

CASE STUDY

Community Based Disaster Risk Reduction

Contribution To Hyogo Framework Of Action



KAILALI DISASTER RISK REDUCTION INITIATIVES

February 2009

EUROPEAN COMMISSION



Humanitarian Aid



Nepal Red Cross Society
Kailali



Authors:

Dhruba Raj Gautam

Independent Researcher and Consultant

Phone: 98510-95808

E-mail: drgautam@wlink.com.np

Sudarshan Khanal

Student at the School of Forestry and Environmental Studies,

Yale University, USA

Email: sudarshan.khanal@yale.edu

Special contributors: Ulla Dons, Chet Bahadur Tamang ,Sagar Pokhrel, Himal Ojha

Photo contributors: Sagar Pokharel, Chet Bahadur Tamang, Himal Ojha, Dhruba Raj Gautam and Ulla Dons

Editor: Perry Thapa

Cover photo

Front: Community Level Consultation,

Front Inside: Community work for river

Back Inside: Observation of IEC posters

Back: Clock-wise ; Skill Training, Use Of EWS Siren, Rescue using life Jacket, Boat Constructed from funds, Interaction with DHM Technician, River bank protection

Design and Printed by: Mind Share Communications Pvt.Ltd.

Published by: Mercy Corps Nepal, Lalitpur, Nepal

The views expressed in this document should not be taken in a way to reflect the European Commission; and it is not liable for any use that be made of the information contained herein.

Table of Content

Foreword	I
Acknowledgements	II
Acronyms	III
Executive Summary	IV

1. The Context	1
----------------	---

2. Methodology	2
----------------	---

3. The Hyogo Framework for Action (2005-2015)	2
---	---

4. Project contributions in achieving the priority actions of HFA	3
---	---

4.1 Priority action 1	3
-----------------------	---

4.2 Priority action 2	5
-----------------------	---

4.3 Priority action 3	8
-----------------------	---

4.4 Priority action 4	13
-----------------------	----

4.5. Priority action 5	15
------------------------	----

5. Project contribution in achieving the strategic goals of HFA	17
---	----

5.1 Strategic goal 1	17
----------------------	----

5.2 Strategic goal 2	17
----------------------	----

5.3 Strategic goal 3	17
----------------------	----

List of tables

Table 1: Number of households and ethnic composition by community and VDC	1
---	---

Table 2: Gender and ethnic composition of DPC	3
---	---

Table 3: Lead-time of flooding for different locations	6
--	---

Table 4: Warnings based on water levels	6
---	---

Table 5: Number of participants in various trainings	10
--	----

Table 6: Status of mitigation work, community nurseries and plantation	13
--	----

Foreword

Mercy Corps Nepal is pleased to release the enclosed case study: *Community Based Disaster Risk Reduction - Contribution to Hyogo Framework for Action*. This case study is the result of an evaluation of a DG ECHO-supported project implemented by Mercy Corps and the Nepal Red Cross Society, Kailali District Chapter under the DIPECHO Fourth Action Plan for South Asia, *Kailali Disaster Risk Reduction Initiatives*. The case study was conducted by an independent researcher and consultant, Dhruba Raj Gautam, with contributions from a graduate student at Yale University's School of Forestry and Environmental Studies, Sudarshan Khanal. Support for the case study was provided by Mercy Corps' disaster risk reduction team, while funding for the case study was provided by DG ECHO.

As opposed to evaluating the contributions of the project against its own stated objectives, this case study was designed to evaluate the contribution of the project's community-based disaster risk reduction activities to the Hyogo Framework for Action (HFA), a 10-year plan adopted by 168 governments to make the world safer from natural disaster by substantially reducing disaster-related human, social, economic and environmental losses by 2015. The HFA emerged from the World Conference on Disaster Risk Reduction in Hyogo, Japan, and is a global blueprint for disaster risk reduction efforts. In evaluating the effects of our disaster risk reduction work against the HFA, Mercy Corps is aiming to ensure that its actions are commensurate with, and contribute to, a coordinated, multi-stakeholder framework to reduce the loss of lives and livelihoods as a result of natural disasters. As one of many local, national, and international relief and development actors, we believe that our efforts are much more relevant when adding value to this type of coherent, international action plan.

The case study highlights that community-based disaster risk reduction activities in the Kailali district have contributed to the HFA's strategic priorities and objectives by: a) ensuring that disaster risk reduction is a priority with a strong institutional basis for implementation (HFA Priority Action 1); b) identifying, assessing, and monitoring risks, and carrying out early warning systems (HFA Priority Action 2); c) supporting knowledge, education and innovation to build a culture of safety and resilience (HFA Priority Action 3); reducing underlying risk factors (HFA Priority Action 4); and, increasing preparedness for effective response and recovery (HFA Priority Action 5). On behalf of Mercy Corps, I would like to thank all of those who made these achievements possible: DG ECHO under its DIPECHO Fourth Action Plan for South Asia; Nepal Red Cross Society; local, district and national level Government of Nepal stakeholders; our DIPECHO Nepal colleague agencies; our own disaster risk reduction team; and, of course most importantly, the partner communities themselves.

Josh DeWald
Country Director
Mercy Corps Nepal

Acknowledgements

We would like to acknowledge the support of the European Commission's Humanitarian Aid department, both in the production of this publication and for its funding of the Kailali Disaster Risk Reduction Initiatives Project under the 4th DIPECHO Action Plan for South Asia.

This case study report has been possible because of the support of project communities of Bisanpur, Jokaiyapur, Mankapur, Lalitpur, Mohanpur and Shivaratanpur of Kailali district for their patience and cooperation during this study. Members of Disaster Preparedness Committees, community members and stakeholders, teachers and students, Village Development Committee and district level stakeholders enthusiastically shared their experience so many people personally and professionally. We would like to extend our sincere gratitude to all persons who contributed to this study in many different ways: by sharing their experience, during the study, helping the study team to understand the contribution of the project towards the Hyogo Framework of Action by contributing time, advice and hospitality.

We would also like to acknowledge the Kailali District Chapter of the Nepal Red Cross Society, Mercy Coprs partner for activities under the Kailali Disaster Risk Reduction Initiatives Project. The importance of their role both in terms of this study and in terms of overall project implementation cannot be overstated.

We are grateful to Ulla Dons and Project Team for their feedback and suggestion in the methodology as well as coordination of the whole study. The painstaking efforts made by project team during the study were highly appreciable. We would like to appreciate Josh DeWald, Country Director and other senior management of Mercy Corps Nepal for their valuable comments in the draft report. Last but not least, our thanks go to Mercy Corps Nepal who entrusted us with the task of conducting this case study.

Thanks,
Dhruba Raj Gautam and Sudarshan Khanal

Acronyms and Abbreviation

BASE	Backward Society Education
CSSD	Conscious Society for Social Development
DDC	District Development Committee
DoHM	Department of Hydrology and Metrology
DP	Disaster Preparedness
DPC	Disaster Preparedness Committee
DRM	Disaster Risk Management
DRR	Disaster Risk reduction
DSCO	District Soil Conservation Office
DTO	District Technical Office
DWIDP	District Water Induced Disaster Prevention
EWS	Early Warning System
FGD	Focus Group Discussion
HFA	Hyogo Framework of Action
JRC	Junior Red Cross Circles
KII	Key Informant Interview
S&R	Search and Rescue
SHP	Sub-health Post
VCA	Vulnerability and Capacity Assessment
VDC	Village Development Committee
VDMC	Village Disaster Management Committee

Executive summary

The context: In cooperation with the Nepal Red Cross Society (NRCS) in Kailali, Mercy Corps is currently implementing the Kailali Disaster Risk Reduction Initiatives project in six communities. The European Commission supports this project through its Humanitarian Aid Department (under the DIPECHO 4th Action Plan for South Asia). This case study was conducted to demonstrate whether and how and to what extent the project contributes toward achieving the goals towards the Hyogo Framework for Action (HFA). Consultations with NRCS and Mercy Corps staff, key informant interviews, focus group discussions, exit meeting with project staff and analysis and reporting were some of the main approaches used in carrying out the study.

