TRAINING NEEDS ASSESSMENT REPORT AND CURRICULA AND MATERAILS

Submitted to:
World Wide Fund for Nature (WWF) Nepal
Managing Watersheds for Enhanced Resilience of Communities to Climate Change in Nepal (MaWRiN) Project
Sindhuli, Nepal

Submitted by:
Institute for Resource Management and Technology Nepal (IRMT Nepal)
Nagarjun-10, Kathmandu

June 2025

Abbreviation

CC	Climate Change
CCA	Climate Change Adaptation
CFUG	Community Forest User Group
DFO	Division Forest Officer/s
FECOFUN	Federation of Community Forestry Users Nepal
FGD	Focus Group Discussion
GEDSI	Gender Equality, Disability, and Social Inclusion
GEF	Global Environment Facility
IPs	Indigenous Peoples
IPOs	Indigenous Peoples Organizations
KII	Key Informant Interview
LAPA	Local Adaptation Plans for Action
LFG	Leasehold Forestry Group
MaWRiN	Managing Watersheds for Enhanced Resilience of Communities to Climate Change in Nepal
NAP	National Adaptation Plan
NEFIN	The Nepal Federation of Indigenous Nationalities
NGO	Non-Governmental Organization
OPs	Operational Plans
PMU	Program Management Unit
USD	United States Dollar
WWF	World Wide Fund for Nature (formerly World Wildlife Fund)

EXECUTIVE SUMMARY

BACKGROUND

The Managing Watersheds for Enhanced Resilience of Communities to Climate Change in Nepal (MaWRiN) Project is being implemented in Sindhuli district, covering the two major river systems, i.e., Marin and Kyan rivers, in the Midwestern part of the district within the Churia belt of Nepal. The project considers watershed approach to ensure the longer-term resilience of local and indigenous communities against climate emergencies. The objective of the project is to enhance climate resilience of Indigenous Peoples and local communities through nature-based solutions and livelihood improvement. Climate change has significant impacts on women, Indigenous Peoples, and other marginalized and vulnerable communities in the project area, as their livelihoods depend on sectors like agriculture, forestry, livestock and water. Climate change has exacerbated these challenges, increasing hardship for these communities. At the local level, climate change issues are not systematically addressed or integrated into sectoral plans. Local governments are often at the forefront of addressing these issues, but they face difficulties in designing and implementing effective climate change adaptation (CCA) strategies that are gender-sensitive, participatory, and context-specific.

In this context, one of the mandates of the project is to build the knowledge and skills of municipal officials, sub/divisional forest officials, district-based government line agencies and community-based natural resource management groups on understanding local climate risks and vulnerabilities, along with their impacts on key sectors (agriculture, livestock, forestry, water), and conducting participatory assessments of climate risks and vulnerabilities, identify adaptation options, and mainstream CCA at the local level. Therefore, to address the affirmed issues and concerns, the project had signed an agreement with the Institute for Resource Management and Technology Nepal (IRMT Nepal) to conduct Training Needs Assessment and Development of Training Curricula and Materials for training on participatory, gender-sensitive assessments of climate risks, vulnerabilities, adaptation options, and the integration of CCA in key sectors at the local level..

ASSESSMENT METHODOLOGY

The assessment team adopted phenomenological methodology including various methods and tools, such as document reviews, consultation meetings, focus group discussion (FGD), key informant interviews (KII) and direct physical observation of the socio-ecologically vulnerable sites. The team conducted 27 FGDs and 38 KIIs with the communities/targeted project beneficiaries and key stakeholders within the sub-watersheds reaching a total of 347 and 38 individuals, respectively. Additionally, the team also carried out field observation at 18 socio-ecologically vulnerable sites within the priority sub-watersheds of the project. The FGDs and KIIs included targeted discussions with women and member of vulnerable and marginalized communities, such as Hayu, Majhi and Danuwar. Four consultation and validation events were conducted at the four project rural/municipalities to share the findings of the assessment, receive feedback and validate them The assessment report along with the training curricula and materials were finalized after incorporating feedback from the project team and stakeholders during the consultations.

KEY FINDINGS

Climate Change Impact

Forestry sector: Landslides during the rainy seasons and forest fires during dry seasons were reported as the main challenges of the forestry sector across all sub-watersheds, despite all forests in the sub-watersheds being managed under the Community Forestry regime. Rising temperatures and low precipitation, exacerbated by climate change, are leading to increased frequency and severity of forest fires, impacting forest composition and health. The increasing occurrence of landslides, forest fires, and spread of invasive species has led to the degradation of forest resources and ecosystems.

Agriculture sector: Prolonged drought, increasing sedimentation in agriculture field, on-going crop damage caused by pests, decrease in water availability both in springs and rivers, deteriorating of soil moisture due to excess heat, and non-functional or damage of irrigation infrastructure due to climate-induced events are the climate-change related key issues and challenges that the communities are currently facing. These challenges and issues have resulted low production of agricultural crops leading to food insecurity and hardship time to farmers. During the FGDs and KIIs, the respondents across all sub-watersheds consistently expressed their concerns that if the current agriculture patters and declining production trends continues, food shortage could occur in coming years.

Livestock sector: Despite huge potential of livestock farming- especially goat and cattle- throughout the project area, prolonged drought, rising temperature, water scarcity, increased pest and disease on livestock, and decreased fodder and grazing availability due to forest fires have emerged as major challenges that have forced local communities to scale down livestock farming. Those who have kept livestock is also primarily for subsistence purposes; commercial livestock farming was found minimal. However, there less impact on livestock production and management practices

in upstream (Simle sub-watershed) compared to downstream sub-watersheds (e.g.,Dhungejor, Ghagar, Kyan sub-watersheds). This has resulted farmers from downstream sub-watersheds to shift from livestock as main source of livelihood to other livelihood options. Poor livestock and veterinary support services and migration of youths were reported as other reasons for declining livestock farming practices. Although development partners like Heifer International are promoting improved goat and cattle farming practices in some of the priority sub-watersheds (especially, Dhungajor and Ghangar sub-watersheds), climate change induced problems are the major challenge for its growth.

Water resource sector: As in other sectors, rising temperature and prolonged drought are the key climate change impacts on water resources. These climatic changes have led to drying up of natural springs, streams, and other local water sources, significantly reducing the availability of water for both irrigation and drinking purposes. These impacts have resulted in damage or poor operation of existing irritation and drinking water related infrastructures. Reduced water availability has further resulted in reduced agriculture and livestock productivity, poor health condition of people, especially women, girls and marginalized groups due to lack of safe drinking water and poor sanitation conditions, and increased burden to girls and women who are responsible for household water supply and sanitation and other household chores.

GEDSI sector: The sectoral challenges due to climate change have disproportionately impacted women and girls, Indigenous Peoples and marginalized and vulnerable communities in the sub-watershed areas. For example, women and girls have to spend more time for collecting drinking water and managing foods for the family. The IPs and vulnerable communities are struggling to sustain their traditional livelihoods (e.g., *goat farming by Danuwar, fishing by Majhi, bamboo-mat making by Hayu*), as climate change impacts have exacerbated their opportunities for livelihoods. Due to climate-induced impacts such as water scarcity and prolonged drought, rising temperature, and reduced availability of fodder and grazing due to forest fires, these communities have slowly started abandoning their traditional livelihood practices with increased uncertainty about their livelihoods. These problems have been further triggered up due to poverty, temporarily migration of youth, inadequate support services from the governments, poor road and market conditions, poor access to productive infrastructures (e.g., irrigation) and limited access to government's resources, including climate information and early warning systems.

Existing Knowledge and Practice of Climate Change Adaptations

Knowledge about climate change and its impacts: Majority of the respondents (about 90%)- particularly farmers, community forest users, Indigenous Peoples, ethnic minorities and other marginalized and vulnerable groups, and elected representatives of rural/municipalities (e.g., ward chairpersons and ward members) lack basic level of knowledge about climate change, its impacts and adaptation options/ measures. Even greater gaps were observed among women farmers and members of Indigenous People (IPs), ethnic minorities and vulnerable communities, who have not even heard about climate change impacts and adaptation actions, although they have experienced and suffered from the impacts. At government official level, both at district line agencies and local governments, they have fundamental knowledge on climate change and its impacts, but they lack skills and knowledge on identifying adaptation options and mainstreaming the options in the planning process and implementing them.

Local, indigenous Climate change adaptation practices: Interestingly, despite lacking formal knowledge about climate change impacts and adaptation, local communities have been applying local climate change adaptation practices based on their indigenous knowledge, experiences and capacities. For example: women across all sub-watersheds (except Simle sub-watershed) have practiced to collect drinking water by digging shallow wells along the bank of river/streams during the dry season when water in the rivers/streams dries up due to rising temperature. Similarly, few households (e.g., Hayu households in Guranse village of Kamalamai Municipality-1) have started harvesting rain water during rainy season to use later. Similarly, farmers along Dhungejor and Ghagar sub-watersheds have planted bamboo along the river banks to protect cutting of their lands during flooding.

Mainstreaming of climate change adaptation options: All four rural/municipalities were found weak in identifying climate change adaptation options, developing adaptation strategies and mainstreaming them in their plans and programs. One of the main reasons for such weak performance is due to the lack of adequate knowledge and skills about mainstreaming CCA options. However, there were some initiations of mainstreaming CCA options in the local level plans and programs. For example: Marin Rural Municipality has included one-page information on climate change agenda in its policy and program for 2081/82. Similarly, at the CFUG level, climate change agendas were included into their operation plans (OPs).

TRAINING NEEDS ASSESSMENT

Since the project area comes under high to very high climate risk category, it needs focused initiatives to conserve ecosystems, build community resilience, and enhance adaptive capacity of local communities against the climate change impacts. Therefore, the assessment team identified training needs for different target groups/ project stakeholders for different sectors considering these aspects. These proposed trainings will be useful for building the

capacity of local communities and the project stakeholders (community, local government and district level stakeholders) to contribute to the MaWRiN project objective of enhancing climate resilience of Indigenous Peoples and local communities to sustain their livelihoods by adapting to the impacts of climate change. However, effective delivery of the training is vital to ensure long-term impacts of the training, and it is the responsibility of the MaWRiN project and other relevant institutions (especially, district line agencies and local governments) to design and deliver effective training. Two separate but interlinked training frameworks are designed here as per the findings of training need assessment. The identified training needs and proposed training curricula were shared with MaWRiN Project Management Unit (PMU) team as well as the four rural/ municipalities within the project area, and all inputs and feedback received were incorporated.

Training Framework for Participatory Assessments of Climate Risks and Vulnerabilities, Identifying Adaptation Options, and Mainstreaming CCA at Local Level

A training framework with training curricula, materials and tools for conducting training on participatory assessments of climate risks and vulnerabilities, identifying adaptation options and mainstreaming climate change adaptation for key sectors (forestry, agriculture, livestock and water resource) was designed based on specific needs and requirements of the targeted participants of the project area. For the effectiveness of training, the target groups have been categorized into four groups – local communities, community-level stakeholders, district line agency officials and local government representatives and officials. The training has three modules: (1) Foundational knowledge on climate change, (2) Climate change vulnerability and risk assessment and identification of CCA options, and (3) Mainstreaming cliamte change adaptation options. The training curricula/modules can be customized and tailored to meet the needs of different target groups for enhancing their knowledge and skills on climate change adaptation options at the local level/sub-watershed level.

Training Framework for Sector Specific Training Needs

A total of 37 separate but interlinked training modules have been proposed to cover the training needs identified during the training need assessment. This includes 11 modules for forestry sector, 11 modules for agriculture sector, 4 modules of livestock sector, 4 modules for soil and watershed management sector and 7 modules for water sector. The sector-wise specific training curricula and materials have been designed based on specific needs, context and priorities of the targeted participants in the project area. The training approach also emphasizes inclusive participation, local knowledge integration, and climate resilience.

PROGRAMMATIC WAY-OUT STRATEGIES

It is often observed that the project's interventions use to fail in sustaining the interventions later when the project ends, either due to a lack of continued support or poor integration of the interventions into local system or inadequate localization of the initiatives. Therefore, it is recommended to the MaWRiN project to mainstream project plans and activities into the local government's annual plans, policies, and budget cycles from the beginning of the project implementation. This approach will provide opportunity of institutionalizing climate adaptation and resilience measures within local governance systems, which contributes to continue the best practices beyond the duration of the project.

Similarly, recognizing CFUG as another key institution for the success of this project, the MaWRiN project needs to engage with the CFUG during the project implementation, and encourage and support them, in particular to mobilize their community development fund in CCA interventions.

The Sub-watershed Coordination Committee (SCC) formed by the project can play a crucial role in ensuring the sustainability of the sub-watershed management interventions and outcomes, as its role is not confined by the administrative boundary like a local government. It can act as a platform to bring together diverse stakeholders to develop and implement CCA strategies promoting inclusive and participatory local level planning process, which is a pre-requirement for sustainability. It can also mediate and resolve conflicts related to water allocation, land use or resource sharing, promoting equitable and sustainable resource use. It can be one of the key institutions to foster community ownership and empowerment of women and marginalized groups in implementing the project interventions. However, formalization and institutionalization of the SCC is a challenge. Strengthening 'the infant SCC' should be one of the priority interventions of the project for working on 'watershed approach' and sustainability.

Finally, the project might need policy support from the government, as policy interventions play a critical role in scaling, mainstreaming and sustaining climate change adaptation strategies across sectorial and thematic areas. MaWRiN project should, therefore, maintain coordination and collaboration with rural municipalities, as well as with provincial and federal government bodies, to ensure alignment with existing policies and to advocate for necessary policy enhancements or policy coherence for mainstreaming climate change adaptation options in different sectors at local level.

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1. INTRODUCTION

1.1 Background

Climate change has significant impacts on vulnerable communities, as their livelihoods depend on sectors like agriculture, livestock, forestry, and water resources. These challenges have been intensified by climate change, increasing hardships for these communities. On the other hand, local governments, who are at the forefront of addressing these issues, are facing difficulties in designing and implementing effective climate change adaptation (CCA) strategies that are gender-sensitive, participatory, and context-specific. At the local level, climate change concerns are not systematically addressed or integrated into sectoral plans, especially in agriculture and livestock development. As a result, this has led to isolated and ineffective actions.

The World Wildlife Fund (WWF) in collaboration with the Ministry of Forests and Environment of Federal and the Ministry of Forests Environment of Bagmati Province has therefore been supporting to execute "*The Managing Watersheds for Enhanced Resilience of Communities to Climate Change in Nepal (MaWRiN) Project*" covering the two major river system, i.e., Marin and Kyan in the mid-western part of Sindhuli District, which is within the Churia belt of the country. The primary objective of the project is to enhance the climate resilience of Indigenous Peoples and local communities through nature-based solutions and livelihood diversification. This objective is being pursued through three interconnected components: (1) Enabling environment for mainstreaming climate change; (2) Enhanced Resilience of Local Communities to Climate Change; and (3) Monitoring, evaluation and knowledge management (*for details, please refer to the project document*).

A comprehensive understanding of local climate risks and vulnerabilities and their impacts on key livelihoods sectors, such as agriculture, livestock, forestry, and water are essential. Equally important is building the knowledge and skills of municipal officials, divisional and sub-divisional forest officials, and community-based natural resource management groups (including those focused on forestry, agriculture, irrigation, and livestock) so that their increased capacity enables them to conduct participatory assessments of climate risks and vulnerabilities, identify adaptation options, and mainstream Climate Change Adaptation (CCA) into planning and development process at the local level.

Therefore, to address the affirmed issues and concerns, the project had signed an agreement with the Institute for Resource Management and Technology Nepal (IRMT Nepal) to conduct the Training Needs Assessment and Development of Training Curricula and Materials. The IRMT Nepal has successfully completed the field assignments as per the ToR and submitted the Field Findings Report. This Final Draft Report has been prepared incorporating the comments and feedbacks from the Project Management Unit (PMU) along with the training curriculum and training materials for training on participatory gender-sensitive assessments of climate risks, vulnerabilities, adaptation options and mainstreaming climate change adaptation in key sectors at the local level.

1.2 Objectives of the Assessment

The objective of this study was to conduct training needs assessment and develop curricula and materials for training on participatory, gender-sensitive assessments of climate risks, vulnerabilities, adaptation options, and the integration of CCA in key sectors at the local level. The specific objectives were to:

- Conduct training need assessment to identify specific training needs of different stakeholder groups as well as sector specific (agriculture, livestock, forestry and water management) needs.
- Develop training curricula, training materials and tools to enhance the capacity of different stakeholders in conducting comprehensive, participatory, gender-sensitive assessments of climate risks and vulnerabilities, adaptation options, and the mainstreaming of climate change adaptation in key sectors at the local level.

