

Scaling up Early Warning Systems in Nepal



case studies and good practices

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Technology challenging poverty



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Acronyms

CBDRR	– Community Based Disaster Risk Reduction
CBDRM	– Community Based Disaster Risk Management
CBEWS	– Community Based Early Warning Systems
CDO	– Chief District Officer
CSDR	– Centre for Social Development and Research
DDC	– District Development Committee
DG ECHO	– European Commission's Humanitarian Aid & Civil Protection department
DHM	– Department of Hydrology and Meteorology
DIPECHO	– Disaster Preparedness Programme under European Commission's Humanitarian Aid & Civil Protection department
DMC	– Disaster Management Committee
DRR	– Disaster Risk Reduction
EC	– European Commission
EWS	– Early Warning Systems
RKJS	– Radha Krishna Tharu Janasewa Kendra
SEWIN	– Scaling up Early Warning Systems in Nepal
VDC	– Village Development Committee

Foreword

Acknowledging EWS as a major disaster risk reduction mechanism, Practical Action Nepal Office is actively working with the communities at risk to respond to and prepare for the upcoming flood. Since 2002 we are working on establishing EWS in the flood prone communities of few villages in Terai region. Many lessons learnt and good practices from the earlier stage helped formulate Scaling up Early Warning Systems in Nepal (SEWIN) Project. SEWIN was initiated in 2009 with financial support of the Disaster Preparedness Programme of the European Commission's Humanitarian Aid and Civil Protection department (DG ECHO) under DIPECHO V Action Plan for South Asia.

By promoting community based approach in establishing EWS in the flood prone districts of Banke, Bardia, Chitwan and Nawalparasi, we have given equal emphasis to all four key elements of EWS - risk knowledge, monitoring and warning services, dissemination and communication, and response capabilities. This approach is also in line with the international framework for disaster risk reduction, Hyogo Framework for Action 2005-2015, which has cited risk identification, assessment, monitoring and early warning as their second priority in the list.

I am happy to note that SEWIN Project has contributed significantly in minimising the flood risk of the most vulnerable communities. The effort to integrate inclusive approach in every activity by looking at the same situation from different perspective such as gender, disability, elderly, children, and ethnicity is worth mentioning.

This booklet provides an overview of SEWIN Project's activities and how these activities have helped the community to become resilient towards flood in the form of different case studies. It is encouraging to see how the community's knowledge, attitudes and practices have changed over time. I firmly believe that early warning practice should be incorporated by all disaster prone communities to make their life and livelihood safer, and that no one will have to experience hazard turning into a disaster.

I thank Debnarayan Bej, Project Manager; Anup Phaiju, Sr. Project Officer; Sarina Shrestha, Sr. Administrative Assistant; Hritika Rana, Project Assistant, Practical Action; and staff of local implementing partners - Pankaj Koirala, Project Coordinator, SAHAMATI; Lok Narayan Pokharel, Project Coordinator, CSDR and Nirmal Chaudhary, Project Coordinator, RKJS for their enthusiasm and hard work without which the communities at risk would have never felt as safe as they did at the moment. I am grateful to DG ECHO for their support and believing in us and the government and non government agencies, specially the Department of Hydrology and Meteorology. My appreciation to the communities who took ownership of SEWIN Project and helped us in establishing EWS to new heights. I also thank the Communication Unit from Practical Action for editing and coordinating the layout of the book to its final shape. Lastly, I wish the communities at risk will receive early warning prior to a flood and will never have to lose their loved ones or their belongings in the future again.

Achyut Luitel
Country Director
Practical Action Nepal Office



Shakil Ahmad during National Early Warning users' workshop

Establishment of DMC — an approach to community based disaster risk reduction

“Prior to SEWIN Project’s intervention no organisation, government or private had worked on disaster risk reduction and its management in our community.

It was CSDR who opened our eyes and helped us understand that only after establishing an institution can we amplify the voice of every commoner affected by

disaster. They also suggested that only an institution which if made sustainable can properly manage disaster by reducing loss of life and property. Hence, we established a committee named Duduwa Lundri Disaster Management Committee,” states Shakil Ahmad Khan, Secretary of Duduwa Lundri DMC. Disaster Management Committee or

“ We collected NPR 350,000 (€3,684) for disaster preparedness and mitigation by negotiating and influencing the VDC to support our cause. ”

a DMC is an institution created by the community themselves with their own representatives to empower, mobilise and identify resources and capacities already available in their community. DMC pool resources to build community’s capacity to reduce the community risk of the community from any type of disaster, especially by focusing on early warning and preparedness.

