



Experience Capitalisation

Piloting Schemes for Systematic integration of DRR in LEAF

Authors: Adwyait Kumar Roy | Eveline Studer

Contributors: A.K. Osman Haruni | A.T.M. Azmul Huda

Archana Nath | Felix Bachmann

Madhab Chandra Das | Marcus Jenal

Md. Mamunur Rashid | Mostafa Nurul Islam

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Acronyms

APO	Annual Plan of Operation
BMDA	Barind Multipurpose Development Authority
BRRRI	Bangladesh Rice Research Institute
BWDB	Bangladesh Water Development Board
CBO	Community Based Organisation
CDMP	Comprehensive Disaster Management Programme
CF	Community Facilitator
CP	Cluster Platform
CRiSTAL	Community-based Risk Screening Tool, Adaptation & Livelihood
DAE	Department of Agriculture Extension
DoF	Department of Fisheries
DRR	Disaster Risk Reduction
IC	Intercooperation
IGA	Income Generating Activity
IRRI	International Rice Research Institute
LEAF	Livelihoods, Empowerment and Agro-Forestry
LSP	Local Service Provider
MRI	Mango Research Institute
PNGO	Partner NGO
SAAKTI	Sustainable Access to Agroforestry Knowledge, Technology and Information
SDC	Swiss Agency of Development and Cooperation
UDMC	Union Disaster Management Committee
UP	Union Parishad

Executive summary

In the past two decades, more than 200 million people have on an average been affected every year by disasters. Not only has the number of disaster events increased, but there is an overall trend in the increasing costs of disasters over the past two and a half decades. The rising costs and their disproportional impact on the developing world explain why disaster mitigation and risk reduction are important aspects of a sustainable development strategy.

Geographical location and land characteristics make Bangladesh one of the most disaster-prone countries in the world. Furthermore, the adverse effects of climate change will be more severe in Bangladesh than in most other countries and pose a significant threat to the goals of poverty reduction.

Disaster Risk Reduction (DRR) is continuously gaining momentum. In 2007, the Swiss Agency for Development and Cooperation (SDC) introduced new general guidelines on addressing DRR issues in the management of its programmes and projects. Subsequently, DRR was endorsed as a special theme in SDC's cooperation strategy 2008-2012 for Bangladesh and the Livelihoods, Empowerment and Agro-Forestry (LEAF) project implemented by Intercooperation (IC) was selected as one of the pilot projects to be monitored for its DRR mainstreaming efforts. The piloting scheme was implemented from March 2009 to July 2010.

The general objective of the DRR pilots was to reduce risk and vulnerability of the communities to climate related hazards. The specific objectives were to

- define interventions and modalities for the systematic integration of DRR in LEAF; promote and strengthen community based approaches to DRR;
- promote a coordinated platform involving all relevant stakeholders for mainstreaming DRR into development; and
- capitalise on the experiences made with the piloting schemes.

A first step of the piloting scheme was the selection of the working area. Five Unions were selected from three geographical areas that cover the major types of natural hazards of LEAF's working area.

The pilot interventions comprised the following main components:

Stock taking on region specific disasters: At the beginning of 2009 each of the four regional offices of LEAF project together with their partner NGOs (PNGOs) conducted stock taking exercises on natural disasters and climate change related hazards in their respective regions including risks, vulnerabilities, losses and coping mechanisms of the affected people.

Developing a community based DRR planning tool: The tool was indented to enable the communities to assess disaster risks and vulnerabilities and come up with a DRR activity plan for their community. At the same time, the tool was an important instrument for raising the awareness of the community members as well as the local authorities regarding DRR.

Develop communities' capacities to deal with DRR: A community facilitator was selected in each community to lead the DRR planning process. The project provided an intense coaching and accompaniment support to the community facilitators.

Developing DRR plans at community level: Every pilot community developed its own DRR activity plan. Besides a broad representation of the community people, also local authorities were invited to attend the planning workshops. The plans of all communities within a Union were compiled and presented in a common event to the Union Parishad.

Combining smart hardware and software interventions: The project's interventions focused on building the awareness and capacity of the community people. Furthermore, links to relevant supporting organisations like the local government or line agencies were strengthened. Besides this software component, specific smart hardware interventions were supported by the project. Smart hardware interventions are defined as structural interventions that (i) physically protect assets and lives in case of a disaster, (ii) can be implemented by the communities, (iii) can raise the awareness of the whole community about the importance of preparedness and prevention activities, and (iv) can be maintained by the communities without any external support.

As a result of the piloting scheme, the following main lessons could be drawn:

- Community Platforms established by LEAF were found to be the most appropriate entities to lead DRR activities in the communities.
- The active involvement of the local authorities as well as effective collaboration with other relevant organisations is crucial to make DRR programmes successful.
- Participation of community people in the planning process and implementation of activities effectively addressing their needs created a sense of ownership.
- Organising mock drills and cultural programmes were found to be very effective in disseminating important disaster related information among the community people.
- The community based DRR planning tool was found to be very effective to develop awareness and to plan appropriate interventions. In addition the tool was considered to have an important educational component.
- According to the perception of the communities "smart hardware" was found to be the very effective and also helpful to raise awareness and preparedness of the community.

The whole experience gained through the pilots proved to be very valuable for the DRR mainstreaming process in the next phase of LEAF, now renamed as Samriddhi. Particularly important lessons could be drawn concerning appropriate methodologies, relevant stakeholders and institutions, and successful measures in order to reduce the impacts of natural disasters in the concerned communities.

1. Introduction

1.1 Natural disasters

In the past two decades, more than 200 million people have on an average been affected every year by disasters. The number of reported natural disasters such as droughts, floods, cyclones, windstorms and earthquakes has tripled in the past thirty years. Not only has the number of disaster events increased, but there is an overall trend in the increasing costs of disasters over the past two and a half decades. The rising costs and their disproportional impact on the developing world have resulted in an increasing awareness of the connection between disasters and development and explain why disaster mitigation and risk reduction are important aspects of a sustainable development strategy.