1.3 Study Team

To conduct the training need assessment, a six-member team was formed under the leadership of Dr. Raj Bahadur Shrestha, Training Needs Assessment Expert. Other team members are: Dr. Sunit Adhikari, Deputy Team Leader and Curriculum Development Expert; Kamal Rai, Forestry Specialist; Pradeep Pokharel, Agriculture and Livestock Specialist; Draupadi Subedi, GEDSI Specialist; and Bam Bahadur Oli, Climate Change Adaptation Specialist. In addition to the six team members, IRMT Nepal used Mr. Shankar Kumar Bhatta as Community Development and Field Research Specialist within the given budget framework with no extra cost to WWF Nepal.

1.4 Study Limitation

The findings of this study should be interpreted in light of certain limitations. Firstly, the study team primarily employed a qualitative approach, which involves a certain level of subjective judgment and interpretation. Secondly, the study mainly relied on Focus Group Discussions (FGDs), Key Informant Interviews (KIIs), and field observations of the socio-ecologically vulnerable sites as the primary data collection methods and tools. Lastly, the assessment is based on the views and perceptions shared by the informants. As such, the study findings may not be generalized for Sindhuli district, but present a comprehensive picture of the MaWRiN project areas. However, this assessment report can also serve as a valuable reference for future studies of a similar nature.

CHAPTER 2: METHODOLOGICAL FRAMEWORK

2.1 Preparation for Field Work

After signing the contract, the study team reviewed a range of documents, including MaWRiN project document, progress report, MaWRiN- environmental and social management framework and process framework, progress reports and plans of municipalities lying in Marin watershed, progress report of district-based government agencies, few operation plans of selected Community Forest User Groups (CFUGs), government's climate change related documents, policies and strategies (e.g., National Climate change policy, 2019; NAP, 2021; LAPA Framework, 2011; Reports on Vulnerability and Risk Assessment and Identifying Adaptation Options, 2021) and other relevant documents. Based on the review of documents and consultation with MaWRiN project team, the study team developed a draft version of checklists/questionnaires (*referred to Annex 1*) for Focus Group Discussion (FGDs), Key Informant Interviews (KIIs) and Field Observations. Following this, the study team proceeded to Sindhuli for consultation with the Project Management Unit (PMU) and to field work for data collection.

2.2 Data Collection

2.2.1 Consultation with Program Management Unit (PMU)

The study team had a series of consultation meeting with the MaWRiN project team, both in a group or individual in Sindhuli. In the initial meeting held on 24 April 2025, the Technical Team Leader of the project briefed the study team about the MaWRiN project and PMU's expectation from the assignment, particularly regarding development of customized training modules. The major expectations of PMU include: (a) adopting methodology and approach as per the ToR, project documents and discussion with PMU, (b) comply with MEL requirements, such as use of standard attendance sheet, 50% women in every discussion, (c) following the project's environmental and social safeguards integrated policies and procedures. The Technical Team Leader also briefed about the technical aspect of the project. The project, which was recently launched for a six years duration- starting from August 2024 to 14 August 2030, is funded by Global Environment Facility (GEF) with a grant of 9 million USD and an additional 26 million USD as co-financing by the Government of Nepal. The project has recently formed sub-watershed coordination committees in six priority sub-watersheds[1] with an objective of implementing the project through local coordination.

Figure 1: Presentation of the Inception Report to the PMU

The briefing was useful for the study team, as the information helped to refine the design of the field work and the checklists, which had been developed prior to arriving in Sindhuli. The consultation also provided guidance for preparing the inception report. The project team also provided necessary documents and information including WWF's norms and compliance

[1] *The whole project has been divided into 10 sub-watersheds, but the committee has only been formed in six priority sub-watersheds where the project is going to work intensively.*

required for starting the field activities and reporting as well. The study team on subsequent day presented the checklists developed for FGDs and KIIs to the project team, got feedback from PMU, and finalized the checklists incorporating the feedback. The draft inception report along with the final checklists- as required by the TOR and the contract- was submitted to the PMU for their review and feedback. The suggestions and feedbacks on the inception report were incorporated to finalize the report and the final inception report was submitted to PMU.

With the finalized methodology, data collection checklist/questionnaire and field work plan, the study team was again oriented on the finalized approach and methodology, work plan, and revised questionnaires/checklists before starting the field work. The study team then collected data from the field accordingly. For the field works, the team, wherever it was needed, was divided into two groups and completed the data collections accordingly.

2.2.2 Focus Group Discussion

The study team selected the sites for FGDs, covering of each ward within the municipalities that is located in the sub-watershed areas. While selecting the sites, the concerns and suggestions of the MaWRiN project team were duly considered. The number of participants in FGDs ranged from a Minimum of 8 people and maximum of 20 including good number of female participants.

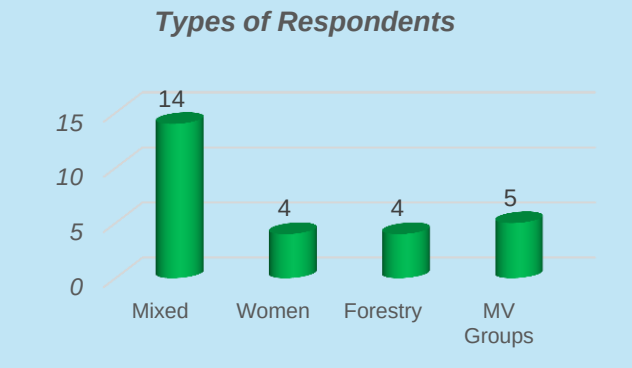

Figure 2: Types of respondents participated in FGDs

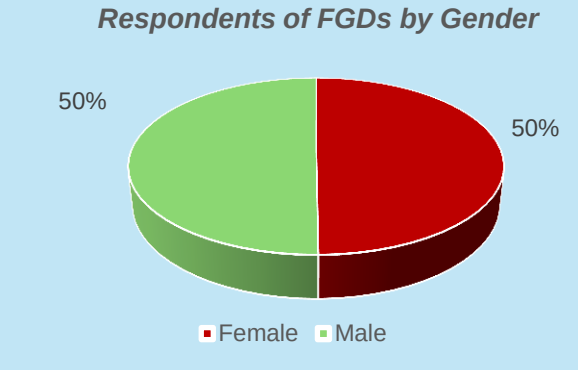

Figure 3: FGD respondents by gender

[Note: Mixed = farmers and others, MV = marginalized and vulnerable groups, and Forestry=CFUG and LFG]

In total, 27 FGDs with 347 participants were conducted, including 9 FGDs with specific groups, such as: Women, Majhi, Danuwar, and Hayu communities. FGDs were also conducted with CFUGs and Leasehold Forestry Groups (LFG). (*Refer to Annex 2 for the lists of FGDs*).

Figure 4: FGD with Majhi community at Kunda Village, Marin – 5

Figure 5: FGD with Hayu community at Guranshe Village, Kamalamai-1

The average time spent in each FGD ranged from 1 hour to 1:30 hours. Efforts were made to ensure at least equal participation of female in the FGDs. However, in some cases, participation of female was comparatively less. While conducting the FGDs, the checklists were used to collect the information. Nevertheless, the study team successfully completed the number of FGDs[2] as required by Terms of Reference of the assignment

2.2.3 Key Informant Interview

Following the approach used in the FGDs, the study team prepared a list of respondents for the KIIs based on the suggestion from the project team (PMU) and the list suggested in the ToR. Respondents ranged from Secretary of Ministry of Forests and Environment of Bagmati province to ward chairperson, rural/municipality technical staff, and key persons of CFUGs (e.g., CFUG Chairperson, female Secretary/member). A total of 38 KIIs were conducted in the sub-watersheds identified by the project. The KII has covered the key respondents listed in the inception report and as suggested by PMU during the first consultation meeting. The list of key informants is given in Annex 3.

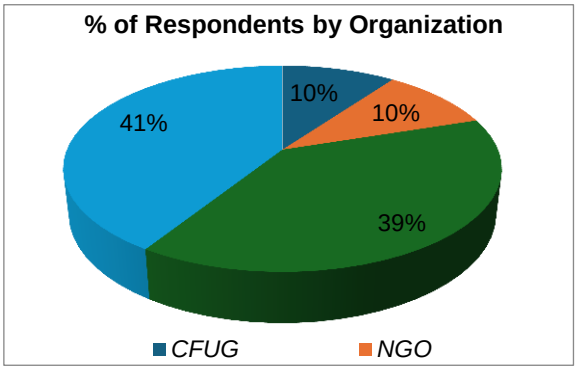

Figure 6: KII respondents by organization

Since several of the key informants for KIIs were selected according to their role/position in the organization (e.g., DFO, Mayor/Palika Chairperson, Deputy Mayor/Vice-Chairperson, Ward Chairperson, CFUG Chairperson, Coordinator of Sub-Watershed Committee, etc.), the number of female key informants available for KIIs were limited. The average time spent for one KII was about one hour. In some cases, for those respondents, who were out of district at the time of field visits (26 April – 7 May 2025), interviews were conducted later via telephone[3]. In some cases, the respondent was consulted in Kathmandu. For instance, Dr. Kedar Baral, secretary of Ministry of Forest and Environment, Bagmati province was consulted in Kathmandu.

Figure 7: KII with Marin Division Forest Officer

Figure 8: KII with Agriculture and Livestock Officers of Marin Rural Municipality

[2] *The study team extends its sincere thanks to PMU-MaWRiN, elected representatives of project rural/municipalities, coordinators of the sub-watershed coordination committee, and all KII and FGD respondents of the six sub-watershed areas for sharing of their information, opinion and experiences. The team is also thankful to all other people who helped the team in communicating/inviting the participants for the FGDs.*

[3] *The telephone interviews were also found effective, and such interviews lasted about 30 minutes, in average.*

KII with the Chairperson of Marin Rural Municipality

KII with the Ward Chairperson of Marin Rural Municipality-4 (left) and KII with the Chief of Environment Section of Kamalamai Municipality (right)

2.2.4 Direct Field Observation

As part of the field observations of socio-ecologically vulnerable sites within the Marin watershed, the study team visited the sites as pointed out by the respondents during the FGDs. Besides, those sites which are at risks or vulnerable to climate change related risks and hazards (*such as: landslides, flooded areas, sedimented riverbeds, etc.*) were also examined while traveling from one location to another during the field work. This visit with field observations was a kind of verification of the information shared by respondents during the FGDs. By observing the physical conditions and challenges at firsthand, the study team was able to better understand the local context, validate community concerns, and had opportunity to identify capacity building needs that is related to climate change adaptation. The details of vulnerable sites visited and their photos are presented in Annex 4.

Figure 9: Agriculture land flooded by Ghanghar stream, below Chauki village, Marin – 5 (left), and Flooding and sedimentation by Ghumaune and Subbeni Streams, Beltar village, Kamalamai-1

2.3 Data Analysis

The non-spatial information/data collected during the FGDs, KIIs and observations of the ecologically vulnerable sites were tabulated in a uniform format. The information/data was compiled in Excel sheet under key thematic areas: i) knowledge and understanding, ii) climate vulnerability and risk, iii) potential climate change adaptation options, and iv) actions for mainstreaming climate change adaptation. Each thematic area was further broken down into three analytical categories: (i) current status, (ii) existing knowledge and skills gaps, and (iii) adaptation measures to improve the vulnerability. The data analysis has also considered differential impacts of CC on women and marginalized and vulnerable groups including Majhi, Hayu, Danuwar and vulnerable Tamang communities. After categorizing into three analytical categories, data filtering was done by ranking, clustering (grouping), imputing (substituting some information for missing), and categorizing the information into required headings. Such categorization helped the study team to data cleaning (entering only required and relevant information), and prioritizing the data as per their importance, relevance and sensitivity to the study context. Since the data are mostly qualitative in nature, the analysis has included anecdotal evidences, ethnographic evidence and quotes of the respondents where relevant.

Findings of the data analysis are presented in Chapter Three. The Chapter presents information with anecdotal and ethnographic evidences gathered during during the FGDs and KIIs. This chapter also highlights the differential impact due to CC on women, IPs, and marginalized and vulnerable communities. Besides, possible training needs required for the district line agencies, local governments, local communities to adapt with the climate change impacts were identified through both literature review, suggestion from KIIs, and community inputs gathered during the FGDs and KIIs. These training needs were then categorized into two areas: i) climate change related training, and ii) sector-based training aimed at minimizing climate change impacts, particularly in agriculture, forestry, livestock, and water resources. The training needs for mainstreaming GEDSI concerns in climate change adaptation have been covered across all sectors as a cross-cutting issue. The data thus categorized was further analyzed and interpreted to produce this report.

2.4 Reporting and Consultations

2.4.1 Submission of Field Findings Report

As part of requirements mentioned in the TOR, the field findings report was submitted to the PMU as the second deliverable within the given timeframe for the review and feedback. The PMU reviewed the draft field findings report and provided constructive feedback, which was

incorporated to finalize the Field Findings Report. The revised report has reflected challenges, training need assessment, possible sector-based training identified during the FDGs, KIIs and field observations, and recommendations, as well.

2.4.2 Preparation of Final Draft Report to PMU for Review and Feedback

Built on preliminary field findings report and PMU's feedback on the report, the study team prepared a Draft Final Report that included analysis of training need assessment, customizable training curricula, and training materials and tools. The report is presented in two parts: (a) Analysis of training need assessment, and (b) Training curricula, materials and tools. The final draft report was shared with the PMU before sharing it with the key stakeholders for their review and feedback. All comments and feedback received on the final draft report was incorporated to the final version of the report.

2.4.3 Project Management Unit (PMU) Office Consultation

The second PMU office-level consultation was conducted on 20 June 2025 at the PMU Office in Sindhuli to share the findings of the field assessment before consulting with the stakeholder. Both the findings of TNA report and the training curriculum and materials prepared based on the findings of the TNA study was presented to the PMU. The comments and feedback received from the PMU on the report and training curriculum were incorporated in the final version of the report. The PMU also advised on some considerations while conducting the stakeholder consultations, which were followed by the team.

2.4.4 Stakeholder Consultations

The key findings of the study with the identified lists of training needs for different levels of stakeholders in different sectors (forestry, agriculture, livestock and water management) were presented to and discussed with the concerned stakeholders to validate the findings of the assessment. Four consultation and validation workshops, one each in the four rural/municipalities under the MaWRiN project area, were organized from 20 to 23 June 2025. The presentation particularly included the findings from the field on climate risks, vulnerabilities, and adaptation options across the watershed, and the curricula and materials developed for training on participatory, gender-sensitive assessments of climate risks, vulnerabilities, adaptation options, and mainstream climate change adaptation (CCA) in key sectors at the local level. The workshop participants mainly included representatives and officials from local governments (Mayor/Chairperson, Deputy Mayor/Vice-Chairperson, Ward Chairpersons, Chief Administrative Officer, technical staffs, and other officials of the rural/municipalities). The list of the consultation and validation workshops is presented in Annex 5. This consultative process has ensured the inclusivity and also validated the findings of the assessment.

Figure 10: Consultation event in (a) Hariharpurgadhi Rural Municipality (left) and (b) Marin Rural Municipality (right)

The participants of the consultation and validation event have well taken the training needs identified as practical to their local context. However, they stressed on the effective

implementation of the training to bring impact. According to them, several training in the past could not bring in many changes in the practice and behavior of the community. They also highlighted the need for conducting the training in close coordination and collaboration with the local governments, as there was several training duplication in the past. All relevant suggestions and feedback received from the consultation and validation workshops were incorporated to finalize the report. However, the event participants, especially in Ghyanglekh, Hahirahpur and Marin Rural Municipality complained about the project not covering all wards within the respected sub-watershed, and demanded to cover the wards within the project implementation area.

Figure 11: Consultation event in Ghyanglekh Rural Municipality, Hayu Tar

Figure 11: Consultation event in Kamalamai Municipality, Sindhuli Bazar

2.4.5 Submission of Final Report

After the consultation and validation events in all four project rural/municipalities, the study team finalized the TNA Report and the Training Curriculum and Materials incorporating inputs, comments and feedback from both PMU consultation and stakeholder consultation and validation workshops. The final report includes the final version of the training need assessment report and customizable training curricula and training materials and tools. The final report is submitted to the PMU for approval.

CHAPTER 3: FINDINGS AND RECOMMENDATIONS

3.1 Key Emerging Challenges of Climate Change at Present

3.1.1 Sectorial Challenges

The findings from the FGDs, KIIs, and field observations that had been expressed by the respondents-directly or indirectly-regarding the impacts of the climate change are presented under the sector-based thematic areas, as outlined below

Forestry: As expressed by respondents during the FGDs and KIIs, landslides during the rainy seasons and forest fires during dry seasons were the main challenge in the forests, despite all forests of the sub-watersheds are being managed under the Community Forestry (CF) regime. Increasing occurrence of landslides and forest fires spread of invasive species have led to the degradation of natural resources and these challenges are common across all sub-watersheds. However, this year the forest fire is comparatively less. In this regard, Division Forest Officer (DFO) of Marin Division Forest Office shared interesting information regarding the forest fires. Use of 'drone' to monitor forest fire significantly reduced the events of forest fire in the current year due to the fear among local residents of being caught setting fire. Other two major reasons identified for lower incidents of fire this year are due to: i) increased awareness level[4] of the people, ii) hiring of forest watchman by CFUGs; and iii) monitoring by the Divisional Forest Office using "Drone". This proves that most of the fire events were deliberate.