DMC in Kamdi VDC was formed on August 2009 right after the inception workshop. Altogether 65 people from flood affected communities and representatives from political parties were involved during the formation of DMC. The DMC consists of 1 chairman, 1 secretary and 13 remaining members.

DMC is involved in awareness raising programmes, organising and participating in training, workshops, seminar, meetings, resource finding and mobilisation,

rapport building with stakeholders and also advocacy related work. Conducting activities through DMC, has been very easy as community people view DMC as trust worthy and legitimate, making the implementation of any activity more effective and efficient.

“Being a part of this committee has given me satisfaction because people in our community now believe that even though no relief institute comes to our rescue or provides us with relief we will be able to save ourselves as well as our belongings and by utilising the emergency fund we will keep our community safe,” affirms Shakil.

“For the sustainability of EWS we will mobilise community as well as other local institutions like Forest Users Group Committee along with VDC or collect ‘Musthi daan’ from the community for emergency fund.”



Discussion facilitated by Dr. Dilip K. Gautam during upstream visit

CBEWS pivotal for making communities resilient

Department of Hydrology and Meteorology (DHM) provides regular monitoring services of weather and rivers in general and weather forecasts for public, mountaineering expedition, civil aviation, and for the mitigation of natural disasters in Nepal. Close collaboration with DHM and Practical Action to extend and scale up CBEWS in Nepal has proved to be effective as it has helped in reducing the risk and vulnerabilities of the flood prone communities.

Before collaborating to promote flood EWS, DHM had extended its monitoring network

of river water level and rainfall with modern and upgraded system to generate timely information on more scientific basis but it was not accessible to other district stakeholders and the local community, besides DHM.

“We are using telemetric system to scale up and extend the network along with the modernisation of the system. Most countries have satellite based telemetric system but since Nepal does not have a satellite, this system became costly, so the most feasible option for us was to use VHF wireless set to collect the data once a day or at hourly basis

during monsoon,” explains Dr. Dilip K. Gautam, Chief, Flood Forecasting Section, DHM. Now, we have upgraded the system with mobile phone based telemetry. He further adds, “though we had the data, we did not know when, how and whom to issue the warning. Although this was not a Herculean task, we were unable to do it. This is when CBEWS became very essential.”

Dr. Dilip stressed that DHM has limited capacity to work directly with the community to establish CBEWS, but collaborative work has made it easier. Cross learning and utilisation of each others expertise was the basis of collaborative action. For example, Practical Action’s expertise was best utilised in community mobilisation, awareness raising and institutional set up such as formation of DMC. Whereas, the installation of equipment and devices for observation, identification of flood danger level as well as communication of warning information was done jointly by community and DHM with facilitation from Practical Action for establishing CBEWS.

Moreover, activity such as the upstream visit for the flood affected community other district and local level stakeholders has been important in building the confidence of the community and trust worthiness

towards the system. The involvement of the community in identification of danger level and lead time during these visits has been crucial in making the community internalise the system as reliable and legitimate.

CBEWS is effective for identifying the risk faced by the community, through this knowledge they are encouraged to identify the danger level by themselves. This practice has furthermore developed a sense of ownership of the system to the community.

Like Practical Action, Dr. Dilip asserts that the community might not be able to manage CBEWS in the long run if the local government authorities, especially District Disaster Relief Committee under Ministry of Home Affairs from central government, DHM under Ministry of Environment, and Disaster Management Section under MoHA, and the community do not coordinate with each other and collaborate. Although the entire system is ultimately for the disaster risk reduction of the community, he further adds that community alone cannot sustain EWS, neither can government alone sustain it, but the mutual cooperation between these units is the ultimate reason for the sustainability and effective functioning of the system. Hence, strengthening the relationship, understanding and cooperation between these three units is vital.



Training on mainstreaming disability in early warning and DRR facilitated by Handicap International

Developing disability inclusive EWS

SEWIN Project has integrated disability into its strategy with the objective of reducing the risks of the most vulnerable people in flood prone districts of Nepal. The project has included specific activities to sensitise and train the DMCs and community members to treat persons with disabilities as differently-able persons and supported the active participation of persons with disabilities into DRR activities.

“We have created a task force group including one person with disability as an active member of the group. The main objective is to understand vulnerability through a different lens during the crisis,” says Shakil, Secretary DMC, Kamdi VDC.

