Nepal Red Cross Society

Finnish Red Cross

FBA SCOPING VISIT REPORT

for Morang and Panchthar Districts

JUNE 29, 2023

FINNISH RED CROSS
Kathmandu

Contents

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The FbA Scoping team

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Introduction & Background

The International Federation of Red Cross and Red Crescent Societies (IFRC) is the world's largest humanitarian organization, with a network of 192-member National Societies. The overall aim of the IFRC is "to inspire, encourage, facilitate, and promote at all times all forms of humanitarian activities by National Societies with a view to preventing and alleviating human suffering and thereby contributing to the maintenance and promotion of human dignity and peace in the world." The IFRC works to meet the needs and improve the lives of vulnerable people before, during and after disasters, health emergencies and other crises.

The IFRC is part of the International Red Cross and Red Crescent Movement (Movement), together with its member National Societies and the International Committee of the Red Cross (ICRC). The work of the IFRC is guided by the following fundamental principles: humanity, impartiality, neutrality, independence, voluntary service, unity, and universality.

The Finish Red Cross, as a member of the IFRC has a long-lasting partnership and collaboration with Nepal Red Cross Society (NRCS) spanning 30 years. FinnRC jointly with NRCS has been implementing a variety of development programmes covering areas of disaster preparedness, climate change adaptation, safe schools, WASH, health, resilience, and livelihood with both FRC and donor funding, including Finnish Ministry for Foreign Affairs (MFA) funding and recently DG ECHO funded disaster preparedness and disaster governance programme. FinnRC has been a crucial partner in Nepal's humanitarian effort notably during major events like the 2015 earthquake, 2017 flooding and the more recent challenges of Covid-19, Dengue outbreak in 2022 and the eastern flood response through the IFRC Emergency Appeal

Reducing Disaster Impact through inclusive preparedness and anticipatory action (REDI) is bilateral project funded by Ministry of Foreign Affair of Finland (MFA) being implemented in both Pachthar and Morang district. The project will contribute to reducing the impact of weather and climate associated disasters of at-risk communities within targeted municipality of both districts. Under the overall objective, the project will focus on improving the capacity of Early Warning Early Action (EWEA) and strengthen EWS at all levels to promote forecast based action.

Forecast based Action (FbA), often referred to anticipatory action or early warning early action, involves taking proactive measures to safeguard communities before an impending disaster. The strategic approach utilizes ealy warning and forecasts to mitigate the potential impacts of a disaster, ensuring the safety and well being of people while also preserving valuable resources.

Objectives and Outcomes of the visit

In the Eastern region of Nepal, there have been isolated instance of Forecast based Action (FbA) initiatives, but a comprehensive and structured FbA Mechanism has yet to be established. Consequently, there is no existing foundational work in the realm of FbA that REDI project can leverage. To address this GAP, Finnish Red Cross in collaboration with NRCS has undertaken a vital technical scoping visit for FbA. This scoping visit is designed to unravel the potential and feasibility of implementing Forecast based Action in a local context. It will also guide us further in the development and positioning of the systems and resources that will help operationalize the FbA mechanism.

The Main objective of the visit was to to understand the context for the application of Early Warning-Early Action (EW-EA) or Anticipatory Action (AA) in the eastern part of Nepal and to scope the possibility of

implementing forecast-based action (FbA) based on the local context. This involved prioritizing the hazard identified in the EVCA report and accessing the feasibility of forecast based activities for those hazards.

The visit resulted in several key outcomes, which are as follows:

1. Assessment of existing Early Warning System (EWS) – The team assessed the effectiveness of the existing early warning system in the target areas. This helped in understanding their strengths, opportunities, and area of improvement.
2. Feasibility of Forecast-based Action – The visit explored the feasibility and potentiality of implementing FbA approach in the identified areas. This involved analyzing the local context, the availability of forecast services & information, the capacity to respond and the suitability of FbA interventions.
3. Identification of specific Hazards – The visit aimed to understand the local context and identify the specific hazards prevalent in the region. This information was crucial to tailoring FbA interventions to address the most relevant and significant risk. The EVCA report has been taken into consideration and referred to priority hazards for the local area.
4. Identification of Gap, challenges, and Opportunities – The visit identified gaps, challenges, and opportunities for the application of FbA in target areas. This includes accessing the capacity of relevant stakeholders, identifying institutional and technical challenges, and exploring potential partnerships and collaborations.