Box 1: Impact of Climate Change on Indigenous Peoples and Vulnerable Communities

Case 1: Majhi Community in Kunda Village, Kamalamai-1, Ghaghar Sub-watershed

This community, whose main occupation is fishing and agriculture, is among the most affected groups. According to Bishnu Majhi, a farmer, said, "Irregular rainfall patterns, rising temperatures, and frequent floods and droughts have disrupted their farming cycles, reduced fish availability, and degraded natural resources, posing threats to their food security and income. The huge flow of sedimentation in the Ghaghar river has increased the river bed level, making water to flow under the sediment and water not visible in the river. This has hugely impacted availability of fish in the rivers". Moreover, another farmer, Hari Majhi stressed, "We have attempted to start fish farming in our agriculture land, but that also failed due to water shortage and water drying problem. The few fish ponds constructed were soon dried". The farmers have planted bamboo to protect farm from flooding and sedimentation, but the farmers have perceived that bamboo planning has also negatively affected water availability. Since Majhi community has the indigenous skill of fishing, promotion of fish farming would be one of the climate change adaptation options that needs to be promoted. Bishnu Majhi further said, "If these issues remain unaddressed, the Majhi communities may displace themselves or got migrated". Therefore, the Majhi communities are demanding opportunities for alternative sources of livelihoods, such as fish farming, water conservation technology, and climate smart agriculture and improved goat farming that would increase their resilience against climate change impacts.

(Source: FGD with Majhi Community in Kunda village, Kamalamai-1 and field observations, April 2025).

During consultation, the Secretary of the Provincial Ministry of Forests and Environment stressed that the province's perception aligns with national and international understanding of climate change impacts. He acknowledged that increased forest fire is a major concern particularly in Chure region. Rising temperatures and low precipitation, exacerbated by climate change, are leading to increased frequency and severity of forest fires. This has also changed

[4] *People have realized that forest fire deteriorates forest resources and increases risk of fire spreading to the nearby villages as well.*

forest composition and health, which in turn has impacted water resources with forested areas. Thus climate change has created threat to forest-dependent livelihoods. Strong emphasis needs to give on utilizing nature-based solutions for climate adaptation, such as forest protection, ecological restoration, agroforestry models, stabilization of landslide-prone areas, and water protection measures. There is a poor exposure of DFO staff at field, which suggest to focus on capacity building and collaboration, promotion of sustainable forest management, exposure visits, capacity building on forest fire management (e.g., prescribed burning), and implementation of pro-poor and inclusive adaptation strategies.

Agriculture: In agriculture sector, prolonged drought, increasing sedimentation in agriculture field, on-going crop damage caused by pests, decrease in water availability both in springs and rivers, deteriorating of soil moisture due to excess heat, and non-functional or damage of irrigation infrastructure due to climate-induced events are the climate-change related key issues and challenges that the communities are currently facing. These challenges and issues have resulted low production of agricultural crops leading to hardship time to farmers. During the FGDs and KIIs, the respondents consistently expressed their concern that if the current agriculture patterns and declining production trends continues, food shortage could occur in coming years. These concerns were consistently expressed across all sub-watershed areas.

Livestock: Livestock production has huge potential in the study area especially for goat and cattle (for dairy) farming. The FGDs in the upstream (specially, in Simle Sub-watershed) shows that climate change has impacted comparatively lesser in terms of production and management practices compared to downstream in terms of availability of fodder. However, frequent incidences of disease and pests, unavailability of health related services (PPR and FMD vaccination) and breed improvement programs are major problems. Farmers from Simle and upper sub-watershed are still dependent on livestock for their livelihoods but farmers in the lower sub-watershed have relatively shifted from livestock to other livelihood options due to unavailability of water, fodder, related services and migration of human resources.

During the field observation and as expressed by the respondents in the FGDs, prolonged drought, rising temperature, water scarcity, declined availability of fodder and grazing problem due to forest fires and other climate change impacts have emerged as major challenges that have forced local communities to scale down livestock farming. Commercial livestock farming was found minimal. Among those who have adopted livestock farming, it is primarily for subsistence purposes. However, over 80% of the respondents suggested that there is huge potential of livestock farming, especially of goats and cattle in the sub-watersheds. However, some factors such as breed selection and genetic improvement, feed/fodder and nutrition management, health and disease management (disease prevention and veterinary services), housing and shelter in the context of changing climate impacts needs to be immediately considered for promoting goat and cattle rearing in the sub-watersheds. Although development partners like Heifer are promoting goat and cattle farming in some of the priority sub-watersheds (especially, Dhungajor sub-watershed and Ghangar sub-watershed), climate change induced problems are the major challenge for its growth.

In terms of government service providers, many municipalities lack specific activities to solve these problems. The activities are mainly concentrated to regular services like vaccination, AI, and shed improvement programs. Some programs from development partners like Heifer are also supporting for livestock development, but the service is limited to urban areas and specific farmers and farms. Livestock Service Department is focusing on improvement/increase of local service providers' capacity to increase health and breed improvement related services to improve production and economic return from livestock sector. They have very little done to

address the climate change impacts on livestock sector, and access of marginalized groups to these government services is very low further increasing the risk to the vulnerable communities.

The FGDs with CFUGs revealed that the availability of fodder in the forest have decreased in past 10 years due to drought and forest fires. Fodder plantation in farm land would be beneficial to increase fodder availability and decrease the effect of water and wind erosion in the farm land.

Water resource: As in other sectors, rising temperature and prolonged drought are key challenges affecting water resources. The climatic changes have led to the drying up of natural springs, streams, and other local water sources, significantly reducing the availability of water for both irrigation and drinking purposes. Some of the examples include Majhkhola in Ghaghar sub-watershed, stream in Dihi in Kamalamai-1, spring in Guranse Hayu settlement in Kamalamai-1, Khattar Tole, Kamalamai-5, Kharkhola in Marin-4, Mugredobar, Marin-2, Gwarkhola, Hariharpurgadhi-2, Guntekhola and Simle Khola, Ghyanglekh-1. In other case, water availability is reduced even in the major rivers like Marin River (e.g., Bhalkhada Vilalge, Hariharpurgadhi-5, Danuwar settlement), Ghagar Khola (e.g., Beltar, Kamalamai-1) during the dry season due to high sediment load, and local people dig a well and lift water for drinking as well as irrigation purposes. This has affected the operation of existing irritation and drinking water related infrastructures. This has resulted in reduced agriculture and livestock productivity, poor health condition of women, girls and marginalized groups due to lack of safe drinking water and poor sanitation conditions, and increased burden to girls and women who are responsible for fetching water for the household.

GEDSI: All these sectoral challenges due to climate change have disproportionately affected women, persons with disabilities, Indigenous Peoples (IPs), and other resource poor marginalized and vulnerable groups within the sub-watershed areas. Women have to spend more time for collecting drinking water and managing foods for her family. The IPs, and vulnerable communities are struggling to sustain their traditional livelihoods (*such as; goat farming, fishing, bamboo-mat making, etc.*), as climate change impacts have limited their opportunities for livelihoods, including production and marketing opportunity. Water scarcity, prolonged drought, rising temperature[5], and decreased availability of fodder and grazing due to forest fires and other climate impacts have forced these communities to slowly abandon their

Box 2: Impact of Climate Change on Indigenous Peoples and Vulnerable Communities

Case 2: Hayu Community in Gurans Hayu Village, Kamalamai-1

This community, though limited in household numbers, has suffered disproportionately than others in the sub-watershed due to climate change impacts. Mr. Amrit Hayu, a local Hayu leader said, “Low agricultural productivity, acute water scarcity even for drinking, landslides, forest fire, and rise in climate induced diseases are major climate change impacts suffered by already vulnerable Hayu community. Additionally, our traditional source of livelihoods- making bamboo mats- is under threat due to declining market demand. Actually, after covid-19, the bamboo mats demand sharply decreased as the use of the mat was replaced by tents and tarpaulin that was introduced at the aftermath of 2015 earthquake victims”.

Amrit said, ”I haven’t sold any bamboo mat for last two years”. The Hayu community is now in the verge of migrating due to lack of livelihood sources to feed their family. They see some hope if they could be supported in making bamboo products that have market and support them in marketing of the products. Besides, they want to move to climate-resilient agriculture if they were provided with irrigation facilities and livestock raising practices. Plantation of fruit trees is another suitable livelihood option for that settlement. The Hayu communities demanded opportunities for alternative sources of livelihoods for them to sustain in their traditional settlement.

(Source: FGDs and field observations, April 2025).

[5] *The rising temperature negatively affects weight gain, reproduction, breeding pattern, feed intake, and conversion efficiency of animals. It increases heat stress, morbidity, vector-borne diseases (such as ticks and flies), parasitic diseases (such as liver fluke and nematodes), new skin diseases, and ectoparasite infestation in animals. (MOFE-A, 2021)*

traditional livestock practices, including keeping big livestock (e.g., buffalo). These problems have been further triggered up due to poverty, temporarily migration of youth[6], inadequate support services from the governments, poor road condition, poor access to productive infrastructures (e.g., irrigation) and limited access to government's resources, including climate information and early warning systems. These issues were commonly reported and noticed across all sub-watershed areas.

The perception of local governments in the MaWRiN project area regarding climate change impacts is characterized by a strong awareness of threats. Local governments recognize that the project sub-watersheds are highly vulnerable to a range of climate-induced hazards, including floods and landslides, drought and water scarcity, forest fires, and these have significantly impacted on livelihoods of local communities, particularly the marginalized and vulnerable groups living in the sub-watersheds. They are also aware that climate change disproportionately affects local and indigenous communities who rely heavily on natural resources and subsistence agriculture. They have also noted the impacts on agricultural productivity and food security.

Local governments acknowledge that climate change impacts cannot be addressed in isolation. There's a push for integrated watershed management that explicitly incorporates climate change adaptation strategies, linking upstream and downstream issues. Moreover, they have recognized the need to enhance their own capacity, as well as that of communities and other key local agencies, to assess climate risks, understand vulnerabilities, and mainstream adaptation actions into local policies and plans. The establishment of multi-stakeholder platforms for dialogue and coordinated action is seen as crucial.

While understanding the perception of KII and FGD participants on recent changes in the geographical, social and economic conditions of the sub-watershed areas, the KII and FGD respondents reported that the conditions have mostly remained unchanged, but in some areas – particularly along the Ghanghar Khola in Ghanghar sub-watershed, Marin river in Hariharpurgadhi rural municipality, and some seasonal torrential streams to these rivers – the conditions may have been even deteriorated with sedimentation and agricultural land cutting problems compared to the time when the MaWRiN project document was initially prepared. This indicates a need of growing urgency for timely support from the concerned authorities to minimize the climate impacts.

3.1.2 Geographical Challenge

The project areas fall within the Chure region, which covers 12.78 percent of the total area of the country. This region is geographically fragile and its continuous degradation has become a major contributor to flooding and obstruction of water seepage in downstream areas, particular in the Terai districts (*Kantipur, 2024*). Although Sindhuli district have high vulnerability index and very high baseline risk as per the vulnerability assessment carried out by the Ministry of Forests and Environment (MOFE-A, 2021), the field observations of the prioritized sub-watersheds and consultations with local communities and other stakeholders the project areas suggest that the sub-watersheds fall under very high climate vulnerability and risk. This assessment is also based on site-specific socio-economic conditions, including low-income levels and a high concentration of Indigenous Peoples (IPs) and other vulnerable communities, and physical conditions of the site observed during the field work. This has also been highlighted by several literature and studies[7, 8].

[6] *Youth from most of households have migrated to big cities and abroad in search of employment. During the survey, when migration pattern was discussed with 10 households, seven reported that their son or daughters or both had migrated.*

[7] https://rightenergypartnership.org/indigenous-majhi-and-local-communities-affected-by-sunkoshi-marin-diversion-multipurpose-project-submit-13-point-demands-to-the-local-authorities/

Sector-wise vulnerability assessment of Sindhuli District (MOFE, 2021)

Vulnerability and Risks	Consolidated indices	Agriculture	GESI, livelihoods and socio-economic	Forest and Biodiversity	Water Resource
Exposure	0.636	0.441	0.718	0.589	0.191
Sensitivity	0.902	0.761	0.458	0.985	0.172
Adaptive Capacity	0.527	0.336	0.852	0.665	0.535
Vulnerability	0.738	0.674	0.243	0.505	0.287
Baseline risk	0.64	0.833	0.419	0.52	0.214

Source: Various VRA Reports by MoFE, 2021. *Available from:* https://www.mofe.gov.np/resources/study-reports-3115

The six priority sub-watersheds-out of ten- identified under the MaWRiN project, which mainly comes under Marin Watershed, fall under the high rainfall zone and are also highly susceptible to weathering resulting in enhanced risks of landslides and slope failures[9]. A vulnerability analysis carried out during the formulation of the MaWRiN-project revealed that the Marin Watershed is one of the most vulnerable to the impacts of climate change in Nepal where the risks are further exacerbated by the fragile geology and topography of the Chure region[10] and now Climate Change. Nevertheless, these sub-watershed areas are playing a critical role in regulating surface water flows, recharge groundwater, and the foothills serve as water recharge area for the adjoining Terai districts (*Source: MaWRiN project document; Kantipur, 2024*).

During the field observations, all selected sub-watersheds areas were noticed as vulnerable and fragile from erosion and sedimentation point of view. While the forest cover is relatively good in many areas, erosion and landslide events were still visible in several catchments. According to the respondents, landslides and erosion process is not new. The process of land degradation has been ongoing process for decades due to slope cultivation and arbitrary tree falling, gradual expansion of settlements into forest areas, and uncontrolled grazing and forest fires throughout the project area, particularly in Chure region (*source: FGDs, 2025; SAWTEE, 2016*). The land degradation process was more visible along the Ghaghar river, where sedimentation is the most critical problems that has damaged a large area of agriculture land along the river bank. The climate change has now exacerbated these existing pressures, increasing the frequency and severity of such hazards.

The key challenge is how to manage and protect Chure hills effectively and sustainably[11]. Keeping entire sub-watershed under protection regime is infeasible, as the majority of the population resides in these hills. Besides, this is a complex policy issue that also requires political commitment. The option could be maintaining balance between human and nature with a tripartite approach. This includes: i) protecting the vulnerable and ecologically fragile hills as a core area from further degradation, ii) adopting other areas under the conservation approach, and iii) raising awareness among the local communities about the climate induced risks and hazards, and promoting their nature-based solutions.

3.2 Assessment of Knowledge and Skills for Climate Change Adaptation

3.2.1 Basic Knowledge on Climate Change

[8] https://daosindhuli.moha.gov.np/en/page/district-profile-2

[9] NCVST (2009) Vulnerability Through the Eyes of Vulnerable: Climate Change Induced Uncertainties and Nepal's Development Predicaments, Institute for Social and Environmental Transition-Nepal (ISET-N, Kathmandu) and Institute for Social and Environmental Transition (ISET, Boulder, Colorado) for Nepal Climate Vulnerability Study Team (NCVST) Kathmandu.

[10] Upreti, et. al., 2023. Water quality, criticality and sustainability of mountain springs – a case study from the Nepal Himalaya, Environmental Monitoring and Assessment, 196 (1). DOI:10.1007/s10661-023-12186-6

[11] Enhancing the resilience of ecosystems and vulnerable communities by adopting climate-resilient land-use practices, Available from: https://brcrn.gov.np/

The respondents were asked how familiar they are with climate change impacts on different sectors, and what was their knowledge and skill gaps to improve their understanding on climate change impacts and identifying hazards and vulnerabilities. Mixed responses were expressed by the people during the FGDs and KIIs regarding their level of knowledge and understanding. Only few respondents- particularly government officials, few selected CFUG leaders and few elected representatives (Mayor/Chairperson and Deputy Mayor/Vice-Chairperson of rural/ municipalities *and very few Ward Chairpersons*) expressed that they have a basic understanding of climate change, its causes and impacts. These people had got exposure on this issue getting an opportunity to participate in the trainings or orientations organized by different organizations on climate change agenda within or outside the district. However, with exception of the government officials, even those who have some level of knowledge and understanding lacked knowledge about identifying available adaptation options and developing adaptation strategies. The cascading of skills and knowledge by these government officials and leaders to the community level was found low. There is an opportunity to use the already trained persons as local resource person to raise awareness on climate change impacts and adaptation options and strategies providing them with additional training required to develop as a local resource person (see Box 3).

