

Proceedings of the Third Regional Hands-on Training on **Community Based Flood Early Warning System**



Australian Government



About ICIMOD

The International Centre for Integrated Mountain Development (ICIMOD) is a regional knowledge development and learning centre serving the eight regional member countries of the Hindu Kush Himalaya (HKH) – Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan – based in Kathmandu, Nepal. Globalization and climate change have an increasing influence on the stability of fragile mountain ecosystems and the livelihoods of mountain people. ICIMOD aims to assist mountain people to understand these changes, adapt to them, and make the most of new opportunities, while addressing upstream and downstream issues. ICIMOD supports regional transboundary programmes through partnerships with regional partner institutions, facilitates the exchange of experiences, and serves as a regional knowledge hub. We strengthen networking among regional and global centres of excellence. Overall, we are working to develop economically and environmentally-sound mountain ecosystems to improve the living standards of mountain populations and to sustain vital ecosystem services for the billions of people living downstream – now and in the future.



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Third Regional Hands-on Training on
Community Based Flood Early Warning System

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Background

The Hindu Kush Himalayan (HKH) region is a dynamic and complex mountain landscape which is known to be extremely fragile and prone to natural hazards like floods, glacial lake outburst, droughts, landslides, avalanches and earthquakes. These natural hazards are further exacerbated by climate change. Floods and flash floods are the major climate-induced natural hazards that threaten the lives and livelihoods of downstream communities, especially in the monsoon season. Floods in small rivers and tributaries can be disastrous if the government and other concerned agencies do not pay due attention.

In order to address the risks posed by floods and enhance the resilience of vulnerable communities, ICIMOD has piloted the Community Based Flood Early Warning System (CBFEWS) in different river tributaries in Afghanistan, India and Nepal. For its contribution on the ground the CBFEWS project received UNFCCC's 'Momentum for Change: 2014 Lighthouse Activity Award' under the ICT Solutions category in COP20, Lima, Peru.

CBFEWS, now equipped with telemetry, comprises different tools and plans that form an integrated system for detecting and responding to flood emergencies. These tools and plans are prepared and managed by the communities themselves. The system also includes an instrument that measures the river water level at five-minute intervals. It alerts the community about increasing water levels and simultaneously uploads the measurements to the Internet cloud to achieve telemetry. Based on the measurements and warnings generated by the instrument, information is disseminated to downstream communities through various means including telephone, SMS, email and remote alarms triggered via SMS. The current telemetry based instrument has evolved from different innovative flood early warning instruments built over a long period.

In this context, the 3rd Regional Hands-On Training on CBFEWS was held in Kathmandu from the 14 to 18 May 2018 (Annex 1), with participants from Afghanistan, India, Nepal and Pakistan. The third training builds on knowledge and experiences from the previous two hands-on trainings including on wireless and telemetry based instruments. The training curriculum is designed around the CBFEWS framework comprising four key elements, namely: risk knowledge and scoping, community-based monitoring and early warning, communication and dissemination, and resilience and capacity building. The training involved different sessions, exercises and hands-on training sessions with the actual instrument. It aimed to enhance the knowledge and capacity of the participants pertaining to the CBFEWS and its complete implementation on the ground. The training provided conceptual and technical knowledge to the participants that would allow the effective use of the different CBFEWS tools and instruments effectively and correctly. The framework and design of CBFEWS and its instrument is credited to ICIMOD with support from Sustainable Eco Engineering (SEE) as the manufacturer of the instrument.

The 3rd Regional Hands On training for CBFEWS is supported by the Government of Australia in Afghanistan under Sustainable Water Resource Management in Afghanistan (SWaRMA) Programme; the Sustainable Development Investment Portfolio (SDIP) for South Asia in Nepal and India (Bihar) under the Koshi Basin Programme, and in Pakistan under the Indus Basin Initiative; the governments of Norway and Sweden in India (Assam) under the Himalayan Climate Change Adaptation Programme. ICIMOD gratefully acknowledges the support of its core donors: the governments of Afghanistan, Australia, Austria, Bangladesh, Bhutan, China, India, Myanmar, Nepal, Norway, Pakistan, Switzerland, and the United Kingdom. We sincerely thank the government organizations and partners, Afghanistan National Disaster Management Authority (ANDMA), Agah Khan Agency for Habitat (AKAH) in Afghanistan; District Disaster Management Authority (DDMA) of Lakhimpur District and Dhemaji District, Assam, Aaranyak in Assam, Disaster Management Department (DMD), Patna and Yuganter in Patna in India; the Department of Hydrology and Metrology/Community Flood and Glacial Lake Outburst Risk Reduction Project (DHM/CFGORRP) in Nepal; and World Wildlife Fund (WWF) Pakistan and Aga Khan Agency for Habitat (AKAH) in Pakistan for trusting the technology developed by ICIMOD and jointly piloting it in the field. We would also like to thank Sustainable Eco Engineering (SEE), Nepal for their support in designing and manufacturing of the CBFEWS instrument.

Objectives of the Training

Broadly, the 3rd regional Hands On training on CBFEWS centered on imparting comprehensive knowledge in all aspects necessary for the implementation of CBFEWS along with hands-on practice on CBFEWS with Telemetry based instruments for widespread flood early warning. The specific objectives of the training include:

- To provide an overview of floods and flash floods in the Hindu Kush Himalayan Region
- To highlight the Social and Gender aspects of the Community Based Flood Early Warning System
- To highlight the concept of early warning system and its four key elements in the context of CBFEWS
- To conduct exercises on site selection, risk scoping and establishment of communication channel
- To provide Hands-On practice on assembling, disassembling and operating the instrument for a “Learn by Doing” experience
- To provide field based practice in installing and calibrating each of the instrument’s components
- To provide lessons on monitoring, fault finding and rectification, maintenance and replacing parts of the instrument
- To hold discussions on identifying key stakeholders and effectively mobilizing them
- To provide a common platform for participants of different nationalities to share experiences and make friends

Participants and Resource Personnel

The 3rd Regional Hands-On Training on CBFEWS garnered 19 participants from 4 countries: 4 from Afghanistan, 3 from India, 6 from Nepal and 6 from Pakistan. They were representatives from CBFEWS implementing communities and organizations including government and non-government organization partners and local caretakers who look after the CBFEWS instruments in their locality (Annex 2). The resource persons who conducted the training included: Dr. Arun Bhakta Shrestha, Dr. Neera Shrestha Pradhan, Narendra Bajracharya, Vijay Khadgi and Dipankar Shakya from ICIMOD; and Mahendra Man Shakya, Shailendra Shakya, Hel Kumar Shrestha and Saroj Bajracharya from SEE (Annex 3).

Proceedings

The training event ran for five days with multiple sessions, each focusing on meeting the specific objectives of the training and the overall objective of imparting knowledge for the complete implementation of CBFEWS. The first day covered the scoping, risk assessment and communication aspects of CBFEWS along with the gender aspects. The second day was dedicated to familiarizing the participants with the telemetry-based CBFEWS instruments and the hands-on practice in assembling, operating and disassembling the instruments. On the third day, participants carried out field-based installation of the instrument and dealt with different scenarios that occur in the field. On the fourth day, they visited the telemetry-based CBFEWS demo site at Khokana and later participated in CBFEWS social and technical implementation sessions. The training ended on the fifth day with a closing ceremony.

Day 1

Inaugural session

The training began in ICIMOD's Kanchenjunga Hall with welcome remarks from Dr Neera Shrestha Pradhan, Programme Coordinator for the Strengthening Water Resources Management in Afghanistan (SWaRMA) programme of ICIMOD. Dr Pradhan welcomed all the participants and mentioned that a total of 50 individuals had participated in the hands-on training so far. She emphasized that it was a "learn by doing" training and encouraged active participation.

Dr Arun Bhakta Shrestha, Regional Programme Manager for River Basins and Cryosphere in ICIMOD, also welcomed the participants. He provided an introduction of ICIMOD and highlighted the six Regional Programmes and four Thematic Areas of ICIMOD. Furthermore, Dr Shrestha provided a background of floods and flash floods in the HKH region with several examples and illustrations, and explained how the CBFEWS –especially the instruments –has evolved over the years.

Dr Pradhan facilitated the introduction session where the participants introduced themselves and voiced their major expectations from the training. Following introductions, the objectives of the training and the agenda were shared. Dr Pradhan gave a presentation on the conceptual framework of CBFEWS encompassing its four key components: Risk knowledge and Scoping, Community Based Installation and Monitoring, Communication and Dissemination, and Resilience and Capacity Building. She also provided examples, success stories of CBFEWS implementation and stories of people who have benefitted from CBFEWS. She mentioned that effective flood early warning is not about a standalone instrument but also about community ownership, the caretakers and how the information is disseminated to the downstream communities.

Expectations

Pakistan

- Help reduce the risk of floods in Pakistan.
- Have a better understanding about the CBFEWS instrument, its installation and implementation on the ground.

Nepal

- Adopt the CBFEWS in Dadeldhura based on the regional geography with respect to the Mahakali River
- Ability to address vulnerabilities associated with topographical weaknesses in the Chure region.
- Get a better understanding about floods and early warning and deliver a positive impact for flood response.
- Understand the CBFEWS and explore possibilities to link the CBFEWS with advocacy.

India

- Involve communities more effectively in building flood resilience and response capacity.
- Better implement communication channels to improve flood information dissemination.

Afghanistan

- Understand the improvements made in the current system.
- Gain an understanding of the CBFEWS framework, its background, tools and equipment.
- Install the CBFEWS in flood vulnerable regions and assess its impact.

Gender Aspects of CBFEWS Session

The session addressing the gender aspects of CBFEWS segued from the CBFEWS framework session. Dr. Pranita Bhusan Udas, Gender, Water and Adaptation Specialist in ICIMOD, and Aditya Bastola, Gender Specialist in ICIMOD, hosted a “bindi game” to introduce the concept of gender and demonstrate how isolation occurs in a society. Absolutely no talking or use of hand signals was allowed in the game. Participants were requested to close their eyes and a coloured bindi was placed on each of their foreheads. Relying entirely on facial signals, the participants had to form into groups comprising people with same coloured bindis. The largest group, which comprised participants with the green bindi, formed first, followed by the smaller yellow and blue groups, while a single participant with a red bindi was isolated. The exercise demonstrated to participants how individual identities are assigned to us by the people around us and that society is composed of different identities. The larger the groups, the stronger and more powerful they felt. The isolated participants, on the other hand, had to fend for themselves as none of the others would accept them in their group.

Further discussions ensued after the screening of a documentary about the flood-affected people of Teesta, Bangladesh. Discussions focused on how people of different genders and social groups are differentially affected by floods due to their varied roles based on social norms and values, and how programs and policy changes are needed to address these issues.

The session ended with the screening of another documentary about some of the most vulnerable communities in the Ratu watershed. It showed how the CBFEWS flood early warning system was reaching the most vulnerable people when they needed it the most.

Scoping, Risk Assessment and Communication Session

The Scoping, Risk Assessment and Communication Session was facilitated by Vijay R. Khadgi, Special Project Coordinator WLE at ICIMOD. The session focused on risk scoping and assessment, networking and communication channels, and response capacity and resilience. The concept of risk was clearly defined and illustrated and means to assess it were highlighted. It involved the identification of risk areas, key structures and safety zones. This was followed by discussions on networking and communication channels and how flood early warning information could flow downstream and to all concerned authorities without any hindrances. The next topic of discussion was building the communities’ response capacity and resilience through disaster response plans, public awareness programmes, and response capacity enhancement with trainings, drills, safety zones and routes identification and clear, precise, predefined warnings.

The participants then engaged in a desk scoping exercise in region-wise groups in which they identified upstream and downstream communities, key structures, risk areas, safety areas and tentative placement of the CBFEWS instruments on maps of their respective regions. The identification was based on knowledge provided about risk scoping and assessment (Annex 4). Next, the participants built a social map identifying the major settlements and the estimated flood vulnerable population within those settlements. Finally, a communication channel for each of the regions was prepared. In this channel, the flood early warning information is sourced at the caretaker, who disseminates to the first recipient in the flood vulnerable community, and then to all relevant stakeholders in a systematic manner, including but not limited to disaster response forces, government authorities and local radio or television stations for mass dissemination (Annex 5). Facilitators from ICIMOD and SEE guided the participants to complete the exercise. Upon completion the participants presented their scoping and planning results to develop an initial tentative plan for CBFEWS implementation in their regions.

Day 2

Instrument Introduction Session

The second day of the training started with a tour of ICIMOD's Godavari Knowledge Park, which would also serve as the site of the technical training. The participants toured the park and its myriad knowledge displays of biodiversity, produce and innovations for mountain life including the wireless CBFEWS. The participants then regrouped at the Hka-Ka-Bo-Razi hall for the technical instrumentation session facilitated by Narendra Bajracharya and Dipankar Shakya. Narendra Bajracharya began with a clear explanation of a block diagram that showed the workings of the CBFEWS system. He went on to describe how the CBFEWS instrument is actually implemented on the ground through illustrations that showed how the water level measurements are made, processed, uploaded through cellular connectivity and presented through the internet. He emphasized key points in the adoption of the CBFEWS, which included network coverage with data facility, server space, mass SMS provisions, and most crucially, a well-trained and enthusiastic caretaker.

Technical Session

The technical session covered all technicalities involved in the effective installation of the CBFEWS instrument. The session was facilitated by Dipankar Shakya with support from Mahendra Man Shakya, Shailendra Shakya, Hel K. Shrestha and Saroj Bajcharya from SEE. The facilitators began by describing the outlook of each of the instrument's components: the Data Acquisition (DA) Unit, Data Upload (DU) Unit and Alarm Unit (AU) and their underlying operating electronics. They provided an illustration of how the DA Unit would be installed at a river bank to measure water levels. The DA Unit can be installed up to 3 km away from the DU Unit with a clear line of sight between antennas. The support structure for the DA Unit could range from a stainless steel tower to walls and bridge piers or whatever would be most viable for an installation site. The facilitators then introduced the mechanical and electronic tools used in the installation of the instruments. One of the most important tools is the multi-meter. With instructions from the facilitators, the participants checked the major functions of the multi-meter, namely voltage, continuity and polarity. Next, the facilitators expanded on the key procedure of installing a SIM card for cellular connectivity. The participants actively engaged in the session and asked how to select an appropriate network service and network service provider. The facilitators explained that one SIM card should be selected for the system with 2G or 3G data connectivity. The system does not support 4G data services yet. The facilitators then demonstrated the actual installation of the instruments, explaining each step. They emphasized that the DU Unit should be installed first, followed by the DA Unit, then the AU, following step-by-step instructions in the training manual. Special attention was paid to the sensor installation, which requires precise tools. The facilitators explained the science behind the workings of the sensor and its precise calibration and attachment. They demonstrated the operation of each unit so that the participants could understand what the instrument was doing and what the signals and messages provided by the instrument meant. They explained when and how the sirens on the DU and AU would be triggered and the differences in their purpose, nature, capacity and mechanisms. .

