Project Report

AP-PLAT Capacity Development Programme: Development of Local Guidebook on Compound and Cascading Disaster Risk Management in Nepal













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2023 Ministry of the Environment Japan Asia-Pacific Climate Change Adaptation Information Platform

AP-PLAT Capacity Development Programme: Development of Local Guidebook on Compound and Cascading Disaster Risk Management in Nepal

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1. Background

Nepal, which is located in the Himalayan mountainous region, is one of the most vulnerable countries to the effects of climate change and hydro-meteorological disasters such as glacial lake outburst floods (GLOF), monsoon floods, landslides, landslide dam burst floods (LDOF), and mudslides. Climate change has been posing a growing threat to Nepal by aggravating the existing natural hazards. The COVID-19 pandemic has also exacerbated vulnerabilities in some local areas that have insufficient healthcare capacity and/or access.

Strengthening local capacity to enhance disaster management and resilience to protect lives and property is thus an urgent priority for Nepal. Although disaster risk management at the community level is being improved, the impacts of compound and cascading disasters have not been adequately considered as disaster management is still an emerging concept for the local people. Building the capacity of local government officials and communities to understand compound and cascading disasters and their impacts is critical given the likely acceleration of such cases due to climate change, population growth, development activities and urbanization in risk areas, and volatile economic conditions.

Since compound and cascading disasters bring an entirely new set of challenges, people and communities at the local level need tools, ability, and knowledge beyond existing disaster risk reduction (DRR) to absorb, accommodate, recover, transform, and thrive in response to the effects of shocks and stresses. In this respect, concerned local stakeholders and authorities need to think about the risks from two angles. First, they need to consider the compound and cascading disasters evolving near the site, such as the occurrence of multi-hazards simultaneously or in sequence, that could bring extensive damage. Some examples include the occurrence of an earthquake, GLOF, and heavy rainfall that could trigger massive floods and landslides at once or in succession. The second consideration is the compound and cascading disasters that happen outside of the local area but over time their impacts cascade to the local area. Local governments and communities need mechanisms to incorporate compound and cascading disaster risk into communitylevel disaster management strategies and plans.

The Ministry of the Environment, Japan (MOEJ) has been promoting international cooperation on climate change adaptation utilizing the Asia-Pacific Climate Change Adaptation Information Platform (AP-PLAT) since 2019. As one of the core pillars, AP-PLAT has worked on capacity development by providing useful tools and training courses to stakeholders. In 2021, the E-learning material "Development of resilience to compound and cascading disaster risks" was published as part of the adaptation literacy page of the AP-PLAT website.

In this vein, MOEJ supported the development of the local guidebook on Compound and Cascading Disaster Risk Management (CCDRM) in Nepal based on the Elearning course and a consultation process with key stakeholders as well as interactions with affected communities. This outcome report outlines the capacity development programme to develop the guidebook for enhancing the CCDRM based on the experiences, needs, and challenges faced by the vulnerable communities.

The capacity development program was implemented between September 2022 and February 2023 by the Institute of Global Environmental Strategies (IGES) with collaboration from the Institute of Engineering, Tribhuvan University, Centre of Research for Environment, Energy and Water (CREEW), and Practical Action. The implementing organizations conducted the key activities including the online consultation meetings with local experts and the onsite workshop in Melamchi Municipality, Nepal, in collaboration with local partners. Furthermore, the team developed the guidebook in the local language (Nepali) that aims to help local government officials, development partners, and stakeholders to well address compound and cascading disaster risks, reflecting consultations with local stakeholders throughout the program.



2. Designing the Capacity Development Program

The capacity building program was designed to enhance the understanding of CCDR in Nepal for the local government, experts, development partners, NGOs, and other related stakeholders, including communities. Co-development of a local guidebook on compound and cascading disaster risk was the core aspect of the capacity building, a learning by doing approach. The capacity building was conducted in multiple stages to ensure the involvement of all key stakeholders. First, there was pre-consultation with key partners who will directly support the implementation of the project, then the gathering of essential facts on disaster risk management practices, including CCDR, and an assessment of the capacity building needs. Second, we organized online workshops with key resource persons from government, practitioners, research organizations, NGOs, and INGOs, in order to share the AP-PLAT and its E-learning material on compound and cascading disaster risk. The online workshop was also used to gather feedback on the key capacity gaps, inputs and suggestions for the guidebook development, and ideas