Dinesh Barma is physically impaired and is an active member of his community’s DMC. He has been involved not only in DMC

meeting but also in risk assessment and awareness raising campaigns, community based EWS and disability training as well as in mitigation activities. His involvement has enabled him to gain knowledge on flood preparedness and to share his knowledge with others.

“As soon as the warning message is communicated, DMC members along with the task force will meet and decide on the steps to be taken according to the contingency plan. The message will then be disseminated among all community members with special attention to the most vulnerable groups. Siren, hand mike, flags and sign boards will be used to disseminate the message. The other task force such as search and rescue team, first aid team, will also disperse and make sure that all vulnerable people have reached shelter safely,” adds Dinesh.

Dinesh has also been provided with a tricycle after a check up in the screening and fitting camp carried out by Handicap International. The tricycle has increased Dinesh’s mobility. It has not only supported him in reducing his vulnerability to flood but has also helped in improving his income.

Since he is a retailer, tricycle has increased his mobility which has further provided him with enough opportunity to build rapport with many people to sustain his business. Like Dinesh, many other differently able persons have been empowered. They are involved in every activity and are constantly consulted to make EWS more inclusive.



Dinesh Barma showing early warning poster



Wall painting with early warning and disaster preparedness messages in Chitwan

EWS training empowering women

Bhagsara B.K is the youngest among her 9 siblings. Her father was a seasonal migratory labourer to Shimla in India and he died there five years ago. Losing her father was a tragedy but having to leave school due to poverty left her heart broken. With a land holding of less than 1 hectare, her family was food secure only for four months in a year and her brother followed their father's footsteps to work as labourer in India.

"After my father's demise I left school when I was in the 6th grade five years ago," recalls Bhagsara.

Binauna VDC where she lives is highly volatile to flood in Banke District. When Binauna's community was chosen as a SEWIN Project site, Bhagsara grabbed the opportunity to participate in several training such as first aid, search and rescue;

No one can stop me from studying now - Bhagsara

CBEWS, participatory vulnerability analysis and book keeping training. Because of the community's vulnerability to flood her family encouraged her to be a part of early warning task force as they believed that increasing her capacity to withstand flood would help her, her family and the community too. Today, Bhagsara is an active member of "Rapti Prakop Byawasthapan Samiti" of Binauna VDC.

"After attending several training provided by SEWIN Project I realised how much I missed school. My family saw the change in me. Our community gained knowledge through these training and it had changed all of us," she explains. The change prompted me to join school again and I admitted myself in 8th grade after a gap of five years. I bear the cost of my school fees by working as a labourer during the holidays," she says with gratification.

Today Bhagsara and her community are well prepared for flood and are less vulnerable.



Bhagsara B.K, member, Rapti Prakop Byawasthapan Samiti



Fulbasiya Tharu with hand operated siren

Preparedness with EWS

With the aspiration of doing something for the community Fulbasiya Tharu (38) of Padnaha VDC ward no. 8- Barbatta is engaged in social work as a volunteer. She is also a member of Babai Pragatisheel Prakop Byawasthapan Samiti a DMC.

Barbatta community is situated near Babai River. Hence, the danger of flood every monsoon is a looming fear in this community.

“In 1995, heavy rain poured for two days continuously. Around 3 AM my house was flooded. That night, my husband Taratal was out for work and could not return because of heavy rainfall. My children were small so I was baffled. I had to save my children, store food and other assets and ultimately save myself.

Since I could not save food we had a big problem. Although I saved my children

during flood I was not sure if I could save them after the flood for long,” recalls Fulbasiya with tears.

When asked what she knew about preparedness for flood she said, “deep down I always thought that we should have been prepared but the prediction we made by observing the river and clouds often went in despair and we always suffered. “When I heard about SEWIN Project which came with the aim of raising awareness on preparedness through flood EWS, I felt this programme was meant for our community. I wanted to become a part of it to help the entire community be prepared so that they will not have to lose their loved ones and their belongings.”

Fulbasiya is responsible for operating the hand siren to warn the community after receiving information on the water level from the upstream gauge observer. She has participated in several training and has also visited the upstream flood monitoring station in Chepang to see the devices that measure the water level and rainfall. She has access to telephone numbers of the gauge reader, local police station and other stakeholders. When the

DMC confirms the water level is high in the upstream, she will operate the siren to warn the community of the impending flood.