Hands-on Practice

This session allowed the participants to practice the lessons learned in the previous session. The participants were divided into country-wise groups so that they could practice how to install the instrument back home. Each group was assigned a supervisor to oversee the process and ensure that the participants were setting up the instruments correctly. The participants began setting up the instrument units on their own, reflecting back on the instructions presented in the previous session and referring to the step-by-step instructions in the manual. They freely used the tools and equipment at their disposal and thus gained a clear understanding of the instrument and the technical complexities of putting together the instrument. Each of the DA, DU and AU units were assembled and all their functionalities tested for a clear understanding.

Reflections and Discussions Session

Following the hands-on practice, the participants regrouped to view the uploaded data from their respective DU Units on the internet and to reflect on what they had learned. Once the uploaded data was viewed on the webpage with each group's unique station code, the facilitators' team proceeded to trigger the GSM-based Alarm Unit through SMS. It was thus demonstrated that the AU only requires a mobile network and the knowledge of the correctly worded SMS message. Then the participants put forth their remaining queries about the setup and installation. The session ended with a discussion on the proper care and maintenance of the instrument.

Day 3

Briefing Session for Field

On the third day, the participants gathered for a briefing session before practicing installation in the field. The session covered the activities for the day and instructions and advice on field setup of the CBFEWS instrument. The participants put forth their queries about the calibration of the sensor and the warning levels, and these were later explained in the field.

Field Installation Practice

A small river stream located approximately 6 kilometers southeast from ICIMOD's head office called Kodhku Khola was identified as the site for the practice of instrument installation. The participants were again divided into groups for the field installation. The river site was ideal as it closely resembled the actual river that the participants would be dealing with in their respective countries. Using the tools and accessories provided for installation, they enthusiastically installed the instruments while getting their feet wet and hands dirty. The shin-deep water, the open environment and the cool, cloudy weather offered them a refreshing experience during the field-based instrument setup. The process of level transfer to identify and mark maximum flood levels and the details of sensor height calibration and adjustment for flood warnings were discussed and demonstrated until all confusions were cleared. The data was continually uploaded to the internet cloud by the telemetry-based instruments, and participants viewed it on their mobile phones after the installation.

Fault-finding and Rectification Session

Once the field practice was completed, participants gathered once again for a session on identifying faults in the instrument when it doesn't display predicted behaviour and for correcting those faults when they occur in the field. Based on a systematic easy-to-follow table in the manual, the participants were provided instructions on rectifying possible deviations in instrument behaviour. The session sought to prepare participants for different scenarios that might occur during field deployment. The participants took turns to pick different scenarios from the table for fault finding and Dipankar Shakya elaborated on the scenarios and their solutions.

Day 4

Khokana DHM Demo Site Visit

On the fourth day of the training, participants were taken on a field trip to the DHM demo site at Khokana to observe the telemetry-based CBFEWS instruments in operation. Khokana is an old Newari village located to the southwest of the ICIMOD headquarters, about 2.5 kilometers away as the crow flies. The participants walked through scenic fields to the riverside demo site at Khokana. Following a short briefing by Narendra Bajracharya about the background and past performance of the installed telemetry-based CBFEWS at Khokana, the participants proceeded to view the DA Unit overlooking and measuring the Bagmati River. Then the participants observed the DU Unit in operation at the house of the designated caretaker nearby, as it uploaded timely measurement samples

to the cloud. Following the observations a short discussion was held on site selection, antenna placement and instrument performance. After the field trip participants would be divided into two groups: technical and social, to discuss key roles, responsibilities and procedures involved for each group.

Social Mobilization Parallel Session

The social mobilization session allowed the participants to identify key stakeholders for mobilization, the challenges involved in their mobilization and possible procedures to address the challenges. The team from Afghanistan identified stakeholders on four levels, namely: community, district, provincial and national. They identified financial, coordination, responsibility, awareness and security issues that need to be addressed by the stakeholders. The Nepal team listed flood-affected communities, local NGO/ INGOs and community groups like mothers' groups, youth groups and womens' groups along with local government and service providers as the main stakeholders. They cited lack of awareness, response, services, equipment, government ownership and preparedness as major challenges. The team from India identified many stakeholders including vulnerable communities, Tola/habitat leaders and ward members, village mukhiya, frontline government workers, government functionaries at the block level, active groups in the block such as youth, Red Cross and religious groups, the district disaster management authority at the district level, elected representatives, state level stakeholders like the Water Resources Department and policy and national level stakeholders like the National Disaster Management Authority as the major stakeholders for mobilization. The team presented issues of faith in CBFEWS, disaster management programmes' focus on rescue and relief rather than on early warning and preparedness, a lack of early warning and preparedness as the major challenges for mobilizing the stakeholders. The Pakistan team categorized stakeholders as internal (vulnerable community, local government and disaster management authorities) and external stakeholders (NGOs and INGOs, provincial government and national government). The team noted the lack of incentives for long-term implementation and maintenance of the CBFEWS, fast-changing technology and instrument update and acquisition of funds for sustainability as key issues in mobilizing stakeholders. All teams highlighted proper communication, awareness programmes, incorporation of disaster preparedness into policy and community ownership as major requisites for addressing issues in stakeholder mobilization.

Technical Implementation: Parallel Session

The technical group was split into two halves so that attention could be distributed among the three instrument units and everyone would get enough time to practice on each of the instrument units. The technical teams were provided specialized instructions for parts replacements within the units' electrical and electronic subsystems such as charge controller, battery, solar panel, siren and SIM card, and handling different screws and fixtures in each of the units. Further instructions were provided on performing checks and minor repairs in the instruments. The groups practiced repeatedly until they were fully confident in handling and repairing the CBFEWS units. Thereafter each participant raised questions regarding the minute technicalities of the instrument, which were answered by the technical facilitators.

Evaluation Session

After days of providing instructions for the implementation of the CBFEWS, it was time to test if the participants had absorbed the instructions and lessons. The light-hearted evaluation session aimed to verify if the technicalities involved in handling the CBFEWS instruments had been properly imparted. The evaluation, facilitated by Dipankar Shakya and Vijay Khadgi and coordinated by the SEE team, included two segments. The first segment comprised an objective test where participants were requested to select the correct answer among options provided. The second segment comprised a session named 'Find the Expert' which involved solving real field scenarios with the aid of instructions provided in the past few days in a discussion among participants. Based on the cumulative points scored during each segment, an excellent performer would be awarded a prize in the closing ceremony. All participants scored very well in the first objective evaluation. In the second evaluation, participants showcased excellent and sound understanding of the system through active and enthusiastic participation and ultimately the top three experts were identified.

Reflection and Feedback Session

In the final session of the training, the participants reflected on their experiences from the past four days and provided feedback on the training. Samira Shakya from Nepal stated that the previously unknown topic of CBFEWS had now become clear to her. Amar Saud from Nepal commented that the practical sessions enabled him to easily understand technical concepts even with his non-technical background. Sanjay Pandey of India indicated that besides giving him the confidence to use the system, the training would also help the participants carry out advocacy and shape policy at the state and national level. Mohammad Tariq Aziz of Afghanistan said that the good thing about the CBFEWS is that it can be implemented and taken forward at the community level. Mohammad Sami Noorzad, also from Afghanistan, stated that the system will help reduce flood risk in Afghanistan. Fazal Karim from Pakistan was grateful for the cross-boundary interaction platform provided by ICIMOD and for gaining confidence regarding the theoretical and practical aspects of CBFEWS. Mir Aftab Alam stated that through proper CBFEWS implementation in vulnerable places, many lives could be saved through early warning.

Day 5

Closing Session and Way Forward

The closing session of the 3rd Regional Hands-On Training in CBFEWS was held in the Greenwich Hotel meeting hall and was facilitated by Dr. Neera Shrestha Pradhan. Narendra Bajracharya delivered brief remarks about the training. He expressed appreciation for the enthusiastic participation from Afghanistan, India, Nepal and Pakistan, and stated that participation is always helpful in improving the training. He further highlighted the crucial role of the participants in the successful implementation of the CBFEWS in their respective regions and expressed confidence in their capacity to implement the CBFEWS.

Dr. Pradhan provided a recap of the training with an engaging presentation encompassing all the activities of the training and key messages from the participants. She said that the training had aimed at providing comprehensive technical and theoretical knowledge about flood early warning systems, and that the hands-on practice in particular sought to encourage “learning by doing”. The training modules included the CBFEWS framework including scoping, monitoring, dissemination and networking and preparedness. She reflected on the gender session, especially the bindi game, which stressed the importance of communication and understanding in society. She reiterated that gender inclusion was necessary in making CBFEWS effective in disaster risk reduction given women’s vulnerability in flood risk scenarios and also their capacity as caretakers. Fazal Karim from Pakistan added that the bindi game highlighted the message that unity is strength and that we cannot function alone in society. She summarized the major activities and achievements of each session of the training.

Dr. Arun Bhakta Shrestha congratulated the participants on completing the training. The training was related to preparedness, he said, and collaboration, commitment and dedication was crucial for the success of the CBFEWS. He also remarked on the importance of gender in the development of an early warning system. He pointed out that the training participants were a small group of people playing key roles for the CBFEWS in their respective countries, and that commitment of other partners and people was important to create meaningful change. He emphasized that the completion of the training was not the end but the beginning of a journey towards effective implementation and out scaling of the CBFEWS.

The participants also shared their key take-home messages. Mohammad Tariq Aziz of Afghanistan expressed commitment to installing the CBFEWS in Afghanistan and sharing the knowledge gained with the government and other ministries in Afghanistan. Mir Aftab Alam from Pakistan highlighted the importance of preparedness in disaster risk reduction and how the CBFEWS provides that, and added that through joint commitment and dedication lives can be saved. Manish Kumar from India thanked the training organizers and said that he would advocate for the government to use the CBFEWS for flood preparedness. Expressing commitment to install the CBFEWS in Pakistan, Fazal Karim highlighted the ICIMOD-WWF partnership and its effectiveness for flood preparedness. Amar Saud of Nepal expressed commitment to implementing the CBFEWS in the Mahakali, overcoming existing challenges and putting forth best efforts to make this system a model for flood risk reduction.

In his remarks, Dinesh Bajracharya, head of WaSH and Water Governance, OXFAM, acknowledged ICIMOD's efforts in organizing a unique training on early warning system and highlighted the significance of early warning in water governance. He also emphasized the partnership between OXFAM and ICIMOD in the TROSA project in the Mahakali and in projects like the CBFEWS. Finally he encouraged participants to play a more active role in the field of disaster risk management.

Certificate and Award Distribution

Dr. Arun Bhakta Shrestha handed out certificates to the participants to acknowledge their active participation and their role in making the training a success. He also gave an 'excellent performer award' to one of the participants of the CBFEWS evaluation session. The winner was selected on the basis of the cumulative point tally for the objective and 'Find the Expert' evaluation sessions. Baig Ghuffran Ullah from Pakistan bagged the prize by a narrow margin.

Vote of Thanks

Vijay Khadgi of ICIMOD delivered a vote of thanks. He acknowledged the support of donors who had supported the training and thanked ICIMOD's implementing partners in the CBFEWS initiative. He also thanked the participants for their active participation, and SEE for manufacturing the parts of the CBFEWS and ICIMOD's CBFEWS team and gender team for facilitating the training. Finally, he acknowledged the support provided by the management, administration, logistics, travel, and motor-pool teams in making the training a success.

Conclusion

The five-day 3rd Regional Hands-On Training on CBFEWS was successfully completed thanks to the enthusiastic participation of representatives from Afghanistan, India, Nepal and Pakistan, the tireless efforts of the training facilitation teams from ICIMOD and SEE, and the support of implementing partners, ICIMOD management and donors. The participants also provided encouraging feedback and suggestions for improvement (Annex 6). The CBFEWS team is hopeful that the shared knowledge, experiences and lessons learned at the training will help ensure successful implementation of the CBFEWS in the participants' respective regions.

Annexes

Annex 1: Agenda of the Training

Day 1

Venue: Kanchenjunga Conference Hall, ICIMOD Headquarters

Time	Particulars	Remarks
8:30	Pickup at hotel	Govinda
9:00–9:30	Participants reach ICIMOD and registration	Shrestha
Session 1: Opening Session		
Facilitator: <i>Dr Neera Shrestha Pradhan</i>		
Rapporteur: <i>Vijay R Khadgi</i>		
9:30–10:45	<ul style="list-style-type: none"> Welcome remarks and the impact of flood and flash flood in the HKH by <i>Dr Arun B Shrestha</i>, Regional Programme Manager, River Basins and Cryosphere, ICIMOD (15 min) Introduction and expectation of the participants (15 min) Objective and agenda of the training and Conceptual Framework of CBFEWS – <i>Dr Neera Shrestha Pradhan</i>, Programme Coordinator, SWaRMA , ICIMOD (15 min) Clarification, if any (15 min) 	
10:45–11:15 Group photo and Tea/Coffee		
11:15–13:00	<ul style="list-style-type: none"> Socioeconomic aspects of CBFEWS – <i>Prof Narendra Khanal</i> (15 min) Gender Aspects of CBFEWS – <i>Dr Pranita Bhusan Udas</i>, Water, Gender and Adaptation Specialist (15 min) Reaching the most vulnerable – Documentary (10 min) Experience sharing from the field (20 min) Discussion and clarifications (30 min) 	Pranita/ Aditya
13:00–14:00 Lunch		
Session 2: Scoping, Risk Assessment and Networking		
Facilitator: <i>Vijay R Khadgi</i>		
14:00–15:30	<ul style="list-style-type: none"> Site selection criteria Know your river (hydrology) Flood risk assessment Key stakeholders and communication channel Role and responsibilities Response capability and resilience building 	Vijay/ Narendra/ Dipankar/ SEE
Tea/coffee served	Discussion Group work (country groups)	
14:25–17:00	Plenary presentation (15 min presentation and 15 min discussion)	Vijay/ Neera

Logistic information for the next day

Reception dinner hosted by ICIMOD (18:00-20:30 hrs)

