruiting Time in Medicinal Plants

Analytical domain	Impact Observed (%)				
	Yes	No	Don't know	Not applicable	Total
Municipality					
Urban	9.3	23.3	45.9	21.5	100
Rural	8.2	30.2	51.6	10.1	100
Ecological zone					
Mountain	15.8	33.1	46.8	4.2	100
Hill	4.7	30.1	53	12.2	100
Terai	11.8	21	43.8	23.4	100
Province-ecological zone					
Koshi-Mountain	-	37.2	50.9	11.9	100
Koshi-Hill	5.4	34.5	58.9	1.2	100
Koshi-Terai	5.3	32.1	51.2	11.4	100
Madhesh-Terai	20.5	15.4	43.7	20.4	100
Bagmati-Mountain	15.1	32.5	49.7	2.7	100
Bagmati-Hill	10	24.2	46.6	19.2	100
Bagmati-Terai	0.3	39.3	42.1	18.3	100
Gandaki-Mountain	5	40.2	47.6	7.1	100
Gandaki-Hill	0.1	29	54.9	16	100
Gandaki-Terai	5.7	38.9	45.2	10.1	100
Lumbini-Hill	0.4	38	59.9	1.8	100
Lumbini-Terai	1.9	15.9	42.5	39.8	100
Karnali-Mountain	0.9	62.5	33.4	3.2	100
Karnali-Hill	0.2	25.9	58.4	15.4	100
Sudurpaschim-Mountain	37.8	15	47.2		100
Sudurpaschim-Hill	0.5	48.3	50.4	0.8	100
Sudurpaschim-Terai	23.6	15.8	24.9	35.8	100
Altitude (meter)					
Below 120	11.9	20.3	43.8	24	100
120 - 350	9.4	22.5	43.2	25	100
350 - 1000	10	28.7	50.1	11.2	100

Analytical domain	Impact Observed (%)				
	Yes	No	Don't know	Not applicable	Total
1000 - 1300	4.6	29.3	51.2	14.9	100
1300 - 1500	6.5	23.8	52.3	17.4	100
1500 - 2000	6.9	36.2	55.8	1.1	100
2000 and above	6.9	40.6	51.4	1.1	100
Nepal	**8.8**	**26.2**	**48.3**	**16.7**	**100**

Table 8.26 highlights observations by respondent regarding the impact of early/delayed flowering and fruiting times of plant species over the past 25 years. 22.5% of respondents reported prevalence of diseases affecting the plants, indicating a substantial impact on agricultural health, 21.3% of respondent reported reduction in fruit size, highlights potential implications for crop yield and quality, 16.3% of household reported decrease in the overall production from the plants. These findings suggest the wide challenges that households are facing due to changes in climatic patterns, the need for targeted interventions and adaptive strategies in agriculture sector.

Table 8.26: Impact due to Changes in Flowering/Fruiting Time of Plant Species

Analytical domain	Impact Observed (%)								
	Reduce fruit size	Loss of juice	Fruit cracking problem	Difference in taste	Increased incidence of disease	Decrease in production	Decreased Medicinal effect of herbs	Not applicable	Total
Municipality									
Urban	23.3	10.9	12.4	15.8	22.1	16.2	0.8	55.7	100
Rural	18.5	13	13.8	15.3	23.1	16.3	0.4	52.8	100
Ecological zone									
Mountain	23.8	26.3	17.6	26.7	25.2	13.5	1	37.3	100
Hill	14.7	9.7	7.7	11.5	17.3	14	0.1	63.7	100
Terai	27.5	11.4	17.6	17.8	27.4	19.1	1.1	48.1	100
Province-ecological zone									
Koshi-Mountain	14.8	10.9	6.8	4.1	32.5	5.8		51.5	100
Koshi-Hill	25.2	6.9	11.6	12.1	30.4	19.4		53.3	100
Koshi-Terai	19.3	6.3	36.3	18.2	32.7	5.4	2.7	52.2	100
Madhesh-Terai	40.6	11.7	13.6	19.6	34.7	31.4	0.9	36.6	100
Bagmati-Mountain	23.1	16.9	17.4	9.1	29.5	6.3	0.5	49.6	100
Bagmati-Hill	15.9	13.7	9.6	15.2	18	24.2		56.3	100
Bagmati-Terai	9.5	7.7	2.4	15.5	6	4.7	0.7	69.6	100
Gandaki-Mountain	5.2	2.4		7.1	19.8	15.7		62.6	100
Gandaki-Hill	9.1	7.5		7.1	4.4	2.0	0.4	82.7	100
Gandaki-Terai	20	14.1	13	14.9	10.9	12.5		57.2	100
Lumbini-Hill	9.5	6.2	2.8	8.6	21.8	1.8	0.3	69	100
Lumbini-Terai	18.9	13.8	13.4	13.4	22.3	15.1	0.2	58.5	100
Karnali-Mountain	14.9	10.3	5.7	14.3	19.8	6.8	3.1	54.4	100
Karnali-Hill	16	10.4	17.3	11.4	23.3	10		51.5	100
Sudurpaschim-Mountain	37.7	58.7	33.9	72	17.7	31.1	1.2	2	100
Sudurpaschim-Hill	6.6	5	3.9	6.7	4	3.9		82.6	100
Sudurpaschim-Terai	20.4	19.2	3	23	4.4	17.5		50.9	100

Analytical domain	Impact Observed (%)								
	Reduce fruit size	Loss of juice	Fruit cracking problem	Difference in taste	Increased incidence of disease	Decrease in production	Decreased Medicinal effect of herbs	Not applicable	Total
Altitude (meter)									
Below 120	27.5	10.5	18.1	16.1	29.8	19.1	1.2	48.7	100
120 - 350	25.2	13	13.9	19.1	20.9	17.2	0.9	51.2	100
350 - 1000	16.2	12.7	11.2	16	19.4	16.5	0.1	55.9	100
1000 - 1300	19.1	10.4	8	12	21.5	11.6	0.1	60.7	100
1300 - 1500	14.0	10.9	9.7	11	16.4	16	0.3	62.5	100
1500 - 2000	18.2	13.5	12.6	16.5	21.8	14.2	0.3	55.5	100
2000 and above	17.7	16.0	8.1	20.2	12.7	14.6	1.3	54.5	100
Nepal	**21.3**	**11.8**	**13.0**	**15.6**	**22.5**	**16.3**	**0.6**	**54.5**	**100**

(This table is based on multiple response)

Table 8.27 highlights shift in breeding period of livestock over the past 25 years. 10.3% of respondents observed change in the breeding period of their livestock. 53.2% of household reported that there has been no noticeable change in the breeding period of their livestock. 18.0% of household reported that they were unaware regarding any shift in the breeding period. This finding highlights the varied perceptions and experiences among respondents concerning the temporal aspects of livestock breeding, emphasizing the importance of further research and exploration.

Table 8.27: Shift in Breeding Period of Livestock

Analytical domain	Impact Observed (%)				
	Yes	No	Don't know	Not applicable	Total
Municipality					
Urban	10.8	45.1	18.1	26	100
Rural	9.7	64	18	8.3	100
Ecological zone					
Mountain	9.4	71.2	12.8	6.6	100
Hill	7.4	57	15.8	19.8	100
Terai	13.5	46	21.2	19.2	100
Province-ecological zone					
Koshi-Mountain	3	67.7	23	6.3	100
Koshi-Hill	14.1	59	22	5	100
Koshi-Terai	14.3	42.9	17.2	25.6	100
Madhesh-Terai	21.5	48.9	14.9	14.6	100
Bagmati-Mountain	12.5	74	2.5	11	100
Bagmati-Hill	8.7	46.8	13.1	31.4	100
Bagmati-Terai	6.4	46.3	14.7	32.6	100
Gandaki-Mountain	-	90.2	7.4	2.4	100
Gandaki-Hill	1.8	50.7	22.7	24.8	100
Gandaki-Terai	9.4	52.5	18.6	19.5	100
Lumbini-Hill	0.3	88.6	5.7	5.4	100
Lumbini-Terai	2.3	40	38.7	19	100

Analytical domain	Impact Observed (%)				
	Yes	No	Don't know	Not applicable	Total
Karnali-Mountain	2.5	86.6	4.4	6.5	100
Karnali-Hill	9.1	63.6	10.4	16.9	100
Sudurpaschim-Mountain	15.2	62.4	20.2	2.2	100
Sudurpaschim-Hill	9.1	67	21.2	2.8	100
Sudurpaschim-Terai	7.7	55.6	19.4	17.4	100
Altitude (meter)					
Below 120	14.5	46.4	19.6	19.5	100
120 - 350	10.7	44.3	24.7	20.3	100
350 - 1000	6.5	65	13.5	14.9	100
1000 - 1300	9	52.9	14.4	23.6	100
1300 - 1500	6.8	45	17.9	30.3	100
1500 - 2000	9.9	67.3	18.4	4.3	100
2000 and above	9.5	71.2	13.4	5.9	100
Nepal	**10.3**	**53.2**	**18.0**	**18.5**	**100**

Conclusion

This chapter highlights the significant impact of climate change on biodiversity, with substantial changes noted in tree species, birds, wild animals, insects, and grass species. The impacts of climate changes are visible in rural-urban municipalities and ecological zones, further differentiated by provincial ecological distinctions. However, a considerable number of households reported either no change or lack of awareness regarding these ecological shifts.

Invasive species reported to increase including shrubs, bushes and creeping plants on both land and plants are specially seen in agricultural and forest. Household experienced distribution of invasive species spread due to natural factor, resulting decrease in income and loss of grass or fodder. For minimizing the impact of IAS plants, households were adopting controlling measures such as cutting, burning, and using of herbicides etc. and adoptive strategies across analytical domains. A shift in flowering and fruiting time was observed especially for trees, shrubs, fruiting plants, and medicinal plants; however, a significant number of respondents were remained unaware of these changes. As a consequence, reduced fruit size, increased disease incidence, altered taste, and decreased overall production. Households also experienced changes in the breeding period of livestock. These broad survey results highlight on the diverse and widespread consequences of climate-induced ecological transformations, emphasizing the need for adoptive interventions and awareness within affected communities.

CHAPTER 9

ADAPTATION MEASURES

Introduction

This chapter explores the adaptation measures taken by households. Diverse adaptation strategies adopted by the households are reported in this chapter. The survey was followed by 27 farm-based and 8 off-farm-based questions which were related to adaptation measures, that were adapted by the respondents to minimize the climate induced disasters. The questions of farm-based adaptation measures mean training, alterations in farming practices, use of hybrid or improved breeds/ varieties, irrigation methods, pond construction, farming timing, and the application of organic or inorganic fertilizers. Additionally, the survey includes adaptation measures on new crops and livestock, disease control measures, crop/livestock insurance, mixed cropping, transitions to specific crops or livestock types, tunnel farming, cold storage for agricultural product conservation, water and land preservation, invasive species control, soil management use and practice of traditional/indigenous knowledge. Off-farm-based adaptation measures includes changes in food consumption, shifts towards off-farm businesses and employment, migration patterns, initiatives to control flood/landslide risks and water management, active participation in safeguarding transportation and road infrastructure from natural disasters, involvement in community-based natural resource management, and engagement in training and capacity building for climate-induced risk reduction. This chapter summarize the dynamic and broad approaches undertaken by households in response to the challenges posed by climate change.

Summary of Findings

The results indicate that households were taking steps to reduce the impacts of climate change. National Climate Change Impact Survey (2016), identified 22 adaptation measures for farm based and 7 for off-farm based. This survey added 5 more farm-based and one additional off-farm based adaptation measure based on export consultation.

The most adopted farm-based adaptation measures were the use of inorganic fertilizers (49.3%) followed by cultivation using improved seed (47.2%), and controlling Invasive Alien Species (IAS) (40.7%). Maintaining soil quality (4.5%) and use of hybrid animal as livestock (6%) remained less prioritized in the farm-based adaptation measures (Figure 9. 1).

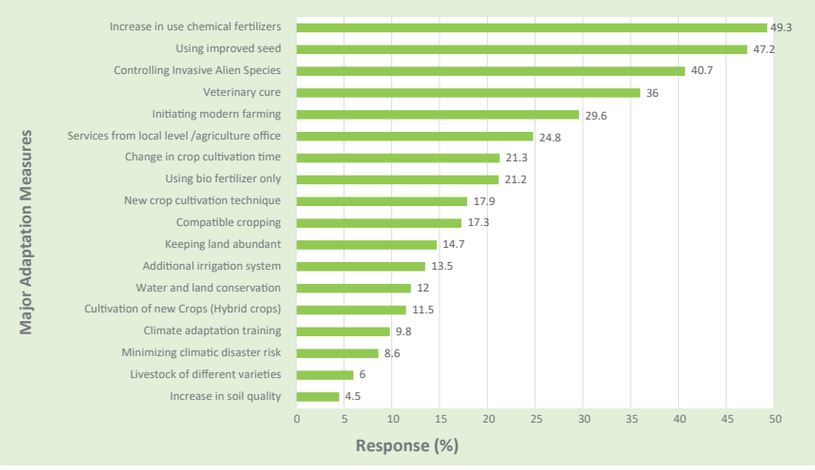
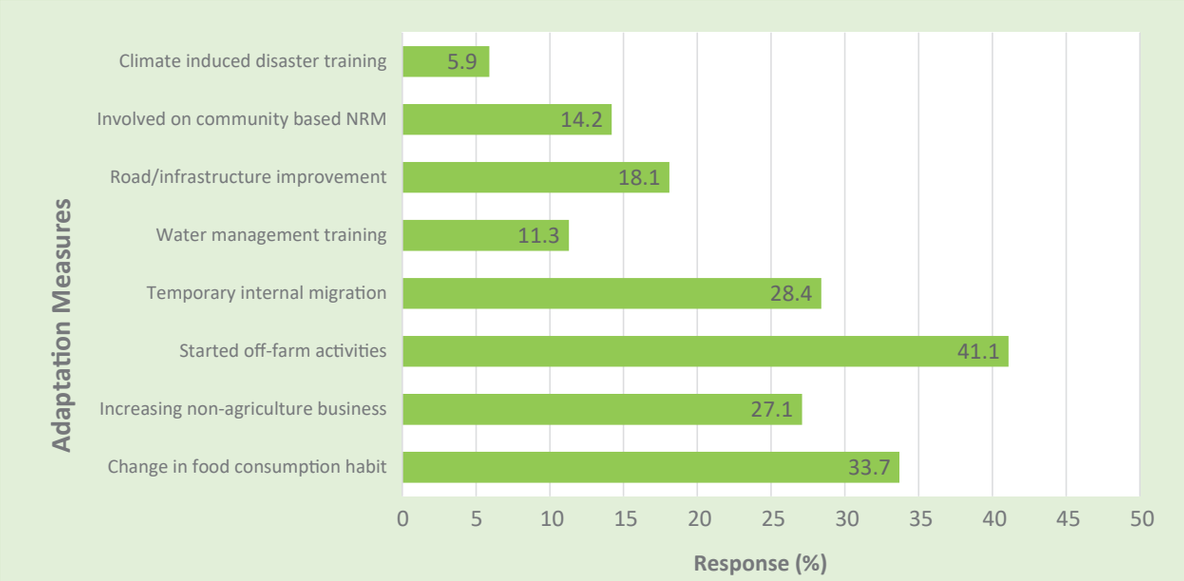


Figure 9. 1: Farm Based Adaptation Measures Adopted in the Last 5 Years

Similarly, households were adopting a range of off-farm based adaptation strategies. Majority of respondent started off-farm activities (41.1%) followed by changing their food consumption habits (33.7%), and temporary internal migration (28.4%), while climate induced disaster training (5.9%) still remained least prioritized (Figure 9. 2).

Figure 9. 2: Off-Farm Based Adaptation Measures Adopted in the Last 5 Years



Farm Based Adaptation

47.2% cultivate with improved seeds, 17.9% changes in crop cultivation techniques, and 36.0% investments to protect livestock from diseases. Other adaptation strategy such as such as construction of ponds (2.4%), use of cold storage (3.8%), and work on water and land conservation (12.0%) were also being followed. The diverse adaptation measures adopted by households within distinct analytical domains are presented in (Table 9.2) in the subsequent sub-sections.

Table 9.1: Households Adapting Farm-based Adaptation Measures in Last 5 Years

S. N	Measures	Farm-based Adaptation Measures (HHs, %)			
		Yes	No	Not applicable	Total
1	Climate adaptation training	9.8	65.1	25.1	100
2	New crop cultivation technique	17.9	56.9	25.1	100
3	Keeping land abandoned	14.7	60.2	25.1	100
4	Livestock of different varieties	6	68.8	25.1	100
5	Additional irrigation system	13.5	61.3	25.1	100
6	Constructing pond	2.4	72.4	25.1	100
7	Using improved seed	47.2	27.7	25.1	100
8	Change in crop cultivation time	21.3	53.6	25.1	100
9	Increase in use of chemical fertilizers	49.3	25.6	25.1	100
10	Using bio fertilizer only	21.2	53.7	25.1	100
11	Cultivation of new crops (Hybrid crops)	11.5	63.4	25.1	100
12	Using hybrid animal	4.7	70.2	25.1	100
13	Veterinary cure	36	38.9	25.1	100
14	Insurance made for livestock	2.6	72.4	25.1	100

S. N	Measures	Farm-based Adaptation Measures (HHs, %)			
		Yes	No	Not applicable	Total
15	Insurance made for agriculture crops	0.3	74.6	25.1	100
16	Animal husbandry only	1	74.3	24.7	100
17	Crop cultivation only	4.2	70.8	25.1	100
18	Initiating modern farming (both animal husbandry and crop cultivation)	29.6	45.3	25.1	100
19	Agroforestry	2.2	72.7	25.1	100
20	Compatible cropping	17.3	57.6	25.1	100
21	Tunnel technique in vegetable cultivation	1	73.9	25.1	100
22	Cold storage	3.8	71.1	25.1	100
23	Water and land conservation	12	62.9	25.1	100
24	Services from local level /agriculture office	24.8	50.1	25.1	100
25	Controlling of IAS	40.7	34.2	25.1	100
26	Increase soil quality	4.5	70.4	25.1	100
27	Minimizing climatic disaster risk	8.6	66.3	25.1	100

Table 9.2: Households Adapting Farm-based Adaptation Measures in Last 5 Years by Analytical Domain

Analytical domain	Farm-based Adaptation Measures (HHs, %)			
	Yes	No	Not applicable	Total
1. Climate adaptation training				
Municipality				
Urban	10.5	54.0	35.5	100
Rural	8.8	80.1	11.1	100
Ecological zone				
Mountain	10.0	79.8	10.1	100
Hill	9.1	67.2	23.7	100
Terai	10.5	60.3	29.3	100
Province-ecological zone				
Koshi-Mountain	11.4	82.7	5.9	100
Koshi-Hill	8.7	83.1	8.2	100
Koshi-Terai	9.6	57.9	32.4	100
Madhesh-Terai	14.3	55.6	30.1	100
Bagmati-Mountain	13.3	70.2	16.5	100
Bagmati-Hill	4.7	57.3	37.9	100
Bagmati-Terai	12.6	59.0	28.3	100
Gandaki-Mountain	17.4	80.2	2.4	100
Gandaki-Hill	11.6	65.4	23.0	100
Gandaki-Terai	8.3	65.2	26.5	100
Lumbini-Hill	14.3	77.2	8.5	100
Lumbini-Terai	5.0	67.6	27.4	100
Karnali-Mountain	13.2	72.7	14.1	100

Karnali-Hill	13.7	60.2	26.1	100
Sudurpaschim-Mountain	3.3	91.7	5.0	100
Sudurpaschim-Hill	11.9	84.2	4.0	100
Sudurpaschim-Terai	8.9	69.3	21.8	100
Altitude (meters)				
Below 120	10.6	60.0	29.4	100
120- 350	9.7	59.7	30.6	100
350- 1000	10.1	72.6	17.3	100
1000- 1300	10.1	62.0	27.9	100
1300- 1500	7.4	55.6	37.0	100
1500- 2000	9.7	83.4	7.0	100
2000 and above	8.7	79.3	12.0	100
Climate risk				
Very Low	10.7	63.0	26.3	100
Low	8.6	77.0	14.3	100
Moderate	6.5	60.2	33.3	100
High	16.9	64.8	18.3	100
Very High	8.1	53.5	38.4	100
Nepal	**9.8**	**65.1**	**25.1**	**100**
2. New crop cultivation technique				
Municipality				
Urban	18.3	46.2	35.5	100
Rural	17.4	71.5	11.1	100
Ecological zone				
Mountain	21.0	68.8	10.1	100
Hill	17.3	59.0	23.7	100
Terai	18.0	52.7	29.3	100
Province-ecological zone				
Koshi-Mountain	13.0	81.1	5.9	100
Koshi-Hill	44.1	47.7	8.2	100
Koshi-Terai	21.9	45.7	32.4	100
Madhesh-Terai	22.1	47.8	30.1	100
Bagmati-Mountain	34.1	49.4	16.5	100
Bagmati-Hill	13.9	48.2	37.9	100
Bagmati-Terai	12.4	59.2	28.3	100
Gandaki-Mountain	22.6	75.0	2.4	100
Gandaki-Hill	12.7	64.3	23.0	100
Gandaki-Terai	26.6	46.9	26.5	100
Lumbini-Hill	8.3	83.2	8.5	100
Lumbini-Terai	6.1	66.5	27.4	100
Karnali-Mountain	15.6	70.3	14.1	100
Karnali-Hill	10.6	63.3	26.1	100
Sudurpaschim-Mountain	16.1	78.9	5.0	100
Sudurpaschim-Hill	11.2	84.8	4.0	100
Sudurpaschim-Terai	19.8	58.4	21.8	100