Project contributions toward achieving the priority actions of HFA: The project has made several efforts *to ensure that DRR is a national and local priority with strong institutional basis for implementation (priority action 1)*. In each community, it established disaster preparedness committees (DPCs) and sub-committees with clearly defined roles and responsibilities for reducing flood risks and people's vulnerability. Financial transparency is maintained through well-established social auditing. Emergency funds, a community-managed initiative, have been instrumental in initiating the disaster preparedness, response and maintenance activities. So far, the six communities have saved a total of Rs. 74,300 (EUR 728). By linking community-level disaster preparedness (DP) plans to village development committee (VDC)-level DP plans, the villagers have secured the resources they need to execute their plans.

The project has helped project communities to identify risks, assess, monitor and carry out early warning initiatives (priority action 2). Physical, attitudinal, and social risks and vulnerability were identified through vulnerability and capacity assessment exercises in each community. In coordination with the Department of Hydrology and Meteorology (DoHM)

field office, early warning information was made available to communities and community-based early warning systems were established. At the community level, either *agharis* (a local messenger who circulates messages to local people) or other persons assigned by the DPC monitor flood levels. Emergency and first aid kits were provided to each community. CDMA phones and hand-operated sirens helped alert people to and save them from flood risks. The dissemination of emergency news and weather-related bulletins by local FM stations was also very effective in providing advance preparation.

For the proper use of knowledge, innovation, and education to build a culture of safety and resilience at all levels (priority action 3), the project published IEC materials for widespread dissemination, showed DRR video documentary, organised cross visits and performed street dramas. Early warning system and evacuation simulations are beneficial for knowledge management. So far, more than 1,000 local people, schoolteachers and students have attended various capacity-building trainings. Viewing students and teachers as the key agents for change, the project's school-level programme focuses on DP and DRR as well as conservation education.

The project has contributed to reducing the underlying risk factors (priority action 4) through introducing low-cost, replicable and easily maintained bioengineering mitigation techniques including bamboo work and sand-filled cement sacks. To reinforce bioengineering efforts and save productive land along riverbanks, 43,000 plants have been planted over an area of 27,300 m². These initiatives have significantly reduced riverbank erosion and increased the local communities' confidence in the possibility that agriculture land and communities can be saved. Community boats have become a means for safe evacuation during flood, and provisions for community shelters have effectively saved lives during periods of inundation. The construction of evacuation routes (so

far 4.2 km have been completed) has helped people reach these shelters or other safe places. Raising hand pumps has ensured a source of safe water and reduced the risk of epidemics and the spread of water-borne diseases during the monsoon season.

The project has positively contributed to increasing preparedness for effective response and recovery (priority action 5). By participating in national and district-level trainings and workshops for sharing and exchanging information and by sharing resources the project has helped strengthen policy, technical and institutional capacities. Inspired by the communities' bioengineering initiatives, the District Water Induced Disaster Preparedness Office has allocated Rs. 50,000 (EUR 490) to build spurs. The District Soil Conservation Office allocated another Rs.70,000 (EUR 686) to five communities so they could replicate bioengineering techniques.

Project contribution in achieving the strategic goals of HFA: Increasing the ability of community-based institutions to carry out DP and DRR activities, developing knowledge-sharing mechanisms and community DP plans promotes the *integration of DRR into sustainable development policies and planning (strategic goal 1)*. Capacity-building initiatives have filled

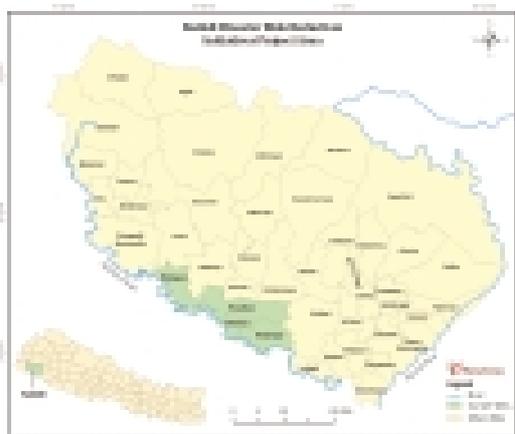
and continue to fill the knowledge gaps of the communities in terms of DP and DRR, thereby contributing to the development of the knowledge and skills needed to identify and assess risk and hazards, to build capacities and to disseminate early warning information. Interventions such as small-scale mitigation measures and nursery management have directly contributed to environmental and natural resource management and land-use planning. These efforts contribute to *developing and strengthening the institutions, mechanisms and capacities to build resilience to hazards (strategic goal 2)*. The project has held several dialogues and consultations to foster information sharing, technical backstopping, resource and idea and experience sharing and to take immediate action in improving project initiatives. With the project's provisions for disaster-preparedness exercises, including evacuation drills and simulations, it was easy to enhance the capacities of local people. Mercy Corps' contribution of food and non-food items to flood-affected communities from alternative funding sources has boosted immediate relief and response, thereby incorporating *risk reduction approaches into the implementation of emergency preparedness, response and recovery programmes (strategic goal 3)*.

Community Based Disaster Risk Reduction Contribution to Hyogo Framework of Action

1. The Context

In cooperation with the Nepal Red Cross Society (NRCS) in Kailali District, Mercy Corps has been implementing the Kailali Disaster Risk Reduction Initiatives in six communities of four village development committees (VDCs) since November 2007. The European Commission supports this project through its Humanitarian Aid department under the DIPECHO 4th Action Plan for South Asia.

Figure 1 Kailali district with project area



The project aims to build safer communities through disaster risk reduction (DRR) initiatives in collaboration with communities, local governments and other key stakeholders. Local capacity building and training, early warning systems, small-scale mitigation, education, and facilitation of coordination are the key areas of project interventions

The project VDCs are located in Kailali District in the Far- Western Development Region of Nepal at latitudes from 28°34'46.31"N to 28°30'39.79"N and longitudes from 80°44'59.21"E to 80°50'52.63"E). Their average altitude is 60 masl. Project communities were selected based on the extent of hazards, the vulnerability of and risk to settlements, and the damage to houses and cropland attributable to river erosion. The history, location, and socio-economic status of communities, as well as their access to services and institutions and the opportunities for replicating good DRR practices in neighbouring communities were also taken into consideration.

³ 20 katha=1 bigha = 0.67ha, and 1 katha = 0.0335 ha

Table 1 Number of households and ethnic composition by community and VDC

VDC	Community	No. of HHS	Ethnicity		
			Tharu	Brahmin /Chhetri	Dalits
Pabera	Mankapur	73	72	0	1
	Bisanpur	33	33	0	0
Phulbari	Lalitpur	78	50	4	24
Hasuliya	Shivratanapur	64	62	1	1
	Mohanpur	78	78	0	0
Ratanpur	Jokhayapur	52	52	0	0
	Total	378	347	5	26

Source: Project record, 2007-08

The majority of the population of project communities (91.8%) is Tharu, the indigenous group of the western Terai. Brahmin-Chhetri and Dalit hill migrants are minority populations (see Table 1). The majority of these people own only *aailani*, or unregistered, land. Landholdings range in area from two *katha*³ to three *bigha*. Most are subsistence farmers who rear traditional livestock though sharecropping is also a common practice. Many youths migrate seasonally to India for the jobs, as labourers they need to meet family needs for food and other household requirements as well as to cover the expenses of various festivals.

Floods are a major hazard in the project communities. The Mohana River and its tributaries, the Kataini, Guraha and Khutiya, regularly inundate the adjacent areas and erode riverbanks and productive land. They cause the loss of life and important belongings, including livestock and houses. Flooding damages infrastructure, including roads, irrigation canals, schools and health posts, and makes accessing clean drinking water sources and sanitation services difficult. It also disrupts people's livelihoods and makes them increasingly vulnerable. Because floods are so devastating, people live in constant fear. Mercy Corps has documented this case study-based research in order to share its key achievements and lessons with a national and global audience. This report also tries to demonstrate whether or not and how and to what extent the project contributes towards the Hyogo Framework for Action (HFA).

Mercy Corps has documented this case study-based research in order to share its key achievements and lessons with a national and global audience. This report also tries to demonstrate whether or not and how and to what extent the project contributes towards the Hyogo Framework for Action (HFA).