Day 2

Venue: Godavari Knowledge Park

Time	Particulars	Remarks
8.30	Pickup from hotel	ICIMOD
Session 3: Instrument introduction		
Facilitator: Narendra Bajracharya		
9:30–12:30 Tea/coffee	<ul style="list-style-type: none"> ▪ Reflection on previous day's sessions by participants ▪ Demonstration and discussion <ul style="list-style-type: none"> - Overview - Introduction of instrument and its parts (prototype site) - Know your tools - Know its functions - Installation procedure - Calibration of instrument - Testing the instrument - Operation and monitoring the instrument - Maintenance of the instrument - Fault finding and rectification - Replace parts and components 	Vijay Narendra, Dipankar and SEE
12:30–13:30	Lunch	
13:30–16:30 Tea/coffee	Hands-on practice	Narendra, Dipankar and team
17:30–20:30	Reception dinner	

Day 3

Venue: Godavari Knowledge Park

Time	Particulars	Remarks
Session 4: Field visit (instrument test in the field)		
8:30	Meet at Greenwich Hotel	Narendra, Dipankar and team
9:00–9:30	Reflections on previous day's sessions and briefing at Greenwich	
9:30	Departure to the field	
10:30–13:30 Refreshments served	Instrument test	
13:30–14:30	Lunch at Hotel View Bhrikuti, Godavari	
14:30–15:00 Refreshments served	Instrument test continued	
15:00–16:30	Fault finding and rectification at Hotel View Bhrikuti	
16:30	Return from the field	

Day 4

Venue: Kanchenjunga Conference Hall

Time	Particulars	Remarks
Session 5: Field trip to Khokana		
9:00	Pickup from hotel	
9:30	Reach Khokana - CBFEWS with telemetry testing site	Bus
9:30–11:00	Site Visit	Narendra/Vijay
11:00–12:00	Lunch at Kathmandu Coffee, Bhainsipati	Indu
12:00–13:00	Reach ICIMOD	
Session 6: Group work (Kanchenjunga Conference Hall, ICIMOD Headquarter)		
13:00–14:30 Tea/coffee	Group 1: Instrument installation Group 2: Social mobilization	Narendra/Vijay
14:30–15:30	Evaluation <ul style="list-style-type: none"> Find the expert – queries on CBFEWS answered by participants 	Vijay/Dipankar
15:30–16:30	Reflection on the training, lessons learnt and way forward	Neera

Day 5

Venue: Hotel Greenwich, Sanepa

Session 7: **Closing Session**

Facilitator: Dr Neera Shrestha Pradhan

9:00	Pickup from hotel	
10:00–12:00	Closing Session <ul style="list-style-type: none"> Briefing of the regional hands-on training by Mr Narendra Bajracharya, Senior Admin Associate, Maintenance Coordination Reflection on the training by Dr Neera Shrestha Pradhan Remarks by participants' representatives <ul style="list-style-type: none"> Afghanistan India Nepal/Oxfam Pakistan Certificate and award distribution to the participants Remarks by Oxfam Closing remarks by Dr Arun B Shrestha, ICIMOD Vote of thanks by Mr Vijay Khadgi, ICIMOD 	
12:00–13:00	Lunch followed by a free afternoon	

Annex 2: List of Participants

List of Participants

Afghanistan

1. **Ahmad Fahim Shahab**
Analyst
Focus Humanitarian Assistance / Agha Khan Agency for Habitat (AKAH)
Email: ahmad.fahim@akdn.org
2. **Mohammad Sami Noorzad**
Project Supervisor
Focus Humanitarian Assistance / Agha Khan Agency for Habitat (AKAH)
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3. **Mohammad Rezay**
Disaster Prevention & Mitigation Manager
Afghanistan National Disaster Management Authority (ANDMA)
Email: mohammad.noorzad@akdn.org
4. **Mohammad Tariq Azis**
Vulnerable Area Identification and GIS Expert
Afghanistan National Disaster Management Authority (ANDMA)
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Pakistan

5. **Mir Aftab Alam**
Assistant Director
Gilgit Baltistan Disaster Management Authority (GBDMA)
Email: miraftabid@gmail.com
6. **Adeel Anjum**
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7. **Baig Ghufuran Ullah**
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Gilgit-Baltistan Disaster Management Authority (GBDMA)
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8. **Khan Abideen**
Community Representative
Gharbuchung, Khapulu
Ghanche District
9. **Saif Raza**
Community Representative - Downstream Shigar, Baltistan
Email: asifshigri91@gmail.com
10. **Muhammad Tufail**
Community Representative - Downstream
Stonpi, Ghurbuchung, Ghanche District
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11. **Fazal Karim**
Project Officer UIB
World Wide Fund for Nature Pakistan (WWF-Pakistan) Gilgit, Pakistan
Email: fkarim@wwf.org.pk

India

12. **Sanjay Pandey**
Executive Director
Yuganter
Email: sanjaypandeyindia@yahoo.com
13. **Ranjit Jha**
Community Representative - Shree Khandi Bhitthamore
Yuganter
Email: ranjeetkumarjha31@yahoo.com
14. **Manish Kumar**
Assistant Director
Flood Management Improvement Support Centre (FMISC)
Water Resources Department
Government of Bihar, India
Email: fmiscbihar@gmail.com

Nepal

15. **Manoj Kumar Singh**
Community Representative- Upstream, Gagan
Department of Hydrology and Meteorology (DHM), Nepal
16. **Amar Saud**
Social Mobilizer/Coordinator
OXFAM
Email: ddl.jov@gmail.com
17. **Manisha Singh**
Social Mobilizer/Community Representative- Downstream
OXFAM
18. **Ramesh Paneru**
Community Representative - Downstream
OXFAM
19. **Yadav Bogati**
Community Representative - Upstream
OXFAM
20. **Samira Shakya**
Project Coordinator TROSA
OXFAM
Email: sshakya@oxfam.org.uk

Annex 3: List of Resources Personnel

ICIMOD

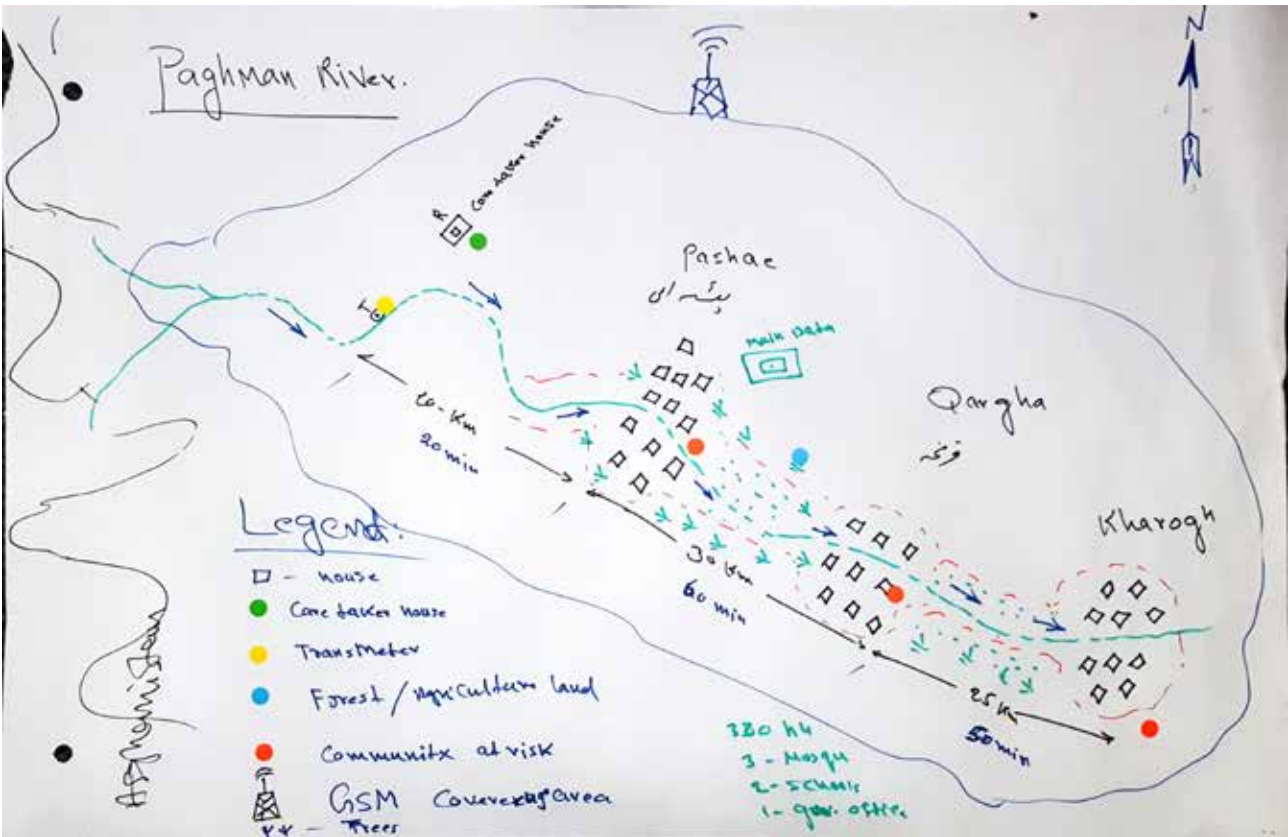
1. Dr Arun Bhakta Shrestha
2. Dr Prof. Narendra Khanal
3. Dr Neera Shrestha Pradhan
4. Ms Pranita Bhusan Udas
5. Mr Aditya Bastola
6. Mr Vijay R. Khadgi
7. Mr Narendra Bajracharya
8. Mr Jitendra Bajracharya
9. Ms Indu Chitrakar
10. Mr Dipankar Shakya
11. Mr Samden Sherpa
12. Mr Jeevan Tamang
13. Mr Govinda Shrestha

SEE

1. Mr Mahendra Shakya
2. Mr Shailendra Shakya
3. Mr Saroj Bajracharya
4. Mr Hel Kumar Shrestha

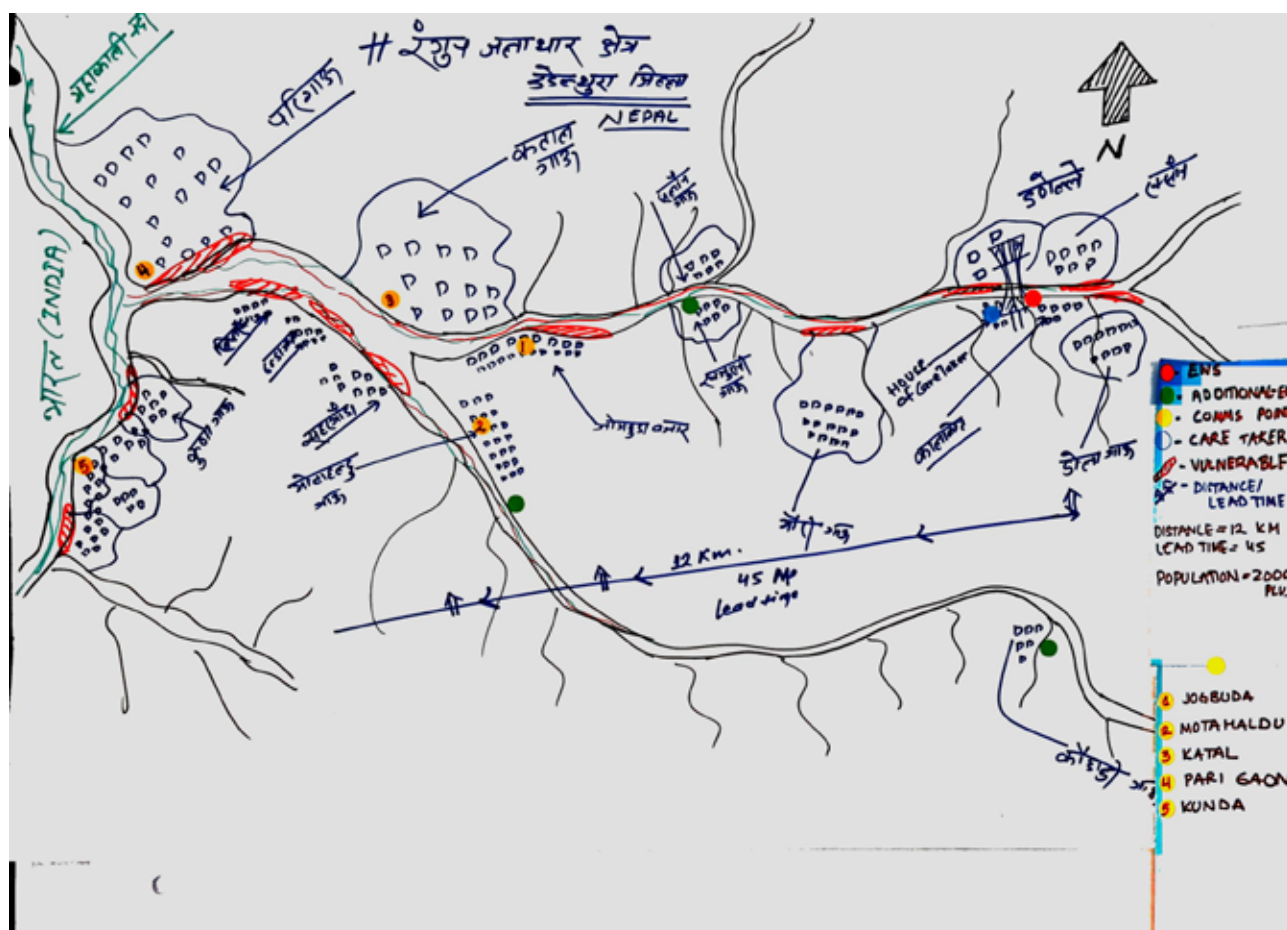
Annex 4: **Site Scoping** (Country-wise exercise)