3. Summary of Literature Review

Recently, Himalayan and mountainous regions in Nepal are increasingly experiencing rather complex situations due to co-occurrences of multi-hazards, such as heavy rain, landslide, floods and debris flow, avalanches, and GLOF, which have compound and cascading impacts. Some examples of hazard combinations or cascading events that may occur in the future include:

- Glacial lake outburst floods (GLOFs) triggered by heavy rainfall during the rainy season, which could lead to flash floods, landslides, and other secondary hazards such as debris flows.
- Earthquakes causing structural damage and fires, which can lead to further damage from subsequent hazards such as aftershocks and landslides.
- Heavy rainfall leading to flash floods and landslides, which can also increase the risk of disease outbreaks, displacement, and other social and economic impacts.
- Forest fires igniting in areas prone to drought, which can lead to soil erosion and water quality problems, as well as increased risk of further fires.
- Heatwaves and droughts affect agricultural production and water resources, which can also increase the risk of wildfires and food insecurity.

It is highly likely that climate change will lead to an upsurge in the occurrence and frequency of compound and cascading hazards. While it is already challenging for developing countries like Nepal to allocate adequate resources to strengthen disaster risk reduction and management (DRRM) activities, they are now experiencing an entirely different and complex situation due to CCDR. Cultivating an understanding of the links for project development that could address the capacity gaps at the local level. Third, a workshop was held in Melamchi Municipality, which was badly affected by compound and cascading hazards, including massive floods and debris in 2021. The workshop was meant to identify local context and cross-validate the guidelines through inputs and interaction with local government and stakeholders. In the workshop, we incorporated knowledge sharing to enhance local government, stakeholder, and community understanding of the concept of compound and cascading disaster risk as well as assessment methods at the local level. The workshop was also used as an opportunity to discuss measures and project ideas to further promote and integrate CCDR into the disaster risk management process across the country. In order to sustain the impact and maximize the benefit of this project, the local guidebook was prepared in the Nepali language so that it can be directly accessed by the local governments.

between climate change, complex types of disasters, and development is becoming increasingly important. However, the level of awareness and capacity to understand, interpret, plan, and act against the risk from CCD is at a nascent stage. While Nepal has made significant progress on DRRM through updated plans, policies, guidelines, early warning systems, and community-based approaches, there is no specific consideration of CCDR except for the recognition to emphasize multi-hazards.

Climate trends and scenarios also need to be identified at the municipality level or community levels. A comprehensive disaster, climate, and socio-economic database at the local level will be necessary to understand compound and cascading hazards and plan DRRM accordingly.

The interconnectedness of CCD events can result in complex and long-lasting impacts, particularly in communities that are already vulnerable due to poverty, lack of infrastructure, or limited access to resources. If the situation remains unchecked, vulnerability at the local level is likely to increase, potentially resulting in more widespread destruction and loss of life and property.

Several knowledge and capacity gaps exist in Nepal, especially at the local level. Most ministries, departments, and provincial and local governments have very limited information about their exposure to CCDR. The government institutions have limited technical and human resource capacity for systemic monitoring and the production of hazard, risk, and vulnerability maps that are required for comprehensive climate risk and multi-hazard risk assessment. The Department of Hydrology and Meteorology (DHM) is rehabilitating the hydrometric monitoring network in Nepal but it is still inadequate and does not cover different hazard types. CCDR is a relatively new area for disaster risk management and as such the country does not yet have an effective multi-hazard early warning system which will be critical to deal with an increasing number of extreme hazards in the future.

River-basin level multi-hazard risk reduction efforts are limited, especially those connecting high altitude processes, such as avalanches, GLOF or landslide dam outburst floods (LDOF), with the vulnerability of downstream communities. Likewise, the linkages between upstream risk reduction approaches and downstream impacts are hardly assessed. Gaps in technology and knowledge prevent systematic efforts of risk reduction at the basin level that would consider how CCDR evolves, their interactions, and impacts at upstream and downstream locations.

There is further need to empower local authorities and local communities to reduce CCDR, including thorough resources, incentives, and decision-making responsibilities. Coverage of modern (sirens, telephones, megaphones, high frequency radios) and indigenous (drums, house-house visits) means of disaster risk communication at the community level is limited to either communities covered by limited projects or vulnerable isolated communities.