Geographical location and land characteristics make Bangladesh one of the most disaster-prone countries in the world. The country is exposed to a variety of recurrent natural hazards, including floods, cyclones, droughts and riverbank erosion, which pull down the development initiatives and progresses. Due to the high population density and significant part of the population living in extreme poverty Bangladesh is highly vulnerable to natural hazards.

Furthermore, the adverse effects of climate change will be more severe in Bangladesh than in most other countries and pose a significant threat to the goals of poverty reduction.

1.2 Disaster Risk Reduction in Bangladesh

Disaster Risk Reduction (DRR) is continuously gaining momentum. In 2005, the international community adopted the Hyogo Framework for Action (HFA) which identifies the integration of DRR measures as a priority for development cooperation. Following the HFA, many countries as well as a range of UN organisations, donors and international and national NGOs have adopted DRR policies. In consideration of its disaster-prone environment being a central issue for all development ventures, the Government of Bangladesh approved the Comprehensive Disaster Management Programme (CDMP) as a key strategy to reduce the country's risks to disasters in 2003.

1.3 Mainstreaming DRR within projects in disaster prone environment

IC has a longstanding experience in the field of natural resource management in which concrete actions to cope with natural hazards are frequently integrated in order to contribute to sustainable development. Through its LEAF project IC has elaborated a range of context specific natural resource management and environmental measures to address the risks of disasters in each of the four working regions in Bangladesh. DRR competence was, however, developed pragmatically and in a context driven manner.

In 2007, the Swiss Agency for Development and Cooperation (SDC) introduced new general guidelines on addressing DRR issues in the management of its programmes and projects. Bangladesh was identified as one of the most vulnerable countries regarding natural disasters and selected as one of seven pilot countries. Subsequently, DRR was endorsed as a special theme in SDC's cooperation strategy 2008-2012 for Bangladesh and the LEAF project was selected as one of the pilot projects to be monitored for its DRR mainstreaming efforts.

Therefore IC decided to integrate DRR issues more systematically in its LEAF project. The whole process and results of the DRR interventions within the pilot schemes are described in detail in the following chapters.

2. Selection of pilot areas

In March 2009 IC organised a workshop to define interventions and modalities for the systematic integration of DRR within the LEAF project. It was decided to initiate the process through pilot projects (referred as pilots) with the following characteristics: In each of the four regions of LEAF one pilot shall be implemented and the pilots should cover all three hazard specific categories. With regard to the most common hazard pattern and climatic conditions of Bangladesh, the working area of LEAF was classified into three broad categories:

- Haor basin (district of Sunamganj): characterised by a deep shallow depression, regularly affected by flooding and devastating flash floods; most of it is inundated from May to October. The people live on scattered small patches of raised land (*hati*) which become islands during the rainy season and are particularly vulnerable to flooding and erosion.
- High barind tract (Chapai Nawabganj district): dominated by drought, with the reduction of soil organic matter and crop production, scarcity of water and fuel wood, health hazards and scarcity of animal feed being common scenarios every year between October and April.
- River basin (districts of Sirajganj and Kurigram): characterised by yearly floods and extensive river erosion along the flow of the mighty Jamuna river.

3. Objectives and hypothesis of DRR pilot scheme

The pilots were carried out as an entry point for the integration of DRR measures. It was assumed that the experience gained through the pilots would be used for a full scale mainstreaming of DRR in the subsequent phase of the project.

General objective of the DRR pilots was to reduce risk and vulnerability of the communities to climate related hazards in the areas under the pilots, while the specific objectives were as follows:

- Define interventions and modalities for the systematic integration of DRR issue in LEAF;
- Promote and strengthen community based approaches to DRR;
- Promote a coordinated platform involving all relevant stakeholders for mainstreaming DRR into development;
- Capitalise on the experience made with the piloting schemes.

The objectives of the pilots were specified through the following four hypotheses:

The experiences gained through the pilots would help

- developing appropriate tools and methodologies, which would later-on be used by the communities in planning DRR activities with a view to mainstream DRR in the next phase of LEAF;
- defining an appropriate way to develop the capacity of the communities so that they can take over the responsibilities to take necessary measures in order to tackle their problems linked to natural disasters;
- identifying appropriate support, regarding software and hardware activities, to be delivered by the project, which would be affordable by the communities in order to reduce the disaster related risks and vulnerabilities specific to three particular hazard-prone areas of LEAF; and
- assessing appropriate institutions to steer the DRR issue at the local level in absence of the project

4. Implementation of the pilots and experiences

4.1 Capacity building of project staff

The way of stepping into DRR

Activity

In 2008, staff of LEAF project participated in training workshops on DRR facilitated by expert organisations like Practical Action and Concern. Afterwards, all four regional offices of IC organised DRR trainings for the staff members of their partner NGOs. The training was facilitated by the trained staff of the project with the assistance of the local expert organisations. The chief executives, and in some cases the executive committee members of the PNGOs, visited DRR activities of other organisations to learn from others' experiences on community initiatives to reduce vulnerability and impacts of natural disasters.

Observation

Combination of classroom training and exchange visit was found to be a prerequisite for implementation of DRR pilots.

4.2. Stock taking on region specific disasters

An instrument of developing regional DRR proposal

Activity

At the beginning of 2009 each of the four regional offices of LEAF project together with their PNGOs conducted stock taking exercises on natural disasters and climate change related hazards in their respective regions. The result of this stock taking exercise was for each region the identification of the major natural disasters, risks, vulnerabilities, losses and coping mechanisms of the affected people related to each type of disaster.

Observation

Life and livelihoods of the communities in LEAF's working area are mainly affected by the following five major disaster related hazards:

- Floods endanger the physical and natural assets of the people;
- River erosions aggravate the pressure on land as natural resource for agriculture and settlement and destroy physical and natural capitals of the people;
- Flash floods endanger the livelihood of the farmers through damaging their crops (mainly *boro* paddy);
- Haor wave action (*afal*) ruin raised clusters of the homesteads (*hatis*);
- Droughts damage crops of the farmers during summer.

4.3 Developing operational guidelines of DRR pilots

Draw a boundary line to implement the programme

Activity

As a next step, operational guidelines for the implementation of the pilot schemes were elaborated. The guidelines included composition of DRR implementation committees at different levels, intervention based implementation modalities, community's contribution, monitoring, reporting, etc.