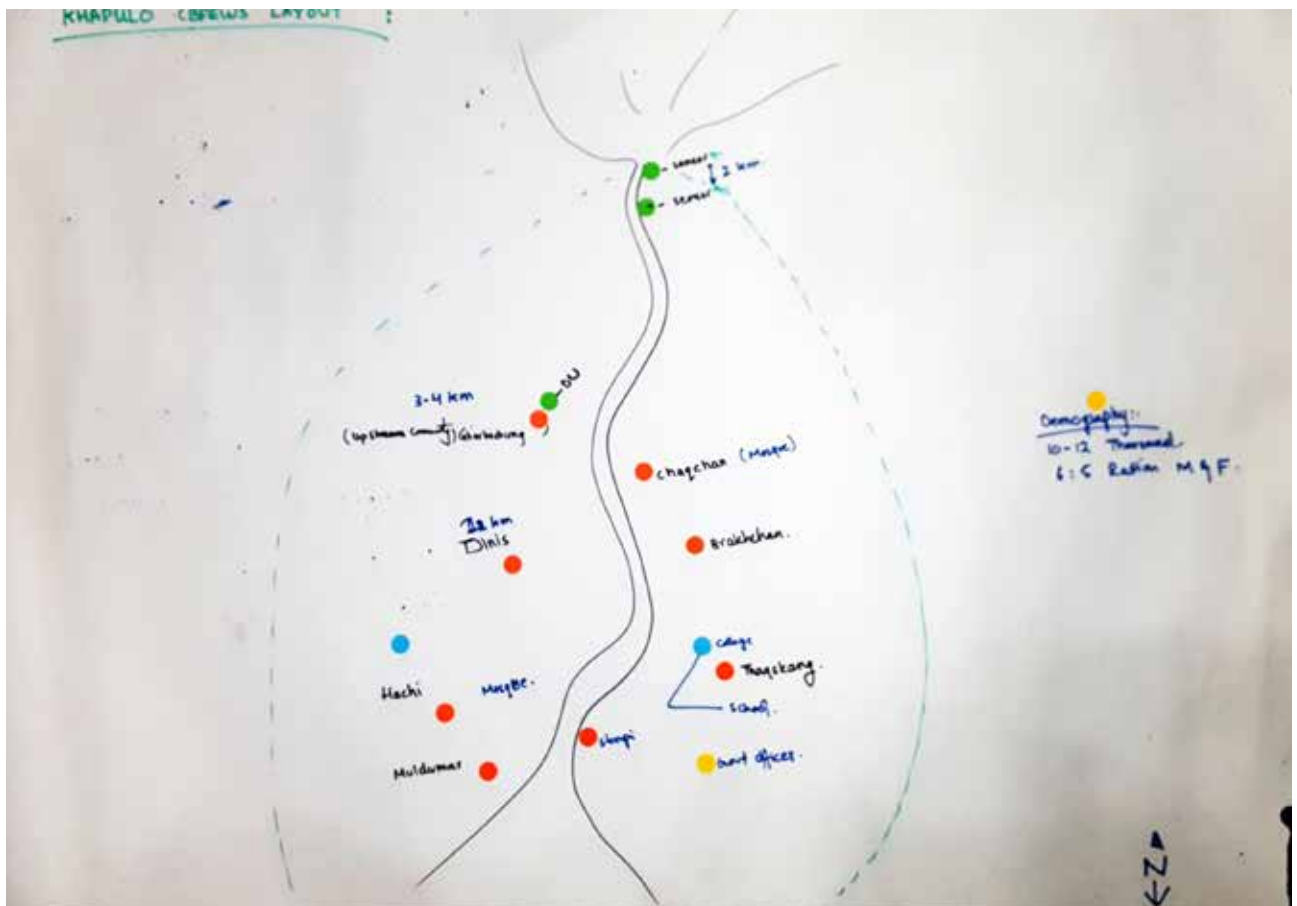
Paghman River, Afghanistan



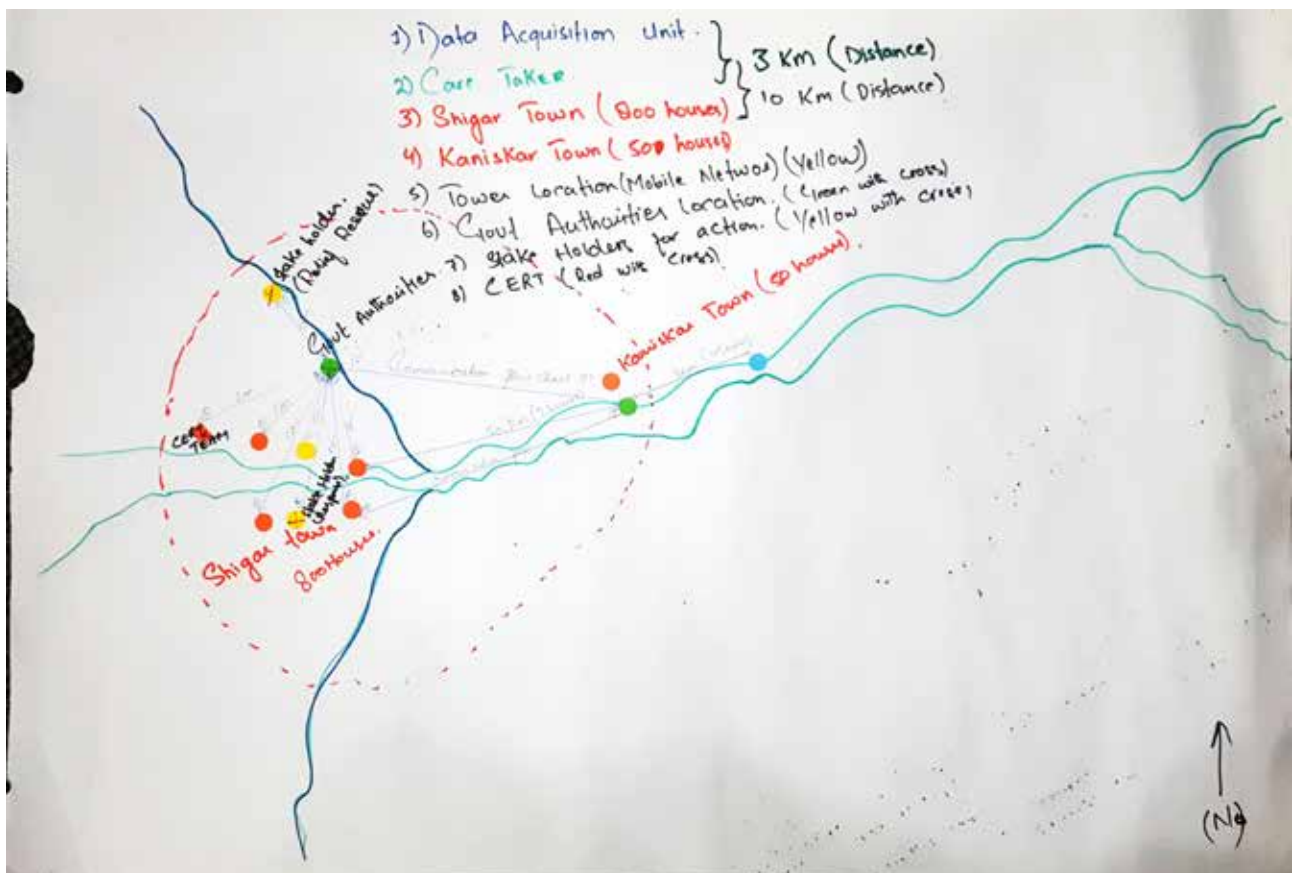
Bhitthamore, India





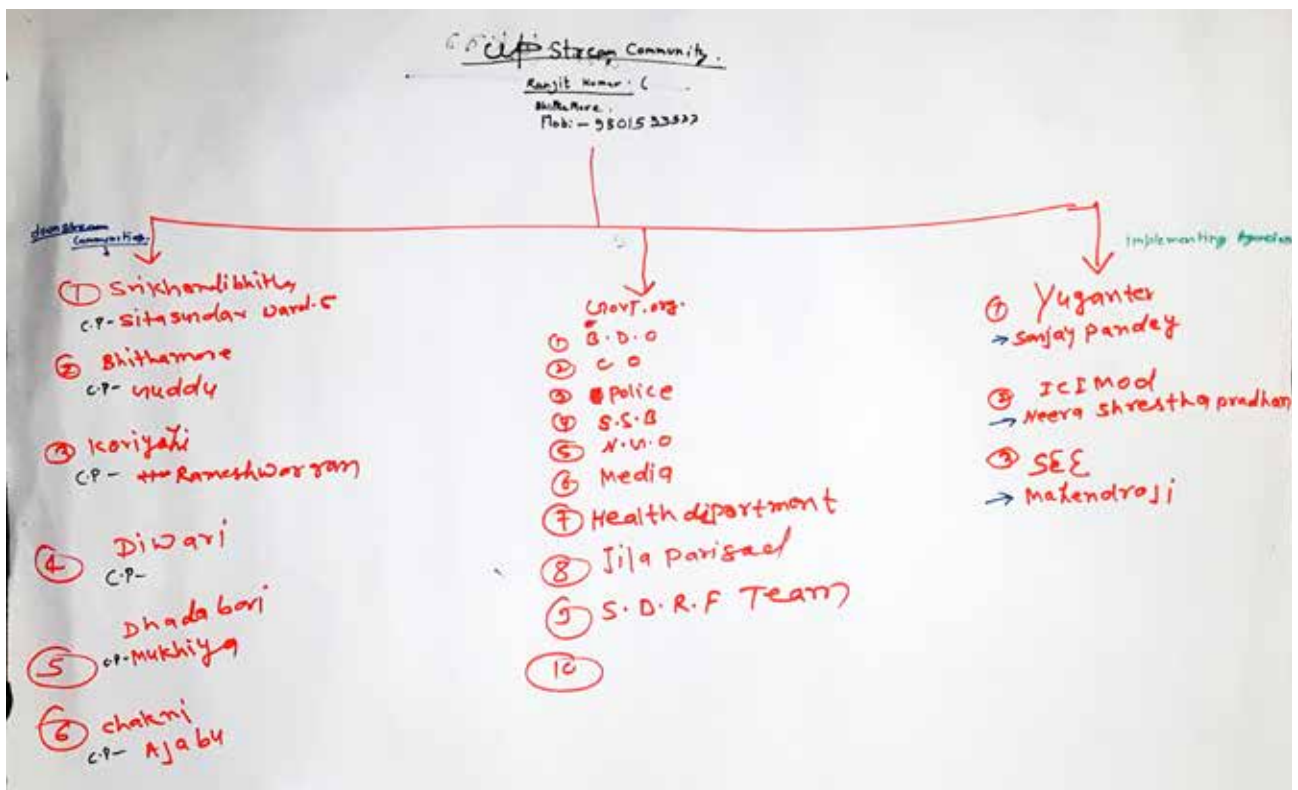
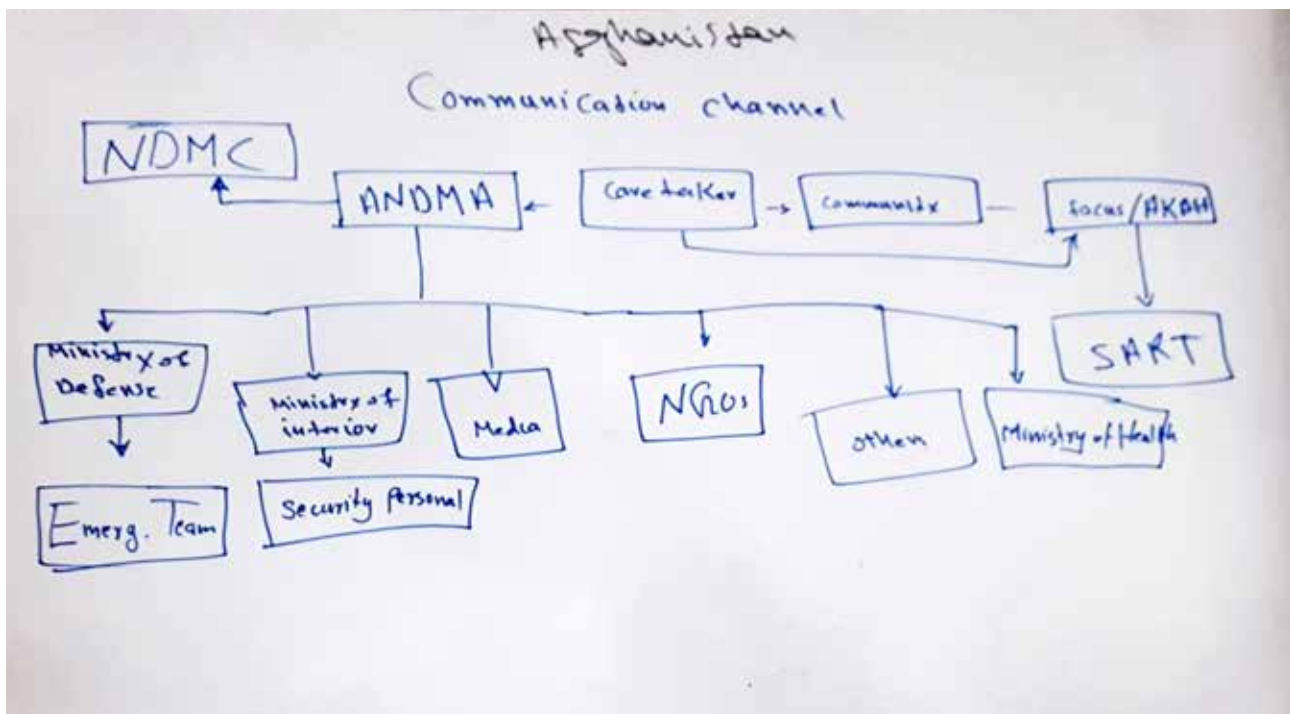