Box 3: Potential Local Resource Person

Mr. Surya Bahadur Pakhrin, Ward Member of Kamalamai Municipaltiy, Ward No. 1 has received training on Climate Change, which had been organized by the Nepal Federation of Indigenous Nationalities (NEFIN). Previously, he was the Chairperson of NEFIN's district chapter. He is still active and has good rapport with the local communities. The MaWRiN project can use him as a local level resource person in future after providing him refresher training. (*Source: FGD, 2025)*

On the other hand, about 90% of the respondents- particularly women, farmers, community forest users, Indigenous Peoples, and marginalized groups, and even elected representatives of rural/municipalities (Ward Chairpersons, Ward Members) lack basic level of knowledge about climate change and adaptation measures. Even greater knowledge and skill gaps were observed among women farmers and members of Indigenous People (IPs), ethnic minorities (*Hayu, Majhi, Danuwar*) and other marginalized and vulnerable communities (e.g., Dalits, resource-poor), who have even not heard about climate change impacts and adaptation. However, they have experienced differential impacts from climate change, such as threatened income and food security, restricted ability to recover from climate-induced disasters, increased burden of care and reduced opportunities for education and economic activities, occupational health risks, and increased risk of displacement/insecurity. These findings suggest the need of foundation level knowledge on climate change both at community as well as local government level.

Box 4: Lack of knowledge on CC issue

During the field assessment, a woman who owns a small tea shop burnt plastic wrappers of instant noodles to create a high flame for cooking. She was cooking team for the study team. When asked about this practice, she explained that it makes her work easier. She mentioned that this is a common practice among women in that village. She also said she does not know anything about the consequence of burning the plastic. Burning plastics releases greenhouse gases, such as carbon dioxide and other health hazardous gases.

During the field study, it was noted that women, IPs, and marginalized and vulnerable communities are residing along the rive-banks and landslide-prone areas and they are heavily depending on climate sensitive sectors, such as: agriculture, forestry, livestock, river-based resources for their livelihoods. Besides, these groups have less access to government-resources and decision-making processes, as well. On the other hand, these people are source of local knowledge and traditional practices, which can be promoted with small inputs to

strengthen their capacity for climate change vulnerability assessment and adaptation options. Therefore, while organizing such education and awareness program, main focus should be given to women, ethnic minority groups, IPs and other marginalized/venerable communities.

3.2.2 Local and Indigenous Practices of Climate Change Adaptation Options

Interestingly, during the interactions across all six priority sub-watersheds, it was noticed that despite lacking formal knowledge about climate change and adaptation, local communities have been applying local level climate change adaptation practices based on their indigenous knowledge, experiences and capacities. It is interesting to note that all the sub-watersheds reported similar local and indigenous practices due to similar geographic, socio-economic conditions and same nature and severity of climate change impacts. Such practices, therefore, highlight the existence of indigenous and experience-based adaptation strategies in the project area, even in the absence of formal climate education. Some examples of local and indigenous practices of CCA is presented in this section.

Water management and women: About 10 years back, there used to be enough water running in the rivers (e.g., Ghanghar stream, Marin river, Kyan river), and women used to collect water from the river for livestock feeding and other household chores/sanitation purposes. However, due to sedimentation and rising of river beds, it is difficult to see water flowing in the rivers during dry season. Women from all sub-watersheds expressed that now they have practiced to collect drinking water by digging shallow wells in the near-by stream/river during the dry season when waters source dries up due to rising temperature.

Figure 11: Local technique for rain water harvesting. Guranshe. Kamalamai-1

These local practices have saved women and girls from the hardship to collect water from far sources. Moreover, some households in Gurans Hayu village, Kamalamai-1 have started harvesting rain water during rainy season and use it later in the dry season. Likewise, few farmers in Khattar Tole in Kamalamai-5 (Dhungejor sub-watershed) reported that they have started collecting greywater from kitchen digging small earthen pond adjacent to dishwashing slab, and use it for kitchen gardening.

Similarly, the FGD participants in Beltar, Kamalamai -1 in Ghaghar sub-watershed reported that most of the wells in the village go dry during dry season, and now they have started making wells at the river bank, from where they can lift water using electric pumps. This local knowledge has helped to manage water scarcity to some extent.

Figure 12: Well constructer near river bank to supply water during dry season in Beltar, Kamalamai-1

Adaptation to raising temperature: Another example of adaptation practice by the

Danuwar community in Hariharpurgadhi-5 is related to rising temperature. The community has now been adjusting their traditional working hours (10:00AM- 6:00 PM) to avoid work at the hottest time of the day. They set early to work (usually in agriculture fields), take rest during the hottest time of the day (12:00PM – 300 PM) and resume the work after 3:00 PM. This time adjustment has health benefits due to less exposed to high temperature, and also increased their productivity. Interestingly, these practices were innovated and adopted by them, without any knowledge of CC adaptation and external intervention.

Agriculture land protection: Planting bamboos along the river banks to protect agriculture field from riverbank cutting and sedimentation is one the adaptation options implemented by the local people. This practices is common is all the priority sub-watersheds, but more abundantly practiced in Ghaghar and Dhungajor sub-watersheds.

Figure 13: Bamboo growing along the river bank for protection of agriculture land from cutting and sedimentation (Left: Kunda village/Majhi settlement), Kamalamai-1; Right: Beltar village, Kamalamai-1 at Ghaghar Sub-watershed)

Other common adaptation practices reported by the farmers from the six priority watersheds are shifting crop patterns, use of hybrid seeds/breeds to cope with changing climatic conditions, and making a well in the river and uplifting water from well[12] for irrigation. Due to lack of sufficient water, farmers have now shifted to kitchen gardens for a continuous supply of fresh vegetables. Moreover, farmers reported that use of mulching is increasing to conserve soil moisture and suppress weeds.

Forestry: Forest fire is a common problem in all forests of the project area, with huge impacts on forest biodiversity, new growths or regeneration, availability of fodder and grass, and timber quality. Realizing the fact that dried leaves and litter are the major hazards for fire risk, community forest users in Hariharpurgadhi rural municipality have started collecting the dried leaves/litter and planning to use that to prepare briquettes or pallets.

It was also noticed during the field consultations that these local communities, if provided with proper training or orientation on climate change impacts, vulnerability and risks assessment and identifying and implementing climate change adaptation options to their local context, can enhance their resilience by adapting to the climate change effects. For doing such, they need to have understanding of easy tools and techniques which help them to rapidly identify, assess, and enhance local based climate change adaption options. Such support would enable them to build on their existing knowledge in a more informed and effective manner, ultimately improving their resilience and livelihoods.

[12] *Digging hole at the river bank for collection of water*

3.2.3 Mainstreaming of Climate Change Adaptation Options and Strategies

The mainstreaming of CCA plan and strategies was noticed in the annual program and plan of the municipalities in the project area. However, participation of communities in the local level planning process is poor. The major areas of CCA options integrated in the local government program and plan include promotion of climate-resilient crop varieties, promotion of climate-smart agriculture practices, fodder management and livestock health programs, protection and recharge of traditional water sources, and construction of river bank protection infrastructure. Besides, the Marin Rural Municipality has included one-pager information about the climate change agenda in its policy and program in the annual plan of 2081/82. People may raise questions regarding the depth, content, and practical implementation of this. Nonetheless, it is a positive initiative that the municipality has started considering the importance of climate change agenda in its plan. For better planning and use, certainly, local elected representatives and staff need their capacity enhanced, which help them mainstream the climate change adaptation strategies in a systematic and meaningful way in the local development planning process in future.

However, there are challenges in mainstreaming CCA into local level planning. Capacity gaps, financial constraints, coordination issues, data and information gaps, political prioritization, gender and social inclusion, conflicting policies, weak monitoring and evaluation, land use and tenure conflicts, lack of awareness, erosion of traditional knowledge, dependency on external support, governance issues, and limited community participation are major challenges to mainstream CCA at local level planning. The project needs to consider these challenges while designing CCA interventions in the project areas. The future priorities include strengthening the legal and policy framework for local CCA; enhancing local capacity and governance for CCA through targeted capacity building programs, promotion of knowledge management and strengthening multi-stakeholder platforms; and diversifying local climate finance sources through increased local revenue allocation and public-private partnerships. Moreover, the local governments should also prioritize data, information and early warning systems for climate-induced hazards (floods, landslides, droughts) especially targeting vulnerable communities.

Box 5: Incorporation of CC agenda in CFUG-OP

Case 1: Shree Komhendo CFUG, Haripurgadhi RM ward no 6 has included one-page (*page no 44*) CC agenda in its OP, outlining strategies of mitigation measures.

Case *2*: Chure Deurali CFUG, Kamalamai-4 and 5 has incorporated CCA options in its OP. Plantation of soil binding vegetation in gullies, construction of water collection pond, promotion of agroforestry system, among others are few measures that have been mentioned in its OP.

In forestry sector, CFUGs have started incorporating climate change agendas into their operation plans (OPs). Currently, when an OP is revised, it has become mandatory to include the climate change agenda. According to the Divisional Forest Officers of Marin and Sindhuli, the plan without CC agenda is not approved. Even then, questions can still be raised about its effectiveness and implementation of the provisions in the OPs. On the other hand, the positive part is that the CFUGs have started realizing the importance of addressing CC issues and the adaptation options. Unlike in other local institutions, funding is not barrier for implementation of CC related to programs in CFUGs, as they are required to allocate 25% of the total income for forest protection, development and management related activities, and minimum 50% of the income for poverty alleviation, women empowerment, and income generation and enterprise development in collaboration with the local government. The main challenge is their limited education and awareness about the climate change issues. With

enhanced knowledge and capacity-building support, CFUGs have the potential to meaningfully integrate and mainstream climate change adaptation strategies into their annual planning processes in coming days.

In agriculture and livestock sector, the concerned line agencies and agriculture and veterinary technicians of rural/municipality have also faced challenges and limitations in mainstreaming CCA in agriculture and livestock sectors. Limited climate information services to farmers, low awareness of climate change impacts and adaptation options, lack of technical knowledge on CCA practices both at staff and farmers' level, and loss of valuable indigenous adaptation practices (e.g., *Muhan* conservation, crop diversification or cultivation of diverse crop varieties, mixed cropping/intercropping versus monoculture, seed saving and exchange practices, minimum tillage and terracing, Rajkulo, traditional fishing practices, etc.) are some of the key challenges. Similarly, limited financial resources, high upfront costs, market problems, policy-practice gap, water scarcity and unpredictability, emergence of new pests and diseases, lack of availability of quality climate-resilient seeds/breeds and other inputs, and gender and social inclusion issues are also hindering mainstreaming CCA in agriculture and livestock sector.

3.3 Leadership for Climate Action in Sub-watersheds

The role of Mayor and Deputy Mayor[13] of local governments, District Level Government Line Agencies and Coordinators of the Sub-Watershed Coordination Committees is significantly important in coming days in terms of addressing the climate change induced challenges in the project prioritized sub-watersheds.

In federal setting, local government - particularly rural municipality in the MaWRiN project area - has authority over development planning and service delivery within their territory. Besides, they are also resourceful and can sustain the development initiatives. In this context, the elected representatives, if they oriented on climate change priorities and vulnerability assessment and accordingly convinced and motivated to implementation, can integrate climate change adaptation and mitigation into municipal development policy, plans and budget. This will ensure the inclusion of climate resilience strategies, and support for the preparation and implementation of adaptation plan, such as Local Adaptation Plans of Action (LAPA). Additionally, they can also coordinate with development organizations, provincial government to mobilize resources and monitor the implemented activities to ensure quality and effectiveness. Therefore, it is necessary to provide them with orientation on climate change and its impacts, vulnerability and risk assessment, identifying adaptation options, and planning and management on mainstreaming climate change adaptation options, leadership, GEDSI and other climate related areas.

The recently formed sub-watershed coordination committee may have crucial role in the implementation of the MaWRiN project in the selected sub-watersheds. Although the formal terms of references have yet to be developed, it can be assumed that the committee in future will serve as a coordinating body among rural municipalities, local communities, and the project itself within the sub-watershed following the watershed management approach. Besides, the committee may be expected to support the local communities in designing and mainstreaming the CCA options. However, without having adequate knowledge and capacity, the effectiveness of their roles could be limited. Therefore, the committee needs special institutional strengthening and capacity building support on (i) basic concept on climate change and its

[13] Chairperson and Vice-Chairperson in case of Rural Municipality.

impacts on different sectors; leadership skill training; orientation on importance and roles of women, IPs, and vulnerable communities in the sub-watershed management; institutional development and management training, and coordination and communication training, and basic knowledge on other relevant areas related to CC initiatives. Nevertheless, the committee urgently needs orientation about the MaWRiN project, which was also found lacking during the community consultations.

District-level government line agencies, such as Division Forest Office, Agriculture Development Office, Livestock Office, Irrigation Office, Technical Office, etc., also have a crucial role in supporting local communities in raising awareness on sector specific issues, providing technical assistance to address the issues, and helping to mainstream climate-resilient solutions into their daily practices. These agencies can act as a bridge between policy and practice by delivering expert knowledge, mobilizing resources, and offering continued guidance to communities. To effectively fulfil these roles, the personnel of the agencies need to technically equipped with up-to-date knowledge on climate change hazards and vulnerability assessment, identifying CCA options and designing CCA strategies based on the possible CCA options, sectoral best practices, existing adaptation practices and indigenous knowledge and skills, and integrating cross-cutting issues in CCA strategies for inclusive results. Therefore, capacitating the personnel of the relevant government agencies will definitely add value in the effective implementation of the MaWRiN project.

3.4 Sector Specific Training Needs

This section has only outlined the CCA related training needs, which were identified during the field observations, FGDs, and KIIs. These proposed trainings might be useful for building the capacity of local communities- particularly of women, IPs, and marginalized and vulnerable communities- to contribute to sub-watershed management interventions in order to sustain their livelihoods by adapting options to the impacts of climate change. The trainings have been further categorized by different sectors (agriculture, forestry, livestock, water) and is mentioned under each respective heading. Some skill-oriented training can also contribute to increasing the income of local communities—particularly women, Indigenous Peoples, and vulnerable groups—by promoting local-resource based entrepreneurship and livelihood development opportunities. However, to ensure effective delivery and long-term impact, the development of training modules, manuals, and materials should be the responsibility of the MaWRiN project or other relevant institutions including the respective government agencies or local governments.

Forestry Sector: The sub-watershed areas are relatively well forested and are currently being managed by CFUGs. However, Chure and Siwalik comes under moderate to very high climate risk category (MOFE-A, 2021), at the moment, it needs focused initiatives to conserve ecosystems, build community resilience, and enhance adaptive capacity of forest users against the CC impacts. Therefore, the following trainings are recommended.

SN	Training Need	Targeted for
1	Climate change science (climate change vulnerability and risk assessment, and identifying adaptation options)	DFO Staff, Forestry Technicians in LGs
2	Use of drone for monitoring of forest fires	DFO Staff
3	Planning and implementation of climate-resilient sustainable forest management practices	Staff and CFUG members
4	Monitoring and evaluation of adaptation effectives	Staff and CFUG members

SN	Training Need	Targeted for
5	Planning and implementation of low-cost techniques and practices for fire prevention, control, and management in a changing climate context	CFUG members
6	Ecosystem-based adaptation and nature based solutions in forestry	
7	Community Forestry Operational Plan Revision for CCA	CFUG members
8	Entrepreneurship and value chain development for forest-dependent communities (forest-based enterprises)	Staff and CFUG members
9	Harmonization of human-wildlife conflict through adaptive strategies	CFUG members/ farmers
10	Basic climate change literacy and understanding local climate impact	CFUG members/ farmers
11	Nursery manage techniques for raising climate-resilient varieties	CFUG members
12	Mainstreaming GEDSI in forest management and CCA	CFUG members

Note: Staff means government agencies' staff and local government staff as appropriate

***Soil Conservation and Watershed Management**:* Landslides, floods and sedimentation are big challenges to the local communities. These issues need to be addressed for better soil and watershed management efforts to sustain the traditional/indigenous as well as improved livelihood opportunities of the communities. Therefore, nature based solutions, which are cost effective and rely on locally available technologies, are suggested. Only the local communities need skills and knowledge to apply the solutions that enhance the capacity to adapt with the CC impacts.

SN	Training need	Targeted for
1	Climate change impacts on integrated watersheds management	Staff
2	Climate smart watershed management techniques, such as soil conservation, water harvesting, springshed management, terrace improvement and SALT Technology for slope stabilization	Local government staff and local communities
3	Nature based solutions for soil conservation and watershed management	Local government staff and local communities
4	Sustainable land management and monitoring of land degradation	Local government staff and local communities

Note: Communities includes farmers, women, youth, IPs and other marginalized and vulnerable

Agriculture and Livestock Sector: About 90% of crop loss in Nepal can be attributed to weather or meteorological events, increased temperature, and hazards such as erratic rainfall, droughts, and floods triggered by them (MOFE-C, 2021). Local communities also expressed similar problems which are occurring in their areas, as draught and poor irrigation systems are their biggest challenge. Based on our field visit and discussions, water seepage caused by crabs has been emerged as a significant issue in the watershed area. Rice and maize are the major crops that local communities are growing. During the interactions, farmers said the production is enough for year-round at the moment. However, they have already experienced decrease in food

productivity and expressed their fear that they might face food scarcity if the climate change impacts continue. To sustain or increase production at present, farmers need skills and knowledge to adapt with Climate Change impacts.