The project also developed financial guidelines for the smooth operation of the fund allocated for the DRR pilots. The guidelines included how to operate the bank accounts, how to make transactions, how to do procurements, how to maintain books of accounts, how to prepare financial reports, etc.

Observation

Both guidelines were found very useful for smooth implementation of programme and an efficient management of fund.

4.4 Developing a community based DRR planning tool

An effective instrument to plan DRR activities

Activity

Complementary to the guidelines a “community based DRR planning tool” was developed with the objective to build the capacities of communities and local authorities to assess disaster risks and vulnerabilities as well as to mainstream them into community-level projects and activities. The direct output of the planning tool was expected to be a DRR activity plan for the communities, while awareness raising and increased capacities at the local level were thought to be the additional results of the whole process.

The community based disaster risk reduction tool was developed by the project as a complementary tool to include aspects of DRR in the regular livelihood activities; the tool was designed to be integrated in the regular planning activities of the community based Cluster Platforms (CP) supported by LEAF. The basis for the tool was the Community-based Risk Screening Tool, Adaptation and Livelihood (CRiSTAL) and the Community Risk Assessment and Risk Reduction Action Plan guidelines developed and used by the Government of Bangladesh. A taskforce comprised of IC staff that had long experience in developing community planning tools was assigned for developing the tool. After developing the draft planning tool, field tests were done to identify necessary adjustments and to finalise the tool on the basis of the feedbacks obtained.



Observation

The planning tool was an essential tool and support for the whole working process. The iterative design of the tool, with the development of a draft, field tests and improvements through the pilots was an effective working process which led to a very useful result. Meanwhile, the tool was published and made accessible to a wider audience concerned with and involved in DRR.

4.5 Developing community facilitators

Develop communities' capacities to deal with DRR

Activity

In order to have a strong internalisation of DRR in the community, it was decided that the activities would as far as possible be led by a Community Facilitator (CF) in each CP. In order to base on existing capacities, the same persons trained by LEAF, who were involved in the elaboration process of the Annual Plan of Operation (APO), were selected as CFs. In order to develop the required capacities of the CFs, the project provided an intensive coaching and accompaniment support. As a result, the CFs could build their confidence and play a vital role in running the planning sessions in the CPs.

Observation

In most cases, the CFs facilitated the planning sessions with the co-facilitation support from the project's Field Facilitators (FF) while in some cases they could facilitate the sessions without any support. During the process of preparing the DRR plan when it was needed to link the outcomes of the different steps with each other and to put them in a logical order many CFs faced difficulties.

They hardly made use of the information collected from secondary sources during facilitating the planning process. In a few cases, the CFs faced problems in determining sustainable strategies to reduce the risks of disasters.

4.6 Developing DRR plans at community level

A new instrument to tackle DRR linked problems

4.6.1 Coordination effort for the collection of secondary data

Activity

As basis for the implementation of their DRR planning process, to comprehensively assess their risk situation, the initial idea was that each CP would collect secondary information from relevant organisations. While collecting the information, government offices were found to be disorganised in preserving the relevant documents. The office bearers were also found to be very reluctant in providing any documents to the responsible people of the communities. In most cases, the government officers could not provide the expected relevant information. However,

**Mr. Afzal Hossain,
Cashier, Wapdarhat
Cluster Platform,
Pachgachi union,
Kurigram**



I have been selected as one of the facilitators for facilitating the DRR planning exercises in our CP. Prior to facilitate the planning process, I attended an orientation training organised by the project. While facilitating, I found the tool creates an environment for the participants to do in-depth analysis about their own context in regard to disasters. The tool could enable the participants to come up with specific actions in order to reduce the disaster related risks. Apart from these positive sides, I found some limitations of the planning tool. I found some participants were leaving the sessions at a point of time before completion of the sessions. Initially I felt very confident but during facilitation I faced difficulties to establish relations between the outcomes generated in different steps.

the secondary information that could eventually be collected was considered to be very useful for developing a DRR action plan.

To make the process easier and less time consuming, it was decided that a single team assigned by all CPs of one union would collect the secondary information from all relevant sources and all CPs would use the same information, as the information that was provided was the same for the whole union, i.e. not community, cluster or ward specific.

Observation

This coordination of information collection could reduce the time in collecting information from secondary sources and contributed to build solidarity among the CPs. Generally, it took the CPs around 15 days to complete the information collection from the secondary sources. The CPs presented all the collected information through different tools like seasonal livelihoods calendar, seasonal disaster calendar, hazard mapping, resource mapping, social mapping, etc.

4.6.2 Participative elaboration process of the DRR activity plan

Activity

Every pilot community developed its own DRR activity plan through using the community based DRR planning tool (see section 4.4). The planning process was led by the CPs with the active participation of all community people. Through using the tool, the community people collected DRR linked information, analysed their situation and developed plans according to their needs. The CPs were supposed to involve all community people in the DRR planning process.

Observation

Identification of hazards and identification of support mechanisms were found to be the most important and useful parts of the planning process to the community people.

While practising, the tool was found to be not only a planning tool but also as an educational tool for DRR. At the same time, the community people became aware about the disasters, hazards and impacts in their region.

Aged people were seen to be particularly important participants in the exercises as they knew very well about existing and previous situations of their respective area regarding the disasters. Involvement and active participation of community people in the planning process contributed to build a sense of ownership of the community regarding the planned activities. This helped community people's participation in the implementation of the plan.

CP leaders commented that the DRR planning process was quite similar to their APO elaboration process, which they were using since the beginning of their collaboration with LEAF. Indeed, they see it as realistic to integrate the DRR planning tool in the APO process.

Despite so many positive things, the planning tool was observed to be quite time consuming for the community people. As a result, participation of all community people in all steps of the planning process was not possible. This problem was more visible in the poor and extreme poor communities, where the people are more involved with the activities for their subsistence and, hence, their opportunity costs for attending a planning session are higher. This limitation of the tool was overcome through splitting the sessions into smaller sessions of reasonable duration. Integration of the tool in the APO process could further simplify the DRR planning.