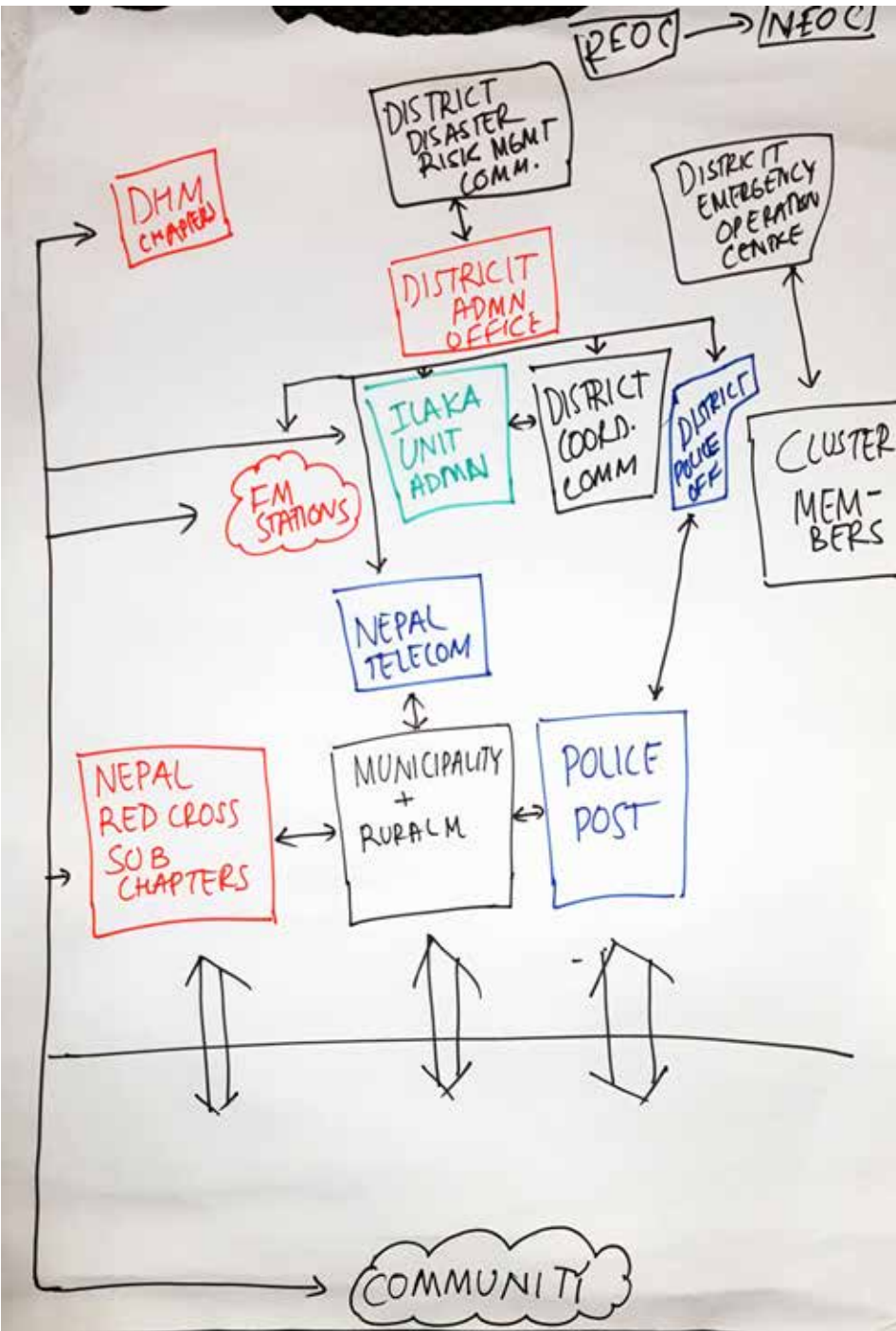
Shigar, Pakistan



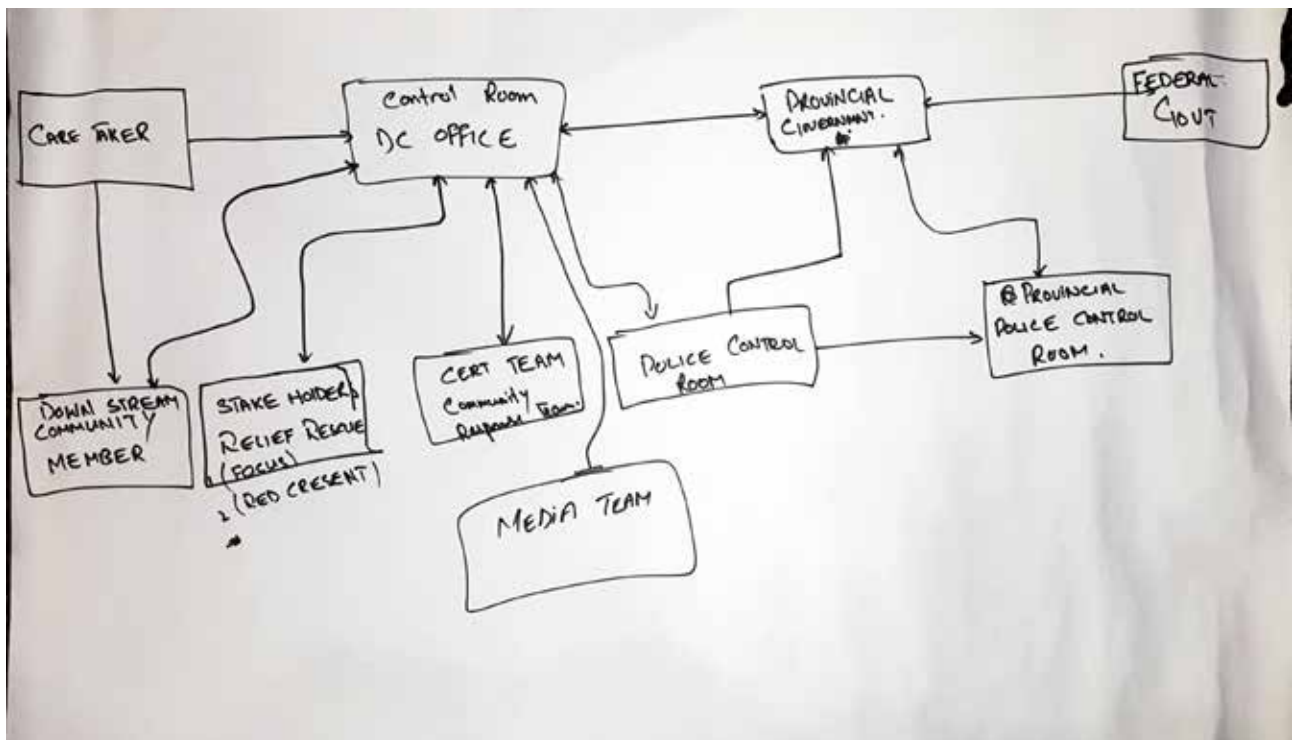
Annex 5: Communications Channel (Country-wise exercise)

Paghman, Afghanistan

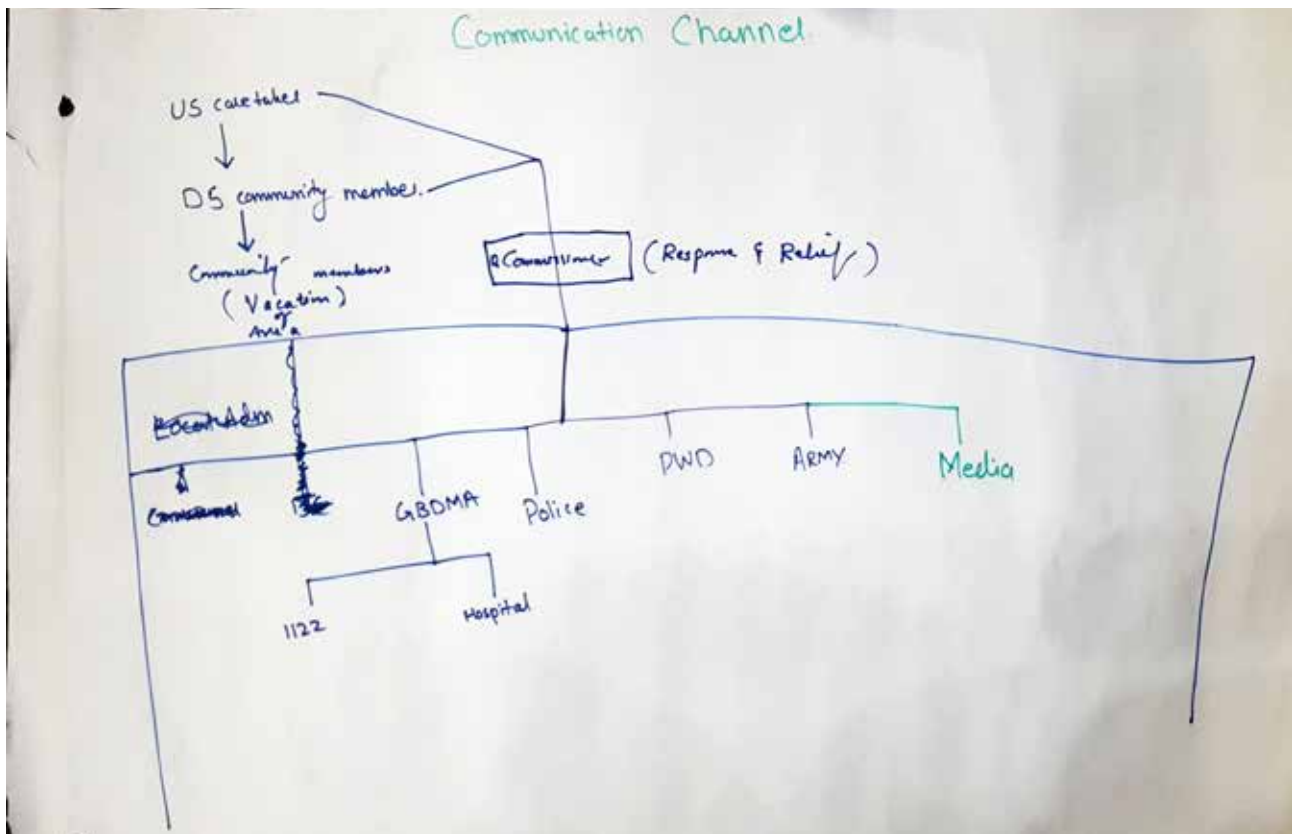




Khapulo, Pakistan

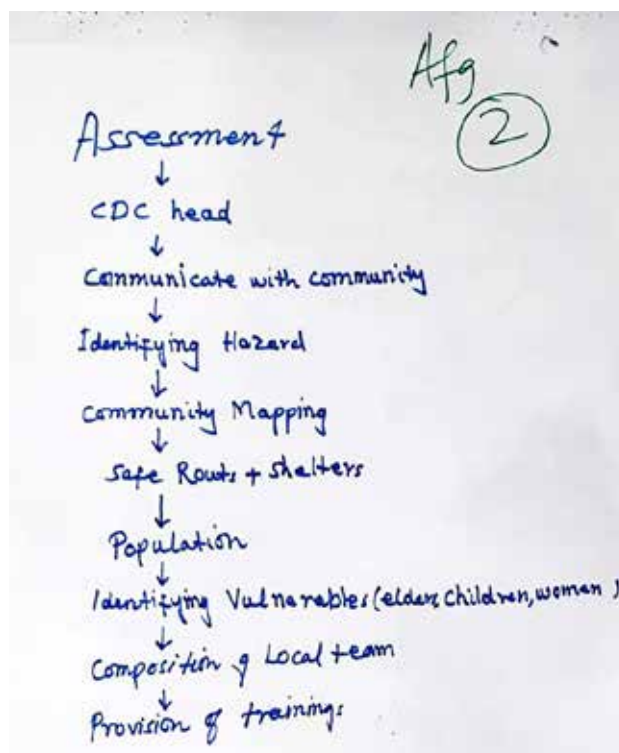
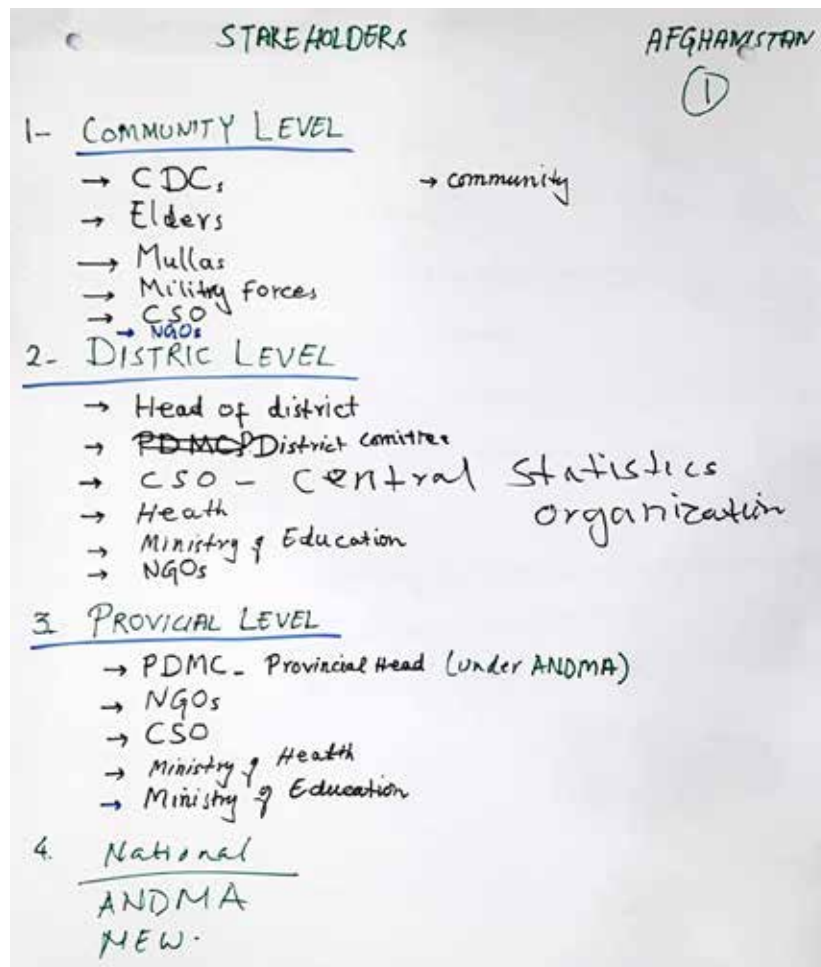


Shigar, Pakistan



Annex 6: Key stakeholders and Mobilization Challenges (Country-wise exercise)

Afghanistan



INDIA

Stakeholders

- 1) Vulnerable Community at village Level.
 - Women
 - children
 - Marginalized Community
 - Economic
 - Social
2. Tola/Habitat Leaders and Ward Members from PRI.
3. Mukhiya/Sarpanch of the village.
4. Frontline Government Workers from
 - Health
 - Education
 - Dalit Empowerment
 - Women Development Cell
5. Government Functionaries at Block Level.
 - BDO
 - CO
 - PHC (Nurses)
6. Active Group at Block/Village.
 - Religious Groups
 - Sports Groups
 - Youth Groups
 - Red Cross
 - Business Federation
7. District Level at District Disaster Management Authority
 - Disaster Management (ADM)
 - District Education Officer
 - Civil Surgeon
 - CDPO - Child Development & Protection Officer
 - Women Development Cell
8. Elected Representatives (district Level): -
 - MLA
 - MP
 - District Council Member
9. State Level: -
 - Disaster Management Department
 - BSDMA
 - WARD
 - Education
 - Health
 - WDC
- 10) Minister Policy Level.
 - Ministers
 - DMD
 - WARD
 - Education
 - Health
 - Planning Cell
- 11) National Level: -
 - NDMA
- 12) Other Stakeholders in CBEWS - OXFAM, LW etc.