“We will have at least 4 - 5 hours for preparation. Everyone will have ample time to collect food, important documents and help each other to get to the shelter. We have contributed our time and labour for the construction of shelter, machan, culverts, and toilets,” explains Fulbasiya.

Like Fulbasiya there are other women volunteers who visit people in their houses and explain to them the benefits of EWS and the danger associated with flood. These volunteers also inform community people on EWS activities that raise awareness on floods through street drama, song competition, training and rallies.

“I am very happy to be a part of this programme. The knowledge we have acquired through SEWIN Project will remain with us even after the project phases out. Knowing that there is EWS in place I feel safe and no longer have to worry about flood,” she concludes.



Spreading risk knowledge through street drama

Things have changed today !

Akbal Khan (42), member of Duduwa Lundri Prakop Byabasthapan Samiti, Kamdi VDC recalls the flood of 2006.

“I woke up at 1 AM and found a foot of water inside my house. I immediately woke my wife and my children and in the process of fleeing we screamed and alerted our neighbours too. Later I learned that I was the first person to alert the community. On that fateful night had I not woken up

me and my family and many people would have died, especially children, elderly and pregnant women. By luck we managed to reach the higher ground. Although we managed to save all human lives, many of us lost our livestock and important documents.

We always thought that floods were a part of planting season and we only talked about flood after the destruction. But this is the

first time we are talking about flood and preparation because SEWIN Project has assisted us in understanding the importance of flood early warning” - Akbal.

Things have changed today. The whole community has changed. We now know what to do during the monsoon. We have a DMC who informs the community about flood preparedness, early warning and spreads awareness on how EWS works for flood. Many people have seen street dramas, participated in local song competitions, rallies and other awareness programmes where they have learnt more about flood preparedness. During street drama and exhibition our community has also seen the siren and hand mike. We know that Jan Ali Nau, member of DMC will operate the siren on time. DMC is responsible for contacting the gauge reader and other stakeholders regularly during monsoon to extract timely information and disseminate among the community people.

“Now, as soon as we hear the siren or contact gauge reader or other stakeholder and get the information on danger water level we will get prepared. We will collect our belongings, take our livestock to higher

ground, help elderly, children and pregnant women and take them to the shelter which is 1 km away from our home. We have also identified alternative shelter or school which is also 1 km away from my house.

Thanks to EWS, it has helped in reducing our vulnerability and has increased our confidence. Now we are ready to take full benefit of the rain. I can now say with confidence that disastrous flood is not a part of planting season.”



Community participation in risk, vulnerability and capacity mapping exercise



Woman observing water level in the downstream

Old and new practices go hand in hand

Inhabitants of Banke District are one of the most vulnerable communities in Nepal who live in constant fear of flooding as they are surrounded by Rapti, Babai, and Mankhola Rivers.

Having lived with flood disaster for many decades, people of Binauna VDC have certain indigenous knowledge used for generations for prediction of flood.

Ramwati Yadav (42) from Aalinagar 9, Binauna VDC, Banke is a permanent resident of this VDC. He recalls how they used to predict flood prior to the implementation of SEWIN Project.

“We did not have a proper system to predict flood or to inform us about the approaching flood. The only way we knew was to observe water in the watershed and the strange and distinct smell coming from

the stream. The ants marching with eggs on their back or crabs coming out of the water in large numbers were some of the indicators we observed to watch the flood. However, these indicators were unreliable, and unsystematic.

Sometimes we used to give due importance to these indicators which would start a pandemonium about the flood in the whole community. People would take their children and their belongings as fast as they could and run away to the higher ground. But there are times when we have ignored the signs and have suffered.”

Though the traditional practices were helpful in predicting flood, sometimes it did not give the community enough time for preparation. Moreover, it was not something to be relied upon wholly.

“SEWIN Project has created awareness and increased our knowledge on EWS. Though the traditional knowledge was helpful it was not sufficient. I have also learned that early warning alone is not enough to save lives but early preparedness and early action is equally important. This year I will contact the gauge reader, listen to radio and also look for traditional indicators during monsoon to alert the community about the approaching flood.” says Yadav.



Local FM staff constantly checking DHM web site for water level information



Local song competition has been considered as one of the best medium to raise awareness among the community about any new knowledge.

Local song competition - a source of edutainment

Awareness raising activities are essential for spreading knowledge and building the community's capacity. Out of several awareness raising programmes such as street drama, exhibition, rallies, elocution, art competition and essay writing, song competition has proven to be the most effective of all.