Altitude (meters)				
Below 120	18.0	52.6	29.4	100
120- 350	18.6	50.8	30.6	100
350- 1000	18.2	64.5	17.3	100
1000- 1300	18.4	53.7	27.9	100
1300- 1500	15.2	47.8	37.0	100
1500- 2000	17.7	75.3	7.0	100
2000 and above	19.9	68.1	12.0	100
Climate risk				
Very Low	18.9	54.8	26.3	100
Low	18.5	67.1	14.3	100
Moderate	11.9	54.8	33.3	100
High	24.3	57.4	18.3	100
Very High	15.2	46.4	38.4	100
Nepal	**17.9**	**56.9**	**25.1**	**100**
3. Keeping land abandoned				
Municipality				
Urban	13.4	51.1	35.5	100
Rural	16.5	72.4	11.1	100
Ecological zone				
Mountain	28.0	61.9	10.1	100
Hill	18.1	58.1	23.7	100
Terai	8.8	62.0	29.3	100
Province-ecological zone				
Koshi-Mountain	18.5	75.6	5.9	100
Koshi-Hill	13.9	77.9	8.2	100
Koshi-Terai	4.7	62.8	32.4	100
Madhesh-Terai	14.5	55.4	30.1	100
Bagmati-Mountain	41.1	42.4	16.5	100
Bagmati-Hill	14.5	47.6	37.9	100
Bagmati-Terai	6.0	65.6	28.3	100
Gandaki-Mountain	20.0	77.6	2.4	100
Gandaki-Hill	25.1	51.9	23.0	100
Gandaki-Terai	9.5	63.9	26.5	100
Lumbini-Hill	13.3	78.2	8.5	100
Lumbini-Terai	2.7	69.9	27.4	100
Karnali-Mountain	33.7	52.2	14.1	100
Karnali-Hill	20.1	53.8	26.1	100
Sudurpaschim-Mountain	19.0	76.0	5.0	100
Sudurpaschim-Hill	33.6	62.4	4.0	100
Sudurpaschim-Terai	10.5	67.7	21.8	100
Altitude (meters)				
Below 120	8.7	61.9	29.4	100
120- 350	7.1	62.3	30.6	100
350- 1000	18.6	64.1	17.3	100

1000- 1300	19.8	52.4	27.9	100
1300- 1500	17.6	45.4	37.0	100
1500- 2000	19.4	73.6	7.0	100
2000 and above	30.1	57.9	12.0	100
Climate risk				
Very Low	16.7	57.0	26.3	100
Low	12.4	73.2	14.3	100
Moderate	10.7	56.0	33.3	100
High	18.0	63.7	18.3	100
Very High	4.8	56.8	38.4	100
Nepal	**14.7**	**60.2**	**25.1**	**100**
4. Livestock of different varieties				
Municipality				
Urban	6.8	57.7	35.5	100
Rural	5.0	83.9	11.1	100
Ecological zone				
Mountain	11.6	78.3	10.1	100
Hill	5.5	70.8	23.7	100
Terai	5.6	65.1	29.3	100
Province-ecological zone				
Koshi-Mountain	6.3	87.8	5.9	100
Koshi-Hill	6.0	85.9	8.2	100
Koshi-Terai	5.6	61.9	32.4	100
Madhesh-Terai	7.1	62.8	30.1	100
Bagmati-Mountain	17.1	66.4	16.5	100
Bagmati-Hill	5.3	56.8	37.9	100
Bagmati-Terai	5.2	66.5	28.3	100
Gandaki-Mountain	5.2	92.4	2.4	100
Gandaki-Hill	6.3	70.7	23.0	100
Gandaki-Terai	9.9	63.5	26.5	100
Lumbini-Hill	5.7	85.8	8.5	100
Lumbini-Terai	3.5	69.2	27.4	100
Karnali-Mountain	7.8	78.0	14.1	100
Karnali-Hill	5.4	68.5	26.1	100
Sudurpaschim-Mountain	12.3	82.7	5.0	100
Sudurpaschim-Hill	3.0	93.0	4.0	100
Sudurpaschim-Terai	2.8	75.4	21.8	100
Altitude (meters)				
Below 120	5.5	65.2	29.4	100
120- 350	5.1	64.2	30.6	100
350- 1000	5.6	77.2	17.3	100
1000- 1300	7.2	65.0	27.9	100
1300- 1500	3.7	59.2	37.0	100
1500- 2000	9.9	83.1	7.0	100
2000 and above	7.5	80.5	12.0	100

Climate risk				
Very Low	6.5	67.2	26.3	100
Low	7.7	78.0	14.3	100
Moderate	2.0	64.6	33.3	100
High	6.1	75.6	18.3	100
Very High	2.6	59.0	38.4	100
Nepal	**6.0**	**68.8**	**25.1**	**100**
5. Additional irrigation system				
Municipality				
Urban	15.3	49.2	35.5	100
Rural	11.2	77.8	11.1	100
Ecological zone				
Mountain	10.7	79.2	10.1	100
Hill	6.0	70.3	23.7	100
Terai	21.8	48.9	29.3	100
Province-ecological zone				
Koshi-Mountain	4.4	89.7	5.9	100
Koshi-Hill	6.7	85.2	8.2	100
Koshi-Terai	14.7	52.9	32.4	100
Madhesh-Terai	27.8	42.1	30.1	100
Bagmati-Mountain	5.0	78.5	16.5	100
Bagmati-Hill	6.2	55.9	37.9	100
Bagmati-Terai	30.6	41.0	28.3	100
Gandaki-Mountain	23.3	74.3	2.4	100
Gandaki-Hill	5.8	71.2	23.0	100
Gandaki-Terai	17.1	56.4	26.5	100
Lumbini-Hill	2.8	88.7	8.5	100
Lumbini-Terai	14.5	58.1	27.4	100
Karnali-Mountain	17.6	68.3	14.1	100
Karnali-Hill	9.7	64.2	26.1	100
Sudurpaschim-Mountain	18.1	76.9	5.0	100
Sudurpaschim-Hill	3.4	92.6	4.0	100
Sudurpaschim-Terai	30.7	47.5	21.8	100
Altitude (meters)				
Below 120	22.1	48.6	29.4	100
120- 350	20.1	49.3	30.6	100
350- 1000	11.1	71.7	17.3	100
1000- 1300	6.4	65.8	27.9	100
1300- 1500	3.8	59.2	37.0	100
1500- 2000	7.2	85.8	7.0	100
2000 and above	7.9	80.0	12.0	100
Climate risk				
Very Low	14.3	59.4	26.3	100
Low	12.3	73.4	14.3	100
Moderate	12.8	53.9	33.3	100

High	16.2	65.5	18.3	100
Very High	8.9	52.7	38.4	100
Nepal	13.5	61.3	25.1	100
6. Constructing pond				
Municipality				
Urban	2.9	61.6	35.5	100
Rural	1.9	87.0	11.1	100
Ecological zone				
Mountain	1.0	88.9	10.1	100
Hill	1.9	74.4	23.7	100
Terai	3.2	67.5	29.3	100
Province-ecological zone				
Koshi-Mountain	0.5	93.6	5.9	100
Koshi-Hill	4.7	87.1	8.2	100
Koshi-Terai	2.9	64.6	32.4	100
Madhesh-Terai	5.7	64.2	30.1	100
Bagmati-Mountain	0.4	83.1	16.5	100
Bagmati-Hill	0.7	61.4	37.9	100
Bagmati-Terai	0.9	70.7	28.3	100
Gandaki-Mountain	26.2	71.4	2.4	100
Gandaki-Hill	0.7	76.3	23.0	100
Gandaki-Terai	0.8	72.7	26.5	100
Lumbini-Hill	0.5	91.0	8.5	100
Lumbini-Terai	0.5	72.1	27.4	100
Karnali-Mountain	0.4	85.5	14.1	100
Karnali-Hill	3.4	70.5	26.1	100
Sudurpaschim-Mountain	1.1	93.9	5.0	100
Sudurpaschim-Hill	6.1	90.0	4.0	100
Sudurpaschim-Terai	1.6	76.6	21.8	100
Altitude (meters)				
Below 120	3.8	66.8	29.4	100
120- 350	1.7	67.6	30.6	100
350- 1000	1.4	81.3	17.3	100
1000- 1300	2.8	69.3	27.9	100
1300- 1500	1.5	61.5	37.0	100
1500- 2000	2.5	90.6	7.0	100
2000 and above	0.9	87.1	12.0	100
Climate risk				
Very Low	2.7	71.0	26.3	100
Low	2.7	83.0	14.3	100
Moderate	0.9	65.8	33.3	100
High	5.1	76.6	18.3	100
Very High	-	61.6	38.4	100
Nepal	**2.4**	**72.4**	**25.1**	**100**
7. Using improved seed				

Municipality				
Urban	45.2	19.2	35.5	100
Rural	49.8	39.1	11.1	100
Ecological zone				
Mountain	50.2	39.7	10.1	100
Hill	42.6	33.6	23.7	100
Terai	51.3	19.4	29.3	100
Province-ecological zone				
Koshi-Mountain	48.4	45.7	5.9	100
Koshi-Hill	63.2	28.6	8.2	100
Koshi-Terai	52.2	15.4	32.4	100
Madhesh-Terai	47.6	22.3	30.1	100
Bagmati-Mountain	66.8	16.7	16.5	100
Bagmati-Hill	33.1	28.9	37.9	100
Bagmati-Terai	50.6	21.1	28.3	100
Gandaki-Mountain	47.1	50.5	2.4	100
Gandaki-Hill	37.2	39.8	23.0	100
Gandaki-Terai	45.0	28.4	26.5	100
Lumbini-Hill	49.3	42.3	8.5	100
Lumbini-Terai	57.9	14.7	27.4	100
Karnali-Mountain	46.9	39.0	14.1	100
Karnali-Hill	38.8	35.0	26.1	100
Sudurpaschim-Mountain	35.3	59.7	5.0	100
Sudurpaschim-Hill	57.8	38.2	4.0	100
Sudurpaschim-Terai	50.9	27.2	21.8	100
Altitude (meters)				
Below 120	53.5	17.1	29.4	100
120- 350	50.4	19.0	30.6	100
350- 1000	51.0	31.7	17.3	100
1000- 1300	48.0	24.1	27.9	100
1300- 1500	31.6	31.4	37.0	100
1500- 2000	41.9	51.2	7.0	100
2000 and above	29.5	58.4	12.0	100
Climate risk				
Very Low	44.0	29.7	26.3	100
Low	56.1	29.6	14.3	100
Moderate	46.6	20.0	33.3	100
High	69.2	12.5	18.3	100
Very High	46.9	14.7	38.4	100
Nepal	**47.2**	**27.7**	**25.1**	**100**
8. Change in crop cultivation time				
Municipality				
Urban	20.4	44.1	35.5	100
Rural	22.7	66.3	11.1	100
Ecological zone				

Mountain	24.5	65.4	10.1	100
Hill	22.7	53.6	23.7	100
Terai	19.3	51.4	29.3	100
Province-ecological zone				
Koshi-Mountain	14.6	79.5	5.9	100
Koshi-Hill	32.8	59.0	8.2	100
Koshi-Terai	12.4	55.1	32.4	100
Madhesh-Terai	24.7	45.2	30.1	100
Bagmati-Mountain	38.8	44.7	16.5	100
Bagmati-Hill	20.9	41.2	37.9	100
Bagmati-Terai	15.4	56.2	28.3	100
Gandaki-Mountain	14.5	83.1	2.4	100
Gandaki-Hill	19.8	57.2	23.0	100
Gandaki-Terai	30.4	43.1	26.5	100
Lumbini-Hill	3.8	87.8	8.5	100
Lumbini-Terai	11.2	61.5	27.4	100
Karnali-Mountain	27.9	58.0	14.1	100
Karnali-Hill	18.3	55.6	26.1	100
Sudurpaschim-Mountain	15.8	79.2	5.0	100
Sudurpaschim-Hill	54.8	41.3	4.0	100
Sudurpaschim-Terai	35.6	42.6	21.8	100
Altitude (meters)				
Below 120	17.7	52.9	29.4	100
120- 350	21.2	48.1	30.6	100
350- 1000	21.7	61.0	17.3	100
1000- 1300	27.6	44.5	27.9	100
1300- 1500	18.8	44.2	37.0	100
1500- 2000	26.4	66.7	7.0	100
2000 and above	17.3	70.7	12.0	100
Climate risk				
Very Low	23.1	50.6	26.3	100
Low	22.0	63.6	14.3	100
Moderate	14.1	52.6	33.3	100
High	29.7	52.0	18.3	100
Very High	6.8	54.8	38.4	100
Nepal	**21.3**	**53.6**	**25.1**	**100**
9. Increase in use of chemical fertilizers				
Municipality				
Urban	48.2	16.3	35.5	100
Rural	50.7	38.2	11.1	100
Ecological zone				
Mountain	43.5	46.4	10.1	100
Hill	42.2	34.1	23.7	100
Terai	57.5	13.2	29.3	100
Province-ecological zone				

Koshi-Mountain	82.8	11.3	5.9	100
Koshi-Hill	37.5	54.3	8.2	100
Koshi-Terai	49.7	17.8	32.4	100
Madhesh-Terai	60.7	9.3	30.1	100
Bagmati-Mountain	62.0	21.5	16.5	100
Bagmati-Hill	41.5	20.5	37.9	100
Bagmati-Terai	53.9	17.7	28.3	100
Gandaki-Mountain	26.9	70.7	2.4	100
Gandaki-Hill	38.1	38.9	23.0	100
Gandaki-Terai	57.2	16.3	26.5	100
Lumbini-Hill	55.9	35.6	8.5	100
Lumbini-Terai	56.7	15.9	27.4	100
Karnali-Mountain	14.0	71.9	14.1	100
Karnali-Hill	38.2	35.7	26.1	100
Sudurpaschim-Mountain	6.7	88.3	5.0	100
Sudurpaschim-Hill	52.3	43.7	4.0	100
Sudurpaschim-Terai	69.6	8.6	21.8	100
Altitude (meters)				
Below 120	61.5	9.2	29.4	100
120- 350	55.4	14.0	30.6	100
350- 1000	58.6	24.1	17.3	100
1000- 1300	44.4	27.7	27.9	100
1300- 1500	29.4	33.6	37.0	100
1500- 2000	36.5	56.6	7.0	100
2000 and above	9.4	78.6	12.0	100
Climate risk				
Very Low	45.7	28.0	26.3	100
Low	57.6	28.1	14.3	100
Moderate	52.6	14.0	33.3	100
High	66.6	15.1	18.3	100
Very High	47.6	14.0	38.4	100
Nepal	**49.3**	**25.6**	**25.1**	**100**
10. Using bio fertilizers only				
Municipality				
Urban	13.4	51.0	35.5	100
Rural	31.7	57.3	11.1	100
Ecological zone				
Mountain	39.2	50.7	10.1	100
Hill	29.9	46.4	23.7	100
Terai	9.0	61.7	29.3	100
Province-ecological zone				
Koshi-Mountain	13.9	80.2	5.9	100
Koshi-Hill	49.0	42.9	8.2	100
Koshi-Terai	20.3	47.3	32.4	100
Madhesh-Terai	2.7	67.2	30.1	100

Bagmati-Mountain	8.6	75.0	16.5	100
Bagmati-Hill	16.2	45.9	37.9	100
Bagmati-Terai	12.4	59.2	28.3	100
Gandaki-Mountain	55.5	42.1	2.4	100
Gandaki-Hill	22.2	54.8	23.0	100
Gandaki-Terai	15.8	57.6	26.5	100
Lumbini-Hill	33.6	57.9	8.5	100
Lumbini-Terai	4.3	68.3	27.4	100
Karnali-Mountain	81.4	4.5	14.1	100
Karnali-Hill	37.7	36.2	26.1	100
Sudurpaschim-Mountain	71.1	24.0	5.0	100
Sudurpaschim-Hill	67.2	28.9	4.0	100
Sudurpaschim-Terai	18.3	59.9	21.8	100
Altitude (meters)				
Below 120	4.8	65.8	29.4	100
120- 350	10.8	58.6	30.6	100
350- 1000	21.5	61.2	17.3	100
1000- 1300	28.5	43.6	27.9	100
1300- 1500	28.4	34.6	37.0	100
1500- 2000	43.6	49.4	7.0	100
2000 and above	67.4	20.6	12.0	100
Climate risk				
Very Low	24.1	49.6	26.3	100
Low	24.9	60.8	14.3	100
Moderate	6.4	60.3	33.3	100
High	8.0	73.7	18.3	100
Very High	5.4	56.2	38.4	100
Nepal	**21.2**	**53.7**	**25.1**	**100**
11. Cultivation of new crops (Hybrid crops)				
Municipality				
Urban	11.4	53.1	35.5	100
Rural	11.6	77.4	11.1	100
Ecological zone				
Mountain	14.1	75.8	10.1	100
Hill	11.1	65.2	23.7	100
Terai	11.4	59.4	29.3	100
Province-ecological zone				
Koshi-Mountain	19.7	74.4	5.9	100
Koshi-Hill	22.3	69.5	8.2	100
Koshi-Terai	17.2	50.4	32.4	100
Madhesh-Terai	11.5	58.4	30.1	100
Bagmati-Mountain	12.1	71.4	16.5	100
Bagmati-Hill	9.7	52.3	37.9	100
Bagmati-Terai	12.4	59.2	28.3	100
Gandaki-Mountain	7.9	89.8	2.4	100

Gandaki-Hill	10.4	66.6	23.0	100
Gandaki-Terai	10.1	63.4	26.5	100
Lumbini-Hill	7.2	84.3	8.5	100
Lumbini-Terai	2.4	70.2	27.4	100
Karnali-Mountain	12.5	73.3	14.1	100
Karnali-Hill	2.7	71.2	26.1	100
Sudurpaschim-Mountain	12.8	82.3	5.0	100
Sudurpaschim-Hill	11.8	84.2	4.0	100
Sudurpaschim-Terai	19.2	59.0	21.8	100
Altitude (meters)				
Below 120	11.7	59.0	29.4	100
120- 350	10.2	59.1	30.6	100
350- 1000	10.0	72.7	17.3	100
1000- 1300	12.6	59.6	27.9	100
1300- 1500	8.8	54.2	37.0	100
1500- 2000	15.9	77.1	7.0	100
2000 and above	11.4	76.5	12.0	100
Climate risk				
Very Low	11.8	61.9	26.3	100
Low	14.8	70.8	14.3	100
Moderate	8.1	58.6	33.3	100
High	3.9	77.8	18.3	100
Very High	2.8	58.8	38.4	100
Nepal	**11.5**	**63.4**	**25.1**	**100**
12. Using hybrid animal				
Municipality				
Urban	5.3	59.2	35.5	100
Rural	3.8	85.1	11.1	100
Ecological zone				
Mountain	6.6	83.3	10.1	100
Hill	3.9	72.4	23.7	100
Terai	5.1	65.6	29.3	100
Province-ecological zone				
Koshi-Mountain	4.1	90.0	5.9	100
Koshi-Hill	5.6	86.2	8.2	100
Koshi-Terai	9.0	58.6	32.4	100
Madhesh-Terai	5.6	64.3	30.1	100
Bagmati-Mountain	10.5	73.0	16.5	100
Bagmati-Hill	3.0	59.0	37.9	100
Bagmati-Terai	3.6	68.0	28.3	100
Gandaki-Mountain	2.6	95.0	2.4	100
Gandaki-Hill	5.0	72.0	23.0	100
Gandaki-Terai	7.9	65.6	26.5	100
Lumbini-Hill	4.1	87.5	8.5	100
Lumbini-Terai	1.3	71.3	27.4	100

Karnali-Mountain	9.6	76.2	14.1	100
Karnali-Hill	2.8	71.1	26.1	100
Sudurpaschim-Mountain	2.9	92.1	5.0	100
Sudurpaschim-Hill	2.9	93.2	4.0	100
Sudurpaschim-Terai	1.2	77.0	21.8	100
Altitude (meters)				
Below 120	5.0	65.6	29.4	100
120- 350	4.2	65.2	30.6	100
350- 1000	4.4	78.4	17.3	100
1000- 1300	5.5	66.6	27.9	100
1300- 1500	3.0	60.0	37.0	100
1500- 2000	5.3	87.7	7.0	100
2000 and above	4.8	83.2	12.0	100
Climate risk				
Very Low	4.4	69.2	26.3	100
Low	7.2	78.4	14.3	100
Moderate	2.6	64.1	33.3	100
High	3.6	78.1	18.3	100
Very High	1.9	59.6	38.4	100
Nepal	**4.7**	**70.2**	**25.1**	**100**
13. Veterinary cure				
Municipality				
Urban	33.2	31.3	35.5	100
Rural	39.9	49.0	11.1	100
Ecological zone				
Mountain	36.1	53.8	10.1	100
Hill	36.1	40.2	23.7	100
Terai	35.9	34.8	29.3	100
Province-ecological zone				
Koshi-Mountain	46.8	47.3	5.9	100
Koshi-Hill	66.7	25.1	8.2	100
Koshi-Terai	49.9	17.6	32.4	100
Madhesh-Terai	40.2	29.7	30.1	100
Bagmati-Mountain	49.0	34.5	16.5	100
Bagmati-Hill	23.6	38.4	37.9	100
Bagmati-Terai	42.7	28.9	28.3	100
Gandaki-Mountain	-	97.6	2.4	100
Gandaki-Hill	31.8	45.2	23.0	100
Gandaki-Terai	20.9	52.5	26.5	100
Lumbini-Hill	19.2	72.3	8.5	100
Lumbini-Terai	20.7	51.9	27.4	100
Karnali-Mountain	41.0	44.9	14.1	100
Karnali-Hill	52.3	21.6	26.1	100
Sudurpaschim-Mountain	12.6	82.4	5.0	100
Sudurpaschim-Hill	52.4	43.7	4.0	100