2. Methodology

This report is based on field research conducted in six project communities. Before checklists and guidelines for questions to ask in the field were prepared, project documents and relevant literature were reviewed.

A consultation between Mercy Corps and the Kailali Chapter of NRCS was held before the fieldwork began in order to identify the key areas of interventions, the emerging issues and the concerns of local people with respect to DRR and DP. A brief meeting with project field staff in Hasuliya revealed some key outputs as well as good practices and success stories. A sharing meeting with district-level stakeholders helped to identify the level of coordination and networking which exists for providing technical backstopping and synergetic impacts

through resource sharing. Primary data was collected using participatory tools and techniques such as focus group discussions (FGDs) and key informant interviews (KIIs). FGDs were carried out with disaster preparedness committees (DPCs) and Junior Red Cross Circles (JRCs) to provide insight into the project's key accomplishments. KIIs with *bhalmansha*⁴, *agharis*⁵, coordinators of sub-committees⁶, early warning system (EWS) volunteers, schoolteachers and students were conducted to explore their perceptions of the project's contributions toward reducing disaster risks. Transects walks with DPC members and nursery management committees helped reveal the extent of mitigation work carried out by the communities, the processes and procedures they followed during that work and the benefits in DRR they acquired from it.

3. The Hyogo Framework for Action (2005-2015)

The HFA provides a strong basis for priority actions by governments and governmental organisations as well as by local, regional and international non-governmental organisations. It is designed to build the resilience of nations and communities to disasters. The HFA has five priorities for action and three strategic goals. The five priorities for action are (i) ensure that disaster risk reduction is a national and local priority with strong institutional basis for implementation, (ii) identify, assess and monitor disaster risks and enhance early warning, (iii) use knowledge, innovation and education to build a culture of safety and resilience at all levels, (iv) reducing the underlying risk factors, and (v) and

strengthen disaster preparedness for effective response. The three strategic goals are (i) integration of disaster risk reduction into sustainable development policies and planning, (ii) development and strengthening of institutions, mechanisms and capacities to build resilience to hazards, and (iii) incorporation of risk reduction approaches into the implementation of emergency preparedness, response and recovery programmes.

This report is organised according to the broad categories set out in the HFA's priorities for action (section 4 of this case study) and its strategic goals (section 5 of this case study).

⁴A *bhalmansha* is a traditional Tharu leader or village guardian selected or elected every year during the Maghi festival (15 to run the village systems. It is a highly respected position found only in Tharu-dominated villages.

⁵An *agharis* is an assistant to a *bhalmansha* who circulates messages to local people as instructed by a *bhalmansha*

⁶The five sub-committees are 1) nursery management, 2) early warning and rescue, 3) procurement and accounting, 4) construction and 5) community mobilisation.

4. Project contributions in achieving the priority actions of HFA

The project's achievements demonstrate that the project has indeed contributed to bringing about the priority actions of HFA. These achievements are discussed briefly in the following sections.

4.1 Priority action 1: *Ensure that disaster risk reduction is a national and local priority with strong institutional basis for implementation*

a. Strengthened community-based institutions to carry out DP and DRR activities

Six gender- and socially-inclusive disaster preparedness committees (DPCs), one in each project community, were formed to promote DP-related activities and to mobilise local people to reduce flood risks (see Table 2). Shivaratanpur community even included a differently-abled person and a widow among its DPC members and has elected a woman *bhalmansa*. DPCs network, coordinate and build rapport with village-level stakeholders. These networks, in turn, promote resource sharing. For instance, the coordination between the Lalitpur DPC and Phulbari VDC made it possible for the former to secure life jackets for two boat operators who service the community and for local police for use during emergencies. Five sub-committees under each DPC were formed in order to clearly allocate roles and responsibilities and to increase accountability in initiating DRR activities. The provision that one DPC member be an *ex-officio* member of each sub-committee has established a culture of sharing and understanding between DPCs and their sub-committees. These committees have grown in

strength through capacity-building trainings and cross-learning visits. Now that they are equipped with sufficient knowledge and skills, these committees independently carry out local-level initiatives to reduce flood risks and various types of vulnerabilities.

b. Developed knowledge-sharing mechanisms

The project has developed a powerful mechanism for building and sharing knowledge. The practice of selecting participants for trainings and orientations through DPC meetings boosts social solidarity and prevents bias. Because it is mandatory for trainees to disseminate the new information, knowledge and skills they acquire to other DPC members, knowledge sharing is also strong.

c. Maintained financial transparency in each project activity

Each DPC has simple but effective measures to maintain financial transparency. Each has its own bank account through which it accesses whatever resources the project and district agencies provide. The procurement and accounting sub-committee assists in maintaining all financial transactions in an orderly manner. Social auditing is fully established at

Table 2 Gender and ethnic composition of DPC

VDC	Communities	Members			Ethnicity			Total
		M	F	T	Tharu	B-C	Dalits	
Phulbari	Lalitpur	8	5	13	8	2	3	13
	Shivaratanpur	6	7	13	12	1	0	13
Pabera	Bisanpur	9	4	13	13	0	0	13
	Mankapur	7	6	13	12	0	1	13
Ratanpur	Jokahiyapur	8	5	13	13	0	0	13
	Total	46	32	78	71	3	4	78

Source: Project record 2007-08 /Note: B-C=Brahmin-Chhetri

Box 1 Information, knowledge and skills are more important than material support

In the beginning, we were quite unhappy with project authorities. They kept inviting us to trainings and orientations, but our interest lay in getting project resources to build gabion spurs to protect the riverbank from floods. However, with the project's persistence in building our knowledge through trainings and exposure, we learned a lot about actions we can take locally to reduce the disaster risks. Because of the project's continuous facilitation, very good practices like sharing knowledge after attending a training, maintaining financial transparency, ensuring equity in resource sharing, and translating community-agreed rules and regulations into action have been ingrained in us. In the long run in, information, knowledge and skills are more important than material support.

-Mr. Khoj Ram Chaudhari, Mankapur
(District Vice-Chairperson, Freed Kamaiya Society, Kailali)

the community level: all expenditures are discussed at community gatherings both at the initial and final stages of project activities. All key decisions and transactions are displayed on community notice boards as well as on the walls of DPC offices. Both the DPC and procurement sub-committee members are involved in procuring materials from outside, so financial transparency and risk-sharing is high.

d. Translated community-agreed rules and regulations into action

The DPCs have formulated and enforced rules and regulations governing DP and DRR activities. Rules include restrictions on grazing near protected riverbanks, safeguarding newly planted areas, and allocating roles and responsibilities among the DPC and sub-committee members. Shivaratanpur community, for example, has agreed to fine members who are habitually late to meetings and who refuse to get involved in weekly sanitation campaigns. Search and rescue sub-committee members are responsible for monitoring flood and blow sirens as needed, while the procurement and accounting committee members are accountable for social auditing. The translation of community-agreed rules, norms and values into action has helped communities adopt a consolidated approach to DRR.

e. Maintained equity in resource sharing to establish emergency funds

Equitable resource mechanisms are enforced to collect cash and grain for emergencies. Each DPC has established an emergency fund to initiate, operate and maintain disaster preparedness and response activities. This fund serves as a local resource for immediate relief and response during emergencies as well as for mitigation initiatives. Locals see the emergency fund as a ray of hope in reducing disaster risks. Different DPCs have agreed that each family will contribute between five and one hundred rupees each month and contribute one kilogramme of wheat per *katha* of land held. The fact that the contribution in grain is based on landholding is an indication that resource mobilisation is equitable. So far, a total of Rs. 74,300 (EUR 728) has been saved by all six project communities. Bisanpur has saved the most, Rs 25,708 (EUR 252), and Jokahiyapur the least, Rs 5919 (EUR 58).

DPCs have adopted a pro-active approach to increasing their emergency funds. Mohanpur, for instance, collected funds by operating a boat service during the monsoon. For its part, Shivaratanpur collected Rs. 564 (EUR 5.5) by conducting Fagui⁷ and Deuso and Bailo⁸ programmes. Though these programmes are traditional, using them to raise funds is a project-inspired initiative. Shivaratanpur also plans to sell seedlings from its nursery.