4.7 Implementing DRR hardware

Smart hardware interventions implemented by the communities

4.7.1 Structural interventions, with focus on smart hardware

Smart hardware interventions are defined as structural interventions that (i) physically protect assets and lives in case of a disaster, (ii) can be implemented by the communities, (iii) can raise the awareness of the whole community about the importance of preparedness and prevention activities, and (iv) can be maintained by the communities without any external support.

According to their needs and opportunities, identified through the DRR planning, each community implemented an average of six smart hardware structures. These interventions are described in the following paragraphs. Photos of smart hardware interventions can be found in the annex.

The communities started their planned interventions in association with the local people and relevant organisations. Up to July 2010, about 70% of their planned interventions have been realised. During the piloting scheme, smart hardware interventions were partly financed through the project LEAF in order to establish some case studies for demonstration.

4.7.2 Protection measures against floods

Multi-purpose livestock shelter

In the flood prone areas, the community people often had to sell their livestock at very low prices during floods because they didn't have a place to protect them. Through the DRR pilots CPs constructed livestock shelters, consisting of a raised surface of land, to save their cattle and goats during floods.

Facts of livestock shelter in Fulbari:

- Size: 24'000 m³ (214242 ft³) earthwork with a surface of 45 m x 60 m = 2700 m²
- Capacity: 800 - 900 animals, mainly cows, some goats, representing a total value of 16'200'000 BDT.
- Construction costs:
600'000 BDT (20 % contributed by community through land and soil)
- Cost-benefit analysis:
Assuming a life-time of 30 years and a protection for a 20 year flood-return period,
cost : benefit = 1 : 40
- Multi-purpose use during dry season:
Vegetable cultivation on slope, place for convocation, drying of jute, rice, etc.

"Once I had 100 acres of land. The river already took 60 acres of land. If my one acre of land can save all villagers' assets then why shouldn't I donate?"



-Said **Md. Abdur Rahman, Wapderhat, Pachgachi union, Kurigram.**

One day Ruhul Amin and Afzal Hossain, two CP-representatives requested me to donate one acre of land for establishing a livestock shelter. I shared the matter with my wife and she strongly supported donating the land to establish a community based livestock shelter. We thought that the livestock shelter would save the livestock of poor and extreme poor villagers from forced selling during flood. Accordingly, I donated one acre of land through transferring the ownership of the land to the CP. The CP established a livestock shelter on that land. I was so happy seeing that the villagers could save their cattle and goats in the shelter during the flood that occurred in September 2009

Community people donated land to the CPs for the construction of the shelters. Donation of land by the community people contributed to increase the confidence of the CPs in the implementation of DRR plan.

Community people shared the construction costs and made a plan for further shelter management and renovation.

The CPs also started using the livestock shelters for the implementation of different income generating activities. This income would generally be used for the maintenance of the shelters. In total 20 CPs were involved for the construction of 8 livestock shelters. During the flood in 2009 thanks to the livestock shelter 3 CPs could save their livestock from forced selling.

Hati protection

In the *haor* area in Sunamganj district, people live on raised patches of land called *hati*, that during the rainy season become islands in the flooded area of the *haor*. To protect their *hatis* (homesteads) from flooding and from wave action in the *haor*, the concerned CPs raised their *hatis* and built protection walls with bamboo and *chaila bon*, a locally growing grass species. Using local resources and indigenous technologies, community households jointly cultivated *chaila bon* in public lands with the permission of the UP.

The raised *hatis* could be used for post harvest management of *boro* rice, poultry and livestock rearing, vegetables cultivation and storage of livestock feed. The communities contributed 14% of the total costs (the rest was paid through LEAF) and took the responsibility for future maintenances.

4.7.3 Protection measures against river erosion

Pilings

Communities living close to the river constructed pilings with bamboos and trunks to protect their land from river erosion. For the construction of the pilings, the CPs included people from the communities in a committee that organised the collection of bamboos and trunks with the understanding that people donate bamboos and trunks. The committee collected almost all required bamboos and trunks from the communities (3200 bamboos, 70 trunks) and from the Water Development Board (400 bamboos). Each of the 200 community people provided voluntary services for 35-40 days for the establishment of pilings. Additionally the CPs received monetary support from the local Member of Parliament and the bazaar committee for the construction work.

Through installation of pilings, two CPs could protect six culverts, one primary school cum flood shelter, about 500 acres of cultivated land and about 900 households from river erosion.

Piling with bamboo and trunk was not found to be a suitable measure for protecting river erosion permanently. It only protects from river erosion for a short period, since the pilings usually get washed away or damaged.

Bundles

Similar to the pilings, CPs established bundles with bamboo to protect their land from erosion of Dudhkumar river. Almost all required bamboos were contributed by the communities themselves. The community people also provided labour for the construction of the bundles. The CPs received donations from local woman Member of Parliament, the upazilla chairman, the UP chairman, and elite persons for the establishment of the bundles. The

communities contributed in kind to about 60% of the implementation cost in form of bamboos, trees, land and labour while the remaining 40% were paid through LEAF.

The bundles could save a big bazaar, 2,500 households of 10 villages, 2,600 acres of cultivable land, one flood shelter, two mosques, one school and three bridges from river erosion.

4.7.4 Protection measures against droughts

The re-excavation of *kharis* (irrigation canals) and ponds combined with tree plantation around pond and *kharis* are the main interventions in drought prone areas. Since these activities are a combination of hardware and software interventions, see 4.8.2 for detailed description.

4.7.5 Other community driven initiatives

Improvement of water supply and sanitation

Many of the pilot communities repaired old tube wells and installed new tube wells to ensure safe drinking water during droughts or floods.

Some communities installed a good number of sanitary latrines. These initiatives were undertaken to prevent waterborne diseases like diarrhoea during flood. The communities mostly received the tube wells and latrines from the UP. Repairing and installation costs of tube wells and latrines were borne by the community people and the project.

4.8 Combining hardware and software interventions

To ensure prevention, preparedness and mitigation

4.8.1 Innovations to mitigate the impacts

Introduction of new varieties

To counteract the devastating impacts from natural disasters some new crop varieties were introduced such as flood tolerant and early varieties of rice, fast growing and heat tolerant fish species, and drought tolerant vegetables.