There is a lack of investment to address climate induced CCDR when we consider the need to cover major basins and hundreds of sub-basins in the most geographically challenging and remote landscapes of Nepal. The combined challenges of limited public funds for climate change adaptation and resilience investment, inadequate climate risk information, and higher needs for finance and investment can hamper implementation would create a sustainable and disaster resilient society and communities.

It is important to address these vulnerabilities and capacity gaps in an integrated and comprehensive manner in order to reduce CCDR, build resilience in the community, and reduce the impact of disasters. This may involve community engagement and participation, risk reduction measures, capacity building initiatives, and investment in resilient infrastructure and systems. An effective response to future CCDR events can be ensured by strengthening disaster risk management governance by establishing clear lines of responsibility and ensuring effective coordination between different organizations. Investing in CCDR early warning systems, along with adequate structures and trained staff, disaster response capacities, and disaster risk information systems, will be helpful to ensure effective and timely responses to future events. In order to ensure the long-term sustainability of CCDRM efforts, the central government should provide a regular budget based on actual needs identified through risk assessments which will ensure that the necessary resources are available to manage and mitigate the impacts of different types of natural disasters effectively.

Conducting research and sharing knowledge on CCDR, including the development of effective monitoring and evaluation systems, awareness and understanding of disaster risks, and mitigation measures, can help improve the understanding of CCDR and support informed decision-making. In absence of the knowledge and capacity within the local government, technical and resource capacity can be accessed from other government, non-government, INGOs/NGOs, and private agencies. It is important to note that capacity enhancement measures must be tailored to local context and be implemented in a participatory and inclusive manner, involving communities, local organizations, and relevant stakeholders during the planning and implementation process.



4. The First Workshop (Virtual)

Overview

A total of four online consultation meetings were held from September to November 2022. The meetings included input from nine stakeholders with knowledge about disaster management in Nepal, including the National Disaster Risk Reduction and Management Authority (NDRRMA), academic and research institutes, and other development partners and local NGOs. Based on the discussions in this workshop, a draft guidebook for Nepal was co-designed in a participatory manner. At each meeting, IGES shared the AP-PLAT E-Learning materials, case studies, and assessment results, and the experts shared expectations for this capacity development program. In light of the CCDRM in Nepal, the participants discussed the elements to be included in the guidebook and what should be considered to make the guidebook more effective and useful.

| | Date and time (JST) | Participants | |
|----|---------------------------------|---|--|
| #1 | September 22, 2022, 14:15–15:15 | Dr. Ranjan Kumar Dahal, Central School of Geology, Tribhuvan University Dr. Bhesh Raj Thapa, NDRRMA Consultant Dr. Bishnu Raj Baral, Hydrogeology and Sediments Specialist, Asian Development Bank Research Mission Dr. Suraj Lamichhane, Disaster Research Center, Tribhuvan University | |
| #2 | September 23, 2022, 14:15–15:15 | Dr. Basanta Raj Adhikari, Central School of Environmental Sciences, Tribhuvan University Dr. Divas Bahadur Basnyat, National Development Research Institute (NDRI) Dr. Rabin Malla, Center for Research on Environment, Energy and Water (CREEW) | |
| #3 | October 1, 2022, 24:00–25:30 | •Dr. Santosh Nepal, International Water Management Institute (IWMI) | |

 Table1. Participants of the first workshop

Key Discussion

First, the participants reached a common understanding that CCDR is a relatively new concept in Nepal but increasingly being experienced across the country. So providing knowledge should be a central element of the guidebook. It was also agreed that planning for implementation strategies and resource mobilization is an important element. It was further suggested that the guidebook should be prepared taking into account limited resources, e.g., lack of staff in charge of disaster management. In addition, it was noted that local governments need the guidebook, but on the other hand lack sufficient capacity for implementation. A participatory approach was also suggested as a strategy to disseminate the guidebook.

The experts also suggested holding a workshop where the draft guidebook could be discussed with stakeholders. Issues raised by the participants included how to secure the resources to implement the guidebook and how to communicate the technical content in an easy-to-understand manner to local stakeholders, who are potential users of the guidebook. During the workshop, participants agreed that a bottomup and community-driven approach to identifying and analyzing region-specific risks from a local perspective is important when discussing regional complex chain disaster risks.