The six project communities have started to advocate providing support to neighbouring vulnerable communities during emergencies. Shivaratanpur and Mankapur communities, for example, gave 72 and 75 kilogrammes of rice respectively from their emergency funds to Basanta when a wild elephant totally destroyed its stored grain and damaged houses. These communities were able to respond immediately because they had an emergency fund. The Bisanpur DPC had agreed to contribute two quintals of wheat to Koshi flood victims, but they were forced to drop this idea after they became flood victims themselves in September. Their efforts show that collaborative efforts are beginning to reduce disaster risks. These initiatives have helped build a sense of social solidarity among villagers and should foster still more collaboration in DRR initiatives.

f. Prepared community- and VDC-level DP plans

Each DPC has prepared a community-level DP plan which incorporates a variety of activities like orientations, evacuation, rescue and relief work, community nursery management, riverbank protection, construction of evacuation routes, allocation of roles and responsibilities for river monitoring, and operation and maintenance of early warning equipment. This was the first time such plans had been prepared and locals are very enthusiastic about implementing them by mobilising local resources. They also hope to get additional support from the VDC and district levels.

The project has facilitated the formation of village disaster management committees (VDMCs) in each VDC whose role is to link community-level DP plans with VDC plans. VDC stakeholders were inspired to encourage such linkages after visiting the six project communities. Community-level DP plans will eventually be incorporated into VDC development plans.

VDCs secretaries serve as VDCM coordinators and are currently overseeing the formulation of VDC-level DP plans which will consolidate community-level plans and consider common issues pertinent to DRR. This step has opened the way to mobilising VDC-level resources in the execution of community-level DP plans. For instance, Hasuliya VDC provided Rs 5,000 to Shivaratanpur DPC to construct a boat. Inspired by Shivaratanpur, other DPCs also plan to solicit funds from their VDCs. Once community-level DP plans are linked with VDC plans, they will automatically be linked to the plans of Kailali District and DRR will be mainstreamed in district policies, planning and implementation.

In short, the establishment of strengthened community-based institutions to carry out DP and DRR activities, the development of knowledge-sharing mechanisms, the maintenance of financial transparency in each project activities, and the drafting of community- as well as VDC-level DP plans have ensured that disaster risk reduction is a local priority with strong institutional basis for implementation.

4.2 Priority action 2: Identify, assess and monitor disaster risks and enhance early warning

a. Developed knowledge and skills to identify and assess risk

The project introduced vulnerability and capacity assessment (VCA) exercises in each community to identify physical, attitudinal, and social risks and vulnerabilities. It also facilitated the assessment of natural and man-made hazards in line with communities' perceptions of the associated risks. Local people have identified and ranked flooding as the main hazard in their area. The factors that increase their vulnerability include ignorance, social disunity, the location of settlements on low land near riverbanks and the lack of preparedness. These VCA exercises are beneficial in that they increase awareness and preparedness and change the attitudes and behaviours of locals with respect to risks and how they cope with them.

Project communities are well aware of which areas are vulnerable to flooding and inundation and were



able to develop risk maps based on the level of risk identified. The categorised areas as being at low, medium or high risk. They identified areas at low risk as those inundated during a general flood. If floodwaters enter areas at medium and high risk, preparations for evacuation to save lives and important belongings are required. During the flood of September 2008, local communities used the skills and knowledge they had acquired with great success to reduce flood risks.

Box 2 No need to worry about getting resources

Since learning that Shivratanpur got resources from Hasuliya VDC to construct a boat, we have planned to visit our VDC to request some resources to replicate bioengineering work. We now know that making such a request is our right. I am quite hopeful that once the VDC-level DP plan is finalised, incorporating our community-level DP plan, it will be easier to secure resources from the VDC to execute the plan's activities. I don't think we need to worry about funds for the VDC either as its plan will automatically be linked with the DDC plan.

-Mr Chheduram Chaudhari, DPC Coordinator, Jokaiyapur

People are well informed about the time it takes a flood to reach their localities from different upstream river gauge stations. Through coordination with the Department of Hydrology and Meteorology (DoHM⁹) field office, early warning information was made available to downstream communities. In order to reduce the possibility of errors being made,

⁷ A popular festival among Tharus in which people throw coloured powder and water balloons at each other. It usually falls in March.

⁸ A song and dance programme practiced from house to house by hill migrants during Tihar, the Festival of Lights, which falls in October or November.

⁹ A department under the Ministry of Science, Technology and Environment

flood warning information was circulated to project communities one to one-and-a-half hours earlier than the calculated lead time (see Table 3). The communities thought that this information was very helpful as it enable them to evacuate in time.

River	Location	Calculated hours	Suggested hour
Mohona	Malakheti to Bisanpur	9	8
	Malakheti to Bhansar	3	2.5
	Bhansar to Bisanpur	6	5
Khutiya	Khutiya Mudi Bhavar to Bisanpur	10	9
Gauri Ganga	Highway to Lalitpur	3	2.5
Kataini	Highway to Manikapur	4.2	3.5

Source: Project record, 2008

b. Hazard monitoring

The project has introduced both watershed and community-level approaches to hazard monitoring. In collaboration with five upstream rain gauge stations and six upstream and three downstream water-level gauging stations, project communities are able to monitor the extent of flood risks in their localities. The project has helped train gauge recorders to monitor water levels hourly so that they can disseminate real-time data to downstream communities. DPC and EWS coordinators are responsible for maintaining communications with upstream stations and for disseminating information to communities. Cross-visits to four rain gauge stations and four water-level gauging stations clarified to DPC and EWS sub-committee members how rain and water levels are monitored and how information is communicated. They learned about average and warning levels and how this knowledge can be translated into preparedness in their communities (see Table 4).

The mechanism for disseminating information about flood hazards is also well defined and functional. At

River	Location	Average flood level	Warning flood level (1st stage)	Warning flood level (2nd stage)
		Ready	Get set	Go
Mohona	Malakheti	2.0 m	2.5 m	3.4 m
Khutiya	Mudi Bhavar	2.1m	3.6 m	4.8 m
Shiva Ganaga	Highway Bridge	1.5 m	1.8 m	2.5 m
Guruha	Highway Bridge	1.2 m	1.5 m	2 m
Kataini	Highway Bridge	1.8 m	2.2 m	2.8 m

Source: Project record, 2008

the community level, either the *agharia* or a person assigned by the DPC monitors flood levels. This project provision built on rather than interfering with traditional EWS-based practices. Hazard monitoring practices vary across the communities. Shivaratanpur, for instance, has allocated a team of people to monitor floods twice a day, at 9 a.m. and 8 p.m., whereas Bisanpur requires that the EWS coordinator monitor flood levels three times a day, at 5 a.m., 1 p.m. and 9 p.m. Keeping safety and security in mind, each monitor has been provided with an umbrella, rubber boots, a torchlight and a raincoat.

Community-based local practices are designed to be accessible to illiterate people. For instance, each community has established a wooden post marked with yellow and red bands at riverbanks. Such a marker is a very simple method of DRR: water reaching the

Box 3 We are proud that no one has died in our communities.

With the careful use of EWS devices and application of the skills and knowledge we gained through various trainings and exposures, we made sure that no human casualties were reported in our project communities although 24 people died in adjoining communities. These figures show that if locals are prepared sufficiently in advance, the extent of flood risks can be reduced dramatically.

-Mr Chhallu Ram Chaudhari, Teacher, Hasulia

yellow band is a sign to get prepared; reaching the red, a warning to evacuate immediately. In terms of rainfall-based warnings, an intensity of 110-150 mm per hour is considered the first warning; 151-200 mm, the second; and above 200 mm, the third. Warnings are issued through FM radio stations.

c. Early warning dissemination

The project has coordinated with district-level stakeholders, and enhanced the capacity of communities through training and equipment and simulation ex-



activity showing wooden post

ercises to develop local knowledge-based early warning systems.

To facilitate the dissemination of early warning messages, the project provided nine CDMA phones at the four downstream and five upstream rainfall and water-level gauges and a hand-operated siren to each community. Both were found to be very effective EWS tools during the September 2008 flood. Communication channels and contact telephone numbers were disseminated to communities through fliers. Because of these simple mechanisms, locals were able to evacuate the elderly, pregnant and lactating mothers, children and livestock before flood levels approached the level of risk. Although their response and evacuation times differed according to the distance to safe shelter and community size, all six communities were able to evacuate all their members safely.