Demonstration plots and trials for Participatory Variety Selection (PVS) were established with the assistance of research organisations such as BIRRI and IRRI. PVS trials on short duration rice proved that the rice could be harvested within 120 days, i.e. before the season of hailstorm and next *Rabi* crop. As a result of this demonstration of short duration variety of rice, BIRRI *dhan* 45 was identified, which could be harvested before the flash flood with a good yield.

Farmers preserved entire paddy as seed and would sell the seed to other farmers for cultivation in the next year. Ten CPs could protect 40 acres of paddy through introducing submerged (flood tolerant) variety of paddy. The submerged variety of paddy remained intact even after 7 days of submersion whereas almost all other varieties were damaged.

Additionally the introduction of submerged rice variety created employment opportunities for poor and extreme poor in the paddy field during job crisis (*Monga*).

Establishment of community seed bank

The CPs established community seed banks to store the necessary amount of rice seeds of flood tolerant varieties. For seed multiplication, the CPs provided seed to the farmers with the condition that after harvesting the farmers would return two to three times more seed to the CPs.

After cleaning and grading, the CPs stored the seed in their seed bank using improved storing method. In case of floods, they will distribute the seed amongst the flood affected farmers for use in the following year.

Introduction of community seed bank was found to be an innovative idea to tackle the community's seed crisis and contributed to the recovery after crop losses by the poor farmers due to flood.

Establishment of community food bank

Besides the seed banks, some CPs established community food banks to store dry food. Main objective of this initiative was to distribute food among the most flood-affected poor and extreme poor households when there is no external support. To stock the banks, CP leaders collected money and dry food like fried rice, puffed rice, etc. from the local rich people.

Introduction of food banks increased the acceptance of the CPs by the community people due to their food support to the poor and extreme poor during severe flood situation.

Communication infrastructures

In the *haor* region, some pilot communities established infrastructures to assure people's mobility during flood. They constructed bamboo bridges to ensure connection between the different *hatis* and arranged boats to bring the community children to school during monsoon season.

4.8.2 Generation of funds to maintain hardware interventions and to increase resilience

Re-excavation of ponds

Several CPs took lease of ponds for 3 to 5 years through a formal agreement, which allowed them to cultivate fish and plant trees and vegetables on their embankments. According to the communities, most of the ponds in the Barind area are *khas* and the government leased them to the existing owners. The existing pond owners don't re-excavate the ponds, and as per the terms and conditions of the lease, the pond owners cannot give sub-lease to others to re-excavate. After seeing the benefits, some additional ponds were, however, re-excavated by the UP, the Department of Agricultural Extension (DAE) and pond owners. The CP leaders seemed to be quite confident that a good number of ponds will be re-excavated in the next year.

Re-excavation of kharis

Some communities re-excavated *khari* (*khas* canals in the crop field of the high Barind area) to ensure the irrigation of the field crops in the surrounding area during dry season. The CPs organised meetings with the local authorities (UP and upazila administration) to get the legal permission for the re-excavation of the *khari*. They also got the permission to cultivate fish in the *khari*, to plant trees, cultivate vegetables and raise rice seedlings on the embankments. The concerned CPs could negotiate a lease agreement of the *khari* for 25 years.

Community people shared the cost of the re-excavation of the *khari*. They expressed that the re-excavation would have a twofold benefit, i.e. crop production of the landowners would be increased due to irrigation from *khari* and additionally there would create employment opportunities for poor and extreme poor who can work in the crop fields. The community people are confident that they would be able to continue the maintenance of the *khari* from Income Generating Activities (IGA) around the *khari*.

DRR measures as income generating activities

Additional to the use of the embankments of ponds and *kahris*, tree saplings (mainly fruit trees) were planted in common places like schools, mosques, temples, graveyards and around homestead areas. For this purpose, the CPs contracted with local nurseries and received quality tree saplings for a reasonable price. In the dry season, the trees would provide shade and increase water retention of the soil. The domestic consumption and/or selling of the fruits represent an added value for the community people. The CPs and community people shared the cost of the plantation programme. DAE provided palm seeds to sow on the pond embankments.

Many CPs developed the diversified IGAs not only to finance the maintenance of the protection infrastructure, but to develop the shock absorbing capacity of poor and extreme poor people by increasing their resilience. Some CPs involved extreme poor in ground nut, maize, china *kawon* and sweet gourd cultivation in the

char area. The poor and extreme poor were contracted by the landowners with the condition that the landowners get 33% and the farmers 67% of production. The CPs and Service Providers Association (SPA) jointly organised training for the poor and extreme poor farmers on crop cultivation and management techniques.

Some CP in the *haor* area started with floating vegetable cultivation to protect their crops from flood.

4.8.3 Preparedness through warning system

Early warning systems have been introduced by different communities using available low-cost technologies like mobile loudspeaker systems, loudspeaker systems of mosques or mobile phones. In case of the early flash flood 2010, the concerned CPs warned the community people of the imminent flash flood with microphones and cell phones. As a result, the community people with the help of UP and UDMC repaired and raised the embankments in due time for protecting crops from flash flood.

Thanks to the new early warning system 80% paddy of *Paknar haor*, 25% paddy of *Halir haor* and 60% paddy of *Sayer haor* could be protected from the unprecedented devastating flash flood in 2010.

4.8.4 Awareness building through special events

The CPs organised mock drills or simulation events with the objective to make the community people aware about the precautionary measures to be taken before and during a flood. As a part of the event different messages were shared through *Bhawaiya* (folk songs).



Mr. Taimur Ali, Village-Dimkoil, Un-Nizampur, UZ-Nachole, Chapai Nawabganj

I am an agricultural labourer of this village. During the drought period, I don't have any work in this area. Each year, I go to other districts to get employment. Employment is not always available in other districts, neither.

In the coming seasons, all landowners surrounding the *khari* will get irrigation facilities to grow paddy and other crops. This will create job opportunities for agricultural labourers like me. I hope next year during *Aman* and *Rabi* seasons I can stay and work in my own village, which will only be possible because of the availability of water in the *khari*.

The CPs organised cultural programmes (folk song, drama, dance, etc.) as awareness raising events. They also commemorated international environment day, national disaster risk reduction day and national disaster preparedness day. CPs/UP arranged discussions and rallies at UP level in order to make people aware of disasters.