In addition, the workshop also discussed the need for consistency with existing institutions and efforts related to disaster risk reduction, e.g., a national framework on risk-sensitive land use planning being developed by the government and examples of disaster risk reduction in communities supported by the World Bank's Green, Resilient and Inclusive Development (GRID) initiative. It was a common view that the guidebook to be developed should emphasize the importance of adding value to these existing efforts, especially the concept of a complex chain of hazards and additional steps to be considered. The guidebook should complement the existing DRR guidelines as well as support formulation of projects and programs at the local level. One of the experts also suggested that the structure of the workshop should be simple and future-oriented.

5. Field Assessment and Consultation

The workshop organization team carried out a field visit to assess the damage caused by the 2021 flood and the progress of recovery. The team also had a preconsultation with representatives from local government and participants invited to the workshop.

The floods and debris flow intensified by heavy rainfall, a sudden temperature rise (in June 2021), and glacial lake outburst in June and August 2021 resulted in catastrophic damage in the Melamchi watershed located about 30 km north-west of Kathmandu, the capital city of Nepal. The disaster was the result of various events, and with one event triggering another created a cascade and compound disaster. The first event was experienced on June 15, 2021, and the second equally severe event was observed on August 1, 2021. On the 15th June 2021, the first flood and debris

flood occurred after rainfall and a glacial lake outburst in the higher reaches of the Melamchi catchment. On the 1st August 2021, a major flood and debris flow events re-occurred after rainfall and a landslide dam outburst flood (LDOF). The rainfall during the extreme flood days (15 June and 1 August 2021) was high but apparently not extreme. The flooding was mainly caused by the outburst of lakes formed behind natural dams (glacier dam and/or landslide dam) and not rainfall runoff only. A graphical summary of the triggering and cascading events is displayed in Figure 1.

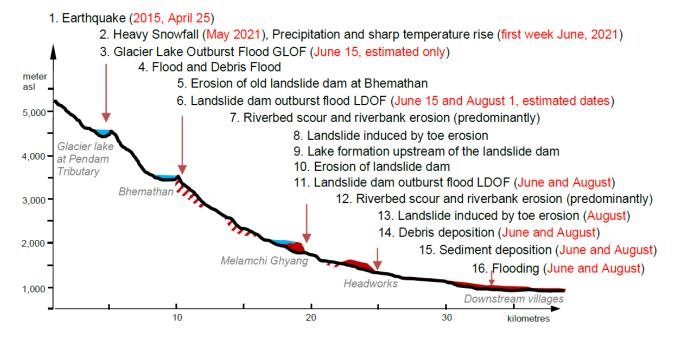


Figure 1. A summary of hazard events of the 2021 Melamchi disaster (Source: ADB/GoN, 2022)

New exposure and vulnerabilities are related to landslides, sediment deposits in the Bhemathan area, and glacier lakes and glaciers. Considering the rapid climate change witnessed in the region, some of these glacial lakes have a potential for outburst and therefore pose a threat to water infrastructures (e.g., the Melamchi Water Supply intake), farmlands, economic activities, and communities in the downstream areas.

The disaster resulted in the loss of life and damage to the settlements, roads, bridges, local livelihoods,

economic activities, and water infrastructures (Maharjan et al., 2021). The Melamchi disaster resulted in the death of 5 people, disappearance of 20 people, and displacement of 525 families. Also, it swept away 13 suspension bridges, seven motor bridges, and numerous stretches of road, cutting off access to several villages. Furthermore, it destroyed 337 houses, 259 enterprises, and thousands of hectares of agricultural farms in the watershed. Supported by local contacts, the team as well as select participants observed the affected areas and the progress of reconstruction and recovery. The field visit helped the team to understand the ground situation and set the conditions for the discussion at the workshop. The team visited from the most upstream where a newly completed intake of the Melamchi Water Supply was severely damaged. On the way back, they observed damaged infrastructure (bridges, roads, houses, farmland), ongoing reconstruction, and temporary housing for displaced households. The damage was massive, and the reconstruction work was still ongoing and not full-scale due to a lack of resources and capacity. Several of the households were living in the temporary houses while many of the residents had returned back to their damaged property due to the lack of alternatives or to conduct business. They moved to safer areas (i.e., rent houses) during the rainy season and only returned after the monsoon. After observation and pre-consultation, the team found that comprehensive planning for build-back-better was lacking while awareness on CCDR was low. The workshop program and expected contributions were amended based on the pre-consultation mainly to focus on future strategy and identify locally feasible actions to speedup the recovery.