Overall, the visit provided comprehensive understanding of the local context, accessed the potential for FbA implementation and identify key area of actions enhance Early Warning – Early Action (EW-EA) mechanism in eastern part of Nepal. These outcomes will guide future interventions and support in development of effective FbA strategies tailored to the local context.

Overview of the Scoping Visit

The visit aims to assess the suitability and opportunities of FbA activities within the REDI project in Morang and Panchthar district, where we started our initial discussion and consultation work from Panchthar. During our visit, we held productive meetings with key stakeholders including the district administration office, District emergency operation center (DEOC), Local Emergency Operation Center (LEOC), Provincial Emergency Operation Center (PEOC), Aero Synoptic Stations and the Nepal Red cross Society (NRCS) Panchthar & Morang district chapters as well subchapter. These meetings were consultative in nature, and we discussed various aspects of possible FbA work. The discussions revolved around key guiding questions (Attached in Annex) that were prepared in consultation and collaboration with the NRCS project team and Red Cross Climate Center (RCCC).

One of the key aspects of visit was to access the Existing hydrological and metrological network in the local area that can be useful for the development of FbA initiatives. As part of this, visits were made to existing hydrological and metrological stations under Department of Hydrology and Metrology (DHM) at the district and province level. The purpose was to access the situation of operation of the gauge station and accessing its relevancy to our FbA initiatives. the scoping studies conducted by a team comprising members from NRCS, Finish Red Cross and Department of Hydrology and Metrology. By engaging with the relevant stakeholders and conducting thorough scoping studies, we aim to gather valuable information that will guide our future actions and initiatives.

In addition, there were some findings that demonstrated the value of the project beyond the FbA elements, particularly by engaging the stakeholders of the hydro met- end user value chain together; for example, during the visit an important issue related to gauge station was identified. The gauge reader was facing difficulties in taking accurate readings due to channelizing of water near the Lohandra Gauge station by local fisherman. The scoping team effectively communicated the issue to the relevant authorities and advocated for its resolution. This highlighted the need for quick action to address such barriers and ensure proper functioning of the gauge station.

Overall, the visit serves as an important step in understanding Potential technical aspects of FbA for the REDI project and strengthening collaboration with key partners to enhance the project effectiveness and impact. The stakeholders were positive about their engagement and are ready to support the project, however they expressed concern about the delay in project activities. They want the project to continue efficiently.

There are scopes of Forecast based Action (FbA) in both districts that demand a broader consideration and detailed further analysis based on specific hazards.

Findings and Observations

During the visit several key findings and observations were made regarding the existing early warning system, its challenges and opportunities and applications of gauge stations in the future FbA intervention. whereas the visit focused on finding key areas of opportunities and challenges based on the local context in operationalizing Anticipatory action.

Main Findings

The main findings of the visit are presented in different sections based on the visited districts.

1) Morang district

- The district has a disaster preparedness and response plan (DPRP) that incorporates Forecast based action, this will help us in tailoring FbA initiatives at Municipality, but the District Emergency Operation Center (DEOC) is not functioning effectively.
- The project location in Morang has access to hydro and metro stations network. There is one hydrological station at Lohandra river system, which does not allow us for sufficient lead time being closer to the community and two metro stations one in Letang and other is in Haraicha. Additionally, there is an Aero Synoptic station at Biratnagar Airport.
- Morang district is vulnerable to riverine floods and flash floods. Jahada Rural Municipality (Targeted Palika) is particularly vulnerable to the Lohandra river system resulting in inundation and loss of property, assets, livestock, and loss of fertile land each year.
- The Lohandra River System, being a small river system poses challenges such as Flash flood, Land Erosion, and Inundation. This issue can be effectively mitigated through the implementation of Nature based solution, green infrastructures.
- The Provincial Operation Center (PEOC) has limited equipment and functionality with one display board not functioning properly.