SN	Training need	Targeted for
1	Climate smart agriculture framework and vulnerability and risk assessment and identification of CCA options for agriculture	Staff, local government
2	Climate-resilient agriculture practices and technologies (to be delivered through climate field school model). The topics could include: crop management, water-saving technologies, integrated pest and disease management, crop diversification and intercropping, soil health management, post-harvest management, conservation agriculture practices, agroforestry, promotion of indigenous crops/seeds production & development	Local government, Farmers
3	Water efficient irrigation technology including water harvesting	Farmers
4	Identification of local adaptation options and mainstreaming GEDSI in CCA for agriculture sector	Local government Farmers
5	Promotion of river bed farming techniques for the agriculture land claimed by floods and sedimentation	Farmers
6	Mobile apps and ICT tool for weather forecasting and early warning system	farmers

Note: farmers also include Women, IPs, and Vulnerable communities

Improved Livestock farming: Local communities-particularly women, IPs, and vulnerable communities- were seen engaged in livestock farming, though in small scale. Among livestock raised, goat farming is the most common, while few households have raised chickens (e.g. Hayu Community). There is also potential for dairy farming. Due to water scarcity and prolonged drought, rising temperature[14], and grazing problem due to forest fires, local communities have slowly abandoned the traditional livestock practices and keeping big livestock (e.g., buffalo). Since livestock farming could generate household income, this should be promoted and continued. To support this, the local communities can be educated and trained in the following areas.

SN	Training need	Targeted for
1	Understanding the climate change impacts on livestock and assessing climate vulnerability and risks for livestock value chain, and identifying CCA options for improved livestock farming	Local government, Farmers
2	Climate-resilient livestock management practices (technical-know-how), including improved breeding for resilience (including artificial insemination), feed and fodder management, animal health and disease management, water management for livestock, Heat stress management, disease surveillance and control, etc.	Farmers

[14] *The rising temperature negatively affects weight gain, reproduction, breeding pattern, feed intake, and conversion efficiency of animals. It increases heat stress, morbidity, vector-borne diseases (such as ticks and flies), parasitic diseases (such as liver fluke and nematodes), new skin diseases, and ectoparasite infestation in animals. (MOFE-A, 2021)*

SN	Training need	Targeted for
3	Manure/waste management for GHG emission reduction	Farmers
4	Fodder and feed management	Farmers
5	Livestock shed improvement and management (climate-resilient)	Farmers
6	Introduction and promotion of climate-resilient improved livestock breeds, including artificial insemination	Farmers

Management of Water Resource: Local communities need water for irrigation, drinking purpose, raising cattle, vegetable farming, fish farming, among others. On the contrary, the availability of water throughout year is limited in the sub-watersheds areas. Therefore, people need training and orientation in the following areas to manage and utilize water resources more effectively to adapt with CC impacts.

SN	Training need	Targeted for
1	Integrated water resource management for CCA; and vulnerability and risk assessment for water infrastructure	Staff, Local government
2	Water scarcity, demand management and water quality management, water source and springshed protection and management in a changing climate	Local government, community
3	Nature based solutions for water management (wetland restoration, recharge ponds, reforestation, etc.)	Local government, community
4	Sustainable and efficient water use practices, such as source protection and recharge, rainwater harvesting and collection technique, traditional water management systems	Community
5	Mainstreaming GEDSI in CCA for water resource management	Community

3.5 Programmatic Way-Out Strategies

3.5.1 Sustainability of Project Interventions

It is often observed that the project's interventions use to fail in sustaining the interventions later when the project ends, either due to a lack of continued support or poor integration of the interventions into local system or inadequate localization of the initiatives. In such cases, the efforts and resources contributed by the project will be useless or lost. Therefore, ensuring sustainability of the project's intervention is needed to achieving long-term objectives of the project and enabling the local communities to continue the implementation of the best practices. For this, MaWRiN project requires to mainstream project plans and activities into the local government's annual plans, policies, and budget cycles. This approach will provide opportunity of institutionalizing climate adaptation and resilience measures within local governance systems, which contributes to continue the best practices beyond the duration of the project.

Another key institution at the community level is CFUG. The most of people living in the sub-watersheds areas, in one way or another are members of the CFUGs. In the study areas, almost all CFUGs are generating income annually, of which 25% needs to be allocated for the forest

development and management activities, while a minimum of 50% needs to be spent on activities targeted to poverty alleviation, women empowerment, and income generation and enterprise development within the CFUG. This provision could be a good funding source for a village to initiate and/or continue finance on climate change adaptation interventions. Therefore, MaWRiN project needs to engage with the CFUG during the project implementation, particularly through Sub-watershed Coordination Committee (SCC), and encourage and support them to mobilize the community development fund in CCA interventions. The SCC can play a crucial role in ensuring the sustainability of the sub-watershed management interventions and outcomes, as its role is not confined by the administrative boundary like a local government. It can act as a platform to bring together diverse stakeholders to develop and implement sub-watershed management plans and can promote participatory planning, which is a pre-requirement for sustainability. It can also mediate and resolve conflicts related to water allocation, land use or resource sharing, promoting equitable and sustainable resource use. It is one of the key institutions to foster community ownership and empowerment of women and marginalized groups in sub-watershed management. However, strengthening 'the infant SCC' should be one of the priority interventions of the project for working on 'watershed approach' and sustainability.

3.5.2 Promotion of Entrepreneurship Development

Simply engaging with local communities for the implementation of project's activities is not sufficient to ensure effectiveness in the implementation, unless and until, livelihoods issues of local communities-particularly women, IPs, and vulnerable communities- are not addressed. Therefore, they should be trained in entrepreneurship and enterprise development at community level. Most rural municipalities already have provisions for promoting enterprise development, including designated staff assigned to this responsibility. Besides, municipalities also have provision budget allocation to support such initiatives. The MaWRiN project only needs strategic partnership with the rural municipalities to tap such provisions, by coordinating with local governments to align efforts and maximize impact.

3.5.3 Policy Intervention

During the implementation of MaWRiN project's initiatives, the project might need policy support from the government, as policy interventions play a critical role in scaling, mainstreaming and sustaining climate change adaptation strategies across sectorial and thematic areas. Effective policies can institutionalize best practices, ensure inter-agency coordination, mobilize resources, and guide local action. Integration of the project plan into the local development plans, protection of vulnerable watershed areas, use of climate sensitive infrastructure guidelines, ensuring for the quality project outcome, use of CFUG fund, among others are few examples of areas where policy interventions may require. Therefore, MaWRiN project should maintain coordination and collaboration with rural municipalities, as well as with provincial and federal government bodies, to ensure alignment with existing policies and to advocate for necessary policy enhancements or policy coherence for mainstreaming climate change adaptation options in different sectors at local level.

Chapter 4: Training Curricula and Materials on Climate Change

4.1 Training Framework for Assessments of Climate Risks and Vulnerabilities, Identifying Adaptation Options, and Mainstreaming CCA at Local Level

This framework presents the training curricula, materials and tools for conducting training on participatory assessments of climate risks and vulnerabilities, identifying adaptation options and mainstreaming climate change adaptation for key sectors (Forestry, agriculture, livestock and water resource), which were designed based on specific needs and requirements of the targeted participants of the project area (*refer to the section 3.2 and 3.3*). For the effectiveness of training, the participants have been categorized into four groups. This categorization is important, because the knowledge, skill needs, and level of understanding between the two groups is different. Accordingly, the training course is tailored to meet their needs and to enhance their understanding level. The four groups categorized for the purpose of training curricula are as follows:

Group 1 - Local Communities: This includes farmers, forest users, youth, women, Indigenous Peoples, and marginalized and vulnerable communities.

Group 2 - Community-level Stakeholders: Community level stakeholders include members of sub-watershed coordination committee, civil society organizations/private sector service providers, community leaders, and local resource persons that support the implementation of the project activities in the project areas.

Group 3 - *Government Officials*: This includes policy makers-high level officers, officers of the federal and provincial ministries, and officers and sectoral mid-level professionals of district-based government line agencies, such as: Division Forest Office, Agriculture Office, Soil Conservation Office, Livestock, and other relevant agencies that provide services to the local communities in the project areas.

Group 4 - Rural/Municipality Officials: This includes local elected representatives and officials of municipalities.

In response to the identified needs of the groups, three modules outlined in Sections 4.2, Section 4.3, and Section 4.4 below, have been fabricated in such a way that it can be delivered either individually or as a combined package. Collectively, the module 1, 2, and 3 can be organized over a period of minimum 4 days. However, the duration and sessions can be customized as per the need of the targeted groups. For instance, only the module 1 and 2 can be packaged if it is necessary as per the need or priorities of the participants or demands of the organizations. Therefore, this modular approach provides flexibility in terms of duration, depth of contents, and session structure without compromising quality. The proposed training modules with detail sessions and training materials are submitted in separate document, as Part B.

4.1.1 Module 1: Foundational Knowledge on Climate Change

This training module has been designed to help the participants understand the concept and reasons for climate change, climate change impacts and the policy frameworks to address climate change in the country, specially keeping in mind their local context and the sector (e.g., agriculture, forestry, water, livestock, etc.) they are engaged with. This will lay the groundwork for understanding climate hazards, vulnerability, risks and adaptation options later. Having foundational knowledge on climate change is also important for building a common understanding among different actors of climate change in different sectors at local level. This

foundational module can also be customized and can be tailored to individual participant's needs irrespective of types of participants, their backgrounds, knowledge level, and learning capacity. For example, if the participants have little to no prior knowledge and/or understanding on climate change; this module can be adjusted accordingly to provide the foundation knowledge on climate change and its impacts. This may involve extending the training duration as per need, simplifying technical content, and providing detailed explanations to build foundational understanding. The day-wise session plan of Module 1 is given below.

Duration: 1 day

Day 1	**Module 1: Foundational Knowledge on Climate Change**
Introductory Session	Training opening, Introduction of participants, Introduction of the training, Expectation collection; Objectives of the training, Pre-training evaluation
Session 1-2	Basic Concepts, terminologies and definition related to Climate Change • Weather and climate • Climate change, causes of climate change and signs of climate change • Global warming and extreme climate events • Climate variability • Greenhouse gases (GHG) and sources of GHG emissions • Adaptation and mitigation • Other key terminologies related to climate change
Session 3	Climate change impacts in different sectors (Agriculture, livestock, forestry, water resources, GEDSI and marginalized and vulnerable groups)
Session 4	Climate change related policies in Nepal Climate change related policies at rural/municipality level

4.1.2 Module 2: Climate Change Vulnerability & Risk Assessment, and Identification of CCA Options

During the field study and stakeholders consultation, the need for providing training on Climate Change Vulnerability and Risk Assessment (CVRA) and Identification of Adaptation Options was identified as essential for a wide range of individuals and organizations, working to understand and respond to the impacts of climate change. In response to the need, this module has been designed for the following groups. Additionally, the module can be offered to other relevant stakeholders of the project, as needed.

The module focuses on "Participatory Gender-sensitive Assessment of Climate Change Hazards, Vulnerabilities and Risks, and Identification of Adaptation Options" for all key sectors – Forestry, Agriculture, Livestock and Water. This model is targeted to all four groups of participants as above (Section 4.1). However, the content and duration of the training will be different for different target groups and participants from different sector. For example, the training to CFUG will focus on participatory gender-sensitive assessment of climate change hazards, vulnerabilities and risks, identification of adaptation options in Forestry Sector.

a) For Communities and Community-level Stakeholders

Engaging local communities (particularly, farmers, CFUG members, women, IPs, and other marginalized and vulnerable groups) and community level stakeholders (CBOs, CFUGs,

Farmers' Groups, private sectors, local resource persons, and elected local government representatives) in the CVRA process and adaptation planning is crucial for assessing climate vulnerabilities and risks and identifying adaptation options to their local contexts, and the sustainability and effectiveness of the adaptation measures. Training community leaders and local stakeholders can empower them to understand the risks they face, participate in identifying solutions, and implement adaptation actions at the local level, incorporating their traditional knowledge and practices.

The training will focus on basic practical knowledge and methods for assessing climate hazards, vulnerabilities and risks, and identifying adaptation options based on the local context. The duration of this module of the training course to the farmers, local communities and community level stakeholders has been proposed for 1 day. The duration can be extended and so can the sessions. The extension should be based on the needs of the participants and the depth of content required. The training curriculum and session plan is given as below:

Module 2: Intermediate and Practical Knowledge on Climate Change Vulnerability and Risk Assessment and Identifying Climate Change Adaptation Options	
Session 1	Basic concepts of Climate Risk, Hazards, Exposure, Vulnerability, Sensitivity, Adaptive Capacity and Resilience
Session 2-3	Participatory gender-sensitive assessment of climate risks and vulnerabilities: Assessment methods and processes for the key sectors: • Forestry • Agriculture • Livestock • Water resource
Session 4	Identification of Adaptation Options (Including Nature-based solutions) for different key sectors: • Forestry • Agriculture • Livestock • Water resource

After the training, the local communities will be equipped with basic practical knowledge and tools to better understand their climate hazards, vulnerabilities and risks, and to develop adaptation options of site-specific challenges such as, floods and landslides, forest fires, draught, sedimentation, drying up of water sources, deteriorating of soil moisture, among others.

b) For Government Line Agencies, Local Government Officials, and NGOs

Staff from ministries (e.g., forests and environment, agriculture, water resources, health, infrastructure) needs the knowledge and skills about climate vulnerability and risk assessment and identifying climate change adaptation options to develop and implement effective climate change policies, strategies and adaptation plans at national as well as provincial levels. This includes understanding climate risks at national and provincial levels, setting priorities for adaptation and allocating resources effectively. Similarly, officials at local government levels also require this training to conduct local-level vulnerability assessments, integrate climate change considerations into development planning, and implement adaptation actions that are relevant to their specific contexts.

Staff working in international and local non-governmental organizations (NGOs) and development agencies needs these skills to design and implement climate-resilient development projects, conduct vulnerability and risk assessments of communities and ecosystems, and identity appropriate adaptation measures at the grassroots levels. Moreover, Sectorial professionals working at local level, such as agriculture extension officers, farmers' organizations, and researchers need to understand how climate change will affect crop yields, livelihood, and water resources and water availability to promote climate-smart agriculture and develop adaptation strategies for sustainable water management.

The training for this group of participants will focus on more technical aspect of assessing climate hazards, vulnerabilities and risks, and identifying adaptation options than that for the community level stakeholders. The duration of this module of the training course for government officials, local government officials and NGOs has been proposed for 2 day – one day for theoretical sessions and one day for practical sessions. The duration can be extended and so can the sessions. The extension should be based on the needs of the participants and the depth of content required. The training curriculum and session plan is given as below:

Module 2: Training on Climate Change Vulnerability, Risk Assessment and Identifying Climate Change Adaptation Options	
Day 1: Theoretical Session	
Session 1	Basic concepts of Climate Risk, Hazards, Exposure, Vulnerability, Sensitivity, Adaptive Capacity and Resilience
Session 2-3	Participatory gender-sensitive assessment of climate risks and vulnerabilities: Assessment methods and tools for the key sectors: • Forestry • Agriculture • Livestock • Water resource
Session 4	Identification of Adaptation Options (Including Nature-based solutions) for key sectors: • Forestry • Agriculture • Livestock • Water resource
Day 2: Practical Field Assessment Session Field Exercise: Participatory Climate Change Hazards, Vulnerability and Risk Assessment and Identifying Climate Change Adaptation Options (for key sectors – Forestry, Agriculture, Livestock and Water)	
Full Day Session 1-4	Participatory climate vulnerability and risk assessment (sector-specific) Identification of appropriate adaptation options based on the assessment Preparing report on participatory climate vulnerability and risk assessment

This training module to the local communities and community level stakeholders will be delivered by the government officials or local government officials trained as above. Since these personnel are responsible for supporting/facilitating the local communities in identifying, planning and implementing the climate change adaptation actions in different sectors, such as forestry, agriculture, livestock, water management, and other relevant sectors, these personnel need to be trained well to enhance their abilities to develop them as trainers or facilitators/resource persons, who will then cascade the knowledge and skills to local communities using participatory training methods. However, to ensure effective delivery, it is essential that the trainers already possess a foundational understanding of climate change**.**

4.1.3 Module 3: Mainstreaming Climate Change Adaptation Options

During the study, the mainstreaming of the Climate Change agenda in the policies and programs of the Marin Rural Municipality was noted, which is a positive step. However, when the annual plan was reviewed, it was seen that the plan did not include any activity related to the climate change agenda despite their mention in policy and program documents. When the reason was asked, the rural municipality officials acknowledged the importance of this issue but admitted that there was a lack of consideration while translating the importance of climate change agenda into action. Similarly, at CFUG level, the community forest operation plan has the provision of supporting the climate change agenda, but there is a gap in the implementation.