Figure 2. Map of Melamchi River with observation points during the pre-workshop field assessment





Figure 3. Photos of the affected areas

6. The Second Workshop in Melamchi Municipality

Overview

The objectives of the workshop included: (1) introduce the concept of CCDR Management using the AP-PLAT E-learning tool; (2) understand community vulnerability and capacity gaps with regards to CCDR; (3) introduce and gather direct inputs and feedback on the proposed guidebook in terms of its content, practicality, and target beneficiaries; and (4) follow-up actions, project development, and support needed for the promotion and wider adoption of the guideline.

The MoEJ was the main organizer of the workshop and the following groups were the co-organizers: Melamchi Municipality; National Disaster Risk Reduction and Management Authority (NDRRMA); Center of Research for Environment Energy and Water (CREEW); Center for Institute for Global Environmental Strategies (IGES); Practical Action; and the Center for Water Resources Studies, Institute of Engineering, Tribhuvan University (CWRS, IoE, TU).

35 participants covering a wide range of stakeholders from Melamchi Watershed municipalities (five local governments, flood-affected communities, local groups/CBOs, actors, vulnerable sectors, media), and invited experts/facilitators from different organizations in Kathmandu, etc. participated actively in the workshop. Eight out of 35 participants were female.

Session Outline

The workshop consisted of five sessions starting from framing presentations to the discussion involving all of the participants. The workshop program can be referred to in Table 2. In Session 1, participants learnt about the CCDRM E-Learning Course and the hazards and vulnerability in the specific context of Melamchi as well as other concrete cases and lessons learned from Japan's experience. Session 2 was devoted to discussion to understanding CCDRM in Nepal and local perspectives including key lessons learned from Melamchi's experience.

| Time | Activity | Responsibility |
|-------|---|--|
| 10:00 | Opening, welcome remarks, self-introduction by participants, group photo | Mr. Aaita Man Tamang, Mayor, Melamchi Municipality, message from NDRRMA, Dr Rabin Malla, CREEW |
| 10:20 | Session 1 Framing presentation (introduction to E-Learning Course, objective of the workshop, anticipated outcomes) and Q&A | Dr.Binaya Raj Shivakoti, IGES |
| 10:40 | Coffee break | |
| 11:00 | Learning compound & cascading disaster risks, impacts, & vulnerability from Melamchi disaster | Prof. Vishnu Panday, IOE, Tribhuvan University |
| 11:20 | International learnings on compound and cascading disaster risks | Ms. Nagisa Shiiba, IGES |
| 11:35 | Session 2 Discussion on compound and cascading disaster risks: Concepts and underlying processes in the context of Nepal | All |
| 12:35 | Discussion: Local perspective on Melamchi disaster What went wrong and did not work Key lessons Earlier initiatives, what needs to be done | All participants supported by facilitators |
| 13:35 | Lunch break | |
| 15:00 | Session 3 Break-out groups Group 1: Analysis of risk scenarios and resultant vulnerabilities/impacts Group 2: Identify disaster resilience enhancement measures (hard and soft, preparedness, response and recovery) Group 3: Adaptive Risk Planning and Implementation Reporting of groupwork outcomes | All participants |
| | Round-table on way forward Purpose, scope, content, and main beneficiaries of the guidebook Discussion on project ideas utilizing the materials in the guidebook. | All participants |
| 16:00 | Closing | IGES, IOE, CREEW |

Key Discussion

The workshop started with an opening session, in which Mr. Aaita Man Tamang, Mayor of Melamchi Municipality delivered a welcome address. He thanked MoEJ and IGES for organizing this workshop while referring to the very good disaster management system in Japan. He said that the Melamchi disaster in 2021 was an unexpected event and so catastrophic that it has pushed back development by decades. He said there are a lot of challenges for recovery and reconstruction, and that he hopes for support, the introduction of good practices on DRR, and collaboration in the future.



Mr. Aaita Man Tamang, Mayor of Melamuchi Municipality



Dr. Rabin Malla, Exective Director of CREEW

The second session discussed the following 5 key issues:

- Melamchi disaster impact mapping by participants and stock-taking: A sketch of Melamchi watershed and river system was prepared and participants were asked to locate key locations impacted by the Melamchi disaster and quantify damages/losses (Figure 4). Participants also shared what went wrong, what initiatives were taken after the disaster and until now, and what needs to be done moving forward.
- Techniques for identifying and mapping CCDR: Discussion was focused on using local and traditional knowledge on identifying and mapping CCDR in a locality.