- The district administration office (DAO) is supportive and positive towards establishing a functional Early Warning System (EWS) in the district. The office emphasized supporting Rural Municipality office in establishing Local Emergency Operation Center (LEOC) and providing necessary technical assistance.
- The DEOC in Morang is operational but lacks adequate human resources and technical capacity.
- Communication mechanisms for EWS with in district are not well established, although there is communication with the local police stations for information collection and dissemination of messages during emergencies.
- The Provincial government has initiated the concept of Chief Minister Emergency Services Center (CM-ESC), Clustering 3 to 4 Local Government and establishing centralized emergency services with ambulance, fire brigade and technical human resources.
- The Office of Hydrology and Metrology (OHM) Dharan Office under the department of Hydrology and Metrology (DHM) covers two provinces (Madhesh and Koshi) and operates a total of 88 metrological stations and 28 Hydrological stations.

2. Panchthar

- Like Morang, Panchthar District has a Disaster Preparedness and Response Plan (DPRP) that incorporates Forecast based action which will be basis of tailoring FbA initiatives at Palika Level, But DEOC is not functioning effectively.
- The targeted area in Panchthar has access to Hydro and metro stations network. There is one hydrological station near to the phidim bazar in Tamor river system and one climate stations at Phidim and Precipitation station at mememjagat.
- Panchthar district is vulnerable to landslide, fires, thunderbolts, Drought, and flash floods. Falelung rural Municipality is particularly prone to Landslide and thunderstorm.
- The rural municipality and DEOC Panchthar have limited knowledge of early warning mechanisms and do not have access to forecast information.
- The linkage between LEOC-DEOC-PEOC-NEOC has not been established and needs standardization at the basic level in terms of technical equipment.
- OHM office highlighted the use of forecast information shared about way of accessing the information from DHM different sources.

Gaps & Challenges

1. Poor Telephone Network – The EWS system is heavily reliant on effective communication, but the telephone network in the area is very poor. Since the area is closer to the Indian boarder many people use Indian sim card for the communication which creates barriers is providing early warning from government offices. This poses a significant challenge in timely and reliable communication during emergencies.

2. Land slide Early warning system and lead time – As in Pachthar district Landslide is major hazard but establishing an effective landslide early warning system and accurately determining lead time for land slide events is challenging. It requires comprehensive monitoring, data analysis, understanding local geological conditions and so on. As the primary hazard for the area is Landslide, Palika and stakeholders are concerned about potential initiatives that project can intervene. NDRRMA has been testing some technology for landslide EWS which project team can explore further.
3. The Jahada Rural Municipality office has expressed its expectation and demand for hardware components, due to the unique nature of the project it might be challenging in convincing them.
4. The population living in close proximity to the Lohandra River system, Despite being exposed to flood risk is reluctant to relocate. Because of the attachment to the place and livelihood options they cultivate from the area. Though the government has plans in place for the relocation, they are not ready and happy with the idea.
5. Downscaling of forecast information – There is a challenge in downscaling forecast information and relating it to local areas. Fine tuning the forecast information to provide localized and actionable information is essential for effective early warning and early action.
6. Accuracy of station reading – The manual reading from stations may not always be accurate due to human error. This can affect the reliability and effectiveness of data used for forecasting and triggering early warning mechanisms.
7. Limited resources to establishing new stations – The department of hydrology and metrology does not have the resources to establish stations, despite the critical need for additional monitoring stations in certain areas. This limitation hinders the availability of comprehensive and real time data for accurate early warning.

Addressing these gaps and challenges will be crucial in strengthening the effectiveness and impact of the Early Warning System (EWS) and improving the overall disaster preparedness and response capabilities in the respective districts.