Sudurpaschim-Terai	15.7	62.5	21.8	100
Altitude (meters)				
Below 120	36.9	33.7	29.4	100
120- 350	32.6	36.8	30.6	100
350- 1000	33.7	49.0	17.3	100
1000- 1300	42.3	29.8	27.9	100
1300- 1500	30.7	32.3	37.0	100
1500- 2000	37.9	55.1	7.0	100
2000 and above	38.6	49.4	12.0	100
Climate risk				
Very Low	34.7	39.0	26.3	100
Low	46.7	39.0	14.3	100
Moderate	23.8	42.9	33.3	100
High	55.2	26.5	18.3	100
Very High	32.1	29.5	38.4	100
Nepal	**36.0**	**38.9**	**25.1**	**100**
14. Insurance made for livestock				
Municipality				
Urban	3.0	61.5	35.5	100
Rural	2.0	87.0	10.9	100
Ecological zone				
Mountain	6.0	84.4	9.6	100
Hill	2.1	74.1	23.8	100
Terai	2.4	68.5	29.2	100
Province-ecological zone				
Koshi-Mountain	1.6	92.5	5.9	100
Koshi-Hill	2.6	89.5	7.9	100
Koshi-Terai	2.6	65.4	32.0	100
Madhesh-Terai	0.9	69.1	30.0	100
Bagmati-Mountain	12.8	71.7	15.5	100
Bagmati-Hill	1.4	60.6	38.1	100
Bagmati-Terai	15.4	54.4	30.1	100
Gandaki-Mountain	2.6	95.0	2.4	100
Gandaki-Hill	3.1	73.9	23.0	100
Gandaki-Terai	8.7	64.8	26.5	100
Lumbini-Hill	2.7	88.4	8.9	100
Lumbini-Terai	2.4	70.3	27.4	100
Karnali-Mountain	10.3	75.6	14.1	100
Karnali-Hill	3.4	70.2	26.4	100
Sudurpaschim-Mountain	-	95.6	4.4	100
Sudurpaschim-Hill	-	96.0	4.0	100
Sudurpaschim-Terai	0.6	78.1	21.3	100
Altitude (meters)				
Below 120	1.5	69.0	29.4	100
120- 350	4.5	65.1	30.4	100

350- 1000	2.4	80.4	17.2	100
1000- 1300	3.9	68.2	27.9	100
1300- 1500	1.6	61.4	37.0	100
1500- 2000	1.9	91.2	6.9	100
2000 and above	2.9	85.4	11.7	100
Climate risk				
Very Low	2.0	71.6	26.3	100
Low	4.1	81.6	14.2	100
Moderate	2.5	64.5	33.0	100
High	5.5	76.2	18.3	100
Very High	2.6	59.4	38.0	100
Nepal	**2.6**	**72.4**	**25.1**	**100**
15. Insurance made for agriculture crops				
Municipality				
Urban	0.2	64.3	35.5	100
Rural	0.5	88.5	11.1	100
Ecological zone				
Mountain	2.3	87.6	10.1	100
Hill	0.0	76.3	23.7	100
Terai	0.2	70.5	29.3	100
Province-ecological zone				
Koshi-Mountain	-	94.1	5.9	100
Koshi-Hill	-	91.8	8.2	100
Koshi-Terai	0.5	67.1	32.4	100
Madhesh-Terai	-	69.9	30.1	100
Bagmati-Mountain	-	83.5	16.5	100
Bagmati-Hill	-	62.1	37.9	100
Bagmati-Terai	0.6	71.1	28.3	100
Gandaki-Mountain	-	97.6	2.4	100
Gandaki-Hill	0.1	76.9	23.0	100
Gandaki-Terai	-	73.5	26.5	100
Lumbini-Hill	-	91.5	8.5	100
Lumbini-Terai	-	72.6	27.4	100
Karnali-Mountain	15.6	70.3	14.1	100
Karnali-Hill	-	73.9	26.1	100
Sudurpaschim-Mountain	-	95.0	5.0	100
Sudurpaschim-Hill	-	96.0	4.0	100
Sudurpaschim-Terai	0.9	77.3	21.8	100
Altitude (meters)				
Below 120	0.1	70.5	29.4	100
120- 350	0.4	69.0	30.6	100
350- 1000	0.1	82.7	17.3	100
1000- 1300	-	72.1	27.9	100
1300- 1500	-	63.0	37.0	100
1500- 2000	-	93.0	7.0	100

2000 and above	4.3	83.6	12.0	100
Climate risk				
Very Low	0.4	73.3	26.3	100
Low	0.3	85.4	14.3	100
Moderate	-	66.7	33.3	100
High	-	81.7	18.3	100
Very High	0.2	61.3	38.4	100
Nepal	**0.3**	**74.6**	**25.1**	**100**
16. Animal husbandry only				
Municipality				
Urban	1.3	63.7	35.0	100
Rural	0.6	88.5	10.9	100
Ecological zone				
Mountain	3.2	86.9	9.9	100
Hill	0.6	76.0	23.4	100
Terai	1.1	70.1	28.8	100
Province-ecological zone				
Koshi-Mountain	1.1	92.5	6.4	100
Koshi-Hill	0.7	91.3	7.9	100
Koshi-Terai	1.4	66.3	32.2	100
Madhesh-Terai	1.4	69.1	29.5	100
Bagmati-Mountain	9.2	75.3	15.5	100
Bagmati-Hill	0.7	61.7	37.6	100
Bagmati-Terai	1.9	70.9	27.2	100
Gandaki-Mountain	2.6	95.0	2.4	100
Gandaki-Hill	0.1	77.1	22.8	100
Gandaki-Terai	-	75.5	24.5	100
Lumbini-Hill	1.4	91.4	7.2	100
Lumbini-Terai	0.3	72.4	27.3	100
Karnali-Mountain	-	85.9	14.1	100
Karnali-Hill	0.7	73.7	25.7	100
Sudurpaschim-Mountain	-	95.0	5.0	100
Sudurpaschim-Hill	-	96.0	4.0	100
Sudurpaschim-Terai	0.3	78.6	21.1	100
Altitude (meters)				
Below 120	1.1	69.7	29.1	100
120- 350	1.0	69.4	29.6	100
350- 1000	0.6	82.5	17.0	100
1000- 1300	1.7	70.7	27.6	100
1300- 1500	1.1	62.3	36.7	100
1500- 2000	0.8	92.6	6.6	100
2000 and above	0.1	87.9	12.0	100
Climate risk				
Very Low	1.2	73.0	25.8	100
Low	0.7	85.1	14.2	100

Moderate	1.0	66.1	32.9	100
High	-	81.7	18.3	100
Very High	-	62.0	38.0	100
Nepal	**1.0**	**74.3**	**24.7**	**100**
17. Crop cultivation only				
Municipality				
Urban	4.6	59.9	35.4	100
Rural	3.6	85.4	11.0	100
Ecological zone				
Mountain	6.3	83.4	10.2	100
Hill	2.1	74.3	23.6	100
Terai	6.0	64.8	29.2	100
Province-ecological zone				
Koshi-Mountain	1.9	91.7	6.4	100
Koshi-Hill	1.4	90.3	8.3	100
Koshi-Terai	10.8	56.4	32.8	100
Madhesh-Terai	4.4	65.3	30.4	100
Bagmati-Mountain	14.3	69.1	16.5	100
Bagmati-Hill	1.2	60.9	37.9	100
Bagmati-Terai	4.4	68.4	27.2	100
Gandaki-Mountain	5.2	92.4	2.4	100
Gandaki-Hill	2.9	74.3	22.8	100
Gandaki-Terai	7.7	66.8	25.4	100
Lumbini-Hill	5.6	86.7	7.7	100
Lumbini-Terai	4.6	68.4	27.1	100
Karnali-Mountain	1.9	83.9	14.1	100
Karnali-Hill	1.9	72.4	25.7	100
Sudurpaschim-Mountain	3.5	91.6	5.0	100
Sudurpaschim-Hill	1.3	94.4	4.3	100
Sudurpaschim-Terai	3.5	75.4	21.1	100
Altitude (meters)				
Below 120	6.4	63.9	29.7	100
120- 350	4.6	65.6	29.7	100
350- 1000	3.4	79.5	17.1	100
1000- 1300	4.5	67.8	27.8	100
1300- 1500	2.0	61.1	36.9	100
1500- 2000	1.6	91.2	7.2	100
2000 and above	2.1	85.9	12.0	100
Climate risk				
Very Low	3.5	70.3	26.2	100
Low	4.9	80.6	14.5	100
Moderate	5.0	62.0	32.9	100
High	4.0	76.7	19.3	100
Very High	9.4	52.1	38.4	100
Nepal	**4.2**	**70.8**	**25.1**	**100**

18. Both animal husbandry and crop cultivation				
Municipality				
Urban	22.0	42.5	35.5	100
Rural	40.0	49.0	11.1	100
Ecological zone				
Mountain	32.8	57.1	10.1	100
Hill	36.4	39.9	23.7	100
Terai	22.1	48.7	29.3	100
Province-ecological zone				
Koshi-Mountain	1.0	93.1	5.9	100
Koshi-Hill	44.5	47.4	8.2	100
Koshi-Terai	37.6	29.9	32.4	100
Madhesh-Terai	6.9	63.0	30.1	100
Bagmati-Mountain	45.1	38.4	16.5	100
Bagmati-Hill	33.0	29.1	37.9	100
Bagmati-Terai	15.7	55.9	28.3	100
Gandaki-Mountain	5.0	92.6	2.4	100
Gandaki-Hill	7.0	70.0	23.0	100
Gandaki-Terai	41.7	31.8	26.5	100
Lumbini-Hill	73.4	18.1	8.5	100
Lumbini-Terai	33.3	39.3	27.4	100
Karnali-Mountain	33.1	52.7	14.1	100
Karnali-Hill	35.7	38.2	26.1	100
Sudurpaschim-Mountain	47.0	48.0	5.0	100
Sudurpaschim-Hill	62.3	33.7	4.0	100
Sudurpaschim-Terai	18.2	59.9	21.8	100
Altitude (meters)				
Below 120	19.2	51.5	29.4	100
120- 350	26.9	42.5	30.6	100
350- 1000	30.9	51.9	17.3	100
1000- 1300	36.9	35.3	27.9	100
1300- 1500	28.4	34.6	37.0	100
1500- 2000	49.6	43.4	7.0	100
2000 and above	34.5	53.5	12.0	100
Climate risk				
Very Low	26.6	47.1	26.3	100
Low	39.8	45.9	14.3	100
Moderate	29.4	37.3	33.3	100
High	33.1	48.6	18.3	100
Very High	27.5	34.1	38.4	100
Nepal	**29.6**	**45.3**	**25.1**	**100**
19. Agroforestry				
Municipality				
Urban	2.0	62.5	35.5	100
Rural	2.6	86.4	11.1	100

Ecological zone				
Mountain	3.7	86.1	10.1	100
Hill	2.1	74.2	23.7	100
Terai	2.1	68.7	29.3	100
Province-ecological zone				
Koshi-Mountain	4.9	89.2	5.9	100
Koshi-Hill	6.1	85.7	8.2	100
Koshi-Terai	4.9	62.6	32.4	100
Madhesh-Terai	1.6	68.3	30.1	100
Bagmati-Mountain	5.6	77.9	16.5	100
Bagmati-Hill	1.5	60.6	37.9	100
Bagmati-Terai	0.3	71.4	28.3	100
Gandaki-Mountain	-	97.6	2.4	100
Gandaki-Hill	2.5	74.5	23.0	100
Gandaki-Terai	0.8	72.6	26.5	100
Lumbini-Hill	0.3	91.3	8.5	100
Lumbini-Terai	1.1	71.6	27.4	100
Karnali-Mountain	0.4	85.4	14.1	100
Karnali-Hill	0.4	73.5	26.1	100
Sudurpaschim-Mountain	2.7	92.4	5.0	100
Sudurpaschim-Hill	0.8	95.3	4.0	100
Sudurpaschim-Terai	-	78.2	21.8	100
Altitude (meters)				
Below 120	2.2	68.4	29.4	100
120- 350	1.0	68.3	30.6	100
350- 1000	1.2	81.5	17.3	100
1000- 1300	3.6	68.5	27.9	100
1300- 1500	1.0	62.0	37.0	100
1500- 2000	3.9	89.2	7.0	100
2000 and above	4.7	83.2	12.0	100
Climate risk				
Very Low	2.0	71.7	26.3	100
Low	3.4	82.2	14.3	100
Moderate	1.3	65.4	33.3	100
High	-	81.7	18.3	100
Very High	3.6	58.0	38.4	100
Nepal	**2.2**	**72.7**	**25.1**	**100**
20. Compatible cropping				
Municipality				
Urban	14.2	50.3	35.5	100
Rural	21.4	67.5	11.1	100
Ecological zone				
Mountain	23.6	66.3	10.1	100
Hill	19.1	57.2	23.7	100
Terai	14.2	56.5	29.3	100

Province-ecological zone				
Koshi-Mountain	-	94.1	5.9	100
Koshi-Hill	14.6	77.2	8.2	100
Koshi-Terai	13.3	54.3	32.4	100
Madhesh-Terai	19.0	50.9	30.1	100
Bagmati-Mountain	36.8	46.7	16.5	100
Bagmati-Hill	14.4	47.6	37.9	100
Bagmati-Terai	5.4	66.2	28.3	100
Gandaki-Mountain	12.9	84.8	2.4	100
Gandaki-Hill	28.0	49.0	23.0	100
Gandaki-Terai	20.2	53.3	26.5	100
Lumbini-Hill	-	91.5	8.5	100
Lumbini-Terai	7.3	65.3	27.4	100
Karnali-Mountain	50.1	35.8	14.1	100
Karnali-Hill	30.6	43.3	26.1	100
Sudurpaschim-Mountain	15.4	79.6	5.0	100
Sudurpaschim-Hill	45.7	50.3	4.0	100
Sudurpaschim-Terai	15.0	63.2	21.8	100
Altitude (meters)				
Below 120	13.9	56.8	29.4	100
120- 350	14.0	55.3	30.6	100
350- 1000	17.5	65.3	17.3	100
1000- 1300	18.9	53.3	27.9	100
1300- 1500	15.8	47.2	37.0	100
1500- 2000	22.6	70.5	7.0	100
2000 and above	35.1	52.8	12.0	100
Climate risk				
Very Low	17.7	56.0	26.3	100
Low	18.3	67.4	14.3	100
Moderate	11.4	55.2	33.3	100
High	32.7	49.0	18.3	100
Very High	15.7	45.9	38.4	100
Nepal	**17.3**	**57.6**	**25.1**	**100**
21. Tunnel technique in vegetable cultivation				
Municipality				
Urban	0.9	63.5	35.5	100
Rural	1.2	87.8	11.1	100
Ecological zone				
Mountain	2.5	87.3	10.1	100
Hill	1.7	74.6	23.7	100
Terai	0.1	70.6	29.3	100
Province-ecological zone				
Koshi-Mountain	-	94.1	5.9	100
Koshi-Hill	2.5	89.3	8.2	100
Koshi-Terai	0.3	67.2	32.4	100

Madhesh-Terai	0.1	69.8	30.1	100
Bagmati-Mountain	5.9	77.6	16.5	100
Bagmati-Hill	0.6	61.4	37.9	100
Bagmati-Terai	-	71.7	28.3	100
Gandaki-Mountain	-	97.6	2.4	100
Gandaki-Hill	0.4	76.6	23.0	100
Gandaki-Terai	-	73.5	26.5	100
Lumbini-Hill	-	91.5	8.5	100
Lumbini-Terai	-	72.6	27.4	100
Karnali-Mountain	4.8	81.1	14.1	100
Karnali-Hill	8.1	65.8	26.1	100
Sudurpaschim-Mountain	-	95.0	5.0	100
Sudurpaschim-Hill	2.7	93.3	4.0	100
Sudurpaschim-Terai	-	78.2	21.8	100
Altitude (meters)				
Below 120	0.1	70.5	29.4	100
120- 350	0.2	69.2	30.6	100
350- 1000	0.5	82.2	17.3	100
1000- 1300	2.7	69.5	27.9	100
1300- 1500	1.1	61.9	37.0	100
1500- 2000	2.6	90.5	7.0	100
2000 and above	2.8	85.2	12.0	100
Climate risk				
Very Low	1.2	72.5	26.3	100
Low	1.2	84.4	14.3	100
Moderate	0.2	66.5	33.3	100
High	-	81.7	18.3	100
Very High	0.7	60.9	38.4	100
Nepal	**1.0**	**73.9**	**25.1**	**100**
22. Cold storage				
Municipality				
Urban	4.12	60.37	35.52	100
Rural	3.28	85.66	11.05	100
Ecological zone				
Mountain	1.68	88.20	10.12	100
Hill	2.31	73.98	23.71	100
Terai	5.63	65.11	29.26	100
Province-ecological zone				
Koshi-Mountain	0.53	93.57	5.90	100
Koshi-Hill	1.07	90.76	8.17	100
Koshi-Terai	1.35	66.20	32.45	100
Madhesh-Terai	12.42	57.49	30.10	100
Bagmati-Mountain	0.45	83.06	16.50	100
Bagmati-Hill	1.77	60.29	37.94	100
Bagmati-Terai	6.01	65.65	28.34	100

Gandaki-Mountain	-	97.62	2.38	100
Gandaki-Hill	6.15	70.86	23.00	100
Gandaki-Terai	-	73.48	26.52	100
Lumbini-Hill	0.24	91.30	8.46	100
Lumbini-Terai	-	72.65	27.35	100
Karnali-Mountain	9.57	76.30	14.13	100
Karnali-Hill	2.37	71.52	26.11	100
Sudurpaschim-Mountain	-	95.03	4.97	100
Sudurpaschim-Hill	0.51	95.52	3.98	100
Sudurpaschim-Terai	1.05	77.12	21.83	100
Altitude (meters)				
Below 120	7.44	63.19	29.37	100
120- 350	2.61	66.75	30.64	100
350- 1000	1.68	81.06	17.26	100
1000- 1300	3.11	69.03	27.86	100
1300- 1500	2.75	60.25	37.00	100
1500- 2000	0.84	92.21	6.95	100
2000 and above	2.80	85.16	12.04	100
Climate risk				
Very Low	4.31	69.38	26.31	100
Low	3.21	82.45	14.34	100
Moderate	1.54	65.15	33.32	100
High	-	81.70	18.30	100
Very High	5.83	55.75	38.41	100
Nepal	**3.76**	**71.12**	**25.11**	**100**
23. Water and land conservation				
Municipality				
Urban	11.2	53.3	35.5	100
Rural	13.1	75.8	11.1	100
Ecological zone				
Mountain	5.2	84.7	10.1	100
Hill	12.7	63.6	23.7	100
Terai	12.5	58.2	29.3	100
Province-ecological zone				
Koshi-Mountain	11.9	82.2	5.9	100
Koshi-Hill	35.8	56.0	8.2	100
Koshi-Terai	32.7	34.9	32.4	100
Madhesh-Terai	7.5	62.4	30.1	100
Bagmati-Mountain	1.3	82.2	16.5	100
Bagmati-Hill	12.6	49.5	37.9	100
Bagmati-Terai	2.0	69.7	28.3	100
Gandaki-Mountain	15.2	82.4	2.4	100
Gandaki-Hill	6.4	70.6	23.0	100
Gandaki-Terai	11.2	62.3	26.5	100
Lumbini-Hill	5.9	85.6	8.5	100

Lumbini-Terai	0.5	72.1	27.4	100
Karnali-Mountain	1.3	84.6	14.1	100
Karnali-Hill	3.8	70.1	26.1	100
Sudurpaschim-Mountain	5.4	89.7	5.0	100
Sudurpaschim-Hill	1.1	94.9	4.0	100
Sudurpaschim-Terai	18.7	59.5	21.8	100
Altitude (meters)				
Below 120	11.8	58.8	29.4	100
120- 350	14.2	55.2	30.6	100
350- 1000	8.7	74.0	17.3	100
1000- 1300	12.4	59.7	27.9	100
1300- 1500	9.8	53.2	37.0	100
1500- 2000	13.0	80.1	7.0	100
2000 and above	20.0	67.9	12.0	100
Climate risk				
Very Low	9.8	63.9	26.3	100
Low	21.3	64.3	14.3	100
Moderate	5.8	60.8	33.3	100
High	16.2	65.5	18.3	100
Very High	16.7	44.9	38.4	100
Nepal	**12.0**	**62.9**	**25.1**	**100**
24. Services from local level /agriculture office				
Municipality				
Urban	22.4	42.1	35.5	100
Rural	28.1	60.9	11.1	100
Ecological zone				
Mountain	20.8	69.1	10.1	100
Hill	26.9	49.4	23.7	100
Terai	23.4	47.4	29.3	100
Province-ecological zone				
Koshi-Mountain	28.7	65.4	5.9	100
Koshi-Hill	58.5	33.3	8.2	100
Koshi-Terai	27.8	39.8	32.4	100
Madhesh-Terai	28.1	41.8	30.1	100
Bagmati-Mountain	15.2	68.3	16.5	100
Bagmati-Hill	21.4	40.7	37.9	100
Bagmati-Terai	17.0	54.7	28.3	100
Gandaki-Mountain	9.8	87.9	2.4	100
Gandaki-Hill	19.2	57.8	23.0	100
Gandaki-Terai	25.3	48.1	26.5	100
Lumbini-Hill	16.3	75.3	8.5	100
Lumbini-Terai	15.8	56.8	27.4	100
Karnali-Mountain	20.9	65.0	14.1	100
Karnali-Hill	28.9	45.0	26.1	100
Sudurpaschim-Mountain	20.9	74.2	5.0	100