In the first session, three presentations were made mainly to explain the CCDR concepts and real case examples. Dr. Binaya Raj Shivakoti (IGES) explained the overall framing of the study, including the introduction of the AP-PLAT E-learning course and its contents. It was then followed by sharing of international learning/experience on CCDR by Nagisa Shiiba (IGES), and learnings from the Melamchi disaster by Prof. Vishnu Prasad Pandey (Institute of Engineering, Tribhuvan University).



Dr. Binaya Raj Shivakoti , Senior Researcher of IGES



Prof. Vishnu Prasad Pandey, Professor of Institute of Engineering, Tribhuvan University

- Disaster risk communication: Existing practices of disaster risk communication, cases of using such practices in the Melamchi disaster, and how such communication practices/techniques should be improved in the future.
- Ways of responding better in a post-disaster context for CCDR: Phase-wise planning for re-development (or develop back better); making risk communication as a part of planning; and mobilizing internal and external resources.
- Potential contents for CCDR guidebook and implementation challenges: Focus on adaptive risk planning and management.

The third session featured discussions in three breakout groups. Each group discussed one of the three following topics: the analysis of vulnerabilities/impacts using risk scenarios, the identification of resilience enhancement measures, and adaptation planning and implementation. Discussions then focused on what to include in the guidebook and implementation challenges. Here, we discuss the importance of understanding local vulnerability as a context, and how to plan for the short to long term (including budget, policy, equipment, management, etc.) and suggest that guidance for local businesses be included in this process. In addition, feedback indicated that participatory evaluation of CCDRs in local governments, creation and analysis of potential scenarios, CCDRM implementation structures, monitoring, evaluation, and learning would also be important content.

The participants also discussed the potential contents for the guidebook and implementation challenges. They emphasized the importance of a context of local vulnerability and short-term to long-term planning for budget, policy, equipment, and management. It was also stressed that CCDRM communication before, during, and after disaster events could be strengthened, e.g., by using emergency broadcast systems in disaster prone zones. In addition, participants raised various challenges associated with CCDRM implementation and ways forward to address them, including unified planning and housing, ways to deal with the mental health of children that have been affected due to massive destruction, etc.

Furthermore, Prof. Vishnu Pandey, Ms. Nagisa Shiiba, and Dr. Binaya Raj Shivakoti interacted with Radio Shindhu, a local radio program, and discussed the objectives of the activity and expected outputs. The media also published a news article (website: https://www.radiosindhu.org/news/810). The audio file (interview) was broadcasted to an audience of nearly one million people in eight districts in the region. The



Figure 4. Participatory mapping of the disaster affected areas, damage locations, and needed interventions for discussion

active audience of that radio station at any moment is about 300,000 people. The radio interview was part of the dissemination of the workshop and communicated the importance of CCDR to wider communities who could not attend the workshop in person. Radio Sindhu was at the forefront during the Melamchi disaster in 2021 and provided critical early warning and dissemination of important updates to wider communities. In the aftermath of the disaster, the radio was a key mode of communication for disseminating information on rescue and recovery.

The importance of local media became very evident. The input from members of Radio Sindhu contributed hugely to risk communication as well as validating the local needs. The radio is an effective medium for bringing community voice to relevant authorities even till date.



Figure 5. Active engagement of the workshop participants

7. Post-workshop Consultation and Guidebook Finalization

The IGES team thanked NDRRMA for co-organizing the workshop and updated the CEO, Dr. Anil Sharma, and staff about the outcome of the workshop. IGES will seek their advice on follow-up actions in the next year, such as developing project ideas based on the CCDR guidebook, which will be integrated as part of the AP-PLAT E-learning course. Dr. Anil admired the support from MoEJ and IGES regarding CCDR which is yet to be fully incorporated into national disaster plans and policies. NDRRMA has been stressing the need for a multi-hazard approach but has yet to go deeper to address CCDR. A lot of capacity gaps remain. We are already drafting a local level DRR guideline, so it is relevant to use the planned CCDR guidebook to complement what we are developing. This also helps to avoid potential duplication. We hope for continuous support from MoEJ to develop projects targeting the promotion of the CCDR guideline, including developing an E-learning course in the local language. This could be part of a major project on CCDR in the coming years. IGES expressed our plan to support the development of new project proposals for submission to entities like GCF.