Opportunities

1. Integration of Forecast based Action Mechanism in DPRP – Both districts have a disaster preparedness and response plan (DPRP) that includes the FbA mechanism in its content. This provides opportunities for seamless integration of FbA activities within the existing system at the municipal level.
2. Utilization of existing stations for FbA work – The existing hydro and metro stations in both districts can be leveraged for forecast based activities. The valuable data from these stations can be analyzed and used to determine thresholds, enabling timely and targeted actions.
3. Collaboration potential with DFO Panchthar – The district forest office in Panchthar has funding available for collaboration work in the land slide prone area. This presents an opportunity to align efforts and resources in implementing FbA initiatives and strengthening the coordination between relevant stakeholders.
4. Active involvement of District Administration Office – The active involvement of the district administration offices (DAO) in the respective area of work ensures a well-coordinated mechanism for FbA implementation as DAO is key stakeholder in the district to regulate DRM initiatives. This collaboration enhances the reach and impact of early warning early action measures.
5. Stakeholder interest and commitment – There is strong interest and commitment from major stakeholders in the project area Specially Municipality office, DHM. This provides an enabling

environment for effective collaboration, resource mobilization and sustained implementation of FbA Initiatives

6. Readiness of OHM Dharan for support – The office of Hydrology and Metrology in Dharan is ready to support in strengthening the District Emergency Operations Centers and sharing forecast information. This collaboration enhances the technical capabilities and ensures a robust early warning system.
7. Presence of Key organizations working in the district – The presence of the world food programme (WFP) in panchthar and 20 other organizations in Morang (including local) provides opportunities for collaboration and knowledge sharing. This can strengthen the implementation of FbA initiative and ensure a comprehensive approach to disaster risk reduction and management.

Organizations working In FbA or AA

World Food Program (WFP) is actively involved in implementing anticipatory action initiatives in Panchthar district while organization such as LWF and SAHAS Nepal are engaged in the field of Disaster Risk Management in Morang district. In discussion with NRCS, It was highlighted that Morang district benefits from active participation of 20 other organizations that are working diligently in the area of disaster management.

Technical Services (Hydro & Met)

Technical Services related to hydrological and metrological stations play a crucial role in the implementation of forecast based action work. The department of hydrology and metrology is at the forefront of providing these services, serving as a backbone for FbA activities. Within the DHM Dharan office there are a total of 89 metrological stations and 29 hydrological stations, underscoring the extensive network available within Madhesh and Koshi Province.

Following the completion of the visit and fruitful discussion, a technical meeting was organized with OHM Dharan office to dive deeper into the technical aspects of forecast based action. The meeting provided valuable insights and shed light on the complexity of implementing FbA. One of the key topics of discussion was the four pillars of the early warning system, emphasizing the importance of strengthening and fostering collaboration with partners. OHM expressed their keen interest and willingness to extend their assistance and support in developing a robust early warning system. The OHM office underscored the critical importance of strengthening the hydro and metro network within the specific area to establish a robust Early Warning System. How ever it is essential to undertake a comprehensive study of optimum network analysis to ensure its effectiveness and efficiency.

The office of hydrology and metrology (OHM) Dharan demonstrated a vital role in making the visit successful and productive by providing technical expertise in early warning system and forecasting services. The chief of OHM office Dharan emphasize that While DHM focuses on generating forecast information, the dissemination of early warning messages and forecast information is equally crucial and important. In this regard organization such as Nepal Red Cross Society (NRCS) can play critical and important roles mobilizing its volunteers, youth circle that are available at the ground. OHM Dharan expressed strong commitment to facilitating and supporting the development of forecast based action initiatives in the future, which serves as a significant enabler for our work.

Panchthar	***Morang***
1. Climatic Station – Phidim	1. Hydrological station – Ward –4, Jahad RM at Lohandra
2. MememJagat – Precipitatation station	2. Haraicha PPT station
3. Hydrological station Majhitar – Tamor River system	3. Letang Rain fall station (Both Mannual and Tipping bucket)
4. Precipitation station at Majhitar	4. Biratnagar Aero synoptic Station

District wise Hydrological and Metrological gauge stations nearby Falelung and Jahada Rural Municipality area

Discussion and feedback

The scoping team organized a debrief meeting dated 8 June 2023 with all team members including red cross climate center, IFRC and DRC to get suggestions and feedback on the possible way forward for operationalizing forecast-based action under REDI project. The meeting was successful in getting deep insights and experience sharing from the team members that allows us to understand what could be possible in the local context. It has helped the team to shape out the project anticipatory actions activities.