Sudurpaschim-Hill	21.1	74.9	4.0	100
Sudurpaschim-Terai	9.1	69.0	21.8	100
Altitude (meters)				
Below 120	25.0	45.6	29.4	100
120- 350	21.6	47.7	30.6	100
350- 1000	25.9	56.9	17.3	100
1000- 1300	25.8	46.4	27.9	100
1300- 1500	19.4	43.6	37.0	100
1500- 2000	32.9	60.2	7.0	100
2000 and above	21.0	67.0	12.0	100
Climate risk				
Very Low	25.1	48.6	26.3	100
Low	29.8	55.9	14.3	100
Moderate	17.6	49.1	33.3	100
High	19.0	62.7	18.3	100
Very High	18.9	42.7	38.4	100
Nepal	**24.8**	**50.1**	**25.1**	**100**
25. Controlling Invasive Alien Species (IAS)				
Municipality				
Urban	35.8	28.7	35.5	100
Rural	47.3	41.7	11.1	100
Ecological zone				
Mountain	41.5	48.4	10.1	100
Hill	46.6	29.7	23.7	100
Terai	34.4	36.3	29.3	100
Province-ecological zone				
Koshi-Mountain	52.2	41.9	5.9	100
Koshi-Hill	71.8	20.0	8.2	100
Koshi-Terai	49.2	18.3	32.4	100
Madhesh-Terai	37.7	32.2	30.1	100
Bagmati-Mountain	47.9	35.6	16.5	100
Bagmati-Hill	41.6	20.5	37.9	100
Bagmati-Terai	33.5	38.1	28.3	100
Gandaki-Mountain	5.2	92.4	2.4	100
Gandaki-Hill	39.3	37.7	23.0	100
Gandaki-Terai	30.5	43.0	26.5	100
Lumbini-Hill	36.1	55.5	8.5	100
Lumbini-Terai	14.9	57.7	27.4	100
Karnali-Mountain	17.8	68.1	14.1	100
Karnali-Hill	38.4	35.4	26.1	100
Sudurpaschim-Mountain	39.8	55.2	5.0	100
Sudurpaschim-Hill	65.5	30.6	4.0	100
Sudurpaschim-Terai	31.2	47.0	21.8	100
Altitude (meters)				
Below 120	33.0	37.6	29.4	100

120- 350	36.0	33.4	30.6	100
350- 1000	40.5	42.3	17.3	100
1000- 1300	48.9	23.3	27.9	100
1300- 1500	36.1	26.9	37.0	100
1500- 2000	59.5	33.5	7.0	100
2000 and above	47.0	41.0	12.0	100
Climate risk				
Very Low	39.3	34.4	26.3	100
Low	53.5	32.2	14.3	100
Moderate	28.1	38.6	33.3	100
High	42.6	39.1	18.3	100
Very High	34.6	27.0	38.4	100
Nepal	40.7	34.2	25.1	100
26. Increasing soil quality				
Municipality				
Urban	4.1	60.4	35.5	100
Rural	5.0	84.0	11.1	100
Ecological zone				
Mountain	6.5	83.3	10.1	100
Hill	5.2	71.1	23.7	100
Terai	3.4	67.3	29.3	100
Province-ecological zone				
Koshi-Mountain	4.0	90.1	5.9	100
Koshi-Hill	3.4	88.4	8.2	100
Koshi-Terai	3.3	64.2	32.4	100
Madhesh-Terai	4.0	65.9	30.1	100
Bagmati-Mountain	14.2	69.3	16.5	100
Bagmati-Hill	2.6	59.4	37.9	100
Bagmati-Terai	8.3	63.4	28.3	100
Gandaki-Mountain	19.3	78.3	2.4	100
Gandaki-Hill	5.0	72.0	23.0	100
Gandaki-Terai	7.8	65.7	26.5	100
Lumbini-Hill	10.0	81.5	8.5	100
Lumbini-Terai	0.6	72.0	27.4	100
Karnali-Mountain	4.8	81.0	14.1	100
Karnali-Hill	15.7	58.1	26.1	100
Sudurpaschim-Mountain	0.5	94.5	5.0	100
Sudurpaschim-Hill	1.9	94.1	4.0	100
Sudurpaschim-Terai	4.8	73.3	21.8	100
Altitude (meters)				
Below 120	2.3	68.4	29.4	100
120- 350	4.0	65.4	30.6	100
350- 1000	5.3	77.5	17.3	100
1000- 1300	7.8	64.3	27.9	100
1300- 1500	4.7	58.3	37.0	100

1500- 2000	4.7	88.4	7.0	100
2000 and above	6.1	81.8	12.0	100
Climate risk				
Very Low	4.8	68.9	26.3	100
Low	5.4	80.2	14.3	100
Moderate	1.9	64.8	33.3	100
High	6.1	75.6	18.3	100
Very High	1.2	60.4	38.4	100
Nepal	**4.5**	**70.4**	**25.1**	**100**
27.Minimizing climate disaster risk				
Municipality				
Urban	7.3	57.2	35.5	100
Rural	10.3	78.6	11.1	100
Ecological zone				
Mountain	10.2	79.7	10.1	100
Hill	9.5	66.8	23.7	100
Terai	7.4	63.3	29.3	100
Province-ecological zone				
Koshi-Mountain	5.3	88.8	5.9	100
Koshi-Hill	21.4	70.4	8.2	100
Koshi-Terai	21.1	46.4	32.4	100
Madhesh-Terai	3.7	66.2	30.1	100
Bagmati-Mountain	20.4	63.1	16.5	100
Bagmati-Hill	8.4	53.6	37.9	100
Bagmati-Terai	1.8	69.8	28.3	100
Gandaki-Mountain	7.6	90.0	2.4	100
Gandaki-Hill	2.8	74.2	23.0	100
Gandaki-Terai	8.7	64.7	26.5	100
Lumbini-Hill	2.4	89.1	8.5	100
Lumbini-Terai	2.8	69.8	27.4	100
Karnali-Mountain	6.6	79.3	14.1	100
Karnali-Hill	18.5	55.4	26.1	100
Sudurpaschim-Mountain	5.2	89.9	5.0	100
Sudurpaschim-Hill	6.0	90.1	4.0	100
Sudurpaschim-Terai	0.9	77.3	21.8	100
Altitude (meters)				
Below 120	6.7	63.9	29.4	100
120- 350	8.2	61.2	30.6	100
350- 1000	8.6	74.1	17.3	100
1000- 1300	10.4	61.7	27.9	100
1300- 1500	8.6	54.4	37.0	100
1500- 2000	9.9	83.1	7.0	100
2000 and above	13.4	74.6	12.0	100
Climate risk				
Very Low	7.4	66.3	26.3	100

Low	14.4	71.2	14.3	100
Moderate	5.4	61.2	33.3	100
High	10.1	71.6	18.3	100
Very High	7.2	54.4	38.4	100
Nepal	8.6	66.3	25.1	100

Off-Farm Based Adaptation Measures

Table 9.3 presents households adopting of off-farm-based adaptation measures over the past 5 years. 33.7% of the respondent reported behavioral change in consumption, 27.1% in increased engagement in non-agricultural local businesses, 41.1% in acceptance of non-agricultural employment, and 28.4% in temporary emigration. Additionally, other adaptation measures were also being adopted such as; 11.3% in water management, 18.1% in road infrastructure improvement, 14.2% in natural resource management, and 5.9% in training to minimize climatic disaster risks.

The diverse adaptation measures adopted by respondent households within different analytical domains are presented in (Table 9.4) in the subsequent sub-sections.

Table 9.3: Households Adapting Off-farm Based Adaption Measures in Last 5 Years

S. N	Measures	Off-farm Based Adaption Measures (HH, %)		
		Yes	No	Total
1	Change in food consumption habit	33.7	66.3	100
2	Increase non-agriculture business	27.1	72.9	100
3	Started off-farm activities	41.1	58.9	100
4	Temporary internal migration	28.4	71.6	100
5	Water management training	11.3	88.7	100
6	Participating in road/infrastructure improvement	18.1	81.9	100
7	Involved on community based Natural Resource Management (NRM)	14.2	85.8	100
8	Climate induced disaster training	5.9	94.1	100

Table 9.4: Households Adapting Off-farm Based Adaption Measures in Last 5 Years by Analytical Domain

Analytical Domain	Off-Farm based Adaption Measures (HHs, %)		
	Yes	No	Total
1. Change in food consumption habit			
Municipality			
Urban	36.0	64.0	100
Rural	30.7	69.3	100
Ecological zone			
Mountain	31.5	68.5	100
Hill	41.4	58.6	100
Terai	26.3	73.7	100
Province - ecological zone			

Koshi-Mountain	45.1	54.9	100
Koshi-Hill	50.0	50.0	100
Koshi-Terai	14.7	85.3	100
Madhesh-Terai	37.3	62.7	100
Bagmati-Mountain	33.2	66.8	100
Bagmati-Hill	43.0	57.0	100
Bagmati-Terai	12.8	87.2	100
Gandaki-Mountain	15.0	85.0	100
Gandaki-Hill	45.7	54.3	100
Gandaki-Terai	40.2	59.8	100
Lumbini-Hill	26.3	73.7	100
Lumbini-Terai	23.7	76.3	100
Karnali-Mountain	19.4	80.6	100
Karnali-Hill	40.8	59.2	100
Sudurpaschim-Mountain	25.4	74.6	100
Sudurpaschim-Hill	24.9	75.1	100
Sudurpaschim-Terai	14.3	85.7	100
Altitude (meter)			
Below 120	27.0	73.0	100
120 - 350	25.3	74.7	100
350 - 1000	30.2	69.8	100
1000 - 1300	42.7	57.3	100
1300 - 1500	42.1	57.9	100
1500 - 2000	46.3	53.7	100
2000 and above	38.9	61.1	100
Climate risk			
Very Low	37.3	62.7	100
Low	29.5	70.5	100
Moderate	25.8	74.2	100
High	15.4	84.6	100
Very High	28.0	72.0	100
Nepal	**33.7**	**66.3**	**100**
2. Increase in non-agriculture business			
Municipality			
Urban	30.8	69.2	100
Rural	22.2	77.8	100
Ecological zone			
Mountain	23.9	76.1	100
Hill	28.0	72.0	100
Terai	26.9	73.1	100
Province - ecological Zone			
Koshi-Mountain	27.0	73.0	100
Koshi-Hill	29.2	70.8	100
Koshi-Terai	21.7	78.3	100

Madhesh-Terai	30.3	69.7	100
Bagmati-Mountain	9.2	90.8	100
Bagmati-Hill	34.5	65.5	100
Bagmati-Terai	35.0	65.0	100
Gandaki-Mountain	5.0	95.0	100
Gandaki-Hill	36.6	63.4	100
Gandaki-Terai	30.0	70.0	100
Lumbini-Hill	12.8	87.2	100
Lumbini-Terai	29.0	71.0	100
Karnali-Mountain	9.2	90.8	100
Karnali-Hill	10.2	89.8	100
Sudurpaschim-Mountain	45.9	54.1	100
Sudurpaschim-Hill	12.8	87.2	100
Sudurpaschim-Terai	12.6	87.4	100
Altitude (meter)			
Below 120	26.7	73.3	100
120 - 350	28.3	71.7	100
350 - 1000	27.8	72.2	100
1000 - 1300	28.2	71.8	100
1300 - 1500	26.3	73.7	100
1500 - 2000	29.1	70.9	100
2000 and above	17.6	82.4	100
Climate risk			
Very Low	28.8	71.2	100
Low	21.6	78.4	100
Moderate	24.7	75.3	100
High	18.9	81.1	100
Very High	38.9	61.1	100
Nepal	**27.1**	**72.9**	**100**
3. Started off-farm activities			
Municipality			
Urban	42.3	57.7	100
Rural	39.5	60.5	100
Ecological zone			
Mountain	32.2	67.8	100
Hill	38.8	61.2	100
Terai	45.1	54.9	100
Province - ecological Zone			
Koshi-Mountain	33.9	66.1	100
Koshi-Hill	33.6	66.4	100
Koshi-Terai	38.3	61.7	100
Madhesh-Terai	45.6	54.4	100
Bagmati-Mountain	17.4	82.6	100
Bagmati-Hill	44.4	55.6	100

Bagmati-Terai	56.3	43.7	100
Gandaki-Mountain	5.0	95.0	100
Gandaki-Hill	45.7	54.3	100
Gandaki-Terai	37.6	62.4	100
Lumbini-Hill	27.2	72.8	100
Lumbini-Terai	52.1	47.9	100
Karnali-Mountain	18.9	81.1	100
Karnali-Hill	25.0	75.0	100
Sudurpaschim-Mountain	55.2	44.8	100
Sudurpaschim-Hill	38.0	62.0	100
Sudurpaschim-Terai	39.2	60.8	100
Altitude (meters)			
Below 120	45.4	54.6	100
120 - 350	45.0	55.0	100
350 - 1000	38.1	61.9	100
1000 - 1300	36.6	63.4	100
1300 - 1500	32.0	68.0	100
1500 - 2000	48.3	51.7	100
2000 and above	31.7	68.3	100
Climate risk			
Very Low	41.9	58.1	100
Low	39.5	60.5	100
Moderate	37.7	62.3	100
High	30.0	70.0	100
Very High	52.3	47.7	100
Nepal	**41.1**	**58.9**	**100**
4. Temporary internal migration			
Municipality			
Urban	28.2	71.8	100
Rural	28.7	71.3	100
Ecological zone			
Mountain	23.2	76.8	100
Hill	34.9	65.1	100
Terai	22.7	77.3	100
Province- ecological Zone			
Koshi-Mountain	23.9	76.1	100
Koshi-Hill	28.9	71.1	100
Koshi-Terai	14.3	85.7	100
Madhesh-Terai	36.8	63.2	100
Bagmati-Mountain	14.0	86.0	100
Bagmati-Hill	36.9	63.1	100
Bagmati-Terai	36.0	64.0	100
Gandaki-Mountain	2.6	97.4	100
Gandaki-Hill	56.8	43.2	100

Gandaki-Terai	4.9	95.1	100
Lumbini-Hill	6.8	93.2	100
Lumbini-Terai	12.2	87.8	100
Karnali-Mountain	33.5	66.5	100
Karnali-Hill	16.3	83.7	100
Sudurpaschim-Mountain	28.5	71.5	100
Sudurpaschim-Hill	46.9	53.1	100
Sudurpaschim-Terai	3.3	96.7	100
Altitude (meters)			
Below 120	23.3	76.7	100
120 - 350	20.7	79.3	100
350 - 1000	35.0	65.0	100
1000 - 1300	32.9	67.1	100
1300 - 1500	25.3	74.7	100
1500 - 2000	34.6	65.4	100
2000 and above	42.1	57.9	100
Climate risk			
Very Low	30.3	69.7	100
Low	25.8	74.2	100
Moderate	20.4	79.6	100
High	29.2	70.8	100
Very High	33.8	66.2	100
Nepal	**28.4**	**71.6**	**100**
5. Water management training			
Municipality			
Urban	11.9	88.1	100
Rural	10.6	89.4	100
Ecological zone			
Mountain	12.5	87.5	100
Hill	16.0	84.0	100
Terai	6.3	93.7	100
Province- ecological Zone			
Koshi-Mountain	2.5	97.5	100
Koshi-Hill	18.8	81.2	100
Koshi-Terai	4.8	95.2	100
Madhesh-Terai	9.7	90.3	100
Bagmati-Mountain	24.7	75.3	100
Bagmati-Hill	14.0	86.0	100
Bagmati-Terai	8.3	91.7	100
Gandaki-Mountain	15.0	85.0	100
Gandaki-Hill	12.8	87.2	100
Gandaki-Terai	11.9	88.1	100
Lumbini-Hill	9.8	90.2	100
Lumbini-Terai	2.3	97.7	100

Karnali-Mountain	17.1	82.9	100
Karnali-Hill	33.8	66.2	100
Sudurpaschim-Mountain	5.0	95.0	100
Sudurpaschim-Hill	15.8	84.2	100
Sudurpaschim-Terai	1.3	98.7	100
Altitude (meters)			
Below 120	6.4	93.6	100
120 - 350	5.1	94.9	100
350 - 1000	9.9	90.1	100
1000 - 1300	21.6	78.4	100
1300 - 1500	14.0	86.0	100
1500 - 2000	17.2	82.8	100
2000 and above	15.5	84.5	100
Climate risk			
Very Low	12.4	87.6	100
Low	12.5	87.5	100
Moderate	3.8	96.2	100
High	2.5	97.5	100
Very High	14.5	85.5	100
Nepal	**11.3**	**88.7**	**100**
6. Participating in road/infrastructure improvement			
Municipality			
Urban	16.5	83.5	100
Rural	20.3	79.7	100
Ecological zone			
Mountain	16.5	83.5	100
Hill	23.6	76.4	100
Terai	12.7	87.3	100
Province- ecological Zone			
Koshi-Mountain	1.5	98.5	100
Koshi-Hill	46.1	53.9	100
Koshi-Terai	28.7	71.3	100
Madhesh-Terai	11.0	89.0	100
Bagmati-Mountain	30.6	69.4	100
Bagmati-Hill	14.5	85.5	100
Bagmati-Terai	7.5	92.5	100
Gandaki-Mountain	15.2	84.8	100
Gandaki-Hill	9.4	90.6	100
Gandaki-Terai	22.4	77.6	100
Lumbini-Hill	38.1	61.9	100
Lumbini-Terai	2.1	97.9	100
Karnali-Mountain	26.0	74.0	100
Karnali-Hill	34.5	65.5	100
Sudurpaschim-Mountain	8.5	91.5	100

Sudurpaschim-Hill	24.2	75.8	100
Sudurpaschim-Terai	4.0	96.0	100
Altitude (meters)			
Below 120	11.6	88.4	100
120 - 350	12.0	88.0	100
350 - 1000	18.8	81.2	100
1000 - 1300	28.3	71.7	100
1300 - 1500	19.1	80.9	100
1500 - 2000	25.5	74.5	100
2000 and above	24.7	75.3	100
Climate risk			
Very Low	17.3	82.7	100
Low	25.9	74.1	100
Moderate	8.9	91.1	100
High	11.2	88.8	100
Very High	21.4	78.6	100
Nepal	**18.1**	**81.9**	**100**
7. Involved on community based Natural Resources Management (NRM)			
Municipality			
Urban	13.4	86.6	100
Rural	15.4	84.6	100
Ecological zone			
Mountain	20.3	79.7	100
Hill	20.2	79.8	100
Terai	7.0	93.0	100
Province- ecological Zone			
Koshi-Mountain	3.0	97.0	100
Koshi-Hill	21.4	78.6	100
Koshi-Terai	7.0	93.0	100
Madhesh-Terai	7.6	92.4	100
Bagmati-Mountain	48.4	51.6	100
Bagmati-Hill	20.4	79.6	100
Bagmati-Terai	7.1	92.9	100
Gandaki-Mountain	12.6	87.4	100
Gandaki-Hill	15.3	84.7	100
Gandaki-Terai	27.0	73.0	100
Lumbini-Hill	3.4	96.6	100
Lumbini-Terai	2.5	97.5	100
Karnali-Mountain	18.6	81.4	100
Karnali-Hill	44.1	55.9	100
Sudurpaschim-Mountain	5.3	94.7	100
Sudurpaschim-Hill	24.0	76.0	100
Sudurpaschim-Terai	11.0	89.0	100
Altitude (meters)			

Below 120	5.7	94.3	100
120 - 350	10.6	89.4	100
350 - 1000	13.2	86.8	100
1000 - 1300	25.8	74.2	100
1300 - 1500	20.0	80.0	100
1500 - 2000	18.0	82.0	100
2000 and above	24.2	75.8	100
Climate risk			
Very Low	14.6	85.4	100
Low	17.9	82.1	100
Moderate	5.1	94.9	100
High	2.5	97.5	100
Very High	22.0	78.0	100
Nepal	**14.2**	**85.8**	**100**
8. Climate induced disaster training			
Municipality			
Urban	6.4	93.6	100
Rural	5.3	94.7	100
Ecological zone			
Mountain	4.5	95.5	100
Hill	6.9	93.1	100
Terai	5.2	94.8	100
Province- ecological Zone			
Koshi-Mountain	0.5	99.5	100
Koshi-Hill	0.7	99.3	100
Koshi-Terai	5.1	94.9	100
Madhesh-Terai	5.6	94.4	100
Bagmati-Mountain	4.5	95.5	100
Bagmati-Hill	3.8	96.2	100
Bagmati-Terai	6.9	93.1	100
Gandaki-Mountain	2.4	97.6	100
Gandaki-Hill	5.8	94.2	100
Gandaki-Terai	7.6	92.4	100
Lumbini-Hill	32.1	67.9	100
Lumbini-Terai	4.9	95.1	100
Karnali-Mountain	14.9	85.1	100
Karnali-Hill	5.6	94.4	100
Sudurpaschim-Mountain	2.6	97.4	100
Sudurpaschim-Hill	3.2	96.8	100
Sudurpaschim-Terai	1.8	98.2	100
Altitude (meters)			
Below 120	4.8	95.2	100
120 - 350	6.3	93.7	100
350 - 1000	5.3	94.7	100

1000 - 1300	7.1	92.9	100
1300 - 1500	4.8	95.2	100
1500 - 2000	10.1	89.9	100
2000 and above	3.4	96.6	100
Climate risk			
Very Low	5.9	94.1	100
Low	5.1	94.9	100
Moderate	6.4	93.6	100
High	3.5	96.5	100
Very High	10.3	89.7	100
Nepal	**5.9**	**94.1**	**100**

Conclusion

Over the past 5 years, majority of household actively participated in various agricultural adaptation measures. Initiatives include; adjustments in cropping time, use of improved seeds, increased in use of chemical fertilizers, exclusive adoption of bio fertilizers, engagement in mixed agriculture and compatible cropping, and control of IAS. However, a considerable households face challenges in accessing or implementing certain measures, such as water and land conservation, soil or land improvement, and strategies to minimize climate and disaster risks. Moreover, there is a notable low adoption rate for livestock and crop insurance, agro-forestry, and adaptation-related skills and knowledge. Interestingly, among those opting for insurance, livestock coverage exceeds that of crops. Additionally, households have limited access to cold storage facilities and agricultural services. Suggests additional support and intervention are highly necessary to enhance overall adaptive capacity in agriculture sector.