IGES and members expected to contribute drafting a guidebook (such as IoE, Practical Action, CREEW) reviewed the key feedback and outcomes from workshops and individual consultations. Given the lack of clarity on CCDR concepts and the process involved, the guidebook should be prepared to educate the communities and local authorities about not only CCDR but also additional steps. As per the requests from the key stakeholders and workshop participants, cases from Japan and Melamchi will be incorporated to show concrete examples of CCDR. As advised by Dr. Anil, CEO of NDRRMA, we should plan to develop a project to scale-up the dissemination CCDR related information necessary of and planning tools all across Nepal. Such activities have to be planned with a multi-year time-frame. We discussed the timeline for finalizing the draft of the CCDR guidebook in the Nepali language by February and accordingly coordinated with contributors and experts.



Figure 6. Group photo of the workshop participants

8. Guidebook on CCDRM in Nepal

The guidebook is divided into five chapters (including this introduction chapter) and an additional chapter on conclusions and recommendations. The guidebook includes two concrete examples of CCDR from Nepal and Japan.

Chapter 1 provides initial background information about the concept and importance of CCDR and provides context about how the guideline is an extension of the Elearning course on AP-PLAT. It explains the objectives, process of development, scope, audience, and structure of the guidebook.

Chapter 2 introduces the context of CCDR in Nepal. It provides a good snapshot of how CCDR is becoming more noticeable and linked with climate change impacts. It explains the vulnerability, complexities, resources and capacity gaps, and associated challenges for disaster risk management both in the present and future. Further, the chapter also touches on the current state of intervention and initiatives by government, researchers, and other non-government organizations to address CCDR phenomena in Nepal. The chapter concludes by highlighting the need to capacitate local communities for managing CCDR in the future in Nepal.

Chapter 3 focuses on the participatory assessment of CCDR at the local level. It provides a guide on how to become familiar with and contextualize the nature of CCDR based on experience and risk perception. The key focus of the chapter is on how to understand CCDR correctly in all dimensions, such as multi-hazard context, exposure, and vulnerability, so that communities can comprehend the likely scale of the impacts. The chapter ends by explaining the process of risk mapping and ranking as a part of participatory risk assessment.

Chapter 4 advances the concept of CCDR by engaging relevant local stakeholders to formulate a likely scenario of hazard combination and impacts so that appropriate preparedness and mitigation measures could be identified. The chapter will help to formulate risk reduction and resilience enhancement measures targeting the preparedness (pre-disaster), response (during disaster), and recovery (post-disaster) elements of the disaster management cycle.

Chapter 5 builds on the outcomes of the previous chapter to improvise (or newly build) a disaster management system into adaptive planning with a robust implementation framework. The chapter starts with the assessment of resource and capacity gaps in order to implement the identified measures of risk reduction and resilience enhancement. Following the adaptive approach of learning and gradual improvement, the chapter provides the templates of disaster planning and implementation. The chapter on conclusions and recommendations suggests the necessary steps that need to be taken at different levels to enhance the literacy and awareness of CCDR across local levels and includes the feedback received from the capacity building workshops.

For the following action, the guidebook also suggests piloting and upscaling of cascading and compound disaster risk reduction (CCDRR) by utilizing the planning and implementation framework proposed in Chapter 5. A CCDRR framework requires the development of a set of tools, which involves processes from identifying hazards to analyzing their compounding and cascading potential and developing adaptation strategies and their review. The development of appropriate tools requires a series of hit-and-trial methods for development, piloting, review, and localization. To enable piloting and upscaling, the guidebook suggests the need for developing programs and project ideas that could be funded by sources from national, international or climate change funds.

Two case studies introduce the causes, impacts and damage, and lessons from recent CCDR in Nepal and Japan.