FM radios have been very effective in disseminating information. The project mobilised local FM stations to disseminate emergency news and weather-related

Box 4 Small initiatives promote knowledge about EWS

Before we took exposure visits to upstream rain gauge and flood monitoring stations and interacted with technicians at the DoHM field office, we never understood the weather reports broadcast on radio and TV. Those reports were not useful for us because we did not know the technical terms. We are surprised that with a mechanism as simple as installing a red-and-yellow banded wooden post, so much information can be collected and used for EWS. The exposure visit helped us understand the meanings of flood levels and estimated time for water to reach our communities. This information is very useful for EWS. I think small initiatives are very important in making local communities aware.

-Ms. Gandhabi Devi Chaudhari, EWS Sub-committee Coordinator, Manikapur

bulletins, both of which effectively enabled locals to prepare in advance. During the September 2008 flood, project communities informed FM stations about their situation in order to pressure relevant authorities into acting immediately to provide support. Working with local media is an effective way of fostering EWS.

Box 5 Life jackets became friends during hard times

We appreciated the project's support in providing emergency kits. Life jackets felt like friends in hard times. During the last monsoon, Aitabari Chaudhari, who lives on the other side of the Mohana, had to return home immediately because his wife Draupadi had died unexpectedly. It was night and there was a high flood in Ghuraha River. He couldn't find the boat but insisted that he had to get home. We provided him with a life jacket to cross the river. He reached home in time to attend his wife's funeral. Even now, whenever he meets us, he speaks of the support the life jacket gave him in crossing the river. Life jackets have saved the lives of many other local people, including police officials who perform rescue operations.

-Ms. Raj Kumari Chaudhari, Lalitpur, Phulbari

The joint efforts of district-level agencies have helped establish watershed-level EWS. The Mohana Watershed EWS was designed by a committee under the chairmanship of the district technical office (DTO) with representation from relevant district stakeholders. This committee has given time, energy and other resources to strengthen watershed-level EWS and to link it with downstream communities.

The project provided emergency and first aid kits to all six communities so they could carry out EWS and search and rescue work. The emergency supplies include life jackets, safety vests, throw bags, carabineers, inner tubes, rope, helmets, hand-operated sirens, and stretchers. These materials were put to good use during the last monsoon. The people of Mohanpur saved lives using their emergency materials during the flood of September 2008. In Shivaratnapur, a drowning person was rescued with the help of a life jacket. The first aid kits were widely used during flooding. First aid kits are kept in the houses of *sudeni*¹⁰) so that services can be instantly provided to locals.

¹⁰Traditional birth attendant



use of life jacket during S&R

In short, endeavours in risk identification and assessment were made by increasing knowledge about risks and about suitable strategies for coping with and measures for reducing those risks. EWSs were established by drawing upon the existing knowledge of locals about specific hazards and risks. Information was disseminated by those systems in a timely fashion using simple and understandable language.

4.3 Priority action 3: Use knowledge, innovation, and education to build a culture of safety and resilience at all levels

Information management and exchange: The project has disseminated information about floods and their risks as well as about various protection mechanisms and coping strategies both to locals within the project area as well as to those in neighbouring communities. It has also published information, education and communication (IEC) materials, shown video documentaries, organised cross visits, performed street dramas, and facilitated EWS evacuation simulations in order to share information and build knowledge.

a. IEC materials are the key to raising awareness

IEC materials are essential for imparting knowledge and information. The project published and distributed four posters, two fliers, flip charts, and games. Before designing the IEC material, the project held an IEC orientation training for community leaders, project staff,

and district stakeholders, including CARE Nepal and their local partner NGOs. In agreeing upon the themes and the art for each item, the design team kept in mind the Tharu's social setup and culture. A local artist was employed to refine the sketches drawn up by the team. Each item was field-tested and the feedback of the community incorporated before it was finalised. Design sensitivity and testing have ensured that information about disaster risk, reduction and prevention is readily understandable and that it encourages and enables people to take action to reduce risks and build resilience.

The project's approach to information dissemination is innovative and interesting. Community facilitators disseminated the message of each IEC item using door-to-door campaigns based on the adult learning approach. The facilitators provided enough room for locals to express their understanding of and feelings about key themes and messages and to fill in any gaps if necessary. This flexible, interactive approach increased people's understanding of the main message of each IEC item..



IEC for flood preparedness

b. Cross visits: learning laboratories for locals

To promote learning from others' experiences and replication of good practices, cross visits are very effective tools. Each project community visited two other project communities to observe and learn from their efforts in DRR and to replicate good practices. Locals perceived these visits as learning laboratories because "believing by seeing" is very convincing. After their cross visits to Shivaratanpur, the Mohanpur communities of Ratanpur VDC started to make bam-

boo protection work with assistance from WFP/Backward Society Education (BASE). Emulating Bisanpur, the Lalitpur community plans to make wooden spurs to protect their bio-engineering work. This same bio-engineering work inspired Phulbari-7, Shival, which lies outside the project area, to establish 100 metres of bio-engineering. Similarly, Krishnanagar and Bheria communities have requested funds from the District Soil Conservation Office (DSCO) to implement bio-engineering in their communities. Inspired by Shivaratanpur's example, other communities have started to raise grains for their emergency funds on the basis of landholding (one kilogramme per *kattha*). There is a growing tendency to collect cash and grains from cultural and religious events like Fagui in March and Deusi and Bailo in October.

Box 6 Street dramas were helpful to explore local resources

I was impressed by the street drama. Its subject touched my heart. My eyes were filled with tears when I saw how the irresponsibility of one character increased his own vulnerability and that of his family. Most of the audience was sombre, and many were teary-eyed. We were inspired to use local resources rather than waiting for external resources, and now plan to assess local resources and start risks reduction initiatives. We have heard that the project will not stay with us for much longer.

-Ms. Binita Chaudhary, Treasurer/DPC, Mohanpur, Hasulia -4

c. Street drama: an effective tool for increasing awareness

Street drama is an important way of communicating key messages to illiterate communities. Locals said they found street drama effective in communicating useful information about DP and DRR initiatives. Since dramas were presented in the local language by trained local people, they were lively and their messages accessible. The street drama team also disseminated its messages through the radio station Dinesh FM. That street dramas are effective in awareness raising can be seen through the example of Jokahiyapur: according to the DPC Coordinator, the community were prepared for the September 2008 flood and were able to evacuate and rescue community members because of what they had learned from street drama events. So far, 24 young people have been trained to conceive and perform street

drama, thus creating local capacity for this important service. Altogether, more than 16,000 people have observed street dramas staged in schools and in communities.



mass observing street drama

d. Video documentaries: learning from others' experiences

Video documentaries can sometimes galvanise viewers into reducing disaster risks. Using their emergency funds, each DPC organized to show documentary films about the various coping mechanisms people in high-risk situations adopt. Like street drama, videos successfully generated awareness among illiterate people. Some of the particular risk reduction activities the videos communicated well and that have been emulated on the ground include the enforcement of rules like zero grazing and the practice of agro forestry-based income-generating activities.

e. EWS simulations: increasing confidence

The EWS and evacuation simulation exercises sharpened people's knowledge about and skills in EWS and evacuation but also helped spawn necessary amendments to local plans and practices. Each community conducted these exercises in order to demonstrate the steps of the community evacuation and emergency plan as well as the use of project-provided equipment and material. The steps demonstrated included the communication of a flood warning message by upstream monitoring stations, basic preparation for evacuation, the operation of EWS, evacuation, search and rescue, shelter management, first aid, and distribution of relief materials for recovery and rehabilitation. After the simulation, Mankapur



simulation exercise on EWS

and Bisanpur DPCs revised their evacuation plans to make them more realistic. The locals of the Lalitpur and Mohanpur communities said that the EWS simulation exercises came in handy during rescue operations in September 2008 and increased everybody's confidence.