In the field of off-farm-based adaptation measures, households have actively adapted various strategies over the past 5 years. Respondents highly adopted; alterations in food consumption patterns, the adoption of local non-agricultural businesses, transitioning to off-farm-based employment, and temporary internal migration. These efforts show strategic response to changing economic and environmental conditions. However, certain measures are limited in practice among households such as, water management, engagement in efforts to reduce flood/landslide risks to road and transport infrastructure, natural resource management, and capacity enhancement for climate and disaster risk reduction. This highlights potential areas where adoptive interventions and support programs may be beneficial to enhance community resilience and adaptive capabilities in the face of climatic challenges.

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ANNEX 1

GLOSSARY OF TERMINOLOGIES

Adaptation

Adaptation is 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.

Mitigation

Mitigation is the human intervention to reduce the sources or enhance the sinks of greenhouse gases.

Global warming

Global warming is an increase on the average temperature of the earth surface and the atmosphere. It is considered as an important part for the climate change along with rainfall and sea level change.

Global change

Global change refers to planetary-scale changes in the global environment including on the land use change, damage on the ozone layer, and climate 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 on 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 at the dry season. Climate change impacts on different aspects of water sector have been briefed as follows:

Water quantity

Water sector has already been pressurized due to its mounting demand mainly for irrigation, and its uses on industrial and energy sectors. Increasing temperature but decreasing rainfall may diminished the available water quantity for different purposes such as drinking, on other domestic uses, and for agriculture and industrial sectors. It would result to increase competitive demand of water and hence would need effective good governance mechanism.

Water quality

Water quality is an issue of more interest at the global arena especially in water scarcity areas. The change on rainfall amount and pattern has direct link on the water flow in the watershed area. The water quality will be deteriorated if contaminated with different chemicals during its cycle which limits utility options. For example, salt composition in water would 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 potable water.

Access to water

Competition over existing water resources speeds up rapidly while water quantity and quality decreases as the result of accelerated water cycle. Water demand would be increased specially 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.

Impacts on agriculture and food security due to water imbalance

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

Water borne health issues

Climate change impacts on human health would be further intensifying due to water quantity, quality, and access. Its impact on agriculture sector would also contribute on health issues mainly from malnutrition due to decreasing production and enhancing food insecurity. Least developed countries and its women and children would be impacted more due to such issues. Some health issues those could arise due to climate change impact on water sector are as follows:

- Water borne diseases: The risk of water borne diseases would be accelerated while related virus and bacteria encounters to water resources. The climate induced disasters such as flood could further intensify risks. Human being suffers from water borne disease while consuming contaminated water.

- Water induced diseases: These are the diseases caused from insufficient sanitation practices which potentially due to insufficient amount and access of water.

- Water-based diseases: These are diseases caused by microbial residing on or near water sources.

- Water related diseases: These are diseases caused by transmitting agents of microbes residing on or near water sources. For example, the main underlying cause of recently recorded malaria in Nairobi is reported for the increased numbers of mosquitos because of enabling milieu created from environmental temperature rise.

Livelihood issues caused by water

Water sector has the crucial role on economic development and prosperity. Local communities, especially women and children, have direct impact on education and employment opportunities while available water quantity and quality deteriorates since they need to bestow their additional time on its management. There are some examples in emerging cities where the total income has been investing on water supply to its dwellers. Similarly, water scarcity has further implication on industrial production and productivity implicating on local economic opportunities.

Conflict for water

Overall pressure on the water resources will be increased while water demand for different purposes including individual agriculture, and industrial sectors. Such pressure portrays changes on existing access and availability of water which might invite conflict. Conflicts for water resources such as rivers would have further catalyzed in areas where water scarcity already prevails.

Insect attack

It is an attack on the plant and parts from hexapoda or insecta through sucking, chewing, nesting, or even regeneration.

Farming system

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

Organic farming

It is in fact the holistic farming system mainly based on agriculture and animal husbandry. Its main objective is to produce quality crops with low investment balancing ecosystem, biodiversity conservation, social equity, and economic balance.

Ecosystem diversity

It deals with the study of different ecosystems in a certain location and their overall effects on humans and the environment as a whole. It is one of the types of biodiversity along with species diversity, genetic diversity, and functional diversity.

Organic certification

The farmer needs to certify its product to claim some additional price, maintain market balance, and to ease product exporter/importer following prevailing legislations; and to ensure consumers that the product is produced based on organic farming principles and standards. This process is called organic certification.

Zero and minimum tillage

Zero tillage: It involves planting crop seeds using drillers or manual methods without preparing the land before-hand or disturbing the soil where remnants of previous crop stubbles remain. Minimum tillage: It is a farming approach where soil cultivation is minimized to the extent required for crop establishment and growth.

Mulching

It refers to covering the land surface around the plant using different plant parts including grass, leaf letter, and other plant parts. Mulching contributes to maintain land surface temperature and reduce evaporation which enables to increase microbial activities in the soil.

Cover crops

It refers to the crop plant planted in the uncovered land by main crop in the garden. It is generally short term crop and contributes on sustainable production.

Crop diversification

The 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 the market demand and quality considering feasibility in the landscape and comparative benefit.

Multi-cropping system

It refers to producing multiple products from the same piece of land utilizing principles of permaculture. It involves mixed-cropping, inter-cropping, and rotational cropping system. The multi-cropping system contributes on maintaining natural ecosystem diversity and also reduces the risk of disease and insect attack as in monoculture.

Mixed/intercropping

Mixed/intercropping contributes to increase on per unit productivity with optimum utilization of solar light, plant nutrition, and water. The plant species having different root system cropped in the mixed/intercropping system uses nutrition in different time. For example the mung utilizes soil nutrition after 35th days of it plantation while the maize do so after 50th day only in the maize-mung intercropping.

Crop rotation

It is the traditional but important farming system to increase the production. It mainly has two benefits: land productivity conservation and control from insects, diseases, and weeds though it also contributes on sustainable utilization of overall natural resources and nutrients.

Cereal crops

It mainly refers rice, maize, wheat species, barley species, buckwheat, Latte, Kaguno, Chinu, and Junelo.

Legumes

It refers crop species mostly contains dicotyledonous seeds including soybean and gram.

Oil seed crops

It refers to seeds from which oil could be extracted such as sunflower, mustard, almond, and sesame.

Industrial crops

It refers crops including cotton, tobacco, tea, sugarcane, and jute.

Vegetables

It refers crops used for vegetable such as cauliflower, cabbage, and broccoli.

Bio-diversity

It refers to all residing things including microbial, animals, plants, and ecosystems prevailed in the earth. Convention on biodiversity 1992 has further included all types of ecosystems in land, ocean, and other water system along with genetic, species, and ecosystem diversities of all residing things.

Invasive alien plant species

Exotic and unwanted plant species which displaces and impacts production and expansion of already established community. Mikenia sp. and catweed (Banmara) are some example of invasive 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 categorized as

non-timber forest products (NTFPs). The 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 doesn't yield timber or hard wood also offer other economic benefits due to its medicinal, cultural, edible, or other values.

Deforestation

It refers as the conversion of forests area into other land use purposes or decreases the total forest crown cover to less than 10% in long run.

Forest degradation

It is understood as the degraded state of forest which fails to offer anticipated products and services as its normal state even though there is no universal definition. However, in the context of REDD+, it is understood as the degraded state forests in terms of its ability of carbon storage mainly due to anthropogenic pressure.

Ecosystem services

Ecosystem services are the benefits people obtain from ecosystems. Millennium Ecosystem Assessment (2005) has divided ecosystem services in four major categories: 1) Provisioning services such as food and water; 2) Regulating services such as flood and disease control; 3) Cultural services such as spiritual, recreational, and cultural benefits; and 4) Supporting services, such as nutrient cycling, that maintain the conditions for life on Earth.

Forest management

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

Wetlands

Land area consisting of marshes or swamps; saturated land.

Tourists

It refers visitors to visit in other areas 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'.

Domestic/internal tourists

It refers tourists who visit within its own country and spends at least one night outside their own residential areas.

External/international tourists

It refers tourists who visit outside their own country and spends at least one night.

Tourist area

It is an area including heritage sites and an object which attracts 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

tourist 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 purpose.

Loss and damage

'Loss and damage' refers to the negative effects of climate change that occur despite mitigation and adaptation efforts.

Income quantile

A method to measure the average (mean) household income of residents, ranking them from poorest to wealthiest, and then grouping them into 4 income quartiles (1 being poorest and 4 being wealthiest), each quartile containing approximately 25% of the population.

Climate risk

Climate risk is the potential for negative consequences for human or ecological systems from the impacts of climate change. It refers to risk assessments based on formal analysis of the consequences, likelihoods and responses to these impacts and how societal constraints shape adaptation options.

ANNEX 2

The information asked in this questionnaire are confidential according to the statistical act, 2015 B.S.

Individual information is not published and only used for statistical purposes.

National Climate Change Survey 2022

Questionnaire

Government of Nepal

Office of the Prime Minister and Council of Ministers

National Statistics Office

Thapathali, Kathmandu

Phone No. 5345947, 5329406

Website: www.nsonepal.gov.np

PSU Code			Household No.		

National Statistics Office
Climate Change Survey, 2022

खण्ड १: परिचयात्मक विवरण — Module 1: Introductory Information

परिचय Introduction					विवरण Respondent's Details			
गणना क्षेत्रको (PSU) पहिचान **Identification of Primary Sampling Unit**					**A08.** परिवारमुलीको नाम,थर Householdhead Name	.....		
A01. प्रदेश ..... Province	कोड Code				**A09.** उत्तरदाताको नाम थर (उमेर ४५ वर्ष वा सो भन्दा माथि) Respondent Name (Age 45 years or above)	.....	**A10.** लिङ्ग पुरुष ..... 1 ☐ महिला ..... 2 Male Female	**A11.** उमेर वर्ष) Age (years) .....
A02. जिल्ला ..... District	कोड Code							
A03. गाउँपालिका/नगरपालिका Rural/Urban Municipality	कोड Code							
A04. वडा न. **Ward No.**					**A12.** उत्तरदाताको सम्पर्क नं. Respondent's contact number			
A05. PSU कोड Code					**A13.** उत्तरदाताको जात/जाति Respondent's caste/ethnicity (select code)			
A06. गाउँ/टोलको नाम Village/Tole Name	.....				**A14.** उत्तरदाताको माथिल्लो शैक्षिक योग्यता (कोड लेख्नुहोस) Respondent's highest education (select code)			
A07. आक्षांश, देशान्तर र उचाई Latitude, Longitude and Elevation	X				**A15.** उत्तरदाता यस समुदायमा वसोवास गरेका समय अवधि (वर्षमा) Respondent residing in this community (years)			
	Y							
	Z							

गणक Enumerator	नाम: Name हस्ताक्षर: Signature मिति: Date	सुपरिवेक्षणकर्ता	नाम: Name हस्ताक्षर: Signature मिति: Date

डाटाइन्ट्रीकर्ता Data entry	नाम: Name हस्ताक्षर: Signature मिति: Date	

खण्ड २: व्यक्तिगत तथा पारिवारिक विवरण — Personal and household information

२.१: व्यक्तिगत विवरण Personal Information

B01. यस परिवारमा अक्सर बसोबास गर्ने कति जना हुनुहुन्छ ?

How many members usually live in this family

क्र.सं. संख्या S.N.	परिवारमा अक्सर वसोवास गर्ने व्यक्तिको नाम, थर Name of persons usually staying in this family	परिवारमुलीको के नाता पर्नुहुन्छ ? Relationship with household head परिवारमुली... १ Household head श्रीमान्÷ श्रीमति... २ Husband/Wife छोरा÷ बुहारी... ३ Son/Daughter in law छोरी÷ ज्वाई... ४ Daughter/Son in law बाबु÷ आमा... ५ Father/Mother सासु÷ ससुरा... ६ Mother in law/Father in law	लिङ्ग Sex पुरुष..१ Male महिला.....२ Female	उमेर Age (पुरा भएको बर्ष) (completed years)	शैक्षिक योग्यता Education (पाँच वर्ष वा सोभन्दा माथि(का लागि) (For 5 years' age or above) (शैक्षिक कोड लेख्नुहोस) (Select education code)	बैवाहिक अवस्था Marital status (१० वर्ष वा सो भन्दा माथि उमेर भएकालाई मात्र) (ask only 10-year age or above) अविवाहित Unmarried विवाहित Married बिदुर/बिधुवा 3 Widow/Widower	हालको पेशा Current occupation (१० वर्ष वा सोभन्दा माथि लागि) (Ask 10-year age or above) सशस्त्र सैनिक अधिकारी.....० Armed forces occupations व्यवस्थापक .....१ Managers पेशाविद .....२ Professionals प्राविधिक तथा सहायक पेशाबिद .... ३ Technician and Associate Professional कार्यालय सहायक.....४ Clerical Support Workers सेवा तथा बस्तु विक्री गर्ने कामदार. ५ Service and sales Workers कृषि वन तथा माछा पालन कार्यको दक्ष कामदार..... ६

		दाजु भाई÷ दिदि बहिनी... ७ Brothers/sisters नानि÷ नातिनी... ८ Grandchildren अन्य नातेदार... ९ Other relatives घरेलु कामदार... १० Household worker नाता नपर्ने... ११ Non-relative				पारपाचुके.....४ Divorced छुट दिएको.....५ Separated	Skilled agricultural, forestry and fishiery workers शिल्पकला तथा कारिगरी र यस सम्बन्धी व्यापार गर्ने कामदार..... ७ Craft and related trades workers कारखाना तथा यन्त्र प्रचालक र जडान गर्ने कामदार..... ८ Plant and machine operators and assemble सामान्य तथा प्राथमिक पोशाकका कामदार.. ९ Elementary occupations कुनै आर्थिक काम नगरेको..... १० Not working for wage/salary/revenue
B02	**B03**	**B04**	**B05**	**B06**	**B07**	**B08**	**B09**
१.							
२.							
३.							
४.							
५.							
६.							
७.							
८.							
९.							
१०.							
११.							
१२.							

२.२: घरपरिवारको विवरण Household information

प्रश्न संख्या Q.N.	विवरण Details	कोड Code	प्रश्न संख्या Q.N.	विवरण Details	कोड Code
B10	यस परिवाले प्रयोग गरेको घरको स्वामित्व कस्तो हो ? House ownership १. आफ्नै own २. भाडा rented ३, संस्थागत institutional ४, अन्य others		**B11**	यस परिवारले प्रयोग गरेको घरको प्रकार कस्तो हो ? Type of house १. पक्की concrete २. अर्धपक्की semi concrete ३. कच्ची earthen ४. अन्य others	
B12	यस परिवाको खानेपानीका प्रमुख श्रोतहरु के के हुन ? Drinking water sources (धेरै प्रयोगको आधारमा बढिमा ३ वटा कोड लेख्नुहोस्) (maximum 3 codes in order) १. पाईप/धारा (घर परिसर भित्र) piped/tap (inside house) २. पाईप/धारा (घर परिसर बाहिर) piped/tap (outside house) ३. ट्युबेल/हातेपम्प tubewell/hand pump ४. ढाकिएको इनार/कुवा covered well ५. खुला इनार/कुवा open well ६. मुल धारा spring water tap ७. नदि/खोला river/stream ८. जार/बोतल jar/bottle water ९. अन्य others		**B13**	तपाईको घरपरिवारमा खाना पकाउन अक्सर (मूख्यरुपमा) कुन ईन्धन प्रयोग गर्नुहुन्छ ? (धेरै प्रयोगको आधारमा बढिमा ३ ओटा कोड लेख्नुहोस) Usually cooking fuel (maximum 3 codes in order) १. काठ/दाउरा firewood २. एल.पि. ग्याँस L.P.G ३. बिजुली Electricity ४.गुईंठा/गोरहा Dried cow-dung ५. बायो ग्याँस Bio-gas ६. मट्टीतेल Kerosene ७. अन्य Others	
B14	तपाईको घरपरिवारमा बत्ती बाल्न अक्सर (मूख्यरुपमा) के प्रयोग गर्नुहुन्छ ? १.बिजुली Electricity २. सोलार/सौर्य ऊर्जा Solar ३. मट्टीतेल Kerosene ४. बायो ग्याास Biogas ५. अन्य Others		**B15**	तपाईको परिवारले प्रयोग गर्ने चर्पी कस्तो छ ? Type of toilet १. फ्लस भएको (सार्वजनिक ढलमा जोडिएको) flush toilet connected to sewer २. फ्लस भएको (सेप्टिक ट्यांकमा जोडिएको) flush toilet connected to septic tank ३. साधारण ordinary toilet ४. सार्वजनिक public toilet ५. चर्पी नभएको no toilet	

प्रश्न संख्या Q.N.	विवरण Details	कोड Code	प्रश्न संख्या Q.N.	विवरण Details	कोड Code
B16	यस परिवारको गत १२ महिनामा आम्दानी/जीविको पार्जनका श्रोतहरु के के हुन ? (प्राथमिकताका आधार मा बढिमा ३ ओटा कोड लेख्नुहोस्) Livelihood sourcs in past 12 months (mamimum 3 codes in order) १. कृषि agriculture २. तलव ज्याला salary/wage ३. गैह कृषि non-agriculture business ४. विप्रेषण remittance ५. अन्य others.....		**B17**	तपाईको परिवारमा निम्न घरायसी सुविधा तथा साधनहरु के के छन् ? (यस प्रश्नमा बुहउत्तर संभव छ) Household goods and assets १. रेडियो radio २. टेलिभिजन tv ३. ल्याण्डलाईन टेलिफोन landline phone ४. मोवाईल फोन (साधरण) mobile phone (ordinary) ५. स्मार्ट मोवाईल फोन smart mobile phone ६. कम्पुटर/ल्यापटप computer/laptop ७. ईन्टरनेट सुविधा internet ८. कार जिप/भ्यान car, jeep/van ९. विद्युतीय गाडी Electric vehicle १०. मोटरसाईकल/स्कुटर motorcycle/scooter, ११. विद्यूतीयमोटरसाईकल/स्कुटरelectricmotorcycle/scooter १२. साइकल bicycle १३. विद्यूतीय पंखा electric fan १४. रेफ्रिजिरेटर refrigerator १५. वासिङ्ग मेशिन washing machine १६. एयर कन्डिसनर air-conditioner १७. कुनै पनि नभएको non of above	
B18	यस परिवारले गत १२ महिनामा वैदेशिक विप्रेषण प्रान्त गरेको छ ? Has received remittance in the past 12 months १. छ yes २. छैन no ➡ खण्ड ३ part 3		**B19**	वैदेशिक विप्रेषणबाट प्राप्त भएको वार्षिक रकम total remittance received in past 12 months NPR	

खण्ड ३ : जग्गा सम्बन्धी विवरण — Landholding information

C01. तपाईको घरपरिवारले कृषि चलन गरेको जग्गा छ ? **Households holding agricultural land** छ yes.....१, छैन no.....२ ➡ खण्ड ४ part 4

C02. यस परिवारको खेतीपाती सम्बन्धी कति वर्षको अनुभव छ ? **Household's experience in agriculture in years** ..... वर्ष year

घरपरिवारले चलन गरेको जग्गाको विवरण दिनुहोस् । household landholding details

क्र.सं. संख्या S.N	जग्गाको विवरण Land category	जग्गाका एकाइ Land unit बिघा Bigha.....१ रोपनी Ropani.....२	हाल (२०७९) Now (2023)			पाच वर्ष अगाडि (२०७४) Five years before (2018)		
			वि/रो Bi/Ro	क/आ Ka/Aa	धु/पै Dhu/Pai	वि/रो Bi/Ro	क/आ Ka/Aa	धु/पै Dhu/Pai
C03	C04	C05	C06	C07	C08	C09	C10	C11
१	अस्थायी बाली लागेको जग्गा Land under temporary crops							
२	अस्थायी चौरचरन Land under temporary meadows and pastures							
३	अस्थायी बाँझो Land under temporary fallow							
४	स्थायी बाली Land under permanent crops							
५	स्थायी चौरचरन Land under permananet meadows and pastures							
६	निजी बनबनेलो Private forest							
७	पोखरी Pond							
८	घर घडेरी, गोठ धन्सारले ढाकेको जग्गा Land under farm buildings and farm yards							
९	अन्य जग्गा Other areas not elsewhere classified							
१०	जम्मा Total (१+१+१+१+१+१+१+१+१+१)							
११	तपाई अथवा तपाईको घरपरिवारको नाममा रहेको जम्मा जग्गा (लालपुर्जामा भएको) Total land owned by respondent and family members (as in legal documents)							

खण्ड ४ : घरपरिवारको सामाजिक तथा आर्थिक सेवामा पहुाच — Hosehold access to social and economic services