5 Key Challenges

INDIA Challenges

1. Faith in CBEWS
2. Facing daily routine Problems.
3. Disaster Management system more tuned to response & relief rather than early warning & preparedness.
4. Lack of proper & timely early warning communication b/w stakeholders.
5. Less Funds for early warning system & preparedness.

Over Coming: -

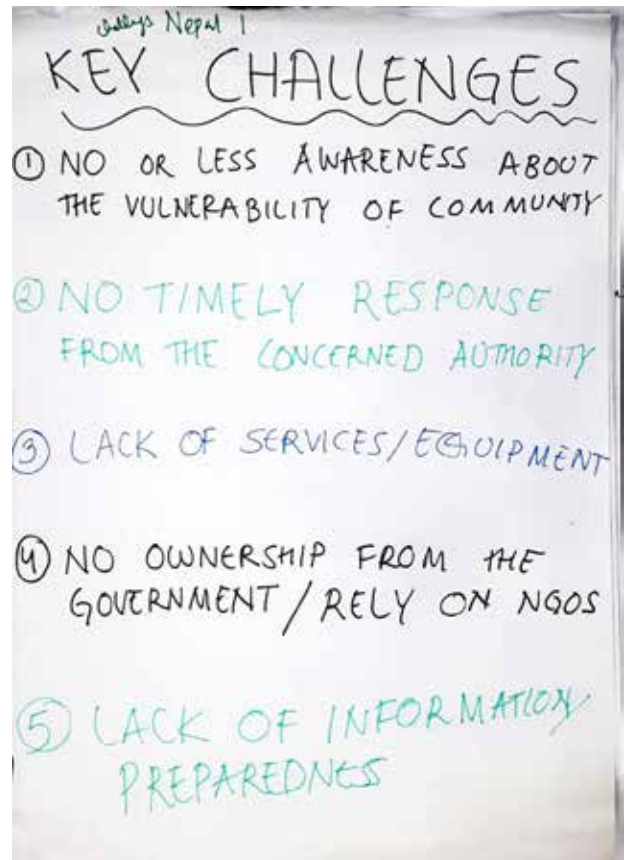
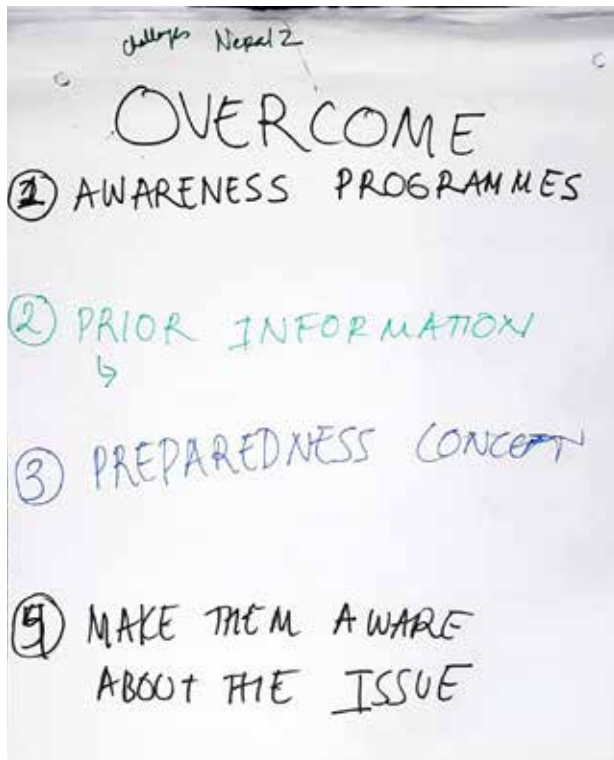
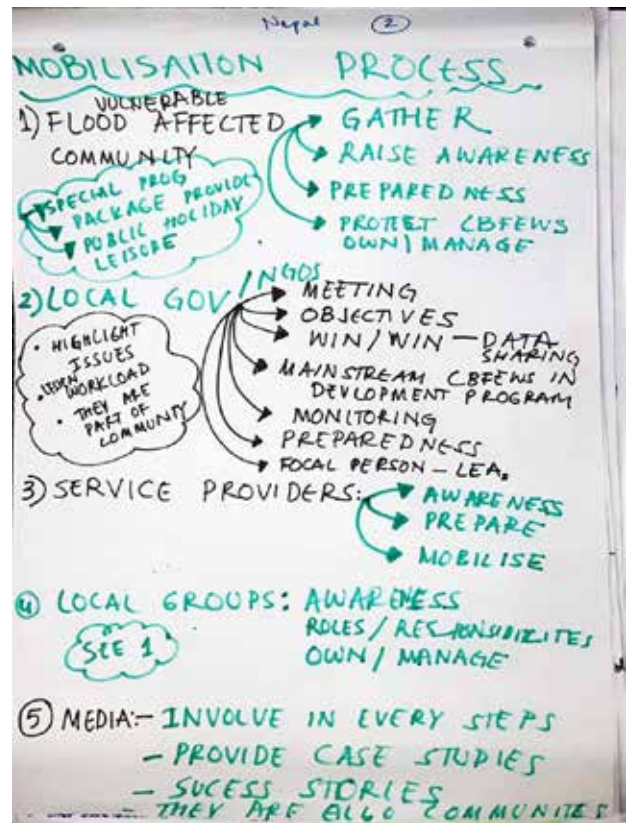
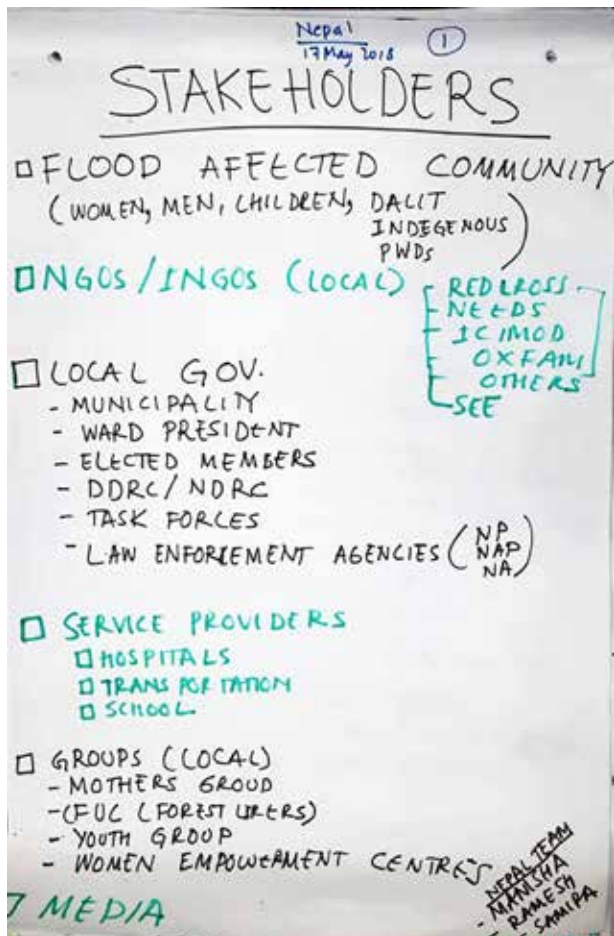
- Piloting of successful CBEWS models.
- Addressing development deficit issues.
- Restructuring disaster management system with continuous meeting with stakeholders.
- Advocacy of proper funding for early warning & preparedness.

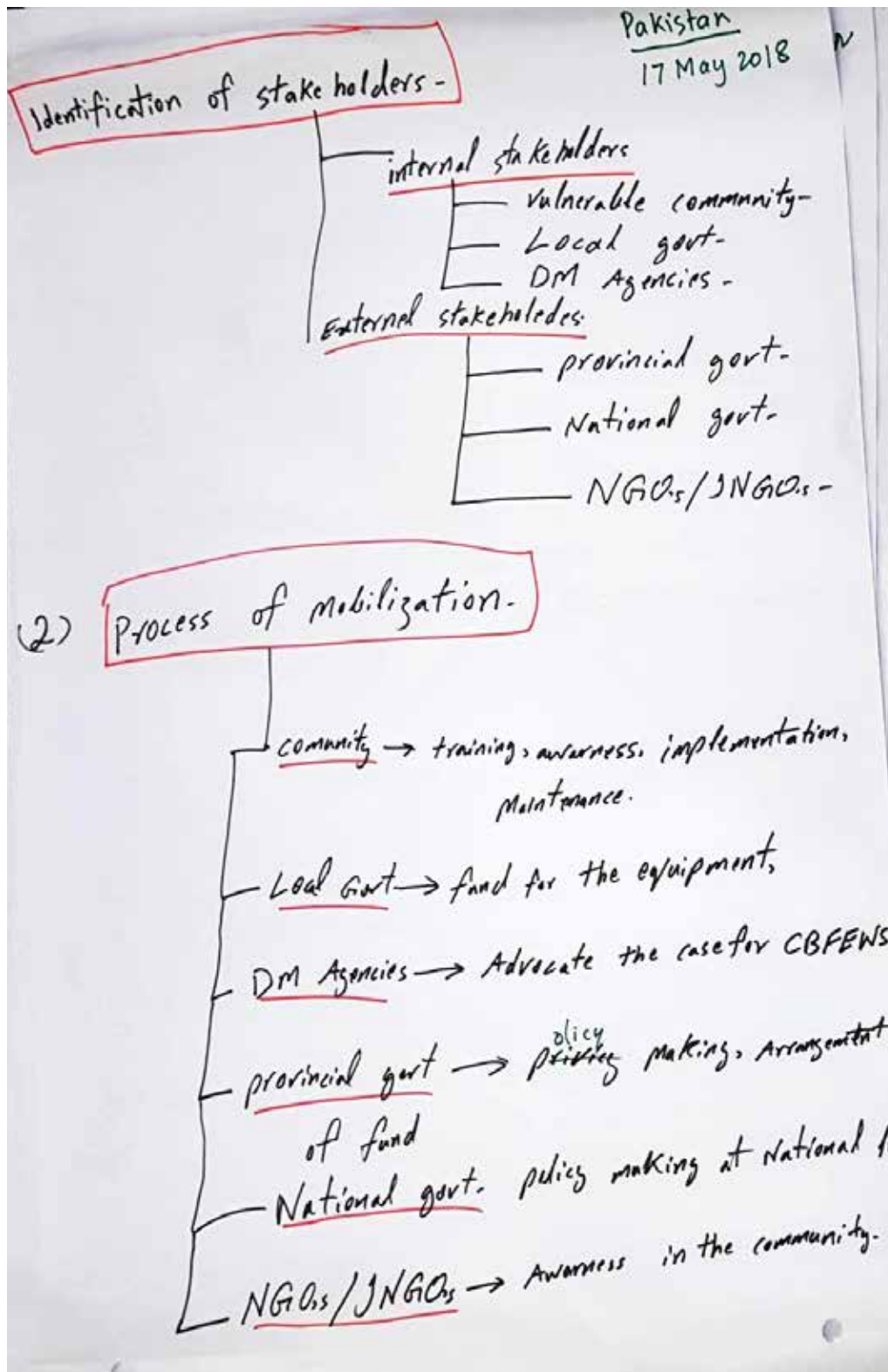
61

Processes involved in Mobilization.

INDIA

1. Survey & Identification of transboundary Rivers which inundates villages.
2. Mapping of Flood prone villages for CBEWS.
3. Meeting with village leaders & PRS members.
4. Identification of caretakers.
5. Training of caretakers.
6. Mobilization of stakeholders.
7. Involvement of government department in CBEWS. Departmental.
8. Sensitization & Capacity Building of community with focus on women & children.
9. Establishment of dissemination protocol -
 - Care taken
 - DDM
 - DMD
 - WAD
10. Integration of CBEWS with govt. Data Centre for larger dissemination.





Pakistan (Challenges)

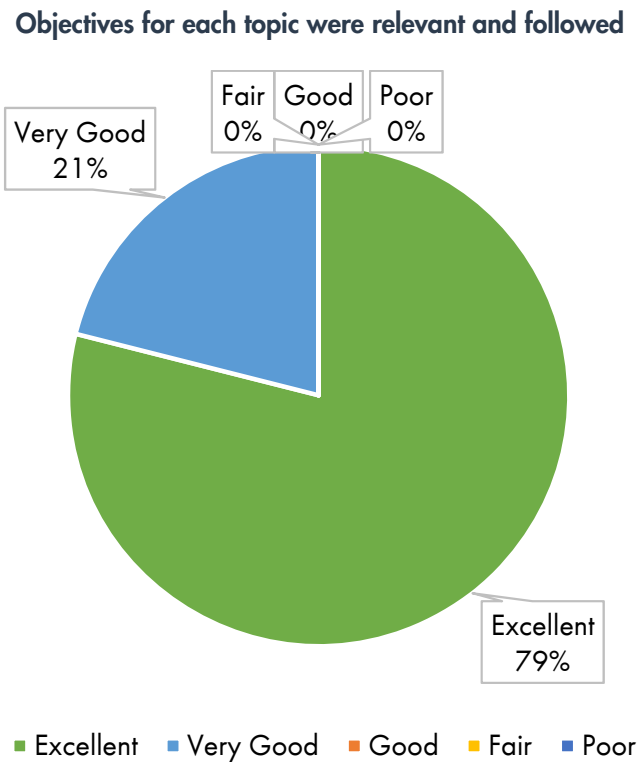
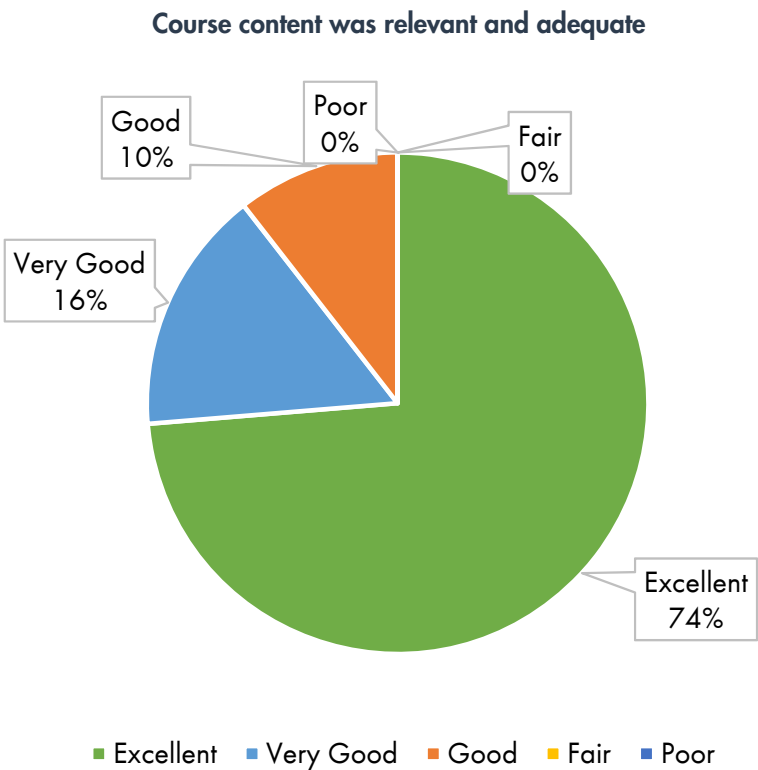
- ① Implementation and Maint. of CBFWS without monetary benefits in the long run.
- ② Acquiring Funds for sustainability of the system.
- ③ Fast changing technology and updating the equipment accordingly.