Some CPs organised experience sharing events which were attended by Upazilla administration, Upazila Chairman, UP chairmen and members, BMDA representatives, government line agencies, project and NGO representatives and other relevant stakeholders at upazila level.

CPs and UDMCs jointly organised health camps to make the community people aware about waterborne diseases that are especially common during floods. Additionally patients got free treatments of waterborne diseases, mostly diarrhetic diseases. The health camps were organised in collaboration with local health centres and relevant NGOs.

Nibaron Das (45)
Village : Kheruala
Un-Sulla, UZ-Sulla
Sunamganj.



Before starting the DRR activities we had the belief that every disaster is made by God

and we have nothing to do against it. But after getting involved with DRR activities community people learnt a lot about disaster and its remedy. Participation in DRR planning process, training and awareness raising events made the community people aware about disasters. Now the community people realise that they can do many things before, during and after the disaster. Now they are aware about the preventive measures, emergency responses and rehabilitation activities in order to reduce the risks of disasters.

4.9 Implementing DRR software activities

Capacity and synergy building for the communities

4.9.1 Software interventions, with focus on linkages and synergies

Software interventions, as planned activity of the established DRR plan refer mainly to awareness raising and capacity building. Nevertheless a special focus was also the strengthening of synergies and linkages between different stakeholders as direct software measurement as well as result of the implementation of the hardware interventions.

4.9.2 Capacity building of community facilitators and key persons

Additionally to the development and training of CFs, as described in section 4.5, the CP leaders, UDMC members, Union Level Committee members (a project promoted committee) and local elite persons were given training on disaster management and facilitation of DRR planning process.

4.9.3 CP with a leading role throughout the whole process

CPs played the lead role in the whole process of planning and implementation of DRR activities in the communities with a view to (i) develop the CPs' capacities and confidence to deal with DRR, (ii) increase the CPs' acceptance in the communities, (iii) develop the CPs' linkages with different organisations.

DRR planning sessions were facilitated in the communities by the CFs from the CPs. CPs invited all community people in the planning sessions so that the community people (i) are involved during the planning stage of the DRR activities, (ii) are aware about the severity and influence of disasters in their livelihoods, (iii) see the planned activities as their own, and (iv) are responsive to implement their planned activities.

Additionally to the DRR planning, the CPs actively implemented a range of measures in connection with DRR in their communities:

- CPs searched for local resources and made people aware about the importance of the availability of local resources like land, labour, bamboo, trunk, *chaila bon*, etc. for the planned DRR interventions. CPs ensured community contribution in constructing infrastructures like livestock shelter, piling, bundle, *hati* protection wall, etc. so that the communities take the responsibilities of their maintenance
- CPs promoted low-cost hardware interventions that are affordable by the community people without or with a minimum external support, especially indigenous technologies like construction of *hati* protection walls by soil, bamboo and *chaila bon*, construction of piling with bamboos and trunks, construction of bundles with bamboos, etc.
- CPs included IGAs like fish culture, vegetable cultivation, tree plantation, etc. in connection with the establishment of structures like livestock shelter, *khari*, *hati* protection wall, etc. so that the communities can generate funds for the maintenance of those infrastructures.
- Different CPs ensured information and resource sharing among the CPs and community people in order to build solidarity among them. For instance, all the CPs of a union used the secondary information collected by one assigned team of the union, which created cohesion among the CPs and community people.
- Different CPs implemented some joint initiatives in order to build solidarity among the community people. For example, community households jointly cultivated *chaila bon* in public lands with the permission from UP, which created cohesion among the community people.
- CPs planned and implemented the hardware interventions considering their multiple purposes. For example, the re-excavation of *khari* was considered to have several purposes:
 - (i) increased crop production of the surrounding area due to irrigation from *khari*,
 - (ii) employment opportunities in the crop fields for the poor and extreme poor,
 - (iii) fish culture, vegetable cultivation and tree plantation around the *khari* to generate income for the leaseholders,
 - (iv) shadow and increased water retention capacity of soil thanks due to the planted trees on the embankment of *khari*.

Mr. Toufik Imam
Upazila Nirbahi
Officer (UNO),
Nachole,
Chapai Nawabganj



I didn't have any idea that communities' mobilisation could reduce disaster risk but now CP's experiences changed my idea and I would suggest to the UP to take community mobilisation into account in implementing this type of interventions.

4.9.4 Linkages and synergies with UDMC

The project involved the UDMC as a key actor of DRR. Members of the UDMC were involved with the whole process, the establishment of the DRR plans and the implementation of the measures.

Traditionally the UP and UDMC are involved with relief and rehabilitation activities only after an emergency using the funds allocated by the government. According to the national plan for Disaster Management, the UDMC is supposed to elaborate a DRR plan at UP level. However, this has rarely been done. After involvement with DRR pilots, some of the UDMC members realised their responsibility beyond the emergency stage. As a result, some UDMCs developed their DRR plans, while others revised their DRR plans, thereby incorporating some new activities from the CP DRR plans. Newly incorporated activities were for example maintenance and repairing of embankments and tube wells, plantation of trees, creation of alternative income and employment opportunities, etc.



Sudhir Chandra Das, UDMC member, Sulla Union Parishad, Sulla, Sunamganj.

I am a member of Sulla UDMC as well as an elected member of Sulla Union Parishad. Since 2003, I have been working as a UDMC member. But I didn't know the activities of the UDMC, roles and responsibilities of UDMC members, and how to develop and implement a DRR plan. In April 2009, I became involved with LEAF's DRR pilot initiative. The project organised training for us on disaster management and facilitated our UDMC to develop a DRR plan for the UP. The project also organised a match making workshop to make necessary adjustments in the DRR plan of the UDMC based on the demand of the CPs. These initiatives developed the capacities of our UDMC to plan and implement the DRR activities effectively.

Now, I along with my other colleagues of UP and UDMC are actively involved with the DRR activities like installation of tube wells, selection of vulnerable villages/halfts for earthwork to protect against wave action, selection of common places for building livestock shelters, repairing embankments, establishment of demonstration plots etc. I am very happy that the UP/UDMC has finally become functional and linked with CPs and other relevant organisations, which are working for DRR. I think this is a good way of strengthening local capacities in line with DRR.