Local song competition was organised with special attention to cultural and linguistic aspect. For example duets and Bhajans are a part of folk culture in Nepal and

due importance was given to these kind of songs by composing the songs into Tharu, Awadhi and Nepali languages.

Since the local communities are aware of the early warning mechanisms which were imparted to them during the exposure visit to the upstream, various training and workshops, street dramas, exhibitions and other programmes, communities were capable of composing songs under the "Early warning and preparedness" theme.

During local song competition in Bankatti on 15 April 2010, the project staff displayed hand mike and hand siren. The mechanics and its use were explained to the community people. I now know how to use the mike and the siren and most importantly when to use it. Now, all of us sleep in peace during the night time - Sukai Chamar, Bankatti VDC-5 Bankattuwa

The DMC members informed the local communities about the song competition and encouraged them to incorporate the knowledge they had learned from previous events. The message of early warning had to be delivered through the songs composed by the locals which would get them more points to win.

Lastly the community members then decided on the number of participants and the number of entries. During the process the whole community was excited to be a part of the competition which served as an important function in their lives.

My daughter always hums the song that she heard a month back during the local song competition. She has taught the song to her younger brother. The song has raised a curiosity for her on early warning and this is very encouraging - Sujata Mahato, DMC member, Bacchyauli VDC

Early warning awareness song

If heavy rain falls in Dang
We get information from Chepang

Phone calls, siren rings
News will spread all around

"Warning, warning" says the team
Everyone wake up from your dream

Take your belongings
Save your life
As you hear the news

Collect your documents
Collect your jewelleries
Collect everything that you need

Phone calls, siren rings
News will spread all around

Run to the shelter
Run to the shelter
And help others reach the shelter

Do not forget old people
Do not forget the pregnant women
And those unable to walk
And also those unable to talk
Lastly don't forget anyone
Especially the most vulnerable

"Search, search" screams the team
Rescue all those who scream

Phone calls, siren rings
News will spread all around

*Composed and sung in Tharu language by
Awareness Youth Club, Gulariya-6, Bardiya*



Low cost and replicable mitigation measures for disaster resilient communities

Small scale mitigation for building safer community

Starting from non structural measures like awareness raising activities to structural measures like construction of shelters and culverts, Practical Action is working on DRR with special focus on preparedness and early warning.

If communities are not made aware of the importance and the function of EWS, little could be done to reduce the loss of life and property. Likewise, awareness and knowledge alone may not suffice to protect themselves

and their valuables as the community may lack the means of safer evacuation routes even after receiving early warning.

Hence, complementing non structural intervention with structural intervention is considered not just an option but a must to reduce the impact of flood. Thereafter, several low cost, replicable mitigation activities were prioritised by SEWIN Project. These activities have been considered important to build confidence of the

vulnerable people, especially at the time of response after receiving early warning for flood.

“Last year I held on to a tree for days with my son in one hand because I did not know where to go as I didn’t know how to swim. I was scared the tree branch I was holding on to might break any time and the fear of snakes was petrifying. Thank god nothing happened to us. I hope this will not happen again because this time I know where I must go. If flood comes I will immediately take my son as well as my belongings to the shelter. We have constructed a bridge, shelter, and a bio dyke. Now that we have all the means for safer evacuation I just hope we receive the warning on time,” Khali Devi Khatri, Binauna -9 Alinagar.

The entire community members were involved in the construction of one or other small scale mitigation activities. For instance, in Bardiya, the DMC formed a construction committee which would complete one activity at a time. Division of labour and time management of each person was sorted out by the committee itself after discussion with the community. Moreover, DMC’s were also responsible for facilitating the community in identifying the site for construction and ranking of the identified

sites for construction, purchasing of goods, and for project monitoring at the local level.

SEWIN Project is aimed at building the capacity of people to cope with flood. In this regard, the project has identified several mitigation activities such as bio dykes, culverts, bridges, machans and retrofitting of buildings and shelters, which will help the community to become more resilient and cope with flood in all its working districts - Banke, Bardiya, Chitwan and Nawalparasi. These small scale mitigation structures are necessary not to control flood but to manage their detrimental effects.