Tools to overcome these challenges:

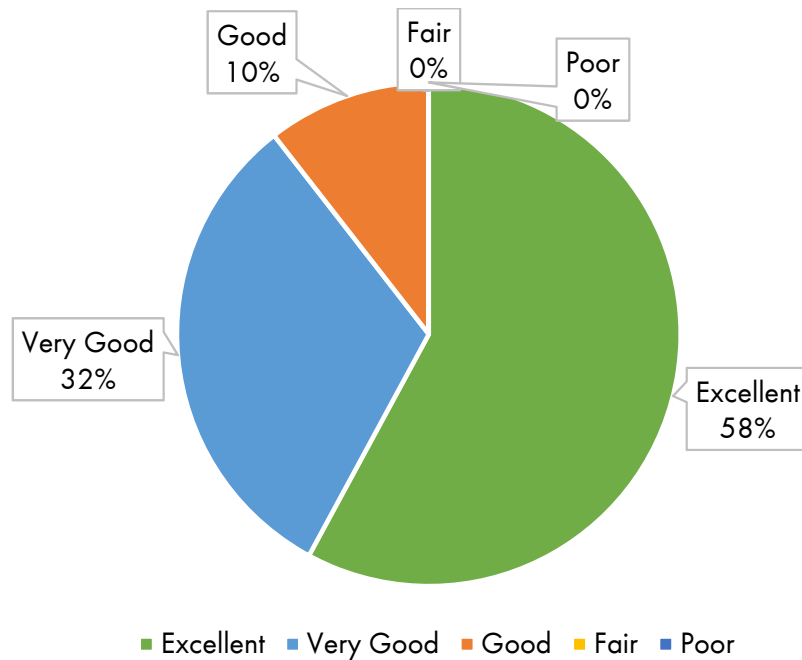
- Giving Ownership to Community.
- CREATION OF ENDOWMENT fund.
- Hiring of Tech Expert/ from Govt Eng Agencies.

Annex 7: Training Evaluation Report

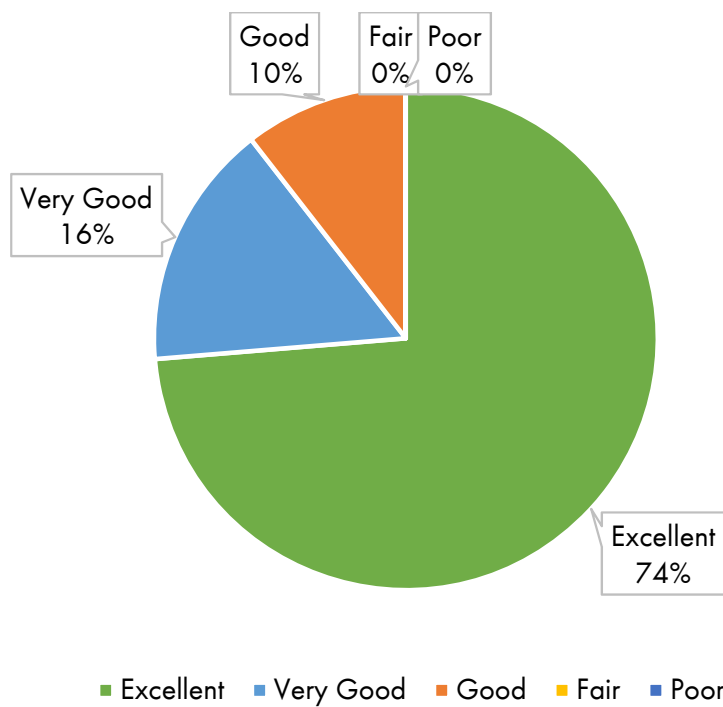
Curriculum



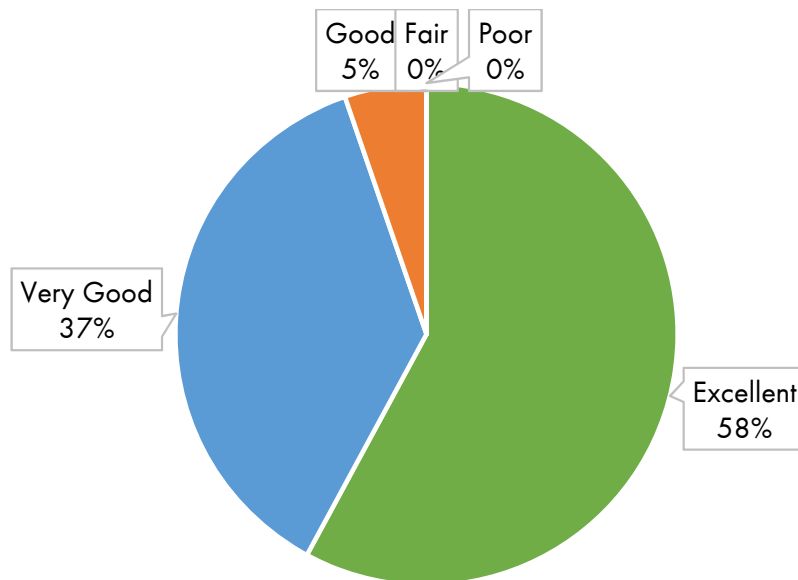
Materials Distributed were adequate and useful



The Course was organised well and easy to follow



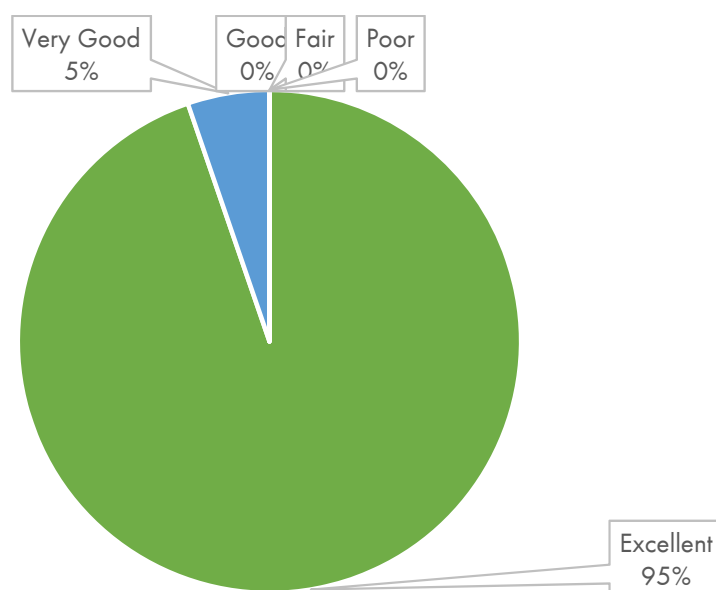
I will be able to apply what I learned



■ Excellent ■ Very Good ■ Good ■ Fair ■ Poor

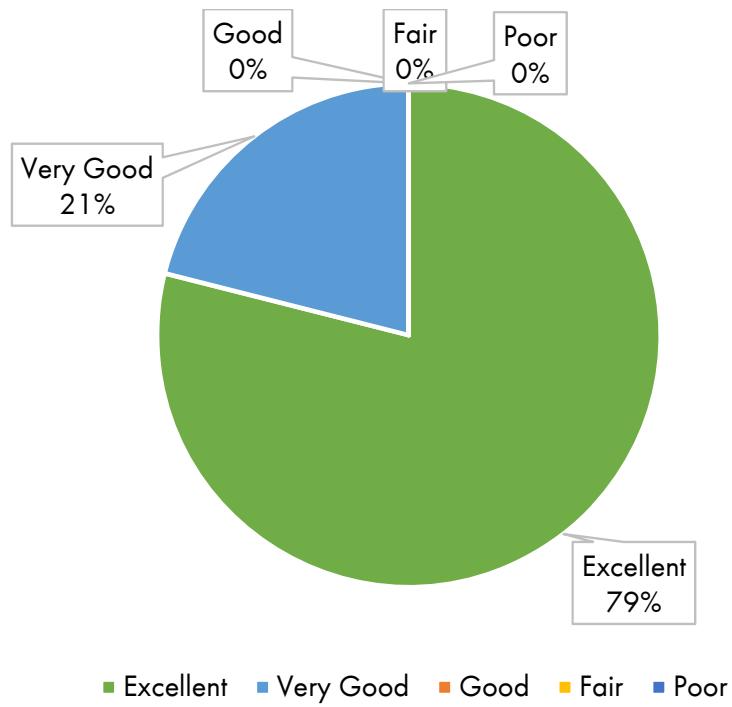
Resource Persons

Overall Quality of Instruction

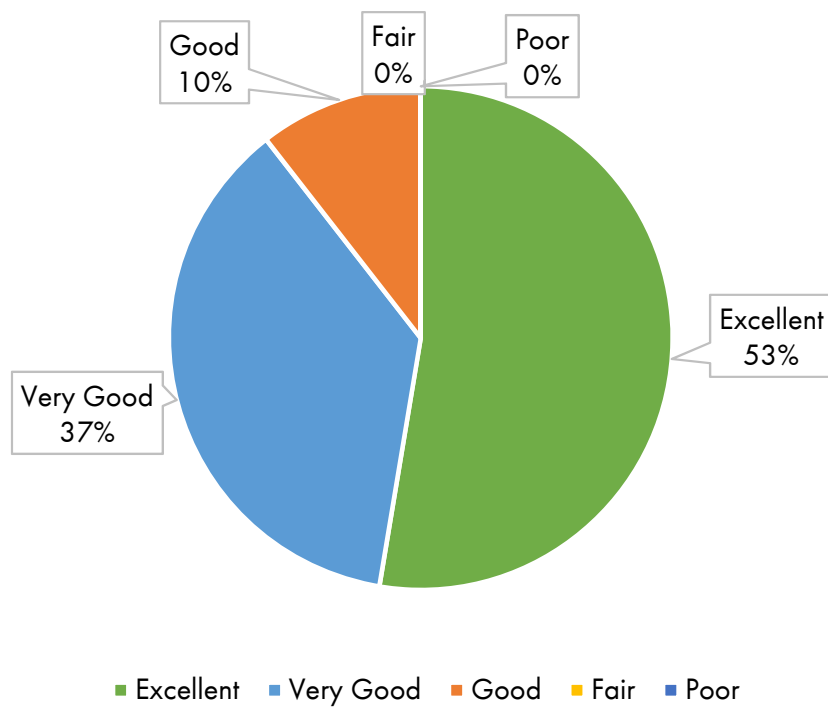


■ Excellent ■ Very Good ■ Good ■ Fair ■ Poor

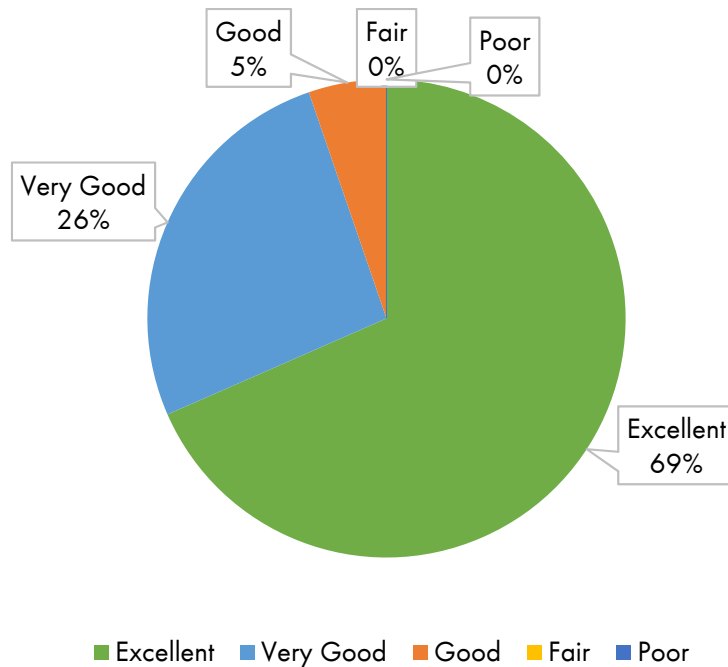
Presentations were Interesting and practical



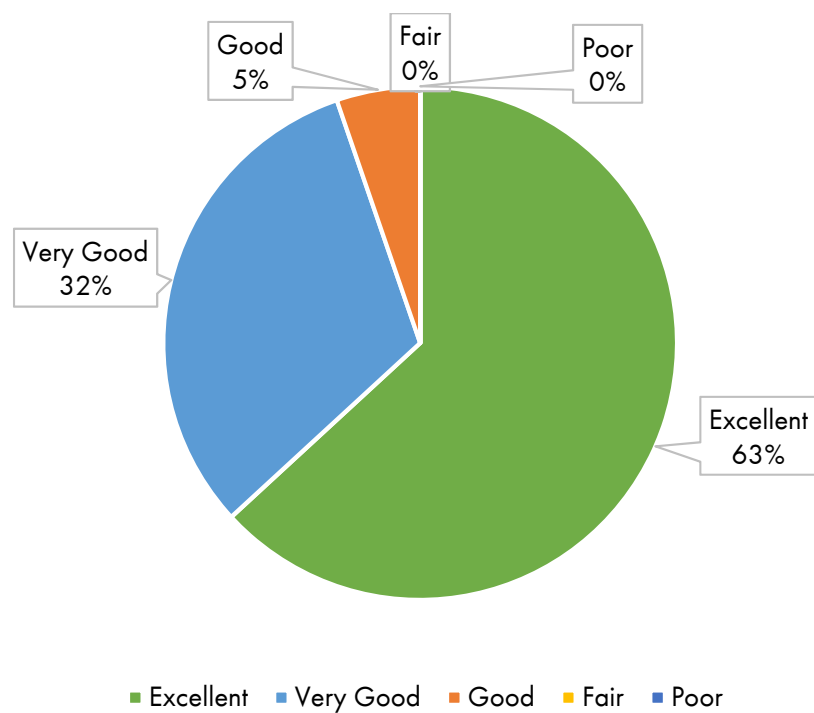
Adequate time was provided for Group work