In response to resolve the above challenges, this module was designed to enhance the capacity level of the local elected representatives and government staff for enabling them to incorporate the CCA strategies and options in their respective plan. Since this module is primarily developed for policy and decision makers, planners, coordinators of sub-watershed coordination committee, and district-based head of government line agencies, the proposed duration is one day. However, the duration and session can be extended, if there is need of more depth learning. The training curriculum or agenda for the Module 3 training is as below:

Module 3: Mainstreaming Climate Change Adaptation Options in Key Sectors at Local Level	
Session 1-2	***Mainstreaming CCA Options in Key Sectors at Local Level*** • What is mainstreaming and why is it important? • Examples of adaptation options that can be mainstreams in different sectors (Forestry, Agriculture, Livestock, Water) • Methods and tools for mainstreaming climate change adaptation options at the local level (Forestry, Agriculture, Livestock, Water) • Challenges of mainstreaming CCA options in the four key sectors • Key considerations on mainstreaming adaptation options at local level
Session 3	• Local planning process and mainstreaming adaptation options • Challenges in mainstreaming adaptation options in local planning process • Role of leadership in mainstreaming climate change adaptations at local level
Session 4	Mainstreaming GEDSI in climate change and adaptation efforts (Sector-specific: Forestry, agriculture, livestock and water management sectors)
Closing Session	• Summarization and review of the training program • Post-training evaluation • Training evaluation by the participants • Closing session

It is important to note that this module can also be customized to tailor the need of local community for enhancing their knowledge and skills on mainstreaming climate change adaptation options at the local level/sub-watershed level.

4.2 Training Framework for other Training Identified during TNA

4.2.1 Forestry Sector

Modules	Training
Module 1	Climate Change Impacts in Forestry Sector of Nepal
Module 2	Role of Forests in Minimizing Climate Change Impacts
Module 3	Identification of Adaptation Options in Forestry Sector of Nepal
Module 4	Climate-resilient sustainable forest management practices
Module 5	Ecosystem-based Adaptation (EbA) in Forestry
Module 6	Low-Cost Techniques and Practices for Forest Fire Prevention, Control and Management in Changing Climate Context
Module 7	Monitoring and Evaluation of Effectiveness of CCA Actions
Module 8	Mainstreaming Gender Equality, Disability, and Social Inclusion (GEDSI) in Climate Change Adaptation Efforts in Forestry Sector of Nepal
Module 9	Integrating CCA in the Community Forest Operational Plan Revision
Module 10	harmonizing human-wildlife conflict (HWC) through adaptive strategies
Module 11	Nursery manage techniques for raising climate-resilient varieties

4.2.2 Agriculture Sector

Modules	Training Content/Subject
Module 1	Climate change impacts in Agriculture Sector
Module 2	Climate change related policies in Nepal (Related to agriculture sector of Nepal)
Module 3	Identification of adaptation options in Agriculture Sector of Nepal
Module 4	Examples of adaptation options that can be mainstreamed in agriculture sector
Module 5	Climate smart agriculture framework
Module 6	Challenges of mainstreaming CCA options in agriculture sector
Module 7	Climate resilient agriculture practices and technologies (including Nature-based Solution)
Module 8	Promotion of indigenous crops and seed production
Module 9	Promotion of riverbed farming in flood damaged agriculture farms
Module 10	Monitoring and evaluation of effectiveness of CCA actions
Module 11	Agricultural value chain development and market linkages

4.2.3 Livestock Sector

Modules	Training
Module 1	Climate resilient livestock management practices
Module 2	Livestock shed improvement and management
Module 3	Fodder and feed management
Module 4	Manure/waste management for GHG emission reduction

4.2.4 Soil and Watershed Management

Modules	Training
Module 1	Climate change impacts on watershed management
Module 2	Climate-smart watershed management techniques
Module 3	Sustainable land management and monitoring of land degradation
Module 4	Nature-based solutions for soil conservation and watershed management

4.2.5 Water Sector

Modules	Training
Module 1	Climate Change Impacts in Water Sector
Module 2	Integrated Water Resource Management for Climate Change Adaptation
Module 3	Water scarcity, demand management and water quality management in changing climate context
Module 4	Water source and spring source protection and management
Module 5	Nature-Based Solutions for Water Resource Management
Module 6	Mainstreaming Gender Equality, Disability, and Social Inclusion (GEDSI) in climate change adaptation for water resource management
Module 7	Challenges of mainstreaming CCA options in Water sector in Nepal

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Annexes

Annex 1: Checklists/Questionnaires

A. Checklist for KIIs

Awareness on Climate Change and Its Impacts

1. Are you familiar with climate change? How do you understand it?
2. What are the major impacts (differential impact) of climate change in your Palika/District?
3. What are the major impacts of climate change in the following sectors?
    - Agriculture
    - Livestock
    - Forestry
    - Water resource
    - GEDSI/IPs
4. How are people tackling with this impact? How you are contributing to that? Give example?
5. What are the major climate change hazards that you have experienced? Please rank the hazards in terms of their occurrence and severity.
6. Have you conducted or participated in any climate change related training/workshop?
    - If yes, when, where and what course or sector?
    - If no, why not?
7. What knowledge and skills do you think is required to improve your understanding on climate change impacts and identifying hazards?

Awareness on Climate Risks and Vulnerabilities

1. Are you familiar with Climate Risks and Vulnerabilities?
2. Has climate change increased climate risk in different sector in your working area?
    - If yes, please provide example/cases of differential climate risk and vulnerability (sector-wise).
3. Who are the most vulnerable people to these climate risks, and how? In particular, how women and vulnerable IPs (e.g. Majhi, Hayu) are impacted by the climate risks?
4. How do you address the identified climate risk and vulnerability?
5. What knowledge, skills, practices and tools/technologies have you used to assess the climate risks and vulnerability?
6. Has anyone from our organization participated in climate risks and vulnerability assessment related training?
    - If yes, when, where and what course or sector? If no, why not?

7. What additional knowledge and skills do you think it is necessary to improve your (and staff) understanding on climate risks and vulnerability assessment?

Knowledge and understanding of Climate Change Adaptation Options

8. Are you familiar with the concept 'Climate change adaptation (CCA)'?
9. Are you aware how CCA helps to minimize or adapt to climate change impacts and climate risks and vulnerabilities? Give example based on your experience.
10. What CCA interventions are currently being used from your organization to adapt to the climate impacts, risks and vulnerabilities identified as above?
11. How the CCA interventions were implemented? (process, engagement, resources, etc.)
12. What gaps do you see to sufficiently address the identified climate impacts, risks and vulnerabilities?
    - Agriculture
    - Livestock
    - Forestry
    - Water resources
    - GEDSI/IPs
    - Other ……
13. What knowledge, skills, tools and technologies do you have at present to address the above gaps (sector-wise)?
14. What additional knowledge and skills do you need to identify CCA options to address the climate impacts, risks and vulnerabilities more effectively?

Mainstreaming CCA on Different Sectors

1. Are you aware of any CCA action plan/strategy in your organization? If yes, what are they?
2. How has the strategy/action plan stressed mainstreaming CCA on different sectors to adapt to climate change impacts, risks and vulnerabilities?
3. Has the local planning process included CCA mainstreaming in different sectors? If yes, what are the major focuses of the process?
    - Agriculture
    - Livestock
    - Forestry
    - Water resources
    - GESI/IPs
4. Have you participated in any training or capacity building events to improve your knowledge and skills on CCA mainstreaming process? If yes, what, when and what course or sector?
5. Do you think you need additional knowledge, skills and tools to enhance your capacity on CCA mainstreaming and localization? If yes, what are they?
6. What challenges do you see in mainstreaming climate change adaptation in your/local development planning process?
7. Who are institutional mechanisms for mainstreaming CCA options in watershed/river system approach? How these institutions can be strengthened (what are capacity needs)?
8. What are the gaps and priorities of local government in assessing climate risks and vulnerabilities, and mainstreaming/implementing CCA options?

B. Checklist for FGDs

Awareness on Climate Change and Its Impacts

1. Are you familiar with climate change? How do you understand it?
2. What are the major impacts of climate change in your community?
    - Differential impact in terms of social marginalization, e.g., women, IPs, NRM group, farmers' group, specific resource dependent vulnerable communities (Majhi, Hayu.),
3. What are the major impacts of climate change in the following sectors?
    - Agriculture
    - Livestock
    - Forestry
    - Water resource
    - GEDSI/IPs
4. To what extent has this climate change affected you? In which area and how?
    - How are you tackling with this impact? Any example?
5. What are the major climate change hazards that you have experienced in your community? Please rank the hazards in terms of their occurrence and severity.
8. Have you participated in any climate change related training/workshop?
    - If yes, when, where and what course or sector?
    - If no, why not?
9. What knowledge and skills do you think that is required to improve your understand on climate change impacts and identifying hazards?

Awareness on Climate Risks and Vulnerabilities

15. Are you familiar with Climate Risks and Vulnerabilities?

    (Example: drought (hazard); risk: drying of springs; decrease in productivity due to soil moisture and nutrient loss; outbreak of insects and pests)
16. Has climate change increased climate risk in different sector in your community?
    - If yes, please provide example or cases of differential climate risk and vulnerability (sector-wise).
    - Specify any vulnerable sites/community.
17. Who are the most vulnerable people to these climate risks, and how?
    (Example: **women** have to travel more for water; **poor farmers** lose their livelihoods)
18. How women and IPs (e.g. Majhi, Hayu) are impacted by the climate risks?
19. How do you assess climate risk and vulnerability now? What are your existing knowledge, skills, practices and tools/technologies for risks and vulnerability assessment? (Indigenous knowledge, practices, tools, etc.)
20. How does the community deal with the identified climate risk and vulnerability?

21. Have you participated in any climate risks and vulnerability assessment related training? If so, how many of you have participated in the training from your community/organization?
    - If yes, when, where and what course or sector?
    - If no, why not?

22. What additional knowledge and skills do you think it is necessary to improve your understanding on climate risks and vulnerability assessment?

Knowledge and understanding of Climate Change Adaptation Options

23. Are you familiar with the concept 'Climate change adaptation (CCA)'?

24. Are you aware how CCA helps to minimize or adapt to climate change impacts and climate risks and vulnerabilities? If yes, can you provide an example of CCA you have noticed or applied?

    - Agriculture
    - Livestock
    - Forestry
    - Water resources
    - GESI/IPs related
    - Other ……..

25. What knowledge, skills, tools and technologies do you have at present to address the identified climate impacts, risks and vulnerabilities (sector-wise)?

26. What kind of indigenous knowledge, practices, tools and technologies are being used as CCA options to adapt to climate impacts, risks and vulnerabilities? How can these be promoted?

27. What additional knowledge and skills do you need to identify CCA options to address the climate impacts, risks and vulnerabilities more effectively?

Mainstreaming CCA on Different Sectors

9. Are you aware of any CCA action plan/strategy in your Palika?

10. Are you aware of the community planning process? Have you participated in local planning process?

11. Has the planning process included CCA mainstreaming in different sectors? If yes, what are the major focuses of the process?

    - Agriculture
    - Livestock
    - Forestry
    - Water resources
    - GESI/IPs

12. Have you participated in any training or capacity building events to improve your knowledge and skills on CCA mainstreaming process? If yes, what, when and what course or sector?

13. Do you think you need additional knowledge, skills and tools to enhance your capacity on CCA mainstreaming and localization? If yes, what are they?

14. What challenges do you see in mainstreaming climate change adaptation in your/local development planning process?

Annex 2: List of FGDs

S.N	Sub-Watershed	Name of Municipality	Ward No.	Tole/Settlement	Remarks
1	Dhungajor	Kamalamai Municipallity	5	Khattar	Mixed groups
2		Kamalamai Municipallity	1	Guranse	Hyau Settlement Focused
3		Kamalamai Municipallity	1	Dadhigurans Tole	Mixed groups
4		Kamalamai Municipallity	4	Kudule	Mixed groups
5		Kamalamai Municipallity	1	Purano Dihi	CFUG Focused
6	Jalkeni Sakhauri	Hariharpurgadhi Rural Municipality	5	Bhalkhada	Danuwar Settlement Focused
7		Marin Rural Municipality	2	Mungredobhan	Mixed groups
8		Hariharpurgadhi Rural Municipality	4	Belpur Tole	Mixed groups
9		Marin Rural Municipality	1	Tudikhel	CFUG Focused
10	Ghargar	Marin Rural Municipality	5	Chauki	Mixed groups
11		Kamalamai Municipality	1	Kunda	Majhi Focused
12		Kamalamai Municipality	1	Beltar	Only Male Group
13		Kamalamai Municipality	1	Beltar	Only Women group
14	Phulbari	Marin Rural Municipality	4	Khayersal	Mixed groups
15		Marin Rural Municipality	5	Mahji Gaun	Youth Club Members
16		Marin Rural Municipality	5	Ghata Tole	Majhi Group Focused
17		Marin Rural Municipality	4	Saahan	CFUG focused
18	Shimle	Ghyanglekh Rural Municipality	1	Tunibhanjyang	Leasehold Forestry Focused
19		Ghyanglekh Rural Municipality	1	Shimle Khattar	Mixed groups
20		Ghyanglekh Rural Municipality	1	Shimle Tole	Mixed groups
21		Ghyanglekh Rural Municipality	1	Moktantole	Women Focused
22	Kyan Sub-Watershed	Hariharpurgadhi Rural Municipality	6	Beshi Tole	Mixed groups
23		Hariharpurgadhi Rural Municipality	6		Women Focused
24		Marin Rural Municipality	3	Barunshir Tole	Mixed groups
25		Hariharpurgadhi Rural Municipality	7	Patharai	Women Focused
26		Hariharpurgadhi Rural Municipality	7	Tallo Patharai	Mixed groups
27		Hariharpurgadhi Rural Municipality	8	Pachtale Jamune	Mixed Group

TNA_FGD List.pdf

The attendance sheet of the FGD respondents is attached here:

Annex 3: List of Key Informants

SN	Name of Interviewee	Position	Office/LG/Organization	Location/Address	Contact No
1	Dr. Kedar Baral	Secretary	Ministry of Forests and Environment	Hetuada	
2	Uma Devi Shrestha	Asst Officer	Agriculture Dev Office	Kamalamai	9842061904
3	Surya Bahadur Pakhrin	Chairperson	Kamalamai Ward 1		9844042329
4	Dipesh Pakhrin	Chairperson	Mahamandal Danda CFUG	Kamalamai 1	9745963103
5	Umesh Kumar Nepali	Teacher	Jnaka Kalyan Primary School		9844260420
6	Sirjana Bamjan	Secretary	Kainagaira CFUG	Marin 5	9761753265
7	MaheshrajKhatiwada	Watershed Coordinator	Dhungajor sub-Watershed	Kamalamai 1	9864140318
8	Jit Bahadur Kaltan	Ward chair	Marin RM	Marin 4	9745695243
9	Kamal Kumar Rai	Ward chair	Hariharpurgadhi RM	Ward 4	9864027807
10	Jitmaya Ghising	Ward Secretary	Hariharpurgadhi RM	Ward 4	9864027000
11	Ghorkha bdr Ghising	Ward Secretary	Hariharpurgadhi RM	Ward 5	9864522636
12	Jagat Bahadur Bholan	Chairperson	Ghyangekh RM	Ward 1	9844595379
13	Som Bahadur Bholan	Ward Chair	Ghyangekh RM	Ward 1	9842613247
14	Ajaya Bikram Manandhar	Officer	Division Forest Office	Mahadevsthan	9854020190
15	Navaraj Thapa	Asst Officer	Livestock Development Office	Kamalamai	9844041022
16	Uddhav Pd Dhakal	Chairperson	Churedeurali CFUG	Kamalamai 5	9854041315
17	Hem Bdr Baraili	Technician	Livestock Office	Marin RM 4	9844517739
18	Madan Shrestha	Agriculture Officer	Marin RM Agri Sectio	Marin RM 6	9744346606
19	Saila Lama	Chairperson	Hariharpurgadhi RM	Ward 5	9848950320
20	Dev Krishna Rai	Chairperson	Hariharpurgadhi RM 5	Shikhar CFUG	9869319599
21	Damber Bdr Acharya	Ward Secretary	Marin RM	Ward 2	9849556395
22	Kamal Bdr Alemagar	Spokesperson	Marin RM	Marin 2	9866403321
23	Ghanshyam Bohara	Forest Officer	Sub Div Kamalami Mun	Ward 1	9848661838
24	Sunita Ale	Chairperson	Jalewadevo CFUG	Kamalamai 1	9844949258
25	Deepk Majhi	Chairperson	Marin RM	Ward 5	9817652942
26	Baburam Devkota	Chairperson	FNJ, Sindhuli	Kamalamai	9869888891
27	Hitlal Shrestha	Chairperson	FECOFUN	Kamalamai	9844075515
28	Sundar Tamang	Chairperson	FENFIT	Kamalamai	9851179677

SN	Name of Interviewee	Position	Office/LG/Organization	Location/Address	Contact No
29	Khetraj Adhikari	Chairperson	NGO-Federation, Sindhuli	Kamalamai	9854041163
30	Pawan Pakhrin	Officer	NRCS	Kamalamai	9844095336
31	Durga Raj Poudel	Officer	Relief Nepal	Kamalamai	9851022634
32	Sagar Kumar Dhakal	Env Dept Head	Kamalamai Municipality	Kamalamai	9854041278
33	Mahendra Dhakal	Ward chair	Kamalamai Municipality	Ward Number 4	9844045333
34	Purna Bahadur Khadka	Ward Chair	Kamalamai Municipality	Ward Number 5	9841739251
35	Binaya Kumar Saha	Officer	Chure Uthan Pariyojana	Kamalamai	9852052317
36	Bimarsha Muktan Prakhyat	Chair	Marin RM	Kapilkot	9864054603
37	Bimala Majhi	Deputy Chair	Marin RM	Kapilkot	9824855560
38	Bikash Sundash	Chief Administration Officer	Marin RM	Kapilkot	9854044130
39	Saroj Rai	Officer	Chure Uthan Pariyojana	Kamalamai	9767265982

The attendance sheet of the respondents is attached here:

TNA_KII List_MaWRiN Project.