The Project holds significant potential and opportunities to engage in early anticipatory actions in both Morang and Panchthar districts. The discussion emphasized the scope of implementing anticipatory actions for flash flood and heat wave in Morang district, and in Panchthar, thunderstorm and landslides. The meeting further emphasized the interconnectedness and interlinkage between various hazards, underscoring the importance of carefully considering and incorporating this connection when defining early action initiatives.

Recommendation

1. To enhance the understanding of multi hazard analysis, particularly in Panchthar, it is recommended to align with the Government of Nepal priority of adopting a multi hazard approach. Given Nepal's vulnerability to multiple hazard and cascading impacts, comprehensive studies should be conducted to analyze the interaction between hazards and their consequences. This will help identify and address root causes of problems. Currently there has been no such work carried out on implementing the FbA approach while considering the multi hazard context.
2. Conduct a comprehensive assessment of flash floods particularly in Jahada Morang. Despite the short lead time the project should try to develop early action plans that consider flash flood and local inundation. One approach that the project can think of to increase the lead time is to establish a connection and correlation between rainfall from the nearest precipitation station to water runoff in the river system.
3. Paying attention to the heatwave and their impact as it is being one major threat to people in Biratnagar. Although a heatwave was not specifically mentioned during our visit or in the EVCA

report, it seems to be an emerging shock across the major cities. Drawing from the experiences of Finish Red Cross together with IFRC and Climate center, developing of heat action plan for city could be effective option.

4. It is recommended to explore the utilization of technologies such as blockchain, that can prove beneficial for all type of sim cards (National and International/Indian Sim). Blockchain is a secure and decentralized digital ledger technology that ensures transparent transactions. Promoting the use of such technology can facilitate communication and ensure connectivity, especially in reaching areas that are typically inaccessible during flood events.
5. The Emergency Operation Centers (Provincial, District and Local) should adhere to minimum standards and be equipped with essential equipment to ensure its effective operation. Establishing an EOC that meets these standards will enhance coordination and response capabilities during emergency situations, promoting smoother and more efficient disaster management.
6. Promotion of Bio dikes or bioengineering approaches to protect riverbank could be a good option for protecting flood entering the community which also enhance the concept of Nature Based Solution (NBS)
7. The project team should place emphasis on Mobilization of NRCS volunteers, JRCs to raise awareness, build capacity and initiate establishing and operationalization of EOC at local level.

Next Step

1. It is important to engage with stakeholders (Government) and leverage partnerships to enhance our forecast based activities, fostering collaboration and joint effort.
2. Conducting a comprehensive technical assessment of flash flood modelling for FbA is essential, along with detailed analysis of the potential for early action, based on the existing capacity and network.
3. Assessing the multi hazard risk and its dynamics in Panchthar district is vital as one hazard can trigger others. Understanding the root cause and dynamics is key to implementing effective early actions. Scoping team clearly understand the need of multi hazard approach because of its vulnerability to multiple hazard (Thunderstorm, Landslide, Flood, drought, storm, fire) and cascading impacts.
4. Considering heat wave as risk or hazard, mentioned above requires hazard perception study because it was not spelled out during the visit.
5. The collection of data from identified network stations and the analysis of available information will provide valuable insights for developing the project's next steps towards forecast based action.

Annexes

♦ Key Guiding questions for Palika, DEOC & LEOC

1. What is the existing level of understanding on Forecast-based Action (FbA)/Anticipatory Action (AA)?
2. Are there sufficient legal and policy frameworks/instruments available about implementation of FbA in your district/municipalities?