Communities constructing culvert in Binauna VDC, Banke



Communication and dissemination task force using hand mike to disseminate water level information

Looking inwards - an initiative for sustainable EWS

Padnaha VDC is separated by Babai River and lies 12 km North West of Gulariya Municipality of Bardiya District. Ward no 8 and 9 of this VDC is one of the most flood affected community as it is surrounded by river in the south and west. Almost 100 bighas (1 bigha = 0.6 hectare) of land has been eroded in the past and many people living in and around this area have become landless since then.

Maan Bahadur Tharu of ward no 8- Sarjipur, Barbatta is the chairman of Babai

Janachetana Pragatisheel DMC. He is involved in every step of decision making and in implementation of every activity starting from risk, vulnerability and capacity mapping to identification of site for construction of small scale mitigation structures, and mobilisation of community as well as resources available in their community.

He recalls the situation prior to the implementation of the project stating that the communities were unaware of the need

For the sustainability of the EWS, we have formed early warning task force with focus on all four elements of early warning which we had learnt during early warning training. Everyone in the community are aware of the task force and their roles and responsibilities - Tharu.

to be prepared as they had no idea about what preparedness could do to save their life and their belongings. He adds that altogether 13 people had lost their lives in this area while other losses were uncountable and the suffering that followed after that loss was even worse as those losses seemed eternal.

Now, people are aware not only about the risk but also about their capacities.

Awareness raising activities like street drama, song competition, door to door activities and training has been very helpful in raising the awareness. These activities are very effective as these activities also incorporated the cultural aspect of the community like their language, their culture and way of life. Also, the level of understanding of the community people was thought of before implementing any activity.



Man Bahadur Tharu showing water level from the past flood



Dukhana Mahato, member of DMC

CBEWS at work

Bacchauli VDC is one of the most flood affected VDCs of Chitwan District. It is surrounded by different streams like Khageri, Budhi Rapti, Dhungre Khola which ultimately joins the Thuli Rapti River (the river which flows from upstream Rajaiya).

Dhukhana Mahato is a member of Bacchauli VDC's DMC and is in charge of the DMC task force. He is responsible for keeping his team stand by in case of

impeding flood for effective response and to alert the community people about the risk with an objective of reducing the risk of the most vulnerable people of the community affected by flood. Altogether 25 people are in this task force.

His team comprises of a person responsible for getting the information from the gauge observer including a team responsible for disseminating information to the

community people with the help of hand operated siren, hand mike, and CDMA phone. The other team under task force includes search and rescue team, first aid team and volunteers who are responsible to help the community people in case of emergency. Another major responsibility of the task force is to coordinate and be answerable to the DMC.

“On 24th August 2010, there was continuous rainfall for more than 10 hours. I received a phone call from Badri Bahadur Dhakal, gauge observer, Rajaiya gauge station for Rapti River at 2:30 PM. Badri informed me that the water level at Rajaiya was 3.80m which was below danger level but something to worry about as the rain poured continuously (warning level -3.5 m and danger level is 4.2 m),” asserted Mahato.

Mahato called other DMC members for their suggestion. A quick decision was made to observe the water level in the downstream too. Nakul, DMC member, responsible for the downstream informed that the water level had risen up three times than usual. DMC members then

gathered in the VDC building which was earlier identified as the midpoint during any emergency. The most vulnerable wards, ward no.1-Badreni, ward no. 7-Magartol and ward no 2-Sauraha was informed first as these wards would be flooded first. The task force members were then on stand by for response.

After the information on danger water level was disseminated, the task force stood by with life saving equipments such as life jackets, ropes, boats and first aid kits ready for use at any time.

“Everyone and everything was in place to alert the community. We informed the community about the water level through hand mike as the siren could not communicate the water level information. Though people had reacted to the siren more during the mock drill we decided to use the siren only when the water reached to danger level to avoid chaos and confusion. Our community was not flooded but we were successful in informing them about the rising water level without causing any stress,” explains Mahato.



Bhadra Bahadur Thapa, gauge observer at upstream gauging station in Kusum

Real time evaluation of CBEWS

Continuous rainfall for several days in the mid western region of Nepal on 19 July 2010 worried the community, district stakeholders and other project staff in Banke District, especially from Binauna VDC. At 9:30 AM the water level in Kusum was 3.90m, but in Bhalubhang the water level had already reached 5.40m. Bhadra Bahadur Thapa, the gauge observer informed the down stream community that the situation might get worse by afternoon if the rain continued pouring at the same

pace. Hence, Thapa immediately informed Basu Dev Dahal, CDO of Banke District. The CDO then informed the police, army, NRCS, media and other stakeholders for an emergency meeting. He emphasised all security forces to be on alert for search and rescue.