Increased skills and knowledge through education and training: The project has targeted community members, particularly schoolteachers and students, to be disseminators of knowledge about DP and DRR. It has also promoted community-based training initiatives to enhance local capacities to cope with disasters risks (see Table 5). Some of the outcomes of project trainings are described below.

a. Community mobilisation training: This type of training demonstrates that social unity and solidarity is needed if flood risks are to be reduced. It resulted in the formation of DPCs and their sub-committees. All trainees conducted a similar training in their own communities to pass on the knowledge and skills they had gained. As participants realised "unity is power," they began to promote social solidarity and harmony.

One particularly good example of progress was seen in Lalitpur, where a decade-long conflict between Tharus and Dalits over public land was resolved. Inspired by this training, project communities have included neighbouring communities in trainings, orientations, street dramas and IEC material distribution through door-to-door campaigns. For instance, Khonpur and Bhitariya communities were invited by Shivaratanpur and Jokaiyapur DPCs respectively to collaborate in their plans to fight against flood risks. The idea of emergency funds also emerged from community mobilisation training.

b. Search and rescue training: These trainings were very tough but also beneficial to locals for use during floods. Trainees in Lalitpur learned to rescue a person by using a throw bag as well as to use life jackets to pull a boat against current. Shivaratanpur and Jokaiyapur communities used inner tubes and wooden planks to make temporary boats to carry grains and rescued children, pregnant and lactating mothers, and elderly. Communities felt that this training helps save the lives and important belongings during a flood.

c. First aid trainings: With skills gained from these trainings, locals were able to handle minor cases of injury. Trainees in Lalitpur said that they treated about 40-50 injured cases locally and referred other cases to the district hospital for further treatment. The people of Shivaratanpur, Bisanpur and Mankapur were able to convince sub-health post official to procure some medicines for them to keep in their first aid kits.

Table 5 Number of participants in various trainings

VDC	Community	Training													
		FA		DRM		S&R		NM		GW		CM		AK	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F
Phulbari	Lalitpur	18	14	17	19	4	0	1	1	1	0	12	23	9	7
Hasuliya	Mohanpur	14	15	15	16	4	0	1	1	1	0	19	10	10	8
Pabera	Shivaratanpur	22	14	19	16	4	0	1	1	1	0	24	13	9	8
	Bisanpur	19	13	17	15	4	0	1	1	1	0	21	8	8	7
Ratanpur	Mankapur	15	18	11	21	4	0	1	1	1	0	18	14	9	6
	Jokaiyapur	22	12	16	17	4	0	1	1	1	0	15	23	8	8
Total	110	86	95	104	24	0	6	6	5	0	109	91	53	44	

Source: Project records, 2007-08

Note: FA=First Aid; DRM=Disaster Risk Management; S&R=Search and Rescue; NM=Nursery Management; GW=Gabion Weaving; CM=Community Mobilisation; AK=Account Keeping

d. Disaster risk management training: Project field staff organised local-level disaster risk management (DRM) trainings after themselves participating in community-based DRM trainings. These trainings were seen as instrumental in changing beliefs about internal resource mobilisation. Locals are now less likely to wait for external assistance to reduce disaster risk; their knowledge, attitudes and practices have changed. For instance, those who believed that God was responsible for floods now understand that floods are the outcome of natural and man-made phenomenon. People still celebrate Dorbandi, Hereri and Lawangi¹¹ worships to please village and river gods, but they also understand that flood risks can be reduced using local resources and community knowledge-based preventive activities.

e. Nursery management training: The projects has provided basic nursery management skills and techniques to each community and helped it to establish a nursery. Fast-growing, deep-rooted species are being promoted to control soil erosion in bio-engineering sites. Gulmohar, *khair*, *bains*, *amlisho*, bamboo, *bakaino*, *sisoo*, napier, *moos*, *narkat*, *badahar*, and *Epil epil* are some of the species grown in nurseries and planted along riverbanks. The communities of Lalitpur, Mohanpur and Bisanpur produced enough seedlings to meet their needs, but the other three communities have had to get additional seedlings from outside. In Manikapur, people have also planted different species of trees along their evacuation route.

In addition to the trainings described above, trainings in account keeping and gabion weaving were also organised to make sure financial transactions are appropriately recorded and to teach locals to produce gabion boxes. Trainings in skills like nursery training and gabion weaving have increased job opportunities in an area without many such opportunities.

The project has prioritised equal access to trainings and educational opportunities for women (see Table 5) and vulnerable communities. It has focused on recruiting female participants for each training and orientation (except in the search and rescue training

people's participation in polybag filling



for trainers¹²) and on facilitating trainings so that they reach a large audience. It has also made the participation of at least one DPC or sub-committees member in each training mandatory. The IEC material it develops also exhibits gender and cultural sensitivity. Local traditions and culture are addressed in street drama and radio programmes are broadcast in the local language. By respecting local ideas and indigenous knowledge in each project endeavour, the project has ensured that the locals' sense of ownership, participation and spirit of voluntarism is high.

Changing practices through school-based activities: The project has selected eight schools to carry out DP and DRM activities because it sees students and teachers as key agents for change. The school-level programme focuses on developing teachers and students into local resource persons who can disseminate key messages about DP and DRR at a wider context than just within schools.

a. Formation of Junior Red Cross Circles

Junior Red Cross Circles (JRCs) are crucial for imparting knowledge and information as well as for making school-level DP plans to reduce risks through peer education. A JRC was formed in each school so that students could provide other students with knowledge about the causes and effects of disasters and ways to minimise their risks. JRCs act under the guidance of *sichhak nayak*¹³ and *saha-sichhak nayak* teachers to bring about effective DRM. The members of each JRC participated in trainings and orientations facilitated by teachers and project staff to transmit DP-, DRM- and DRR-related knowledge and skills. After it had acquired DRM knowledge, the JRC of

¹¹ These are traditional ceremonies held to protect villagers from natural calamities, diseases and ghosts

¹² Though there were no women trainees, in community-level search and rescue exercises themselves, female were included

¹³ *Sichhak nayaks* (teacher sponsors) and *saha-sichhak nayaks* (co-teacher sponsors) provide good advice and moral support for the initiatives undertaken by JRCs. They assist JRCs in taking their issues, concerns and plans to their headmasters (*sanrakshaks*) for the proper implementation of their plans.

Box 7 We realized that students also contribute in reducing disaster risks

We never realized that the project would consider us as a potential beneficiary to contribute in the risks reduction work. However, it was otherwise. We are able to get skills, knowledge and information through trainings, orientations and short sessions. The conservation education, nursery management and art, easy and speech competitions were particularly important for us for knowledge building. We have started to prepare school level DP plans to make our surrounding risks free. The sanitation has been improved through the active efforts of JRC.

-Mr Prashant Thakur, chairperson of JRC, Dipendra Higher Secondary School, Hasuliya

Dipendra Higher Secondary School, Hasulia, started conducting sanitation campaigns around the school in order to reduce the risk of snake bites. The trainings are instrumental in establishing a student-guardian link to DRR and in enabling students to fill in the knowledge and skills gaps among their fellow students and family members, particularly their mothers.

b. DP and DRM trainings for schoolteachers

The project provided DP and DRM trainings to schoolteachers so that they can serve as local resource persons and impart new information and knowledge to students and, through students, to the community, and fill in gaps. In this way, schoolteachers serve as local resource persons in disseminating DRR-related knowledge and information. Developing and enforcing school-level DP plans has been one immediate outcome of these trainings. These plans will be

linked with VDC plans. Communities recall the active roles played by trained teachers during the search and rescue efforts in the flood last September. They helped mobilise locals to reduce possible threats and risks.

The project has helped develop a simple curriculum for a three-days training in DRR. The curriculum was revised and its methodology amended to suit the local people's understanding of DP and DRR. More demonstrations, exercises, and interactions were added to make the training action-oriented, and technical jargon was removed.

c. Conservation education knowledge for school students

Knowledge about conservation education helps students initiate and get involved in community-based environmental management. Conservation education training focussed on natural resource management, the benefits of nursery management, and the rationale for community plantation as it relates to present and future DRR. An immediate outcome of the training was that students realised the role nurseries play during nursery management and plantation programmes conducted along riverbanks to promote flood control. In Lalitpur, schoolchildren planted seedlings, while in Bisanpur students' help speeded up the process of filling polythene bags. Their keen participation in these activities suggests children are committed to risk reduction initiatives.

d. DP awareness orientations and campaigns in schools

DP awareness campaigns help fill gaps in knowledge about DP and DRR. A two-hour session on disasters and their types, causes (primary and secondary) and effects, and possible ways of managing them at the local level was organised in eight schools. The session was designed after evaluating the existing curriculum on disaster with schoolteachers and identifying the gaps. The focus agreed upon was the disaster management cycle. Since the sessions used techniques such as art, essays, speeches, games, charts, and pictures, children enjoyed themselves and learned a lot.