3. Are LEOC operational and required eq. and tools available for the delivery of early warning and forecasting messages? HR,
4. What kind of early warning system exists in your district/municipalities, and for which hazard?
5. Are LEOC and Palika well connected with any national EWS system?
6. How many rain or river gauges are available in your area and connected with EOC? Is there direct communication between gauge stations, upstream – downstream?
7. Are there any thresholds (rainfall or river level) defined in your area? How relevant is it regarding observed impact on ground?
8. How is the early warning information communicated at a local level? Communication Channel? Challenges, indigenous way of communication, existing channels?
9. What kinds of forecasts are available for different hazards in your area? How far in advance (lead time) you can receive forecast information in your area? Forecast information flow process and involvement of organizations? How are you using that forecast information and what are the challenges and opportunities you see to translate such forecasts into action?
10. Are there any local actors working in FbF/A, AA, EWS, DRM?
11. Choice of flood forecasting services and products, what type of information would have been helpful?
12. How accurate are the flood and weather forecast in Morang and Paachthar? Do you have any such evaluation (quantitative or qualitative) on the same? Any specific weather events in the past when the forecast was able to capture it? How far in advance can we rely on the forecast for these areas?
13. What is the available lead time (with respect to priority hazards like heavy rainfall (landslides), floods, drought, winds, for the local communities?

- Key Guiding questions for NRCS DC and sub-Chapters

1. What is the existing level of understanding & experience on Forecast-based Action (FbA)/Anticipatory Action (AA) in the NRCS DC & Sub-Chapters?
2. Technical & Operational human resources to deliver FbA at scale, and/or the capacity to inform and enable at-risk communities to take anticipatory actions? - Link with risk communities explore
3. Targeting: Identification and assistance to beneficiaries based on clear targeting criteria (risk indicators) ensures impact- and needs-based assistance? What kinds of forecasts are available for different hazards in your area? How far in advance (lead time) you can receive forecast information in your area? Forecast information flow process and involvement of organizations? List of previous impactful events (disasters) per priority hazards and key impacts to prioritize for FbA & AA work.
4. Did you know it was going to happen? How did you know? What was the information and when did you get it?
5. Did you do anything/ take any actions based on this? did other actors?
6. Would you have done anything different if you had more information? What information would have been helpful?
7. Looking back, what would you have liked to do before the event to reduce the impact?
8. Most impacted/vulnerable group and why? Key household level criteria for targeting FbA support.
9. Are there any actors working in FbF/A, AA in the districts/municipalities?

- Risk Profile of District based on EVCA report.

Risk Info	*Panchthar*	*Morang*
Priority Hazard	1.Landslide, Animal Attack, Flooding, Drought, Storm, Fire	1. Flood, Fire Drought, Snakebite, Pandemic and storm
Impact	Loss of life, Livelihood, Livestock, Property, food scarcity, access to health services, drinking water	Loss of life, land, Livelihood, Livestock, Property, food scarcity, access to health services, drinking w ater Inundation

Source – EVCA reports conducted by project.

- Photos

Meteorologist from Office of Hydrology and Metrology (DHM) Dharan, briefing us about the Hydrology station in the Lohandra River System, He briefly shared the importance of the station for Early Warning System

Forecast based Action (FbA) Scoping team including Gauge readers both rain and water level after visiting hydrology station at Majhitar in Panchthar. The station helps downstream communities and districts to save lives and properties by getting timely information.