Annex 4: Lists of Vulnerable Sites

SN	Vulnerability of the Site	Location/ Address	Current or future climate risks or vulnerability issue	Community demand to address the climate vulnerability and risk
1	Sedimentation in the confluence of Ghumaune Subbeni streams	Beltar, Kamalamai-1, Ghaghar Sub-Watershed	Flooding, riverbed cutting, sedimentation, decrease in water availability	Retaining wall, river bank protection with nature-based solution, water lifting support for irrigation
2	Cutting of land by Ghaghar Khola	Kunda Village, Kamalamai-1, Ghaghar Sub-watershed	Flooding, riverbed cutting, sedimentation of agriculture land, loss of traditional fishing occupation (reduced fish availability)	Retaining wall for river bank protection and protection of agriculture land, water source protection, climate smart agriculture technology with fish farming for livelihood support
3	Sedimentation of agriculture land by Ghaghar Khola	Chauki Village, Marin -5, Ghaghar Sub-watershed	Flooding, sedimentation on agriculture land, loss of agriculture productivity	Retaining wall for river bank protection, riverbed farming, livelihood (goat) support
4	Confluence of Marin and Dwar Khola	Bhalkhada Village, Hariharpurgadhi-5, Jalkeni Sakhauri Sub-Watershed	Drought, Reduced water availability both for drinking and irrigation resulting in loss of livelihood opportunities, flooding/cutting of agriculture land, sedimentation, Loss of traditional fish farming, increased heatwaves,	Irrigation infrastructure, climate-smart agriculture, Drinking water supply, River training works, Livelihood improvement activities
5	High possibility of landslide in Hayu settlement in Guranse Mahedehi village	Guranse village, Kamalamai -1, Dhungajor Sub-watershed	The settlement is on the ridge of the hill, which has risk of having landslide in future. Water scarcity, decreasing agricultural production due to land erosion, spread of insects and diseases Loss of their traditional occupation – bamboo mats making- due to lack of market after the COVID-19 endemic	Plantation of bamboo and soil binding vegetative species, expansion of rainwater harvesting, construction of drainage. Support and capacity building for alternative livelihoods, e.g, climate-smart agriculture and livestock practices, irrigation support (efficient irrigation technologies) Market assessment and support to promote their traditional occupation and skills
6	Kharkhola, Magani settlements (affected by flood and reduced water sources)	Khayarsal Tole, Fulbari Chyane, Marin-4	Big loss due to flooding in the settlements like Kharkhola, Fulbari and Magani, significant decrease in water availability in the rivers in these settlements, while two streams are completely dried now.	Need to conduct flood control gabion wall construction at the chure area with nature based solutions. Increased access to irrigation facilities, support to drinking water supply scheme, promotion of climate-smart agriculture practices, livelihood improvement activities.
7	Sedimentation at Ghata Tole by Marin River	Ghata Tole, Marin-5	The sedimentation from Chure in Ghata Tole has raised the river bed of Marin river, due to which agriculture land along the river has been deprived of irrigation facilities. Moreover, the	River bed protection, irrigation facility, river bed agriculture training and support, water availability

SN	Vulnerability of the Site	Location/ Address	Current or future climate risks or vulnerability issue	Community demand to address the climate vulnerability and risk
			agriculture land has been covered with sediments. The water-well is also gets dried during dry season.	
8	Agriculture land cutting by Fulbari Khola and sedimentation in Thulidamar, Dharange, Maruwa dovan and Pasupati Mandir area	Pashupati Community Forest, Sahani Tole, Marin - 4	The Fulbari stream has cut the agriculture land and even settlements along the river. There are around 8-9 small streams that get flooded during rainy season. This stream has increased the vulnerability of the settlements.	Protection of agriculture land cutting (river bed training, seasonal stream protection to reduce sedimentation load alternative livelihoods support
9	Irrigation canal not in operational/damaged due to drying up of water source in Purani Dihi	Jalewa Aadarsha Community Forest User Group, Purano Dihi, Kamalamai-1	The source of Muhan Khola is dried up due to ephemeral or seasonal streams, and poor access to irrigation due to landslide in the irrigation canal from Muhan Khola	The management of the Jalewa stream has proven challenging as diverse water sources emerge at various points when check dams are constructed by the CFUG. Check dams should be installed to a depth of at least 2 meters.
10	Landslide at Mugredovan and land cutting at ward office premises	Mugredobar village, Marin-2	The Mugredovan River has caused significant damage in the Chuhar settlement, eroding approximately 2 Bighas of land due to landslides. Since 2050 BS, the Majhi community has been forced to abandon their traditional fishing profession because of drying of river or water flowing under the surface due to sediment deposition. Additionally, in Tilbari settlement, two houses are at high risk of being swept away by landslide. If these houses are affected, it poses a significant risk of causing extensive damage to the settlements downstream. The open area in front of the Mugredwar Ward Office is suffering increasing damage annually due to erosion caused by the Marin River.	Construction of check dams with nature based solutions, plantations
11	Landslide and flood	Bhaisitole,	Flood and Landslide Damage: The Jalwe	Flood and landslide control measures with nature-based

SN	Vulnerability of the Site	Location/ Address	Current or future climate risks or vulnerability issue	Community demand to address the climate vulnerability and risk
	in Jalabe stream, Kai, Stream, Raman Stream affected land cutting. Irrigation canal is destroyed by Range Khola	Hahiharpurgadhi - 6	Khola, Kai Khola, Ghatte Khola, and Raman Kholsi have caused significant damage due to recurrent floods and landslides. Agricultural Impact and Irrigation Challenges: The **Kyan River's** floods have washed away paddy fields and caused extensive land erosion. An irrigation canal was constructed from the Bagmati River to the Range Khola**;** however, consistent irrigation has been hampered by frequent landslides along its course.	solution. Repair of irrigation facilities and promotion of climate resilient agriculture practices for improved livelihoods of the local women, marginalized people.
12	Water sources disappearing in Panchtale CFUG	Panchtaale Jamune Tole, Hahariharpurgadhi - 7	Water scarcity and lack of proper management of forest areas. Natural water sources are disappearing. There's shortage of drinking water sources in the forest areas, and the existing springs/sources have not been conserved.	Nature based solutions, proper management of forests and plantation for soil erosion and conservation of water springs/sources.
13	Sheer Tole: Land erosion and lack of irrigation canal	Kyan Watershed, Marin ward 3 Sheer Tole	The Barun river is causing erosion of land in Shari village. There has been no provision for an irrigation canal (kulo).	There is a need for embankments (revetments), afforestation/nature-based solutions to control river bank cutting and erosion.
14	Risk of Landslide and flood from Guntekhola to Shimlekhatar village	Simlekhatar village (Dalit Majority) Ghyanglekh-1	In Simlekhatar village, the Gunte Khola and Simle Khola have caused floods and landslides.	Conservation should be undertaken using bioengineering technology/nature based solution There is a need to establish an irrigation system by lifting water from the Simle Khola
15	Erosion in Tundikhel village	Tundikhel village, Marin-1 (Jalkeni Sakhauri Sub-watershed)	Erosion of agriculture land due to rain (sheet erosion) and wind due to farming in slopy land and no vegetation in the bunds. Drought due to unavailability of irrigation and climate change impact (changes in rainfall patterns). Increased forest fire incidence, reduced agriculture	Support to lift irrigation system from Marin river, Irrigation canal construction, Protection of the origin of Kokchar Khola and Gangare Khola, Construction support to water collection tank/pond as well as support to rainwater harvesting systems. Skill development training on commercial vegetable

SN	Vulnerability of the Site	Location/ Address	Current or future climate risks or vulnerability issue	Community demand to address the climate vulnerability and risk
			production, increased spread of pests and diseases in crops and livestock	farming for income and (self) employment opportunities, climate-resilient agriculture and livestock practices; promotion of conservation agriculture practices in sloppy land
16	Tunibhanjyang: Fire and drought in leasehold forest	Gyanglekh-1 (Shimle Sub-watershed) (Leasehold forest site)	Forest fire and drought in the leasehold forest; construction of road inside the leasehold forests has caused sedimentation in the lower area/downstream causing loss of broom grass (amriso). It has also triggered soil erosion and sedimentation in the farm land	Training and equipment support to leasehold forest users for forest fire control measures, promotion of citrus and *amriso* cultivation in the leasehold forest through support on irrigation facilities. Fodder plantation in the farmland bunds to support livestock production and improve vegetative cover for reduced soil erosion.
17	River bank cutting by Barun Khola	Marin-3 (Kyan Sub-watershed), Barun Shir Tole	Barun khola, which later merges with Kyang khola, has significant river cutting and loss of agriculture lands. Although this problem is smaller now, but could be severe and hence need to address when small.	Irrigation and drinking water supply, river protection infrastructure (plantation, gabion wall construction with nature based solutions)
18	Landslide and sedimentation in Kudule Tole (Dhungajor sub-watershed)	Kamalamai Municipality-4	Landslides and sedimentation, droughts, drying water sources and water scarcity for irrigation, forest fires, reducing agriculture production and increased pests, insects and diseases in crops and livestock.	Special request to MaWRiN project to support lift irrigation system from Marin River. Field-based training in commercial vegetable production (climate-resilient technology) and climate-smart livestock farming support. Training on Disaster Risk reduction and forest fire control, Organizational strengthening training to sub-watershed committee based on watershed management approach.

Annex 5: Photos of the Vulnerable Sites

Sedimentation in the confluence of Ghumaune and Subbeni streams
Beltar Village, Kamalamai-1, Ghaghar Sub-Watershed

Cutting of agriculture land by Ghaghar Khola in Kunda Village (Majhi Settlement), Kamalamai-1, Ghaghar Sub-watershed

Agriculture land claimed by flooding and sedimentation of Ghaghar Khola, Chauki Village, Marin - 5, Ghaghar Sub-watershed

Flooding/sedimentation in the confluence of Marin and Dwar Khola
Bhalkhada Village, Hariharpurgadhi-5, Jalkeni Sakhauri Sub-Watershed

Sedimentation at Ghata Tole by Marin River, Ghata Tole, Marin-5

Depletion of water source in stream in Purani Dihi, Kamalamai-1 (above). This has affected irrigation canal, which is not in operation due to no water availability (below)

Water recharge pond constructed in Panchtale CFUG is at risk due to drought, Panchtaale Jamune Tole, Hahariharpurgadhi - 8

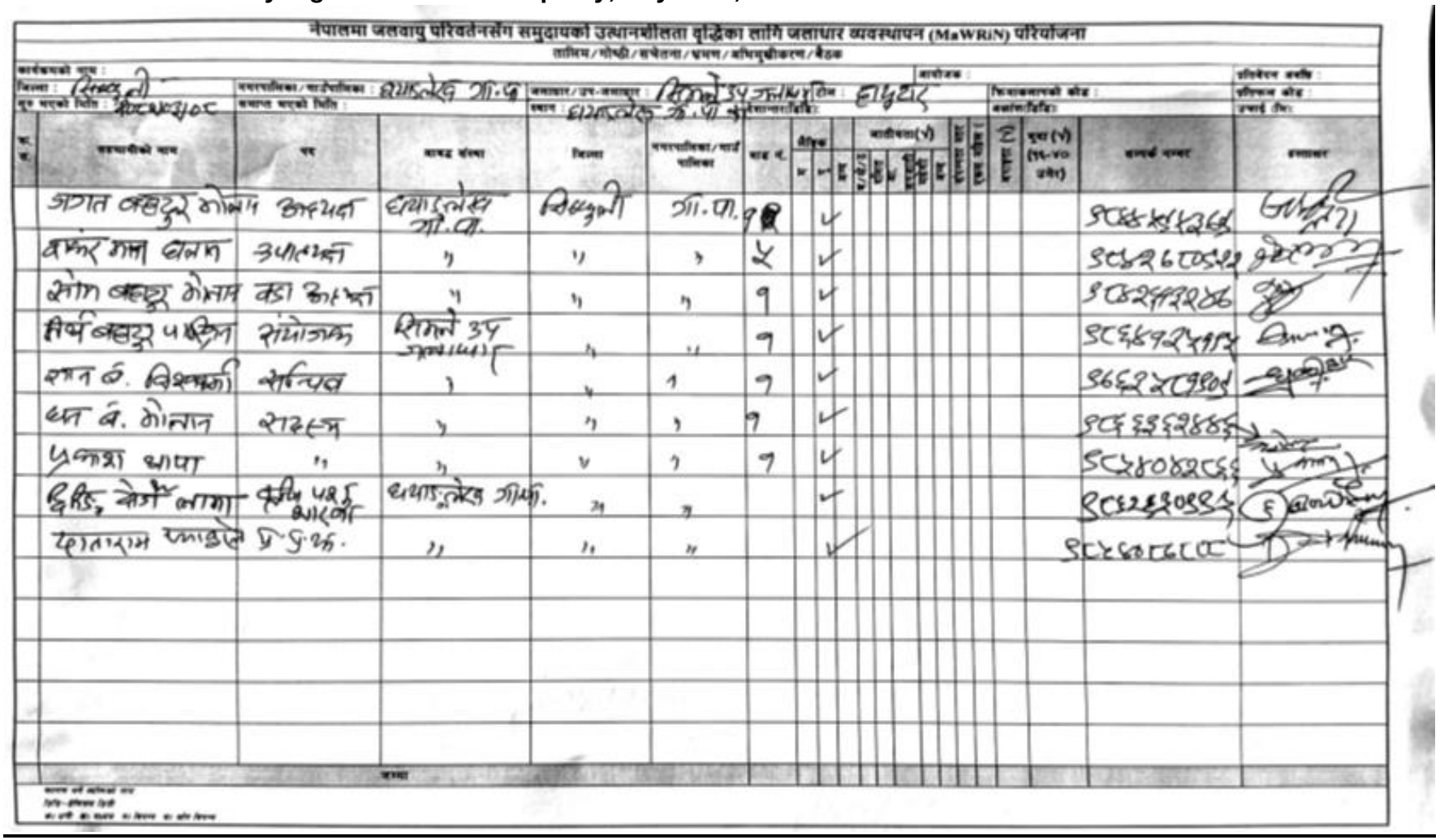
Flood cutting agriculture land and lack of irrigation canal in Kyan Watershed, Marin- 3

Soil Erosion in agriculture farm land in Tundibhangyang village, Ghyanglekh -1 (Simle Sub-watershed)

Forest biodiversity loss due to forest fire Marin-3 (Kyan Sub-watershed), near Barun Shir Tole

Annex 6: List of Participants of the Stakeholder Consultation and Validation Events

Attendance list of Ghyanglekh Rural Municipality, Hayu Tar, Sindhuli



नेपालमा जलवायु परिवर्तनसँग समुदायको उत्थानशीलता वृद्धिका लागि जलाधार व्यवस्थापन (MaWRiN) परियोजना