CPs also built linkages to other institutions for implementing DRR activities. For the realisation of the hardware interventions, they established contacts with different relevant local authorities, research, line departments, extension organisations, etc.

4.9.5 Linkages and synergies with line departments

Formal collaboration was made by the project with the Fisheries Department of Rajshahi University and BRRRI to get support for setting up trials on cultivation of heat tolerant fish and drought tolerant paddy. Informal collaboration was established with the Department of Fisheries to get technical support for fish culture in the re-excavated ponds and *khari*. Mango Research Institute (MRI) provided training and advice to the CPs on plantation of mango trees using an improved method. These linkages with the line departments proved to be very important for the successful implementation of the measures.

5 Results of the interventions with regard to the hypothesis

In Chapter 3 the objectives of the pilot schemes were specified with the help of four hypotheses. The results and lessons learnt through the pilots are summarised here below in order to respond to the set hypotheses.

5.1 Results regarding institutions, linkages and synergies

Hypothesis: The experience of the pilots will help assessing appropriate institutions to steer DRR at the local level in absence of the project.

Results:

- CPs were found to be the most appropriate entities to lead DRR activities in the communities.
- Local Service Providers (LSP) played a vital role in providing technical and input support to the CPs in the domains of horticulture, field crop, livestock and fisheries.
- The UDMC has proven to be the most appropriate local authority to lead DRR activities at UP level in collaboration with the CPs at the Ward level¹.
- Effective collaboration with relevant organisations is very important to make DRR programmes successful.
- Similarly, the local authorities' involvement is important to make DRR interventions successful.
- Organisation of meetings with the UPs and other line departments were found to be helpful to involve relevant stakeholders with DRR linked issues and to get the required support from them.
- In some cases the project's role was found to be more prominent than the one of the CPs for making linkages / synergies with stakeholders.

5.2 Results regarding capacity building of the communities

Hypothesis: The experience of the pilots will help defining an appropriate way to develop the capacity of the communities so that they can take over the responsibilities to take necessary measures to tackle their problems linked to natural disasters.

Results:

- Participation of community people in the planning process and implementation of the activities created a sense of ownership.
- Community's participation in a particular intervention could be maximised if the intervention reflected the priority needs of the community.
- Organising mock drills and cultural programmes were found to be very effective in disseminating important disaster related information among the community people.
- People's initiatives (e.g. establishment of bundles on the river) could bring different stakeholders on a single platform. Community's joint efforts, use of indigenous technologies and local resource mobilisation were the driving forces to make the initiative successful.
- Capacity building and awareness raising events were found to be very effective for internalising and understanding DRR. However, most of the vulnerable people of flood prone areas were found more habituated to get various hardware supports during and after floods than investing before disasters.

¹ Since the responsibilities and terms of reference for the Standing Committees (with link to DRR) are not yet defined.

5.3 Results regarding the community based DRR planning

Hypothesis: the experience of the pilots will help developing appropriate tools and methodologies, which later on can be used by the communities in planning DRR activities with a view to mainstream DRR into the next phase of LEAF.

Results:

- The community based DRR planning tool was found to be very effective to develop awareness and to plan appropriate interventions. The tool was considered being suitable to be integrated with the APO of the CP. In addition the tool was considered to have an important educational component. However, the success and benefits of the tool depended on the skills of the facilitators.
- In most cases, the community facilitators needed the support from the project's FFs. During the elaboration process of the DRR plan, when it came to link the outcomes of the different steps with each other and to put them in logical order many CFs faced difficulties.
- Aged people of the area were observed to be key informants as they could differentiate both the existing and previous situation.
- The collection of secondary information (as seasonal livelihood and disaster calendar, hazard mapping, resource mapping, social mapping etc.) for the entire union by one single team saved time and contributed to build solidarity among the CPs. However, it was also observed that the CFs made hardly use out of the information collected from secondary sources.
- Especially by communities in remote areas with a low literacy rate the DRR tool was found to be difficult.
- In several cases the tool was observed to be too time consuming.

5.4 Results regarding smart and other hardware interventions

Hypothesis: The experience of the pilots will help identifying appropriate support regarding software and hardware activities to be delivered by the project, which would be affordable by the communities in order to reduce the disaster related risks and vulnerabilities specific to three particular hazard-prone areas of the project.

Results:

- According to the perception of the communities "smart hardware" was found to be the very effective and also helpful to raise awareness and preparedness of the community. Nevertheless, the success of smart hardware as a means to strengthen software depended on the maturity of the group receiving the support.
- The involvement of the community for the smart hardware implementation created a sense of ownership and built capacities within the communities.
- Big smart hardware interventions (livestock shelter, bundles, piling etc.) served as example for other communities who visited the pilots.
- Generally almost all interventions (introduction of new varieties, early warning system, livestock shelter, *hati* protection etc.) were perceived as effective measures to reduce losses due to natural disasters.
- The costs of big interventions such as livestock shelters can't fully be paid by the communities. Nevertheless, they are highly cost-effective (high benefit-cost ratio).
- The bundles and pilings cannot protect from river erosion as a permanent solution since the constructions get washed away or damaged.
- The introduction of community seed and food banks can reduce impacts of damages due to floods or other disasters. It is an efficient self-help measure in case of absent assistance from outside.

- Since several interventions required support from other stakeholders (UDMC, UP, in line departments, landowners etc.) hardware interventions gave opportunities to build linkages and synergies.
- Several measures have multiple functions in addition to the reduction of the impact from disasters
- The introduction of new rice varieties (submerged rice) created employment opportunities for poor and extreme poor in the field during job crisis.
- Slopes of livestock shelters, embankments of *khari* and ponds, *hati* protection walls can be used for vegetable and fruit tree plantation.
- Raised *haties* and livestock shelters can be used for post harvest management of rice (drying) or storage. These activities generated common funds for maintenance or other investments.