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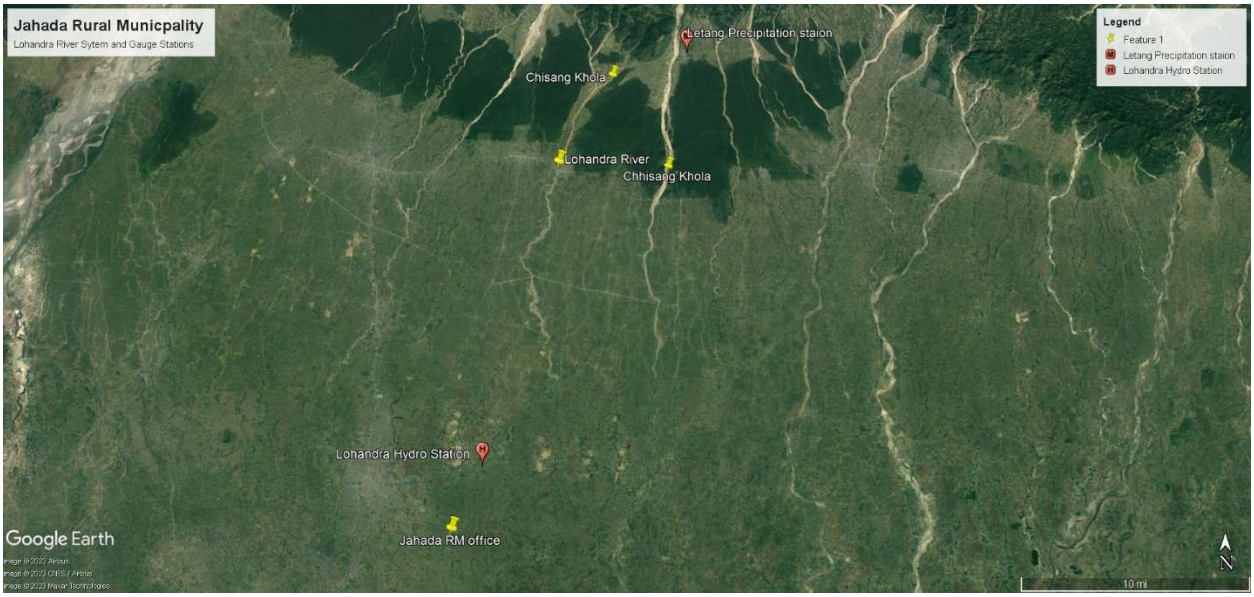
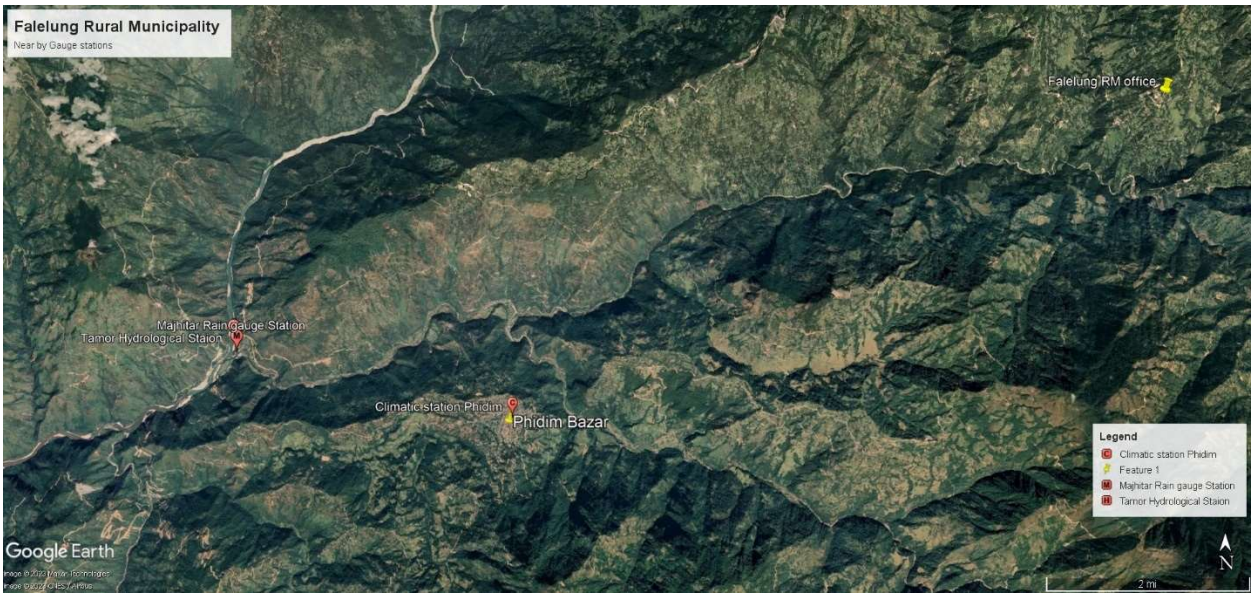
Figure 1NRCS Panchthar District Chapter President pointing out the flood level highest reach.

Chief, Office of Hydrology and Metrology Mr. Rudra Pariyar describing about the four pillar of early warning system and sharing his experiences to effective and collaborative work in strengthening all the 4 pillars for Early Warning System



Jahada Rural Municipality area and Lohandra River system following and its stations.



Falelung RM area and nearby Gauge stations