DRR orientation to students

In sum, through its provisions for information management and exchange as well as for increasing skills and knowledge through education and training, it was possible for the project to use knowledge, innovation, and education to build a culture of safety and resilience at all levels.

4.4 Priority action 4: Reducing the underlying risk factors

a. Small-scale mitigation through bio-engineering

The project promotes the adoption of local resource and skill-based technologies and practices as part of DRR efforts. The priority of the project has been to introduce low-cost, easily-maintained and replicable mitigation techniques which are accepted by the communities. The project has implemented mostly bio-engineering activities but also some structural engineering work like spur construction. The bio-engineering work includes low-cost bamboo work, sand-filled cement sacks and community plantation along riverbanks. So far, the project helped carry out 1398 meters of bio-engineering work along crucial sections of riverbanks. To reinforce bio-engineering efforts and save productive land along riverbanks, 43,000 plants have been planted over an area of 27,300 m² (see Table 6).

The river mitigation work has prevented the loss of cultivable lands, housing and local infrastructures. In Lalitpur, for instance, farmers estimated that about 15 *bighas* of the cultivable land of nine families was saved through 300 metres of bio-engineering work. In Mohanpur, 300 metres of bio-engineering work prevented about 20 *bighas* of cultivable land from being washed away.

Box 8 We are happy with the river protection work carried out to save our crops and productive land

Until last year, fearing flooding and riverbank erosion, we felt compelled to harvest our paddy crops prematurely. Those of us who harvested in time did have a crop but the harvest was less than it could have been. Those who waited too late lost their entire crop because of the flooding in the Mohana River. Now that we have carried out protection work along the riverbanks, we do not need to harvest prematurely. There is no fear of risks. We are also inspired to replicate the technology elsewhere through our own efforts and resources to protect crops along riverbanks.

-Mr. Prem Bahadur Chaudhary, Coordinator, DPC of Lalitpur

Because of bio-engineering activities, local communities are more confident about saving productive farmland and ensuring their own safety. Initially, local people were sceptical about the use of bamboo to protect riversides until an exposure visit organised for some community leaders to Srilanka village in the western part of Kailali District helped to convince them that bio-engineering work can effectively protect riverbanks and communities.

Bio-engineering is being replicated in surrounding communities. After having seen its effectiveness in preventing riverside erosion, the project communities of Lalitpur and Mohanpur have protected 150 metres of riverbank with bio-engineering techniques. The Bisanpur and Mohana communities convince they have successfully diverted the river to the other side through protection work. Local people of Kavre, Banke and Bardiya districts have visited Bisanpur to see and learn about the outcome of DRR initiatives, the strengths of wooden spur work and how low-cost bioengineering work can be initiated by mobilising local resources.

Table 6 Status of mitigation work, community nurseries and plantation

VDC	Community	Bio-eng sites	Nursery area	Seedlings (No.)	Plantation area
Phulbari	Lalitpur	300 m	250 m ²	10000	8000 m ²
Hasuliya	Shivaratanpur	100 m	100 m ²	6000	2000 m ²
	Mohanpur	300 m	100 m ²	6000	3000 m ²
Pabera	Bisanpur	280 m	100 m ²	4000	2800 m ²
	Mankapur	150 m	150 m ²	5000	1500 m ²
Ratanpur	Jokahiyapur	268 m	275 m ²	12000	10,000 m ²
	Total	1398 m	975 m ²	43000	27,300 m ²

Source: Project record 2007-08



community management bio engineering work

After reclaiming land along a riverbank through bio-engineering work, people often start to farm off-seasonal vegetables, watermelon and nuts, to diversify local sources of income.

Box 9 We are now fully convinced that bamboo works

We were sceptical about the project’s proposal to use bamboo spurs for flood mitigation. After the project suggested we make them in our community, I met project officials to request them to focus on gabion boxes instead of bamboo spurs. I remember our community saying, ‘Aandhika agadi benako ke kam (What is the use of a fan in front of a hurricane)?’ to the officials. When we saw what bamboo spurs can do, we were amazed. Now we are committed to making more bamboo spurs upstream from the present bioengineering site with the support of the DSCO. We are thinking about requesting other agencies to support us in introducing bio-engineering work because it has already demonstrated its strength and its functionality during heavy flooding. Gabion work is no longer our main demand.

-Mr. Maya Ram Chaudhari, Coordinator, DPC, Mohanpur Hausulia-4

b. Using community- managed boats to reduce risk

Community-managed boats can effectively save people’s lives and livelihoods during floods. With project resources and community contributions, all six communities run community boat services. Besides their regular function of helping people cross rivers

safely, the boats facilitate safe evacuation during floods. With these boats, children, elderly people, pregnant and lactating mothers and important belongings were saved. The locals of Shivaratnapur believe that they would have lost 10-12 people of the Khalla community during the last flood if the project had not provided boats. The locals of Shivaratnapur



community managed boat

used to use *doond* (wooden troughs used to feed livestock) as boats though the risk of their overturning was great. The rescuers of Bisanpur rescued some members of Chotki Palia community after their boat was submerged. The community members of Lalitpur and Bisanpur even managed to save some police officers.

c. Community shelters serve as a refuge during flooding

Shelters play an important role in mitigating the fear of floods and inundation. Mohanpur and Shivaratnapur communities are constructing safe buildings linked to safe evacuation routes in order so serve as community shelters. In Bisanpur, people realised the importance of such shelters after 15 households were displaced for seven days last year.

d. Construction of evacuation routes

Evacuation routes are needed so that people can reach safe places before major risks arrive. The project has facilitated the effort to construct such routes. So far, a total of 4.2 kilometres (1.7 in Lalitpur and 1.5 in Jokahiyapur) have been completed with additional support from a “cash for work”¹⁴ scheme. The heights of routes are determined by assessing the flood levels of the last 50 years. The evacuation route at Shivratanpur is high enough to serve as a dike and prevent water from flowing in from the Indian side.

¹⁴ This initiative was supported by World Food Programme



people's participation in evacuation routes

Box 10 The appeal of migrating has declined

Because we face flood-related problems every year, we were planning to move our whole village to a community forest site to the west of Kamal Pokhari at Hasulia-3. Most of us had visited the site and were ready to migrate there. We had even asked some VDC executives to provide the site to us. After the project came, though, we learned more about flooding and how to prevent flood risks. We also learned about safe evacuation methods and routes to safe shelters. We are confident that we can reduce the adverse effect of floods by applying preventive measures. Our desire to migrate has petered out, and we are positive that we want this area to be our home permanently.

-Ms. Jumani Devi Chaudhari, Bhalmansa, Shivaratanpur, Hasulia-5

e. Raised hand pumps

Raised hand pumps can provide safe drinking water and minimise the incidence and spread of water-borne diseases during floods. With project support, five communities have constructed hand pumps. Although Lalitpur and Mohanpur communities were completely inundated during the flood last September,



raised hand pump

people were still able to get safe and clean water from their raised hand pumps. As all private hand pumps were submerged, people have realized the importance of having at least one raised community pump. People are trying to get VDC authorities and local NGOs to support them in the constructing more such pumps.

In sum, with its initiatives in small-scale mitigation work, community-managed boats, raised hand pumps and safe shelters with evacuation routes, the project has effectively contributed in reducing the underlying risk factors.