तालिम/गोष्ठी/सचेतना/प्रवर्धन/क्षमतावृद्धीकरण/बैठक

क्र.सं.	सहभागीको नाम	पद	सम्पर्क नम्बर	जिल्ला	नगरपालिका/गाउँपालिका	वडा नं.	लैङ्गिक			जातीयता(ज)								उमेर समूह (१६-४० वर्ष)	सम्पर्क नम्बर	हस्ताक्षर
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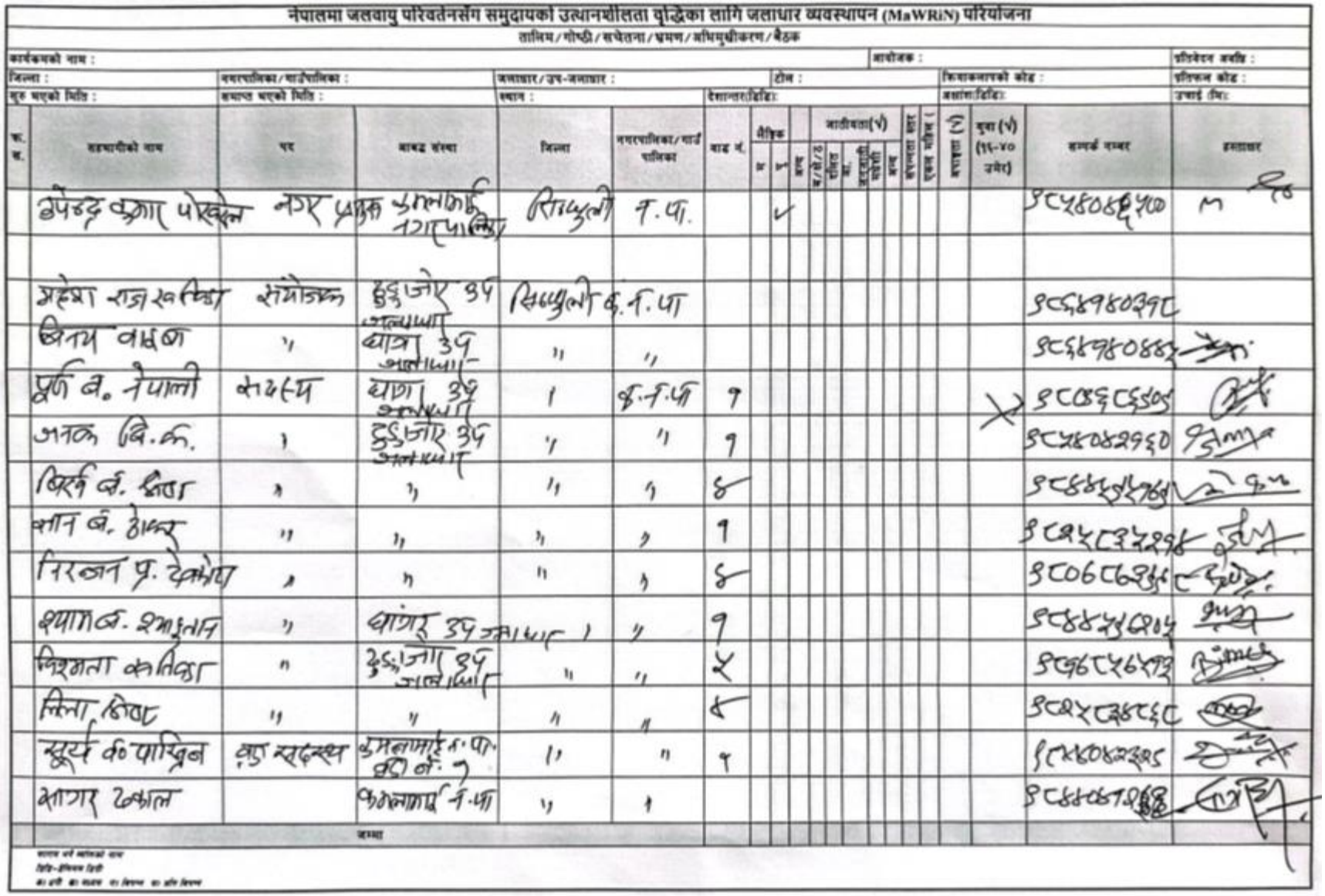
जम्मा

Attendance List of Kamalamai Municipality, Sindhuli

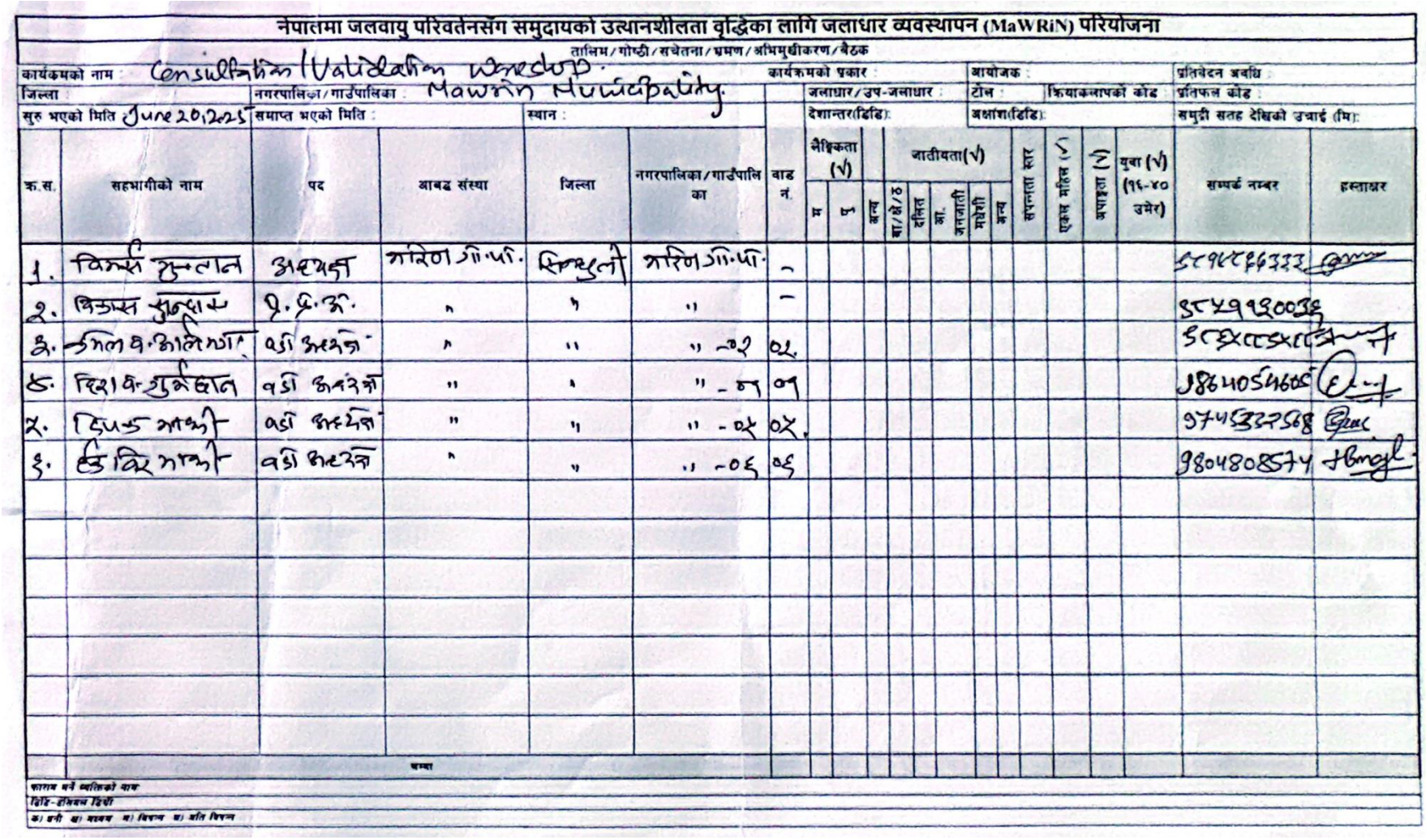


नेपालमा जलवायु परिवर्तनसँग समुदायको उत्थानशीलता वृद्धिका लागि जलाधार व्यवस्थापन (MaWRiN) परियोजना

तालिम/गोष्ठी/सचेतना/भ्रमण/अभिमुखीकरण/बैठक

| | | |

Attendance list of Marin Rural Municipality, Sindhuli



नेपालमा जलवायु परिवर्तनसँग समुदायको उत्थानशीलता वृद्धिका लागि जलाधार व्यवस्थापन (MaWRiN) परियोजना

तालिम/गोष्ठी/सचेतना/भ्रमण/अभिमुखीकरण/बैठक

कार्यक्रमको नाम: Consultation/Validation Workshop. | कार्यक्रमको प्रकार: | आयोजक: | प्रतिवेदन अवधि:

जिल्ला: | नगरपालिका/गाउँपालिका: Mawarin Municipality. | जलाधार/उप-जलाधार: | टोल: | क्रियाकलापको कोड: | प्रतिफल कोड:

सुरु भएको मिति June 20,2025 | समाप्त भएको मिति: | स्थान: | देशान्तर(डिग्रि): | अक्षांश(डिग्रि): | समुद्री सतह देखिको उचाई (मि):

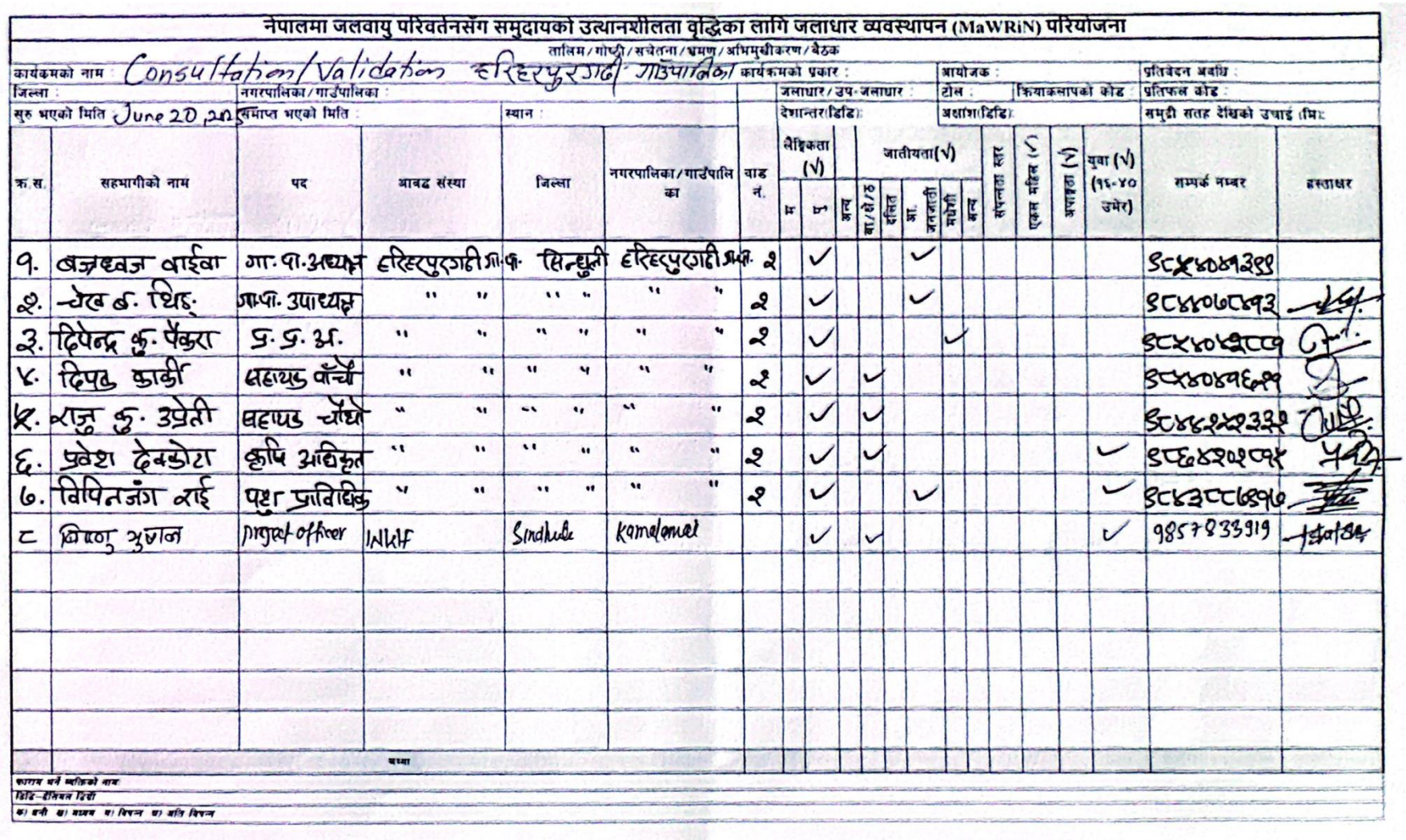
क्र.स.	सहभागीको नाम	पद	आबद्ध संस्था	जिल्ला	नगरपालिका/गाउँपालिका	वाड नं.	लैङ्गिकता (√)			जातीयता(√)					सपन्नता स्तर	एकल महिला (√)	अपाङ्गता (√)	युवा (√) (१६-४० उमेर)	सम्पर्क नम्बर	हस्ताक्षर
							म	अ	अन्य	बा./बे./ठ	दलित	आ. जनजाती	मधेशी	अन्य						
१.	विरेन्द्र सुल्तान	अध्यक्ष	मरिण गा.पा.	सिन्धुली	मरिण गा.पा.	-														
२.	विकास सुनुवार	प्र.प्र.अ.	"	"	"	-														
३.	[illegible]	वडा अध्यक्ष	"	"	" -२	०२														
४.	हिरा प्र. गुरुङ्ग	वडा अध्यक्ष	"	"	" - ७	०७														
५.	दिपक मगर	वडा अध्यक्ष	"	"	" - ०४	०४														
६.	[illegible]	वडा अध्यक्ष	"	"	" -०६	०६														
					जम्मा															

फाराम भर्ने व्यक्तिको नाम

दिहि-हस्ताक्षर दिहि

क) जनी ख) मदनव ग) विपन्न घ) अति विपन्न

Attendance list of Hariharpurgadhi Rural Municipality, Sindhuli



नेपालमा जलवायु परिवर्तनसँग समुदायको उत्थानशीलता वृद्धिका लागि जलाधार व्यवस्थापन (MaWRiN) परियोजना

तालिम/गोष्ठी/सचेतना/भ्रमण/अभिमुखीकरण/बैठक

कार्यक्रमको नाम: Consultation/Validation हरिहरपुरगढी गाउँपालिका | कार्यक्रमको प्रकार: | आयोजक: | प्रतिवेदन अवधि:

जिल्ला: | नगरपालिका/गाउँपालिका: | जलाधार/उप-जलाधार: | टोल: | क्रियाकलापको कोड: | प्रतिफल कोड:

सुरु भएको मिति: June 20, 20 | समाप्त भएको मिति: | स्थान: | देशान्तर(डिग्री): | अक्षांश(डिग्री): | समुद्री सतह देखिको उचाई (मि):

क्र.स.	सहभागीको नाम	पद	आवद्ध संस्था	जिल्ला	नगरपालिका/गाउँपालिका	वाड नं.	वैधिकता (√) म	वैधिकता (√) म	जातीयता(√) अन्य	जातीयता(√) बा./से./ठ	जातीयता(√) दलित	जातीयता(√) आ. जनजाती	जातीयता(√) मधेशी	जातीयता(√) अन्य	सचेतना स्तर	एकल महिला (√)	अपाङ्गता (√)	युवा (√) (१६-४० उमेर)	सम्पर्क नम्बर	हस्ताक्षर
१.	बज्रध्वज थाईबा	गा.पा.अध्यक्ष	हरिहरपुरगढी गा.पा.	सिन्धुली	हरिहरपुरगढी गा.पा.	२		✓				✓							9841083998	
२.	चेत ब. थिङ्	गा.पा. उपाध्यक्ष	" "	" "	" "	२		✓				✓							9840706893	
३.	दिपेन्द्र कु. पैंकरा	ज.ज.अ.	" "	" "	" "	२		✓					✓						9841042004	
४.	दिपक कार्की	सहायक पाँचौं	" "	" "	" "	२		✓		✓									9841084699	
५.	राजु कु. उप्रेती	सहायक चौथो	" "	" "	" "	२		✓		✓									9841222332	
६.	प्रवेश देवकोटा	कृषि अधिकृत	" "	" "	" "	२		✓		✓								✓	9841820195	
७.	विपिनजंग राई	पशु प्राविधिक	" "	" "	" "	२		✓				✓						✓	9841266946	
८	क्षितिज भुषाल	Project officer	INHF	Sindhuli	Kamalamai			✓		✓								✓	9857833919	

जम्मा

फरक पर्ने व्यक्तिको नाम:

टिप्पणि—तीनमध्ये टिप्नु

क) धनी ख) मध्यम ग) विपन्न घ) अति विपन्न