विवरण Details	उत्तर Answer	कोड Code
D01. तपाई अथवा तपाईको परिवारको कुनै सदस्य बचत समुह अथवा सहकारी संस्थाको सदस्य हुनुहुन्छ ? Are you or any of your family member of any saving group or cooperative?	छ yes .....१ (1) छैन no.....२ (2)	
D02. तपाई अथवा तपाईको परिवारको कुनै सदस्यले गत १२ महिनामा बचत समुह अथवा सहकारी संस्थामा नियमित बचत गर्ने गर्नुभएको छ ? Have you or any of your family member regular saving in any saving group or cooperative during past 12 months?	छ yes .....१ (1) छैन no.....२ (2)	
D03 तपाई अथवा तपाईको परिवारको कुनै सदस्यको कुनै वित्तिय संस्था/बैंकको (सहकारी बाहेक) बचत गर्ने गर्नुभएको छ ? Have you or any of your family member have saving in any financial institutions or banks?	छ yes .....१ (1) छैन no.....२ (2)	
D04. तपाई अथवा तपाईको परिवारको कुनै सदस्यले साहुमहाजन, बचत समुह, सहकारी अथवा कुनै वित्तिय संस्थाबाट ऋण लिनु भएको छ ? Have you or any of your family member taken loan from money lender, saving groups, cooperative or any financial institutions?	छ yes .....१ (1) छैन no. २ (2) ➡**D07**	
D05. यदि छ भने कहाँबाट लिनुभएको हो ? (बहुउत्तर) If loan has been borrowed, from which source (multiple answer)?	व्यक्तिगत/साहुमहाजन Moneylender १. बचत समुह Saving group २. सहकारी Cooperative..... ३. लघुवित्त Microcredit. ४. फाइनान्स कम्पनी Financecompany. ५. विकास बैंक Development bank. ६. बाणिज्य बैंक commercialbank	
D06. ऋण कुन प्रयोजनको लागि लिनुभएको हो ? (बहुउत्तर) Purpose of a loan (multiple answer)	कृषि agriculture..... १, पशुपालन livestock……२, गैर कृषि व्यवसाय गर्ने non- agriculture business. ३, घर/जग्गा/जमिन किन्न house/land purchase..... ४, बिदेश जान abroad migration..... ५, शिक्षा education..... ६, औषधी उपचारका लागि treatment and medicine..... ७, अन्य others..... ८	

विवरण Details	उत्तर Answer	कोड Code
D07. तपाई अथवा तपाईको परिवारको कुनै सदस्य अन्य समुह अथवा समुदायिक संस्थामा आय (आर्जन, कृषि, सामुदायिक वन, आदि) आबद्ध हुनुहुन्छ ? Have you or any of your family a member of community organizations (institution related to income generation, agriculture, community forest, etc.)	छ yes.....१ (1) छैन no..... २ (2)	
D08. तपाई अथवा तपाईको परिवारको कुनै सदस्य समुदाय/वडा/पालिकास्तरीय विपद जोमिख न्यूनीकरण समितिमा आबद्ध हुनुहुन्छ ? Have you or any of your family a member of community/ward/municipality level disaster risk reduction committee?	छ yes.....१ (1) छैन no..... २ (2)	
D09. तपाई अथवा तपाईको परिवारको कुनै सदस्य टोल विकास समितिमा आबद्ध हुनुहुन्छ ? Are you or any of your family a member of tole development committeee	छ yes.....१ (1) छैन no..... २ (2)	
D10. तपाईको परिवारले गत १२ महिनामा कृषि अथवा पशुसेवा केन्द्रबाट कुनै सेवा लिनु भएको छ ? Have your family received service from agriculture or livestock center during past 12 months?	छ yes.....१ (1) छैन no..... २ (2) लागु नहुने not applicable ..... # (3)	
D11. तपाईको बासस्थानदेखि वडा कार्यालयको दूरी कति छ ? Distance of ward office from you residence	..... कि. मी. km	
D12. तपाईको बासस्थानदेखि मोटरबाटोको दूरी कति छ ? Distance of motorable road from your residence	..... कि. मी. km	
D13. तपाईको बासस्थानदेखि नजिकको स्वास्थ्य केन्द्र/संस्थासम्मको दूरी कति छ ? Distance to nearest health care center from your residence	..... कि. मी. km	
D14. तपाईको बासस्थानदेखि नजिकको आधारभूत विद्धालयसममको दूरी कति छ ? Distance to nearest basic education facility from your residence	..... कि. मी. km	
D15 तपाईको बासस्थानदेखि खरिद बिक्रीका लागि नजिकको बजारको दूरी कति छ ? Distance to nearest market (buy and sale) from your residence	..... कि. मी. km	
D16. तपाईको बासस्थानदेखि नजिकको कृषि अथवा पशुसेवा केन्द्रको दूरी कति छ ? Distance to agricutlure or livestock center from your residence	..... कि. मी. km	
D17. तपाईको परिवारमा हाल कृषिको यान्त्रिकीकरण (फलामे हलो,पेडल थ्रेसर, मकै छोडाउने मेसिन, पम्पसेट, ट्राक्टर, डिप टुबेल, हावँस्टर, ह्याचर, स्प्रेर, मिल, आदि) गरिएको छ ? Has your family adopted modern agricultural tools for agriculture?	छ yes.....१(1) छैन no..... २ (2) लागु नहुने not applicable ३ (3)	

खण्ड ५ : घरपरिवारको आम्दानीको विवरण (विगत १२ महिना) Household income information (past 12 months)

विवरण Details	रकम (रुपैयामा) amount (NPR)	
E01. गत १२ महिनाको बाली उत्पादन बिक्रीबाट भएको कुल आम्दानी रकम कति हो ? (धान, गहुँ, कोदो, आलु, जुट, मकै, मास, तरकारी, तेलहन, फलफूल, अलैची, अदुवा, लसुन, चिया, कफी, च्याउ, उखु आदि) Total income from crop sale (rice, wheat, millet, potato, jute, maize, corn, lentil, vegetables, oilseeds, fruits, cardamom, ginger, garlic, coffee, mush-room, sugarcane, etc.) in last 12 months	.....	
E02. गत १२ महिनाको पशुपन्छीको विक्री (गाई, भैंसी, पाडा/पाडी, वाखा/बाखी, पाठा/पाठी कुखुरा, आदि) तथा पशुपन्छीजन्य (दुध, मासु,आदि) उत्पादनको बिक्रीबाट भएको कुल आम्दानी रकम कति भयो ? Total income from livestock (cow, buffalo, poultry, livestock, etc.) and livestock product (e.g. milk, meat, etc.) sale in the last 12 months	.....	
E03. गत १२ महिनाको अन्य कृषि तथा वनसम्बन्धी उत्पादन विक्रीवाट कुल आम्दानी र रकम कति भयो ? (टिम्बरका लागि रुख बिक्री, फलफूलको रुख बिक्री, रुखका हाँगा, पराल, खरानी र भुस बिक्री गरेर आदि) Total income from sales of other agriculture and forest related product in the last 12 months	.....	
E04. गत १२ महिनामा गैर कृषि व्यवसायबाट कुल कति रकम आम्दानी भयो ? (तलब, ज्याला, ब्यापार, सेवा, आदि) *T*otal income from non-agricultural business (salary, wage, business, service etc.)	.....	

खण्ड ६ : जलवायु परिवर्तन सम्बन्धी ज्ञान तथा धारणा Climate change related knowledge and perception

६.१ : सामान्य जानकारी Basic information

विवरण Details	कोड Code	विवरण Details	कोड Code
F01. तपाईलाई जलवायु परिवर्तनका बारेमा जानकारी छ ? Have you heard about climate change? छ yes १ (1) छैन no..... २ (2) ➡ प्रश्न नं. Q.N **F03**		**F02.** यदि छ भने जलवायु परिवर्तनका सम्बन्धमा तपाईको जानकारीको प्रमुख स्रोत के हो ? If heard, what is the main source of climate change informa-tion? रेडियो *radio*..... १ टेलिभिजन *tv*..... २ पत्रपत्रिका प्रकाशन newspaper..... ३ जनचेतना अभियान public awareness campaign..... ४ शैक्षिक संस्था educational institution..... ५ स्थानीय निकाय/अधिकारी local level/government official..... ६ टोलछिमेक तथा साथी neighbours and friends..... ७ परिवारका सदस्य family members..... ८ इन्टरनेट internet ..... ९ अन्य *others* १०	

विवरण Details	कोड Code	विवरण Details	कोड Code
F03. तपाईको अनुभवमा यस स्थानको जलवायु २५ वर्ष अगाडिको भन्दा अहिले फरक छ ? Based on your experience, has the climate changed compared to past 25 years? छ yes १ छैन no.....२ ➡ प्रश्न नं. **Q.N F06** थाहा छैन donot know..... ... ३ ➡ प्रश्न नं. **Q.N F06**		**F04.** जलवायु परिवर्तनको मुख्य कारणहरु के के हुनस्क्छन् ? What could be the main causes of climate change? (प्राथमिकताका आधारमा बढिमा ३ वटा कोड लेख्नुहोस्) (select maximum 3 codes in priority order) वनविनाश deforestration..... १ प्राकृतिक कारण natural reason..... २ औद्योगिकीकरण industralization..... ३ शहरिकरण urbanization..... ४ मानवीय दोहन human exploitation.. ५ भगवानको इच्छा gods desire ..... ६ भूकम्प earthquake... ७ यातायातका साधनमा बृद्धि transporation congestion..... ८ फोहोरमैलाको उचित व्यवस्थापन नभएको Ineffective waste management.. ९ अन्य others..... १० थाहा छैन donot know..... ११	
F05. यस क्षेत्रमा विगत २५ वर्षमा जलवायुजन्य विपद् सम्बन्धी घटेका मूख्य घटनाहरु के के हुन ? (प्राथमिकताका आधार मा बढिमा ५ वटा कोड लेख्नुहोस्) *what are the main climate induced disasters in this area during past 25 years (select maximum 5 in order)* सुख्खा/खडेरी drough....१ बन डढेलो forest fire....२ आगलागी (बस्तीमा) *fire in settlement*..... ३ बाढी flood...४ डुवान inundation... ५ आँधी/हावाहुरी धुर्म्रपात/चक्रपात windstorm/cyclone/hurricane…. ६ चट्र्याङ्ग *thunderstorm*.. ७ असिना hail..... ८ अतिवृष्टि heavy rain..९ खण्डवृष्टि sporadic rain……....१० भूक्षय land erosion..…११ पहिरो landslide १२ हिमआधी snowstorm...१३ हिमपहिरो avalanche ….१४ हिमताल विष्फोटन GLOF …१५ लू *heat wave*… १६ शीतलहर cold wave…१७ रोग/किराको प्रकोप diesease/insect… १८ अन्य others…१९		**F06.** तपाईले विगत ५ वर्षमा भएका जलवायुजन्य विपद्का पूर्व सूचनाहरु अग्रिमरुपमा पाउनु भयो ? Have you received early warning information on climate induced disaster during past 5 years? छ yes..... १ (1), छैन no ... २ (2) ➡ खण्ड ६.२ part 6.2	

विवरण Details	कोड Code	विवरण Details	कोड Code
F07. यदि सूचना अग्रिम पाउनुभएको थियो भने कुन माध्यमबाट पाउनुभएको थियो ? **if received, what are the source of information?** रेडियो **radio**..... १, टेलिभिजन **tv**..... २ माईकिङ **miking**..... ३ समुदाय **community** ..... ४ स्थानीय तह **local authority**..... ५ एस.एम.एस. **SMS**... ६ साईरन **siren** ... ७ सोसल मिडिया/वेवसाईट **social media/websites** ..... ८ अन्य **others**..... ९		**F08.** अग्रिम सूचना प्राप्त भएपछि विपदबाट हुनसक्ने धनजनको क्षतिबाट जोगिन केही तयारीका कार्यहरु गर्नुभयो ? **After receiving early warning information, were you prepared with the initiatives to be safe and reduce the loss of assets?** गरियो **yes**..... १ गरिएन **no**..... २ ➡ खण्ड ६.२ part 6.2	
F09. यदि गरियो भने के कस्ता तयारीका कार्यत्रहरु गर्नुभयो ? (प्राथमिकताका आधारमा बढीमा ५ ओटा कोड लेख्नुहोस्) **If prepared, what initatives you took during that time? (select maximum 5 codes in order)** सुरक्षित स्थानमा गएर बसेको **moved to safe area**..... १, आवश्यक पर्नसक्ने पैसाको जोहो गरेको **managed some cash for emergency**..... २, बस्तुभाउ लाई सुरक्षित ठाउँमा राखिएको **moved livestock to safe areas** ..... ३, घरमा रहेको खाद्यान्नको सुरक्षित व्यवस्था गरेको **protected the food grains**..... ४, स्थानीय तह तथा संघ संस्थाबाट वित्तीय सहयोग प्राप्त गरेको **received financial support from local level or organizations**..... ५, स्थानीय तह तथा संघ संस्थाबाट खाद्यान्नको सहयोग प्राप्त गरेको **received grain and food support from local level or organizations**..... ६, स्थानीय तह तथा संघ संस्थाबाट गैर खाद्यान्नको सहयोग प्राप्त गरेको **received non-food items from local level and organizations**..... ७, अन्य **others**..... ८			

६. २ : ऋतुहरुको तापक्रममा तथा हावापानीमा आएको परिवर्तन र प्रभाव Changes in seasonal temperature and weather

ऋतुहरु **seasons**	तपाईको अनुभववमा बिगत २५ बर्ष अगाडिको तुलनमा ऋतुको तापक्रममा परिवर्तन छ ? **temperature changed compared to past 25 years** छ **yes**..... १, छैन **no** ..... २ ➡दोस्रो लहर **next row**	यदि छ भने, के कस्तो परिवर्तन देखिएको छ ? (कोड लेख्नुहोस्) **if yes, changes observed [select code]** बढेको **increased**.. १, घटेको **decreased**. २, परिवर्तन छैन **no change**..... ३	तपाईको अनुभवमा बिगत २५ बर्ष अगाडिको तुलनामा ऋतुको वर्षाको मात्रा/प्रकृति तथा हावापानीमा परिवर्तन छ ? **compared to past 25 years, there is a change in weather pattern** छ **yes**..... १, छैन **no**.. २ ➡दोस्रो लहर **next row**	यदि तापक्रम, वर्षा तथा हावापानीमा परिवर्तन भएको छ भने, यसबाट जलवायु जन्य प्रकोपमा **if yes, changes observed in climate induced disasters** (बाढी, पहरो, डुवान चट्याङ्ग, असिना, शितलहर, आधी,/हावाहुरी धुर्म्रपात/चक्रपात, आगलागी, लू,रोग/किरा आदि) **(flood, landsldie, inundation, thunderstorm, cold wave, heat wave, fire, etc.)** कस्तो परिवर्त भएको छ ? बढेको **increased**..... १, घटेको **decreased**..... २, परिवर्तन छैन **no change**..... ३
F10	**F11**	**F12**	**F13**	**F14**
बसन्त ऋतु **spring** (चैत,बैशाख)				
गृस्म ऋतु **early summer** (जेस्ठ,असार)				
बर्षा ऋतु **summer monsoon** (श्रावन,भदौ)				
शरद ऋतु **early autum** (असोज,कार्तिक)				
हेमन्त ऋतु **late autum** (मंसिर,पौस)				

शिशिर ऋतु **winter** (मांघ,फाल्गुन)				

६.३ : जलवायुजन्य विपदको प्रभावसम्बन्धी जानकारी

Impact of climate induced disasters in past 25 years

क्र.सं.	जलवायु जन्य विपद्का घटनाहरु	विगत २५ वर्षको समयावधिमा तपाई र परिवारका सदस्यहरुलाई विपद्का घटनाहरुबाट असर/प्रभाव परेको छ ? You or your family impacted due to climate induced disaster in past 25 years छ yes..... १ छैन. no .. २ ➡ अर्को लहर next row लागु नहुने not applicable..... ३ ➡ अर्को लहर next row	विगत २५ वर्षको समयावधिमा यी घटनाहरुले तपाईको परिवारमा कतिको असर/प्रभाव पारेको छ ? Impact of climate induced disaster to your family in past 25 years न्यून negligible ....१ कम low..... २ मध्यम moderate...३, उच्च high..... ..... ४ धेरै उच्च very high.... ५	विगत २५ वर्षको समयावधिमा बिपद्का घटनाहरु हुनका कारणहरु के के हुन सक्छन ? (प्राथमिकीकरणका आधारमा बढिमा मुख्य ३ कारणका कोडहरु लेख्नुहोस्) Main reasons of occurance of climate induced disaster in past 25 years (select maximum 3 codes in priority)*			विगत २५ वर्षको समयावधिमा बिपद्का घटनाहरु बाट बच्न तथा न्यूनीकरण गर्न के के प्रयास गरियो ? (प्राथमिकीकरणका आधारमा बढिमा मुख्य ३ प्रयास कोडहरु लेख्नुहोस्) Risk reduction Initiatives taken in past 25 years (select maximum 3 codes in priority)**	
F15	**F16**	**F17**	**F18**	**F19**			**F20**	
१	सुखा/खडेरी drought							
२	बन डढेलो forest fire							
३	आगलागी (वस्तीमा) fire in settlement							
४	बाढी flood							
५	डुबान inundation							
६	आँधी/हावाहुरी/धुर्म्रपात/चक्रपात cyclone/hurrican/windstorm							

७	चट्याङ्ग thunderstorm							
८	असिना hail							
९	अतिवृष्टि heavy rain							
१०	खण्डवृष्टि sporadic rain							
११	भूक्षय land erosion							
१२	पहिरो landslide							
१३	हिमआँधी snowstorm							
१४	हिमपहिरो avalanche							
१५	हिमताल विष्फोटन GLOF							
१६	लू heat wave							
१७	शीतलहर cold wave							
१८	रोग/किराको प्रकोप disease/insect							
१९	अन्य others.....							

* अपर्याप्त बर्षा **insufficient rain...** १. अत्याधिक बर्षा **heavy rain...** २. तापक्रममा बृद्धि **temperature increase.....** ३. तापक्रम घटेको **temperature decrease....** ४. सडक निर्माण **road construction....** ५. शहरीकरण **urbanization ....** ६. वनजंगल विनास **deforestration ....** ७. जमिनको पानी धेरै तान्नु **groundwater exploitation....** ८. भुकम्प **earthquake....** ९. जनसंख्या बृद्धि **population increase....** १०. अन्य **others....** ११

** तालिम तथा जनचेतनामुलक कार्यक्रममा सहभागी **participation in training & public awareness.....** १. जमिनको व्यवस्थापन (जस्तै, जमिन काट–छाट) **land management.....** २. वृक्षारोपण **plantation.....** ३. घर तथा गोठको मर्मत **maintenance of house and livestock shelter.....** ४. वर्षाको पानी कटान लगायतका व्यवस्थापन **rainwater management.....** ५. रिटेनिंग पर्खालको निर्माण **construction of retaining wall.....** ६. रुखका हाँगाहरु काटछाट **cutting and pruning of trees.....** ७. सुकेका झार–पातको व्यवस्थापन **management of dried leaves and residues.....** ८. घर वायरिंग, मर्मत तथा अर्थिङ **house wiring maintenance and earthing.....** ९. अन्य **others.....** १०

खण्ड ७ : जलवायु परिवर्तनका कारण परेको विपद्का प्रभाव — Impacts of climate-induced disasters

७.१ : जनजीवनमा परेको प्रभाव — Impact on daily life during past 5 years

क्र.सं.	विपदका प्रकार (माथि ६.३ मा पहिचान गरिएका विपद् को प्रभाव मात्र सोध्ने) Disaster tpyes (only ask to disasters identified in part 6.3)	विगत ५ बर्षको समयावधि मा उल्लेख गरिएका विपद्हरु बाट पछिल्लो पटक कहिले प्रभावित हुनुभएको थियो ? Within past 5 years, when was your family impacted by the climate-induced disasters (वि.सं.मा साल मात्र उल्लेख गर्ने) *(mention year in BS)*				विगत ५ बर्षको समयावधिमा उल्लेखगरिएका विपद्हरुबाट भौतिक पूर्वाधारमा सिंचाई सडक बाटो आदि क्षति पुगी तपाईका परिवार प्रभावित भएको थियो ? Was your family affected due to impact on physical infrastructure during past 5 years? थियो *yes*... १ थिएन *no*... २	विगत ५ बर्षको समयावधिमा उल्लेख गरिएका विपद्हरुका कारण कति दिन तपाईको घरपरिवारका सदस्यहरु काम नगररि कन बस्नु परे को थियो ? Number of working days missed due to disaster in past 5 years	विगत ५ बर्षको समयावधि मा के तपाई र तपाईका घरपरिवार का सदस्यह(रुमा उल्ले ख गरिएका खाद्य संकट परेको थियो Family faced food shortage/ crisis due to disaster during past 5 years थियो *yes*... १ थिएन *no*...२	विगत ५ बर्ष देखि तपाईको परिवारको कुनै सदस्य उल्लेख गरिएका विप(दबाटअपाङ्ग / अशक्तहुनुभएको छ ? Disability or any kind of inability caued due to disaser to family members during past 5 years थियो *yes*... १ थिएन *no*... 2	विगत ५ बर्षको समयावधिमा गरिएका विप(द्हरुका कारण तपाईका घर परिवारको कुनै सदस्यको मृत्यु भएको थियो Loss of family members due to disaster during past 5 years थियो *yes*... १ थिएन *no*२ ➡ अर्को लहर *next row*	मृत्युको विवरण Death information					
											उमेर समूह अनुसार मृत्युको संख्या Number of death by age groups							
											० १४ बर्ष *0-14 years*		१५–५९ बर्ष *15-59 years*		६० बर्ष र माथि *60 years & above*				
											म *F*	पु *M*	म *F*	पु *M*	म *F*	पु *M*			
G01	**G02**	**G03**				**G04**	**G05**	**G06**	**G07**	**G08**		**G09**	**G10**	**G11**	**G12**	**G13**	**G14**			
१	सुख्खा / खडेरी drought																			

२	बन डढेलो forest fire															
३	आगलागी (बस्तीमा) *fire in settlement*															
४	बाढी flood															
५	डुबान inundation															
६	आँधी / हावाहुरी / धुर्म्रपात / चक्रपात clyclone/hurrican/windstorm															
७	चट्याङ्ग thunderstorm															
८	असिना hail															
९	अतिबृष्टि heave rain															
१०	खण्डबृष्टि sporadic rain															
११	भुक्षय land erosion															
१२	पहिरो landslide															
१३	हिमआँधी snwostorm															
१४	हिमपहिरो avalanche															
१५	हिमताल विष्फ(ोटन GLOF															

१६	लू heat wave															
१७	शीतलहर cold wave															
१८	रोग/किराको प्रकोप disease/ insect															
१९	अन्य other.....															