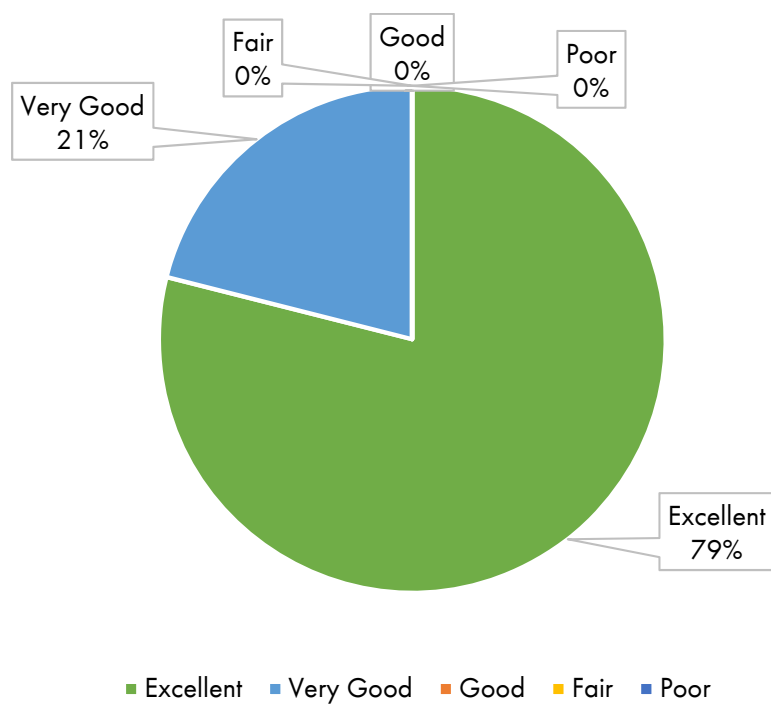
Participation and Interactions were encouraged



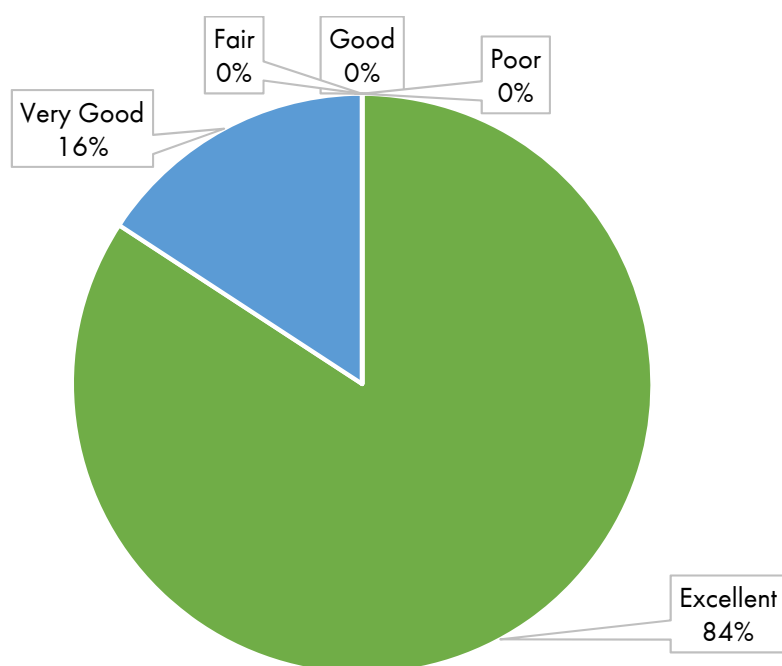
Adequate time was provided for Group work



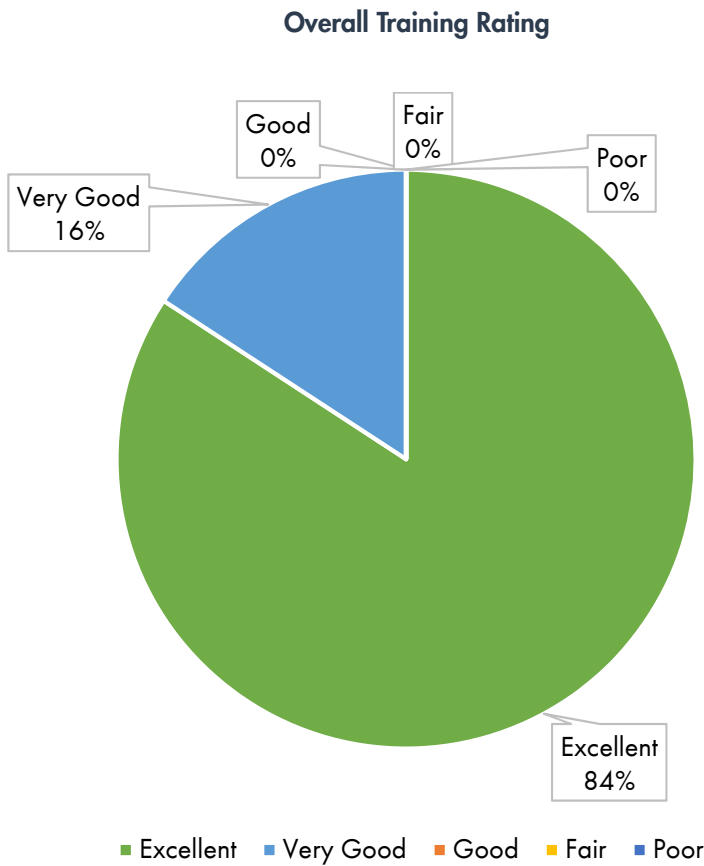
Adequate time was provided for exercises



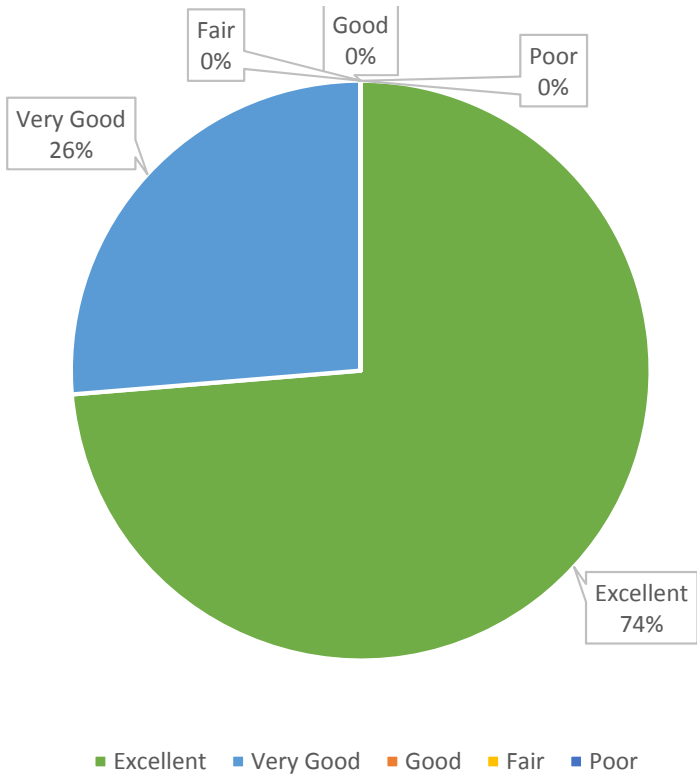
Resource Persons adequately addressed the concerns of participants



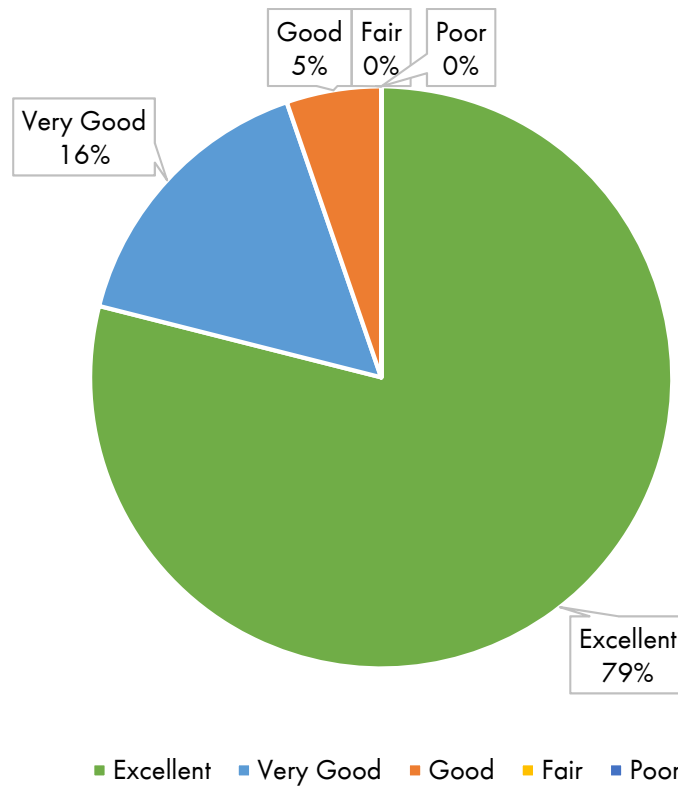
Training Specific Questions



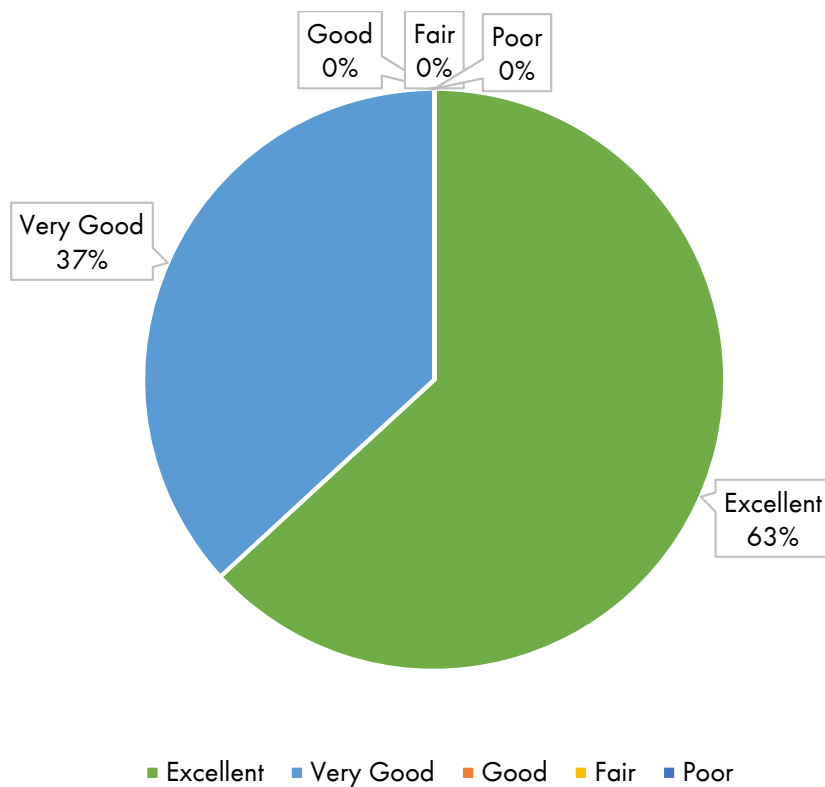
Training helped me understand theoretical knowledge on CBEWS



Training helped me understand practical knowledge on CBEWS



Impression about field Instrument test



Additional Comments

1. Did the course meet your expectations?

90% Yes, due to the practical and comprehensive nature of the course

10% Partly, due to difficulty in understanding the languages used, i.e., English and Hindi.

2. Things gained from course

- a. Sound knowledge about CBFEWS
- b. Site scoping and selection
- c. Practical technical knowledge about instrument
- d. Selection of maximum flood water levels
- e. Significance of gender roles in preparedness

3. What did you find most useful? What did you find least useful?

Most useful:

- Knowledge about disaster risk reduction in community
- Practical exercises and field visits
- Knowledge on CBFEWS implementation
- Hands-on part of the training
- Effectiveness of Instrument
- Telemetry feature of instrument

4. What topics would you like to see changed or added to the course?

- Addition of Nepali language in instructions
- More elaboration on gender and social aspects
- Even more practical demonstrations
- More information on hydrology and morphology of rivers
- Translation of manual into different relevant languages
- More individual focus rather than groups
- Discussions on gender discrimination should be added

5. What topics do you need more information on?

- Regarding data upload processes
- Error finding and rectification
- Making of models in CBFEWS
- Working of internal processes of instrument
- River morphology
- Methods for early warning dissemination

6. How do you implement the knowledge gained

- Engagement in community awareness
- Effective communication with implementing partners
- Advocate at government level and look for ways to incorporate CBFEWS into policy
- Dedication in work as a caretaker of the instrument
- Ensuring effective CBFEWS implementation in flood vulnerable sites
- Try and arrange development budget for implementation.

7. Other comments

- Training was fruitful and excellent
- Suggested adding interpreters in other languages for a more effective delivery
- Request for refresher trainings, exclusively in other languages
- CBFEWS instrument parts seem delicate and difficult to replace in faraway places. Ease of accessibility needs to be explored.

Annex 8: Photographs from the Training



Dr Neera Shrestha Pradhan delivering welcome remarks



Dr Arun Bhakta Shrestha delivering welcome remarks



Team from Pakistan



Team from Nepal



Team from India



Team from India



Gender exercise: Large group



Gender exercise: Small group



Vijay Khadgi facilitating risk scoping session



Site selection exercise



Site scoping exercise



Risk assessment exercise



Site scoping exercise



Communication channel exercise



CBFEWS demo site Godavari



Technical briefing session



Hands-on practice



Instrument assembly



Instrument setup



Instrument testing



Field based orientation



Field based exercise



Field based assembly



Field based testing



Field discussion



Calibration of instrument



Fault finding and rectification discussions



Fault finding and rectification discussions



Khokana demo site visit



Khokana demo site visit



Social mobilization exercise



Stakeholder identification exercise



Challenges to stakeholder mobilization



Group discussion



Instrument parts replacement



Instrument repair



Evaluation session



Closing session



Closing remarks



Certificate distribution



Certificate distribution



Certificate distribution



Certificate distribution



Award ceremony



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