On the other hand, when the community people were contacted to disseminate the information on water level it was known that they had already contacted the gauge

observer. Binauna DMC also assured that after receiving the warning from Thapa the community had started preparation at household level by collecting their belongings and livestock. Whereas, the task force and DMC members were on high alert to respond in case of emergency.

Around 12:30 PM the water level in the upstream had increased to 4.90m and by 2:35 PM it had reached 5.30m. A reading of 5.40 meant a possible flood in the downstream. Fortunately, the water level fell back to 4.90m by 9:00 PM.

On 20th July, Thapa alerted all downstream communities and other stakeholders that the water level had risen to 5.40m from 4.90m in five hours due to heavy rainfall in Piuthan District. After being alerted, the DMC member in Binauna VDC operated the hand siren to about the whole community. The community prepared for evacuation again.

Around 4:30 PM the water level had gone up to 5:80m and the siren was operated for the second time. Hand mike was also being operated. Other task force had been on stand by, while some community members had already evacuated to the shelter following the pre identified evacuation route.

Fortunately after few hours the community got another call from Thapa informing them that the water level had decreased to 5.4m and the community was no longer at risk of flooding. The DMC then informed everyone about the water level and also called for a meeting to discuss on the present water level readings. Though Binauna VDC escaped flooding that time around, quick communication from upstream to downstream helped alert those most at risk and allowed them to prepare for safe evacuation. The incident prompted the community to raise the danger level to 6.0m (upstream) for the future.