७.२ : भौतिक सम्पति तथा व्यवसायमा परेको प्रभाव (नोक्सानी मुल्य रुपैयामा लेख्नुहोस्) Impact on physical assets and business (loss in NPR)

क्र.सं.	विपदका घटनाहरु (माथि ६.३ मा पहि(चान गरिएका विपद् को प्रभाव मात्र सो ध्ने) *Disaster events (ask only identified disasters in part 6.3)*	बिगत ५ बर्षमा तपाईको पविारले उल्लेख गरिएका विपद्का घटनाहरु बाट नोक्सानी बेहोर्नु परेको थियो ? Loss beared by the household on physical asset and business due to disaster in past 5 years थियो yes ....१ थिएन no .... २ ➡अर्को लहर next row	नोक्सानी मूल्य रु. Loss amount in NPR.								
			बसोवास रकेको (घर घर घडेरी तथा गोठ) मा भएको Loss on residential house	अन्न बालीहरुमा भएको cereal crop loss	तरकारी बालीमा भएको vegetable crop loss	फलफूल बालीहरुमा भएको fruit crop loss	अन्य बालीहरुमा भएको other crop loss	पशुपन्छीमा भएको Livestok loss	बगैचा/नर्सरी जग्गमा भएको Gar-den/nursery loss	खेती योग्य जग्गामा भएको agri-cultural land loss	अन्य गैह कृषि व्यवसायमा (पसल, घरेलु उद्योग आदि भएको) non-agricul-tural business loss
G15	**G16**	**G17**	**G18**	**G19**	**G20**	**G21**	**G22**	**G23**	**G24**	**G25**	**G26**
१	सुख्खा/खडेरी drought										

२	वन डढेलो forest fire										
३	आगलागी (वस्तीमा) *fire insettlement*										
४	बाढी flood										
५	डुवान inundation										
६	आँधी / हावाहुरी धुर्म्मपात / चक्रपात cyclone/hurrican/ windstorm										
७	चट्याङ्ग thunder-storm										
८	असिना hail										
९	अतिवृष्टि heave rain										
१०	खण्डवृष्टि sporadic rain										
११	भूक्षय land erosion										
१२	पहिरो landslide										
१३	हिमआँधी snwostorm										
१४	हिमपहिरो avalanche										
१५	हिमताल GLOF										
१६	लू heat wave										
१७	शीतलहर cold wave										
१८	रोग / किराको प्रकोप disease/insect										
१९	अन्य other....										

खण्ड ८ : रोग तथा स्वास्थ्यमा प्रभाव — Disease and health impacts

८.१ : बाली तथा पशुपन्छी — Crops and livestock

H01. विगत २५ बर्ष अघि भन्दा हाल बालीमा (अन्न, तरकारी, फलफूल, आदि) कुनै नयाँ रोगहरुको प्रकोप बढेको देखिन थालेको छ < Emergence of new diseases on crops compared to past 25 years	छ yes..... १, छैन no..... २ ➡**H03**	
H02. यदि छ भने बालीमा लागेका नयाँ रोगहरुको नाम/लक्षण बताउनुहोस् ? if yes, list the name of new diseases or symptoms	१.....	२.....
	३.....	४.....
H03. बिगत २५ बर्ष अघि भन्दा हाल बालीमा कुनै नयाँ किराहरुको प्रकोप बढेको देखिन थालेको छ ? Incidence of new insects on crops compared to 25 years ago	छ yes..... १, छैन no..... २ ➡**H05**	
H04. यदि छ भने बालीमा लागेका नयाँ किराहरुको नाम बताउनुहोस् ? if yes, list the names of new insects	१.....	२.....
	३.....	४.....
H05. विगत २५ बर्ष अघि भन्दा हाल पशुपन्छीमा कुनै नयाँ रोगहरुको प्रकोप बढेको देखिन थालेको छ ? Incidence of new diseases on livestock compared to 25 years ago	छ yes..... १, छैन no..... २ ➡**H07**	
H06. यदि छ भने पशुपन्छीमा लागेका नयाँ रोगहरुको नाम बताउनुहोस् ? if yes, list the name of new diseases	१.....	२.....
	३.....	४.....

H07. विगत २५ बर्ष अघि भन्दा हाल तपाई वा तपाईको परिवारमा कुन रोगको प्रकोप बढी देखिएको छ ? Incidence of new diseases to you and your household members compared to 25 years ago	छ yes..... १, छैन no..... २ ➡**H09**	
H08. विगत २५ बर्ष अघि भन्दा हाल तपाइको परिवारमा कुन रोगको प्रकोप बढी देखिएको छ ? Name of the diseases with increased incidence compared to 25 years ago (तल दिइए बमोजिम रोगहरुको कोड लेख्नुहोस्) (see the code below)* * रोगका कोडहरु: झाडापखला diarrhoea.. १ आउँ dsentery.. २ मलेरिया malaria..३ छालाको रोग skin disease..४ रुघा/खोकी cold/cough.. ५ ज्वरो fever.. टाइफाइड typhoid..७ दम asthma.. ८ जण्डिस jaundice.. ९ कुपोषण malnutrition.. १० डेन्गु dengue.. ११ मानसिक विचलन mental disorder.. १२ चिकन पक्स chicken pox.. १३ हैजा cholera..१४ श्वासप्रश्वास सम्बन्धी रोग respiratory diseases.. १५ भाइरल इन्सेफलाइटिस viral encephalitis.. १६ कालाज्वर kalazar.. १७ पानी/खानाबाट सर्ने रोगहरु water & food borne diseases. १८ क्यान्सर cancer.. १९ मुटुसम्बन्धी रोग *heat related diseases*.. २० क्षयरो tuberculosis २१ अन्य others..... २२	१.....	२.....
	३.....	४.....
	५.....	६.....
H09. विगत २५ बर्ष अघि भन्दा हाल तपाइका परिवारको कुनै सदस्यलाई झिंगा, लामखुट्टे लगायतका किराहरुबाट सर्ने रोग बढी मात्रामा लागेको छ ? Increased indicence of vector borne (flies and mosquitos) to your family compared to 25 years ago	छ yes..... १, छैन no..... २	
H10. विगत २५ बर्ष अघि भन्दा हाल तपाइ वा तपाईको परिवारको कुनै सदस्यलाई पानी वा खानाबाट सर्ने रोग बढी मात्रामा लागेको छ ? Increased incidence of water and food borne diseases to you and your family members compared to 25 years ago.	छ yes..... १, छैन no..... २	

खण्ड ९ : पानीको स्रोतमा जलवायु परिवर्तनको प्रभाव र ऊर्जासम्बन्धी जानकारी

९.१ : पानीको स्रोतको वर्तमान अवस्था (विगत २५ बर्ष अघि भन्दा हाल) Impact on water sources (compared to 25 years ago)

विवरण details		कोड Code
I01. कुनै हातेपम्प इनार तथा ट्युववेलमा पानी सुकेको छ ? Water dried up in hand pump, well and tubewell water	छ yes.....१, छैन no .....२, थाहा छैन donot know.....३, लागु नहुने not applicable.....४	
I02 कुनै हातेपम्प इनार तथा ट्युववेलमा पानीको तह सुक्नै लागेको अवस्थामा पुगेको छ ? hand pump, well and tubewell water level is about to dry up	छ yes.....१, छैन no .....२, थाहा छैन donot know.....३, लागु नहुने not applicable.....४	
I03. पधेरो, कुवा, मूल तथा ढुंगेधारामा पानीको मात्रामा कस्तो परिवर्तन आएको छ ? changes observed in spring and spout water amount	घटेको छ decreased.....१, बढेको छ increased.....२, परिवर्तन छैन no change ...३, थाहा छैन donot know .....४, लागु नहुने not applicable...५	
I04. कुनै पधेंरो, कुवा, मूल तथा ढुंगेधारामा पानी सुकेको छ ? any spring and spout water has completely dried up	छ yes.....१, छैन no .....२, थाहा छैन donot know.....३, लागु नहुने not applicable.....४	
I05 खोला–खोल्सीमा पानीको मात्रामा कस्तो परिवर्तन आएको छ ? Changes observed in stream and rivulets water amount	घटेको छ decreased.....१, बढेको छ increased.....२, परिवर्तन छैन no change ...३, थाहा छैन donot know .....४, लागु नहुने not applicable...५	
I06. कुनै खोला–खोल्सीमा पानी सुकेको छ ? Stream and rivulets water has dried up	छ yes.....१, छैन no .....२, थाहा छैन donot know.....३, लागु नहुने not applicable.....४	
I07. तपाईले दैनिकरुपमा प्रयोग गर्ने धाराको पानी अहाउने समयावधिमा कस्तो परिवर्तन आएको छ ? changes in the flow duration of tap water	घटेको छ decreased.....१, बढेको छ increased.....२, परिवर्तन छैन no change ...३, थाहा छैन donot know .....४, लागु नहुने not applicable...५	

I08. यदि पानीको श्रोत घटेको छ भने घट्नुको कारण के हुनसक्छ ? (प्राथमिकीकरणका आधारमा मुख्य ३ कारणका कोडहरु लेख्नुहोस् ?) *reasons of reduction in water sources (select main 3 causes on priority)* अपर्याप्त वर्षा insufficient rain.....१ खडेरी बृद्धि भएको increased drought.....२ सडक निर्माण road construction.....३ पहिरो/भूक्षय landslide/erosion.....४ शहरीकरण urbanization..... ५ वन जंगल विनास deforestration.....६ जमिनको पानी धेरै तान्नु overexploitation of ground water.... ७ खानी तथा उत्खनन mining and exavation..... ८ जनसंख्या बृद्धि population increase.....९ भूकम्प earthquake.....१० भूउपयोगमा परिवर्तन landuse change.....११ अन्य others..... १२		

९.२ : ऊर्जा/नविकरणीय ऊर्जा Energy/renewable energy

विवरण details		कोड Code
I09. तपाईको घरपरिवारमा कुन–कुन चुल्होको प्रयोग भएको छ ? (प्राथमिकताका आधारमा बढीमा ३ ओटा) cooking stoves used at your home (select maximum 3 which are on priority)	परम्परागत traditional..... १, सुधारिएको improved..... २, LPG/ग्यास चुल्हो..... ३, सौर्य ऊर्जाबाट चल्ने solar stove..... ४, बिद्युतीय/इन्डक्सन चुल्हो electric/induction stove..... ५, अन्य others (उल्लेख गर्ने -mention)..... ६	
I10. मुख्यरुपमा खाना पकाउन कुन चुल्होको प्रयोग गर्नुहुन्छ ? Stove mainly used for cooking at your home	परम्परागत traditional..... १, सुधारिएको improved..... २, LPG/ ग्यास चुल्हा..... ३, सौर्य ऊर्जाबाट चल्न solar stove..... ४, बिद्युतीय/इन्डक्सन चुल्हो electric/induction stove..... ५, अन्य others ((उल्लेख गर्ने -mention).....६	

I11. यदि विद्युतीय/इन्डक्सन चुल्हो छ भने यसको प्रयोगमा देखिएका समस्याहरु के छन ? (प्राथमिकताका आधामा बढीमा ३ ओटा) if If electric/induction stove is used, problems faced in using such stove (select maximum 3 which are on priority)	बेला–बेला बिद्युत अबरुद्ध हुनु unrealiable power supply.....१, पकाउने भाडा महँगो हुनु expensive cooking utensils..... २, इन्डक्सन मर्मतको सेवा उपलब्ध नहुनु absence of maintenance and repair service ..... ३, बिजुली महँगो हुनु expensive electricity..... ४, इन्डक्सन प्रयोगमा ज्ञान नहुनु knowledge gap in operation of induction..... ५, इन्डक्सनमा पकाउन असजिलो महसुस गर्नु uncomfortable to cook in induction..... ६, ठुला भाडाको लागि उपयुक्त नहुनु not applicable to large size cooking utensils..... ७,	
I12. विगत २५ वर्षमा तपाईको घरपरिवारमा दाउराको प्रयोगमा परिवर्तन भएको छ ? changes observed in consumption of firewood in the past 25 years	बढेको छ increased..... १, घटेको छ decreased..... २, परिवर्तन छैन no change..... ३, लागु नहुने not applicable..... ४	

खण्ड १० : जैविक विविधतामा जलवायु परिवर्तनको प्रभाव (विगत २५ वर्षदेखि) Impact of biodiversity (during last 25 years)

१०. १ : विभिन्न प्रजातिमा देखिएको परिवर्तन changes observed in different plant and animals

क्र.सं. S.N	विवरण Details	परिवर्तन देखिएको अवस्था Oberved changes परिवर्तन भएको छ changes observed..... १, परिवर्तन भएको छैन no change..... २,थाहा छैन donot know..... ३, लागु नहुने not applicable..... ४ कोड १ आएमा अन्य महलमा जाने, बाँकी कोड आएमा अर्को लहर मा जाने (if code 1, go to next column else go to next row)	घट्दै गएका प्रजातिको नाम (बढीमा ३ वटाको नाम लेख्नुहोस्) species decreasing (write maximum 3 such species)	बढ्दै गएका प्रजातिको नाम (बढीमा ३ वटाको नाम लेख्नुहोस्) Increasing species *(write maximum 3 such species)*	लोप भएका प्रजातिको नाम (बढीमा ३ वटाको नाम लेख्नुहोस्) Name of extinct species *(write maxium 3 species)*	नयाँ देखिएका प्रजातिको नाम (बढीमा ३ वटा नकरात्मक नाम लेख्नुहोस्) Name of new species appeared (write maximum 3 species)	यसबाट तपाईको दैनिक जनजीवनमा परेको बढीमा मुख्य ३ वटा नकरात्मक प्रभाव बताउनुहोस Negative impact on your daily life due to changes observed in plants and animals (write main 3 impacts)	यसबाट तपाईको दैनिक जनजीवनमा परेको बढीमा मुख्य ३ वटा सकारात्मक प्रभाव बताउनुहोस् Positive impact on your daily due to changes observed in plants and animals (write maximum 3 impacts)
J01	**J02**	**J03**	**J04**	**J05**	**J06**	**J07**	**J08**	**J09**
१.	रुख trees		१..... २..... ३.....	१..... २..... ३.....	१..... २..... ३.....	१..... २..... ३.....	१..... २..... ३.....	१..... २..... ३.....

क्र.सं. S.N	विवरण Details	परिवर्तन देखिएको अवस्था Oberved changes परिवर्तन भएको छ changes observed..... १, परिवर्तन भएको छैन no change..... २,थाहा छैन donot know..... ३, लागु नहुने not applicable..... ४ कोड १ आएमा अन्य महलमा जाने, बाँकी कोड आएमा अर्को लहर मा जाने (if code 1, go to next column else go to next row)	घट्दै गएका प्रजातिको नाम (बढीमा ३ वटाको नाम लेख्नुहोस्) species decreasing (write maximum 3 such species)	बढ्दै गएका प्रजातिको नाम (बढीमा ३ वटाको नाम लेख्नुहोस्) Increasing species *(write maximum 3 such species)*	लोप भएका प्रजातिको नाम (बढीमा ३ वटाको नाम लेख्नुहोस्) Name of extinct species *(write maxium 3 species)*	नयाँ देखिएका प्रजातिको नाम (बढीमा ३ वटा नकरात्मक नाम लेख्नुहोस्) Name of new species appeared (write maximum 3 species)	यसबाट तपाईको दैनिक जनजीवनमा परेको बढीमा मुख्य ३ वटा नकरात्मक प्रभाव बताउनुहोस Negative impact on your daily life due to changes observed in plants and animals (write main 3 impacts)	यसबाट तपाईको दैनिक जनजीवनमा परेको बढीमा मुख्य ३ वटा सकारात्मक प्रभाव बताउनुहोस् Positive impact on your daily due to changes observed in plants and animals (write maximum 3 impacts)
J01	**J02**	**J03**	**J04**	**J05**	**J06**	**J07**	**J08**	**J09**
२.	बुट्यानshrubs		१..... २..... ३.....	१..... २..... ३.....	१..... २..... ३.....	१..... २..... ३.....	१..... २..... ३.....	१..... २..... ३.....
३.	जडीबुटी तथा गैहुँ काष्ठ वनपैदावार (हर्रो, बरो, निउरो, जलुको आदि) Medicinal and non-timber forest products (e.g. Harro, Barro,)		१..... २..... ३.....	१..... २..... ३.....	१..... २..... ३.....	१..... २..... ३.....	१..... २..... ३.....	१..... २..... ३.....
४.	घाँस/डालेघाँस grass/fodder		१..... २..... ३.....	१..... २..... ३.....	१..... २..... ३.....	१..... २..... ३.....	१..... २..... ३.....	१..... २..... ३.....
५.	जलचर acquatic		१..... २..... ३.....	१..... २..... ३.....	१..... २..... ३.....	१..... २..... ३.....	१..... २..... ३.....	१..... २..... ३.....

क्र.सं. S.N	विवरण Details	परिवर्तन देखिएको अवस्था Oberved changes परिवर्तन भएको छ changes observed..... १, परिवर्तन भएको छैन no change..... २,थाहा छैन donot know..... ३, लागु नहुने not applicable..... ४ कोड १ आएमा अन्य महलमा जाने, बाँकी कोड आएमा अर्को लहर मा जाने (if code 1, go to next column else go to next row)	घट्दै गएका प्रजातिको नाम (बढीमा ३ वटाको नाम लेख्नुहोस्) species decreasing (write maximum 3 such species)	बढ्दै गएका प्रजातिको नाम (बढीमा ३ वटाको नाम लेख्नुहोस्) Increasing species *(write maximum 3 such species)*	लोप भएका प्रजातिको नाम (बढीमा ३ वटाको नाम लेख्नुहोस्) Name of extinct species *(write maxium 3 species)*	नयाँ देखिएका प्रजातिको नाम (बढीमा ३ वटा नकरात्मक नाम लेख्नुहोस्) Name of new species appeared (write maximum 3 species)	यसबाट तपाईको दैनिक जनजीवनमा परेको बढीमा मुख्य ३ वटा नकरात्मक प्रभाव बताउनुहोस Negative impact on your daily life due to changes observed in plants and animals (write main 3 impacts)	यसबाट तपाईको दैनिक जनजीवनमा परेको बढीमा मुख्य ३ वटा सकारात्मक प्रभाव बताउनुहोस् Positive impact on your daily due to changes observed in plants and animals (write maximum 3 impacts)
J01	**J02**	**J03**	**J04**	**J05**	**J06**	**J07**	**J08**	**J09**
६.	बन्यजन्त wildlife		१..... २..... ३.....	१..... २..... ३.....	१..... २..... ३.....	१..... २..... ३.....	१..... २..... ३.....	१..... २..... ३.....
७.	चराचुरुङ्गी birds		१..... २..... ३.....	१..... २..... ३.....	१..... २..... ३.....	१..... २..... ३.....	१..... २..... ३.....	१..... २..... ३.....
८.	किरा फट्यांग्रा insects		१..... २..... ३.....	१..... २..... ३.....	१..... २..... ३.....	१..... २..... ३.....	१..... २..... ३.....	१..... २..... ३.....

१०.२ : मिचाहा बाह्य प्रजाति Prevalence of invasive species

क्र.सं. S.N	बिवरण Details	विगत २५ वर्ष देखि मिचाहा बाह्य प्रजातिको प्रकोप बढेको छ ? Increased incidence of invasive alien species (IAPS) during past 25 years छ yes १ छैन no.. २ ➡अर्को लहर *next row* थाहा छैन / लागु नहुने *donot know/ NA*..... ३	मिचाहा बाह्य (संक्रमण) गर्ने बढेको प्रजातिको नाम (बढीमा ३ ओटाको नाम लेख्नुहोस्) Name of IAPS (maximum 3 such species)	मिचाहा बाह्य प्रजातिको प्रकोप बढेको क्षेत्र कहाँ हो ? Location of increased number of IAPS बन forest..... १ चरण range-land..... २ कृषि agriculture..... ३ अन्य other..... ४	संक्रमण गर्ने प्रजाति बढ्नुको मुख्य कारण के हो ? Reason of increase in IAPS प्राकृतिक रुपमानै फैलिएको natural spread..... १ मानिसले फैलाएको human spread..... २ थाहा छैन donot know . ३	तपाईको जीविकोपार्जनमा यसप्रकारको संक्रमणले कस्तो प्रभाव पारेको छ ? (तीनओटा मुख्य प्रभावहरु प्रथामिकताका आधारमा लेख्नुहोस्) Impacts on livelihood due to IAPS *(select 3 main impact in priority)* आम्दानी घट्यो reduced income..... १, काठ नोक्सान timber loss..... २ घाँस नोक्सान grass loss..... ३ खाना पकाउने दाउरा नोक्सान firewood loss ... ४ सोतर नोक्सान dried leaves & tiwgs loss..... ५ मानिस वा जंगली जनावरले खानेकुराको रुपमा प्रयोग गर्ने प्रजाति नोक्सान human & wildlife food species loss..... ६ मानिस तथा घरपालुवा जनावरको स्वास्थ्यमा समस्या human and wildlife health impact..... ७ केहि प्रभाव नपरेको no impact..... ८	मिचाहा बाह्य (संक्रमण) गर्ने बढेको प्रजातिको नाम (बढीमा ३ ओटाको नाम लेख्नुहोस्) IAPS control & management initiatives taken आगो लगाउने buring..... १ काटेर नष्ट गरिने cut & destroy..... २ औषधी / रसायन प्रयोग गरि नष्ट गरेको destroy using medicine/chemial..... ३ ब्रिकेट / बायोचार बनाउन प्रयोग भएका used to make briquette/biochar..... ४
J10	**J11**	**J12**	**J13**	**J14**	**J15**	**J16**	**J17**
१. बुट्ढान / झार shrub			१..... २..... ३.....				