4.5. Priority action 5: Strengthen disaster preparedness for effective response

a. Strengthen policy, technical and institutional capacities for local disaster management

The project has helped strengthen policy, technical and institutional capacities by participating in national, regional and local trainings, workshops and conferences for sharing and exchanging experiences in local disaster management practices. At the local level, these workshops helped mobilise and manage external resources for the sustainable continuation of project initiatives. Inspired by the communities' efforts in bio-engineering work, the Department of Water Induced Disaster Prevention (DWIDP) has allocated Rs. 50,000 (EUR 490) to Lalitpur and Mohanpur for constructing bamboo spurs. Another Rs 70,000 (EUR 686) was allocated by the DSCO. The DSCO also provided some seedlings for plantation. In response

Box 11 We should honour local knowledge and practices

In my opinion, the people of project communities are convinced that bio-engineering techniques are effective in protecting riverbanks because bio-engineering is a low-cost local technology which uses locally available resources. In response to people's enthusiasm, we allocated Rs 70,000 so that project communities could replicate bio-engineering work in the project area. The successes of the project communities have also inspired us to replicate this technology in other VDCs. It is essential to introduce new technology in full recognition of local knowledge and practices.

-Mr. Nava Narayan Mishra, Head, DSCO

to the project communities' efforts, especially those in bio-engineering, the DSCO has sent its training participants to visit the six project communities and to learn from them. The DSCO's interest suggests that district-level stakeholders view project communities as learning laboratories.

b. Promote and support dialogue, exchange of information and coordination

The project has made an effort to promote dialogue geared toward exchanging information and increasing coordination. Project has facilitated the formation of a joint steering committee with the CARE Nepal- supported DIPECHO project. The committee is chaired by the NRCS and includes representatives from the DDC, DWIDP, BASE, Conscious Society for Social Development (CSSD), the Nepalese Federation of Journalists and other organisations as members. The committee has made it easy to coordinate technical backstopping and resource and idea/experience sharing and to take immediate actions for the betterment of the project's initiatives. Mercy Corps and CARE Nepal, in cooperation with local partners, jointly celebrated Earthquake Day in collaboration with the Department of Urban Development and Building Construction of the Ministry of Physical Planning and Construction of the Government of Nepal. While preparing IEC materials, functional coordination with CARE Nepal and CCSD was ensured. The aid of army and police personnel was enlisted during the search and rescue training sessions because of their proven knowledge and skills in these sectors. Similarly, while organising masonry training, the project collaborated with DFID's Community Support Programme.

Box 12 Making institutional arrangements to ensure the continuity of EWS is important

We should make a genuine effort to take steps to replicate local practice-based EWS in neighbouring communities and to ensure the sustainability of the good practices of this project in the future before the project phase is over. There is a need to discuss suitable institutional arrangements and to make provisions for a basket fund. Only efficient EWS can save the lives and properties of people living along riverbanks as it is not possible to carry out bio-engineering work along the entire length of the Mohana and other rivers to save people's lives and livelihoods.

-Mr. Loknath Regmi, DTO, Kailali

As part of its EWS efforts and to the benefit of its own as well as other communities, the project acquired rain- and flood-related data for broadcasting on local FM stations in coordination with the DoHM. Danish Red Cross, Practical Action and CARE Nepal have organised cross visits to project communities to learn from their initiatives. Locals were able to teach visitors how low-cost technologies can save productive land and settlements and how the various training and preparedness activities, evacuation plans, and EWS simulations helped them to save their lives and their important belongings. The Office of Coordination for Humanitarian Assistance (OCHA) claims that community-based preparedness activities and EWS are very useful for widespread dissemination.

This sort of networking, coordination and collaboration has helped project communities to initiate effective EWS, DRR and disaster response because they foster a holistic approach.

c. Promote regular disaster-preparedness exercises

The project has assisted communities in promoting regular disaster-preparedness exercises, including evacuation drills and simulations, in order to enhance their capacities. By drawing upon alternative funds,¹⁵ emergency and recovery support was provided to flood-affected communities. The idea of providing such support was spawned after the flood of last September destroyed all their grain storage containers and no seed was available for sowing in the new season. This initiative helped compensate



consultative meeting with district level stakeholders

¹⁵ Non-food relief items and seed with the support of OdysseyRe Foundation

low-income community members for their losses due to floods.

With its provisions for strengthening policy, technical and institutional capacities for local disaster management; promoting and supporting dialogue, the exchange of information and coordination; and endorsing regular disaster-preparedness exercises at the local level, the project has contributed to strengthening disaster preparedness for effective response.

5. Project contribution in achieving the strategic goals of HFA

5.1 Strategic goal 1: *Integration of DRR into sustainable development policies and planning*

The project's provisions for strengthening the ability of community-based institutions to carry out DP and DRR activities, developing knowledge-sharing mechanisms and maintaining financial transparency in each project activity have resulted in good organisational governance. The mechanisms for linking community-level DP plans with VDC and DDC plans will help communities secure the resources they need to execute their plans. Local-level DRR efforts are indeed integrated with sustainable development policies and planning at the national level. Clearly, the project helps meet the first strategic goal of HFA.

5.2 Strategic goal 2: *Development and strengthening of institutions, mechanisms and capacities to build resilience to hazards*

Through its careful analysis of the knowledge gaps of the project communities with respect to DP and DRR, the project has helped fill these gaps by implementing capacity-building initiatives. It has been able to develop the knowledge and skills needed to identify and assess risk, to monitor hazards and to disseminate early warnings. IEC materials, cross visits, street drama, video documentaries and simulation exercises have further increased the knowledge, skills and confidence of locals. The awareness built

through school-based interventions has played a remarkable role in sensitising locals to DP and DRR efforts. These efforts are fundamental to developing and strengthening local institutions, including DPCs, VDMCs, sub-committees, and JRCs. The interventions of small-scale bio-engineering-based mitigation and nursery management have contributed directly to environmental and natural resource management and land-use planning. The provisions for boats and safe shelters with built-up evacuation routes have increased the resilience of locals. These initiatives collectively contributed to the achievement of the second strategic goal of HFA.

5.3 Strategic goal 3: *Incorporation of risk reduction approaches into the implementation of emergency preparedness, response and recovery programmes*

The project has helped strengthen policy, technical and institutional capacities as well as local disaster management capacities by participating in national trainings, workshops and conferences for sharing and exchanging experiences in local disaster management. At the local level, these sharing workshops helped mobilise and manage external resources for the continuation of project initiatives. With support from the project, activities to promote dialogue, information exchange and coordination are regularly organised with the aims of providing technical backstopping; sharing resources, ideas, and experiences; and taking immediate actions for improving the project's initiatives. The provisions for networking, coordination and collaboration have helped the project communities initiate effective EWS, DRR and disaster response by fostering a holistic approach. The project has assisted communities in conducting regular disaster-preparedness exercises, including evacuation drills and simulations, in order to enhance their capacities. In addition, the distribution of food and non-food items to flood-affected communities has provided immediate relief and response. All these interventions have jointly contributed to achieving the third HFA strategic goal.

तयारी गरौ सुरक्षित होऔ



समूह जनचेतना र प्रकोपको
पूर्वतयारी योजना बनाऔ ।

नदी नियन्त्रणका
लागि ब्युतिकरणका
क्रियाकलापहरु गर्नु



सुरक्षित उपकरणको
खोजी गर्नु



Corps





DIPECHO is the Disaster Preparedness Programme of the European Commission's Humanitarian Aid department, the largest single humanitarian donor in the world. The DIPECHO programme funds pilot projects intended to demonstrate that simple, inexpensive preparatory measures, particularly those implemented by communities themselves, can limit damage and increase resilience and save lives.

Mercy Corps is an international non-governmental humanitarian relief and development organization with headquarters in the USA and UK that focuses on providing support to countries in transition. Mercy Corps exists to alleviate suffering; poverty and oppression by helping people build secure, productive and just communities. Mercy Corps is primarily focusing on emergency relief; economic development; and, initiatives that strengthen civil society. The goal of Mercy Corps Nepal is to alleviate poverty by increasing resilience to shocks, expanding economic opportunity, and fostering social inclusion.

Mercy Corps Nepal

P.O.Box 24374
 Sanepa Chowk, Lalitpur, Nepal
 Telephone: +977 1 555 5532
 Fax: +977 1 555 4370
 E-mail: info@np.mercycorps.org

Mercy Corps European Headquarters

40 Sciennes, Edinburgh, EH9 1NJ, UK
 Telephone: +44 (0)131 662 5160
 Fax: +44 (0)131 662 6648