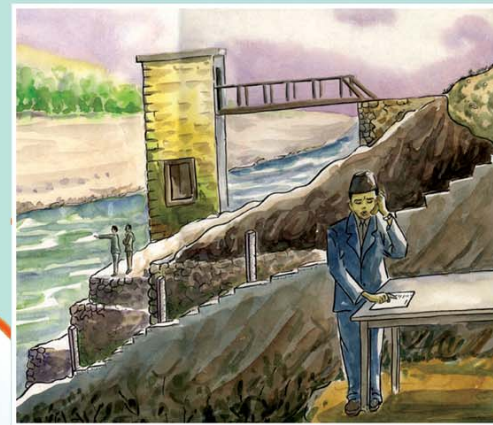


Dr. Dilip using telemetric system for flood forecasting

Key elements of early warning system



Risk Knowledge

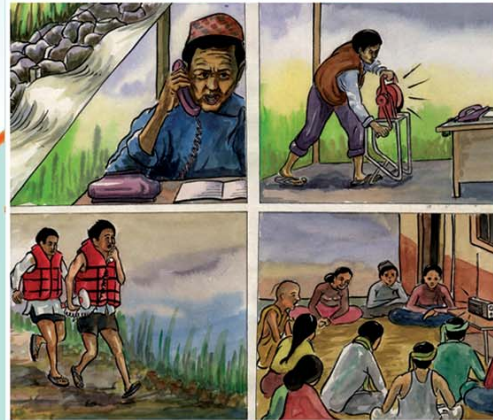


Monitoring & Warning Service

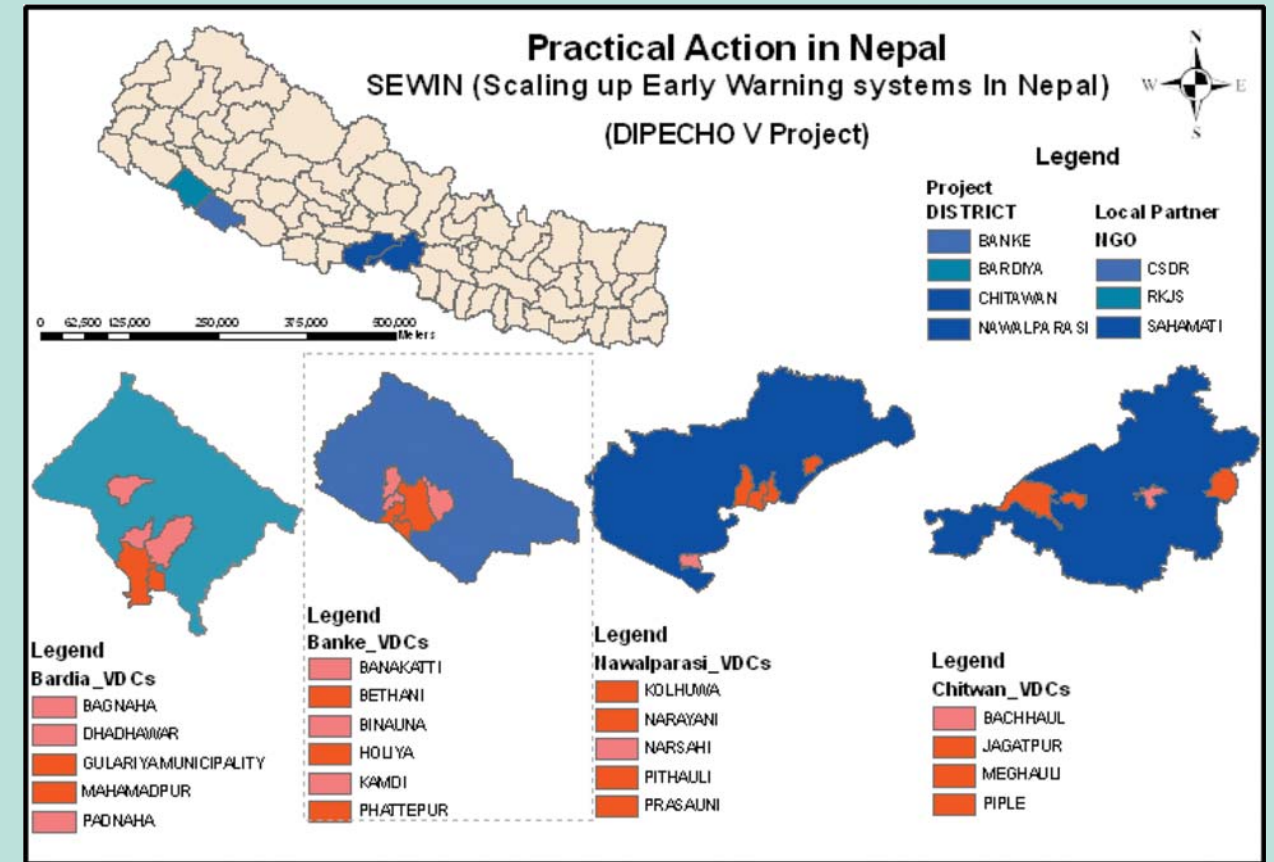
Keeping people at the centre



Response Capabilities



Dissemination & Communication



Project at a glance

In 2009, Practical Action implemented SEWIN - Scaling up Early Warning System in Nepal Project under DIPECHO V Action Plan for South Asia. It is being implemented in four flood prone districts of Nepal (Chitwan, Nawalparasi, Banke, and Bardiya). These areas have been targeted since people living alongside the East Rapti, Narayani, West Rapti, and Babai Rivers are flooded annually.

Practical Action has prioritised CBEWS as a crucial mechanism to aware the people on disaster and its risk, their vulnerabilities and capabilities; and to establish a well functioning warning service with people at the centre; and by putting people at the center of the system to make the warning easier and reliable while disseminating and communicating the warning signal. Moreover, the focus has also been given to increasing the response capacity of the community.

EUROPEAN COMMISSION



Humanitarian Aid

PRACTICAL ACTION

Technology challenging poverty



The European Commission's Humanitarian Aid & Civil Protection department (DG ECHO) is one of the world's largest providers of financing for humanitarian aid operations. Its mandate not only includes the funding of disaster relief but also the support of disaster preparedness activities, in particular at local level. Through its disaster preparedness programme (DIPECHO) it assists vulnerable people living in the main disaster-prone regions of the world in reducing the impact of natural disasters on their lives and livelihoods.

Practical Action is a UK based charity organisation established in 1966 with the objective of reducing poverty through wider use of appropriate technologies in developing countries. With the Head Office in the UK, Practical Action works through its Country and Regional Offices in Bangladesh, Nepal, Sri Lanka, Kenya, Sudan, Zimbabwe and Peru. Practical Action is working in Nepal since 1979. The current Nepal strategy, 2007 - 2012, focuses on six broad programme areas namely 1) securing food for the poor 2) reducing risks from disaster and adverse impacts of climate change 3) maximising the benefits of market for small producers 4) improving the access of rural poor to basic services 5) improving urban environment and 6) supporting in healthy homes. Under its Disaster Risk Reduction programme, Practical Action is working on Livelihoods Centred Approach and Early Warning Systems in Nepal.

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