२.थाक्रोमा चढ्ने लहरे बिरुवा climber		१..... २..... ३.....								
३.जमिनमा फै लने लहरे बिरुवा creepers		१..... २..... ३.....								
४.जलीय वनस्पति acquatic plants		१..... २..... ३.....								

१०.३ : फूल/फुल्ने फल लाग्ने तथा प्रजननको समयमा परिवर्तन changes in flowering/fruiting and fertilization timing

फूल/फुल्ने फल लाग्न flowering/fruiting behavior

विवरण details		कोड Code
J18. विगत २५ वर्ष अघि भन्दा हाल स्थानीय जातको रुखको कुनै प्रजाति छिटो फूल फुल्ने/फल लाग्ने देखिएको छ ? early flowering/fruiting on local tree varieties compared to past 25 years	छ yes .....१ छैन no.....२, थाहा छैन donot know... ३, लागु नहुने not applicable.....४	
J19. विगत २५ वर्ष अघि भन्दा हाल स्थानीय जातको रुखको कुनै प्रजाति ढिला फूल फुल्ने/फल लाग्ने देखिएको छ ? late flowering/fruiting on local tree varieties compared to past 25 years	छ yes .....१ छैन no.....२, थाहा छैन donot know... ३, लागु नहुने not applicable.....४	
J20. विगत २५ वर्ष अघि भन्दा हाल स्थानीय जातको रुखको कुनै प्रजाति छिटो फूल फुल्ने/फल लाग्ने देखिएको छ ? early flowering/fruiting on local shrub varieties compared to past 25 years	छ yes .....१ छैन no.....२, थाहा छैन donot know... ३, लागु नहुने not applicable.....४	
J21. विगत २५ वर्ष अघि भन्दा हाल स्थानीय जातको बुट्यानको कुनै प्रजातिमा छिटो फूल फुल्ने/फल लाग्ने देखिएको छ ?late flowering/fruiting on local shrub varieties compared to past 25 years	छ yes .....१ छैन no.....२, थाहा छैन donot know... ३, लागु नहुने not applicable.....४	

J22. विगत २५ वर्ष अघि भन्दा हाल स्थानीय जातको रुखको कुनै प्रजातिमा छिटो फूल फुल्ने/फल लाग्ने देखिएको छ ?early flowering/fruiting on local fruit varieties compared to past 25 years	छ yes .....१ छैन no.....२, थाहा छैन donot know...३ लागु नहुने not applicable.....४	
J23. विगत २५ वर्ष अघि भन्दा हाल स्थानीय जातको फलफूलको कुनै प्रजातिमा छिटो फूल फुल्ने/फल लाग्ने देखिएको छ ? late flowering/fruiting on local fruit varieties compared to past 25 years	छ yes .....१ छैन no.....२, थाहा छैन donot know...३, लागु नहुने not applicable.....४	
J24. विगत २५ वर्ष अघि भन्दा हाल स्थानीय जातको जडीबुटीको कुनै प्रजातिमा छिटो फूल फुल्ने/फल लाग्ने देखिएको छ ? early flowering/fruiting on local medicinal plant varieties compared to past 25 years	छ yes .....१ छैन no.....२, थाहा छैन donot know...३, लागु नहुने not applicable.....४	
J25. विगत २५ वर्ष अघि भन्दा हाल स्थानीय जातको जडीबुटीको कुनै प्रजातिमा ढिला फूल फुल्ने/फल लाग्ने देखिएको छ ? late flowering/fruiting on local medicinal plant varieties compared to past 25 years	छ yes .....१ छैन no.....२, थाहा छैन donot know...३, लागु नहुने not applicable.....४	
J26. बिभिन्न वनस्पतिका प्रजातिमा छिटो/ढिला फूल फुल्ने/फल लाग्ने यसबाट परेको बढिमा मुख्य ३ वटा प्रभाव बताउनुहोस् ? Imapcts due to early/late flowering/fruiting on different plant varieties (select maximum 3 impacts)	फल सानो हुनु small fruite size.....१, रस कम हुनु less juice....२, फल फुट्ने समस्या cracks on fruit.....३, स्वादमा फरक different taste.....४ , रोगको प्रकोप बढेको increased infestation.....५ उत्पादनमा कमि decreased production.....६, जडीबुटीको औषधी प्रभाव कमि हुनु reduced medicinal effect.....७	

प्रजनन Fertilization

विवरण details		कोड Code
J27. विगत २५ वर्षअघि भन्दा हाल स्थानीय जातको घरपालुवा जनावरको प्रजननको समयमा परिवर्तन देखिएको छ ? changes observed in fertilization timing of local livestock	छ yes .....१ छैन no.....२, थाहा छैन donot know...३, लागु नहुने not applicable.....४	
J28. यसबाट परेको बढिमा मुख्य ३ वटा नकरात्मक प्रभाव बताउनुहोस् ? negative impacts due to changes in fertilization timing	तौल कम हुनु reduced weight.....१, गर्भाधानमा कमि low fertilization rate ...२, मृत्युदर बढेको increased mortality...३, दुधको मात्रामा कमि reduced milk volume.....४,	

खण्ड ११ : जलवायु परिवर्तन सामना गर्न घरपरिवारले अप्नाएका जलवायु अनुकुलित कार्यहरु Households' climate change adaptation activities

११.१ : कृषि क्षेत्र agriculture sector

विवरण details		कोड Code
K01. विगत ५ वर्षको अवधिमा तपाई वा तपाईको परिवारको कुनै सदस्यले कृषिमा आधारित जलवायु अनुकुलनसम्बन्धी कुनै सीप विकास तालिम लिनभएको छ ? Family member(s) have received skill development training on climate change adaptation in agriculture during the past 5 years	छ yes .....१ छैन no.....२ लागु नहुने *not applicable*..... ३	
K02. विगत ५ वर्ष अघिको भन्दा हाल बाली लगाउने पद्धतीमा परिवर्तन गर्नुभएको छ ? changes in cropping pattern during the past 5 years	छ yes .....१ छैन no.....२ लागु नहुने *not applicable*..... ३	
K03. विगत ५ वर्षको अवधिमा कुनै जग्गा बाँझै छाड्नुभएको छ ? have left any land fallow during the past 5 years	छाडेको yes १ नछाडेको no……..२ लागु नहुने not applicable..... ३	
K04. विगत ५ वर्षको अवधिमा पहिलेको भन्दा भिन्न नश्लको पशुपन्छी पालन गर्नुभयो ? have raised different livestok varieties during the past 5 years	गरियो yes १ गरिएन no ....२ लागु नहुन not applicable..... ३	
K05. विगत ५ वर्षको अवधिमा थप सिंचाई प्रविधिको व्यवस्था गर्नुभयो ? have managed additional irrigation technology during the past 5 years	गरियो yes १ गरिएन no ....२ लागु नहुन not applicable..... ३	
K06. विगत ५ वर्षको अवधिमा सिंचाई तथा चिस्यानको लागि पोखरी निर्माण गर्नुभयो ? have constructed pond for irrigation and retaining soil moisture during the past 5 years	गरियो yes १ गरिएन no ....२ लागु नहुन not applicable..... ३	
K07. विगत ५ वर्षको अवधिमा उन्नत बिउ लगाउने अभ्यास गर्नुभयो ? have adopted improved seed during the past 5 years	गरियो yes १ गरिएन no ....२ लागु नहुन not applicable..... ३	

विवरण details		कोड Code
K08. विगत ५ वर्षको अवधिमा बाली लगाउने समय परिवर्तन गर्नुभयो ? (बिउ छर्ने आदि) have changed crop plantation timing during the past 5 years	गरियो yes १ गरिएन no ....२ लागु नहुन not applicable..... ३	
K09. विगत ५ वर्षको अवधिमा खेतबारीमा अजैविक (रासायनिक) मल प्रयोगको मात्रामा वृद्धि गर्नुभयो ? have increased use of inorganic fertilizer during the past 5 years	गरियो yes १ गरिएन no ....२ लागु नहुन not applicable..... ३	
K10. विगत ५ वर्षको अवधिमा खेतमा जैविक मल मात्र प्रयोग गर्नुभयो ? have used only organic fertilizer in any parcel of land during the past 5 years	गरियो yes १ गरिएन no ....२ ➡K12 लागु नहुन not applicable..... ३ ➡K12	
K11. यदि गरियो भने कति जग्गामा जैविक मल मात्र प्रयोग गर्नुभयो ? if used, the land area in which only organic fertilizer is used in the past 5 years	वि÷रो Bi/Ro | क÷आ Ka/Aa | धु÷पै Dhu/Pai	विघा Bigha १ रोपनी Ropani
K12. विगत ५ वर्षको अवधिमा नयाँ बाली लगाउने कार्य गर्नुभयो ? have produced new crops in the past 5 years	गरियो yes १ गरिएन no ....२ लागु नहुन not applicable..... ३	
K13. विगत ५ वर्षको अवधिमा नयाँ जातको पशुपन्छी पालन गर्नुभयो ? have raised new variety livestock in the past 5 years	गरियो yes १ गरिएन no ....२ लागु नहुन not applicable..... ३	
K14. विगत ५ वर्षको अवधिमा पशुपन्छीमा लाग्ने रोग नियन्त्रण गर्न खर्च गर्नुभयो ? cost incured for treatment to livestock in the past 5 years	गरियो yes १ गरिएन no२ ➡K16 लागु नहुन not applicable..... ३ ➡K16	
K15 यदि गरियो भने कति जति खर्च गरियो ? if yes, the amount of cost for livestok treatment	रु.....	

विवरण details		कोड Code
K16. विगत ५ वर्षको अवधिमा पशुपन्छीको बिमा गरियो ? Have insured livestock in the past 5 years	गरियो yes १ गरिएन no २ ➡K19 लागु नहुन not applicable..... ३ ➡K19	
K17. यदि गरियो भने कुन कुन पशुपन्छीको बिमा गर्नुभयो ? the livestocks that were insured (multiple answere)	गाइको *cow*... १, भैंसीको *buffalo*..... २ गोरुको *oxen*... ३ बाखाको *goat*..... ४ कुखुराको *poultry*.. ५, हासको *duck*... ६, अन्य *others*..... ७	
K18. बिमा गरेबापत बार्षिक जम्मा कति रकम तिनुपर्छ ? total annual insurance premium paid for livestock insurance	रु NPR.....	
K19. विगत ५ वर्षको अवधिमा कुनै कृषि बालिको बिमा गर्नुभयो ? have insured any crops in the past 5 years	गरियो yes १ गरिएन no ....२ लागु नहुन not applicable.... ३	
K20. यदि गरियो भने कुन कुन बालिको बिमा गर्नुभयो ? if yes, the crops that were insured (multiple answere)	खाद्ययान्न बाली *cereal crops*..... १, दलहन बाली *lentiles crops*..... २, तर कारी बाली *vegetable crops*..... ३, नगदे बाली *cash crops*..... ४, फलफूल बाली *fruits crops*..... ५	
K21. बिमा गरेबापत बार्षिक जम्मा कति रकम तिर्नुहुन्छ ? toal annual insurance premium paid for crop insurance	रु NPR.....	
K22. विगत ५ वर्षको अवधिमा उन्नतबालि छोडी, पशुपालन मात्र गर्ने कार्यको थालनी गर्नुभयो ? Have dropped crops and started raising livestock only in the past 5 years	गरियो yes १ गरिएन no ....२ लागु नहुन not applicable.... ३	
K23. विगत ५ वर्षको अवधिमा कृषिबाली मात्र लगाउने कार्यको थालनी गर्नुभयो ? have started growing crops only in the past 5 years	गरियो yes १ गरिएन no ....२ लागु नहुन not applicable.... ३	

विवरण details		कोड Code
K24. विगत ५ वर्षको अवधिमा पशुपालन गर्ने तथा कृषिबाली (मिश्रित कृषि) लगाउने दुबै कार्यको थालनी गर्नुभयो ? have started mixed farming (both crops and livestock) in the past 5 years	गरियो yes १ गरिएन no ....२ लागु नहुन not applicable.... ३	
K25. विगत ५ वर्षको अवधिमा कृषि वनको थालनी गर्नुभयो ? have started agroforestry in past 5 years	गरियो yes १ गरिएन no ....२ लागु नहुन not applicable.... ३	
K26. विगत ५ वर्षको (Compartible cropping) अवधिमा संगतिमिश्रित बाली लगाउने कार्यको थालनी गर्नुभयो ? (जस्तै कोदो र सयपत्री) have started compatible cropping (e.g. millet & marigold) in past 5 years	गरियो yes १ गरिएन no ....२ लागु नहुन not applicable.... ३	
K27. यदि गरियो भने कति जमिनमा गर्नुभयो ? if yes, the total land area for compatible cropping	वि÷रो Bi/Ro | क÷आ Ka/Aa | धु÷पै Dhu/Pai	विघा Bigha १ रोपनी Ropani २
K28. विगत ५ बर्षको अवधिमा टनेल (Tunnel) प्रविधिको थालनी गर्नुभयो ? have started tunnel technology in past 5 years	गरियो yes १ गरिएन no ....२ लागु नहुन not applicable.... ३	
K29. यदि गरियो भने कति जमिनमा गर्नुभयो ? If yes, the total land area for tunnel farming	वि÷रो Bi/Ro | क÷आ Ka/Aa | धु÷पै Dhu/Pai	विघा Bigha १ रोपनी Ropani २
K30. विगत ५ बर्षको अवधिमा शीत भण्डारको प्रयोग गर्नुभएको छ ? have used cold storage in past 5 years	गरियो yes १ गरिएन no ....२ लागु नहुन not applicable.... ३	

विवरण details		कोड Code
K31. विगत ५ बर्षको अवधिमा आफूले चलन गरेको जमिनमा जल तथा भूसंरक्षण कार्य गर्नुभएको छ ? have carried water and land conservation activities in land under self holdings in past 5 years	गरियो yes १ गरिएन no ....२ लागु नहुन not applicable.... ३	
K32. विगत ५ बर्षको अवधिमा कृषिमा आधारित कुनै सेवाहरु स्थानीय तह/कृषि कार्यालयबाट प्राप्त गर्नुभएको छ ? have received agricultural services from local level/agriculture office in past 5 years	गरियो yes १ गरिएन no ....२ लागु नहुन not applicable.... ३	
K33. विगत ५ बर्षको अवधिमा मिचाहा जातिका बनस्पति नियन्त्रण कार्य भर्नुभएको छ ? have managed and controlled invasive species in past 5 years	गरियो yes १ गरिएन no ....२ लागु नहुन not applicable.... ३	
K 34. विगत ५ बर्षको अवधिमा जमिन/माटोको गुणस्तर सधार्ने/कायम/बृद्धि गर्ने कार्य गर्नुभएको छ ? have done land/soil improvement activities in past 5 years	गरियो yes १ गरिएन no ....२ लागु नहुन not applicable.... ३	
K35 यदि गरियो भने कति जमिनमा गर्नुभयो ? if yes, the total land area in which land/soil improvement was done	वि÷रो Bi/Ro | क÷आ Ka/Aa | धु÷पै Dhu/Pai	विघा Bigha १ रोपनी Ropani २
K36. विगत ५ बर्षको अवधिमा स्थानीय/रैथाने प्रबिधि/शिप प्रयोग गरि कृषिमा जलवायुजन्य विपद् जोखिम न्यूनीकरणका कार्यहरु गर्नु भयो ? have applied local indigenous technology and skills for climate induced risk reduction initiatives in agriculture in past 5 years	गरियो yes .... १ गरिएन no.....२ लागु नहुन not applicable.... ३	
K37. यदि गरियो भने, के के कार्यहरु गर्नु भयो ? (बढीमा ४ वटा भन्नुहोस्) if yes, write maximum 4 indigenous technologies and skills used in risk reduction	१..... २..... ३..... ४.....	

११.२ : गैरकृषि क्षेत्र non-agricultural sector

बिवरण Details		कोड Code
K38. विगत ५ बर्षको अवधिमा परिवारमा खाद्य उपभोग व्यवहारमा परिवर्तन भएको छ ? Changed the food consumption habit during past 5 years	छ yes .....१ छैन no.....२	
K39. विगत ५ बर्षको अवधिमा स्थानीयस्तरमा गैरकृषि व्यवसाय बढाउँदै जानुभएको छ ? have started off-farm actitivites during past 5 years	छ yes .....१ छैन no.....२	
K40. विगत ५ बर्षको अवधिमा गैरकृषि रोजगारी अपनाउने कार्य गर्नुभयो ? have shifted to the non-agricultural employment sector during past 5 years	गरियो yes ... १ गरिएन no . २	
K41. विगत ५ वर्षको अवधिमा कुनै सदस्य विकल्पका लागि यस स्थानबाट अन्य स्थानमा अस्थायीरुपमा बसाई सरेर जानुभएको छ ? family member(s) have migrated temporarily in other citites or villages in past 5 years	छ yes .....१ छैन no.....२	
K42. विगत ५ वर्षको अवधिमा कुनै सदस्य बाढी/पहिरो जोखिम न्यूनीकरण गर्ने तथा व्यवस्थापन अभ्यासमा सहभागी हुनुहुन्छ ? family member(s) have participated in flood/landslide risk reduction activities in past 5 years	छ yes .....१ छैन no.....२	
K43. विगत ५ वर्षको अवधिमा कुनै सदस्य बाढी तथा पहिरोबाट बचाउन यातायात तथा सडक पूर्वाधारमा सहभागी हुनुहुन्छ ? family member(s) have participated in transport and road improvement activities to reduce the risk of flood and landslide in past 5 years	छ yes .....१ छैन no.....२	
K44. विगत ५ वर्षको अवधिमा कुनै सदस्य समुदायमा आधारित प्राकृतिक श्रोत व्यवस्थापनमा संलग्न हुनुहुन्छ ? family member(s) have participated in community-based natural resource management activities in past 5 years	छ yes .....१ छैन no.....२	
K45. विगत ५ वर्षको अवधिमा कुनै सदस्यले जलवायु जन्य विपद् जोखिम न्यूनिकरणको क्षमता बृद्धि गर्ने तालिममा सहभागी हुनुभयो ? family member(s) have participated in climate induced disaster risk reduction capacity improvement training in past the 5 years	भएको yes..१ नभएको no.२	

ANNEX 3

List of persons engaged in National Climate Change Survey 2022

1. Dr. Hem Raj Regmi, Deputy Chief Statistician, NSO
2. Dilli Raj Joshi, Deputy Chief Statistician, NSO
3. Pramod Raj Regmi, Director, NSO
4. Sushil Kumar Sharma, Former Director, NSO
5. Krishna Tuladhar, Director, NSO
6. Suresh Basnet, Director, NSO
7. Rajan Silwal, Director, NSO
8. Manohar Ghimire, Director, NSO
9. Rishi Ram Sigdel, Director, NSO
10. Birendra Kumar Kayastha, Former Director, NSO
11. Dol Narayan Shrestha, Computer Officer, NSO
12. Kapil Dev Joshi, Statistics Officer, NSO
13. Kul Prakash Neupane, Statistics Officer, NSO
14. Bhim Bahadur Shakha, Statistics Officer, NSO
15. Lila Nath Pandey, Computer Officer, NSO
16. Prakash Poudel, Statistics Officer, NSO
17. Kamala Nath, Statistics Assistant, NSO
18. Ritu Pantha, Under Secretary, Ministry of Forests and Environment
19. Prof. Dr. Chhatra Mani Sharma, Central Department of Environmental Science
20. Dr. Ramesh Prasad Sapkota, Central Department of Environmental Science
21. Dr. Indira Kandel, Senior Meteorologist, Department of Hydrology and Meteorology
22. Dinakar Khanal, Sr. Divisional Engineer, Water and Energy Commission Secretariat
23. Dr. Shiva Khanal, Under Secretary (Tech.), Ministry of Forests and Environment
24. Saroja Adhikari, Senior Scientific Officer, Department of Environment
25. Surendra Raj Pant, Scientific Officer, Ministry of Forests and Environment
26. Deepak K.C., UNDP
27. Ineej Manandhar, UNDP
28. Madhu Sudan Gautam, Consultant, UNDP
29. Rabin Sharma, Central Department of Environmental Science

List of enumerators engaged in National Climate Change Survey 2023

1. Madhav Prasad Paudel
2. Bishnu Prasad Gautam
3. Rajesh Shah
4. Dhundu Ram Saru
5. Manoj Dangal
6. Nitesh Shah
7. Sharmila Sharma
8. Jibesh Gautam
9. Bal Krishna Mehata
10. Ramesh Bahadur Shrestha
11. Ranjan Shrestha
12. Aakriti Adhikari
13. Arjun Regmi
14. Ganga Paudel
15. Jhalak Paudel
16. Madhav Adhikari
17. Mahendra Prashad Upreti
18. Mahesh Prashad Awasthi
19. Rabin Sharma
20. Sanjib Sharma
21. Sarala Adhikari
22. Sudarshan Hamal
23. Sushil Dahal
24. Sushmita Kafle
25. Srijala Maharjan
26. Rashmi Maharjan
27. Barsha Khanal
28. Kiran Gosai
29. Pratima Sharma
30. Bina Thapa
31. Preksha Subedi

Government of Nepal

Office of the Prime Minister and Council of Ministers

National Statistics Office