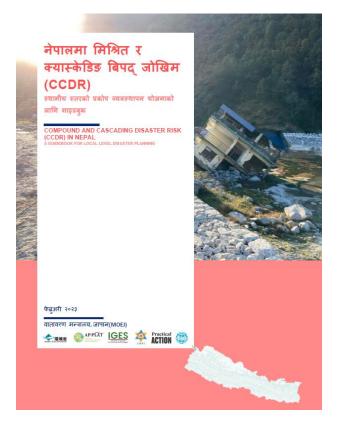


Figure 7. Guidebook on compound and cascading disaster risk management in Nepal

9. Conclusions and Ways Forward

Compounding and cascading disasters (CCD) are the present reality in Nepal. Individuals, families, and communities are struggling to cope with disasters hitting one after another before they can fully recover and reach normalcy. The rise in CCDR depicts the complex nature of risk that could breach management and recovery limits unless addressed from a systems approach. Climate change and other non-climatic stressors are likely to be the key triggers for amplifying CCD cases in the fragile landscape and weak socioeconomic condition of local governments and vulnerable people living across the country. The pertinent question before us is whether we continue to follow the conventional approach of DRR or move forward to enhance community resilience against scenarios of multi-hazards. Clearly, urgent attention and action is required to address CCDR at the local scale across the whole nation. This understanding of various risk scenarios calls for a holistic and multidimensional assessment of risk.

This project is an attempt to enhance the literacy and awareness of CCDR at the local level with communities who are at the forefront to face the impacts of and respond to CCD. The guidebook was prepared building on the inputs from experts, stakeholders, government agencies, and local stakeholders in Melamchi, where a catastrophic disaster involving compound and cascading hit in 2021 causing massive scale damage. The guidebook serves as a valuable supplement to preexisting efforts on DRR planning and implementation at the local level as well as relevant policies at the national level.

The guidebook proposes a step-wise approach for enhancing CCDR awareness and decision-making capacity at the local level. It starts with clarifying the key concepts as well as the state of CCDR in Nepal. The target audience, such as local government, stakeholders, and communities, can use the guidebook to learn CCDR assessment in a participatory manner, understand the potential multi-hazard combinations, and develop scenarios. The guidebook helps to identify resilience enhancement measures and the capacity and resources needed to implement the measures. The guidebook also introduces strategic planning and implementation to establish adaptive disaster governance. Planning and implementation is expected to guide the development of a concrete action plan that could be trialed and upscaled at all local levels that are under the risk of CCDR.

The following box highlights the key recommendations for further promoting this guidebook across the local levels in Nepal and beyond and formulating concrete programs and action action plans to address the risks from CCD.

KEY RECOMMENDATIONS FOR BUILDING LOCAL COMMUNITIES RESILIENT TO CCDR

- There is a huge gap or lack of understanding on CCDR, especially at the local level. There are no specific guidelines or support systems to differentiate CCDR from recurring single hazard phenomena. More efforts are needed to identify key signals of CCDR, vulnerability, and capacity gaps by comparing the past disasters as well as newly evolving ones. Particular attention is needed to integrate CCDR with climate change impacts and adaptation measures.
- Institutional and financial mechanisms as well as capacity to cope with CCDR is severely constrained. It requires a thorough re-evaluation of limits and gaps.
- Significant shift in the mindset and approach of risk assessment is needed to identify new areas of exposure, hidden vulnerabilities, capacity gaps, and innovative measures to enhance the resilience of communities.
- Focus on multi-hazard approaches to scenario development through the involvement of communities and disaster experts as well as by using the latest technology and risk communication systems. Engage media (newspapers, radio, TV and, increasingly, social media) as a vehicle for risk communication and an important stakeholder to mediate knowledge production and action. Also prioritize local language and methods of risk communication when possible through integration of latest technologies.
- Promote locally appropriate and sustainable long-term disaster mitigation and adaptation measures. Where feasible use local knowledge and nature-based solutions that could be designed and implemented at the local level and effective too.
- Coordinate with national government and available stakeholders to establish a CCDR support committee or unit to provide knowledge services, establish multi-hazard early warning, declaring CCDR emergency and so forth.
- Adopt a holistic approach to capacity building by targeting resilience building, strengthening institutional setup, and enhancing collective decision-making capacity at the local level. Strengthening of community-centric DRR planning and implementation. Also, capacitate the cadre of trained and skilled personnel with a sound strategy and incentives to retain and mobilize them.
- Use the guidebook as a basis for developing, piloting, and upscaling concrete action plans on CCDRR measures and for raising awareness and capacity building. For that, consider developing projects and programs that could be funded from available national, international, and climate finance.