6 Conclusion and Outlook

Since natural disasters have a broad impact for the whole livelihoods, DRR will be mainstreamed within next phase of LEAF (Samriddhi) project. Given that it is a project located in poor and vulnerable rural areas with focus on agriculture, many project activities are somehow affected by natural disasters. For the project phase of Samriddhi (August 2010 – July 2013) the following DRR related output was included:

“Capacity and awareness of communities in disaster prone areas to tackle disaster risks are improved.”

The experience gained through the pilots will be used to upscale and mainstream DRR and can be summarised through the following observations:

- IC’s community based DRR planning tool is a useful tool and methodology for the communities to address and handle DRR related issues.
- Within the community the CP is the most appropriate body to address DRR.
- For successful DRR interventions, linkages with other stakeholders (LSP, UDMC, UP, line departments and other organisations) are very important.
- The interventions, especially smart hardware, were perceived as very successful. For big interventions such as livestock shelters the implementing costs are for most of the communities too high to be fully own paid, i.e. without external contribution. Since Samriddhi focus on a sustainable empowerment of the communities, the project activities will focus on awareness raising, preparedness and capacity building, and provide the necessary support for hardware interventions that can be implemented without further budget provision from the project itself. However, the project will provide necessary support to foster for linkages in order to tap other external financial sources (other NGO/donors, CDMP, etc.)
- Also within Sharique, SDC project of Local Governance implemented by IC, DRR will be mainstreamed. Therefore, Samriddhi may look for potential synergies with Sharique by coordinating its DRR collaboration with that project.

In order to mainstream DRR, the project will build the capacities of CPs and CFs. Through the assessment of the local natural hazards and risks, the planning and implementation of the awareness raising, prevention and protection activities the communities will be empowered to protect themselves and their assets from disasters and get connected to government bodies and other relevant actors for local resource mobilisation.

7 Annexes

Annex 1: Process of the DRR planning

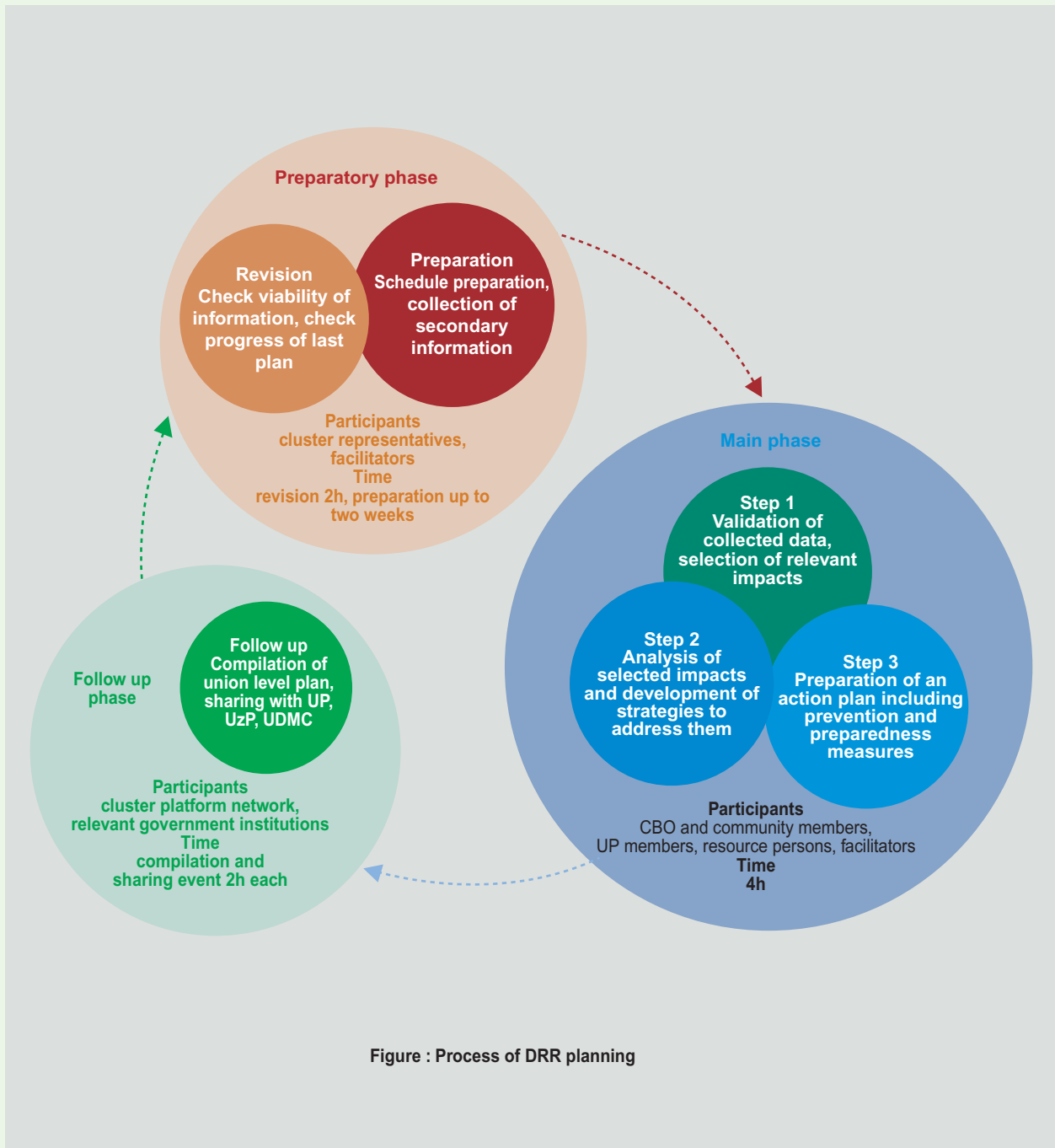


Figure : Process of DRR planning

Annex 2: Photos of smart hardware interventions



Photo 1 : Livestock shelter



Photo 2 : Pond's ex-cavation



Photo 3 : Hati protection against wave erosion



Photos 4,5 : Bandel and pilling against river erosion

About Intercooperation

Intercooperation (IC) is a leading Swiss not-for-profit organisation engaged in international development and cooperation. Intercooperation is both an implementing and an advisory organisation, providing professional resources and knowledge combined with social commitment. Intercooperation's expertise is grouped around three broad working domains:

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LEAF

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Bangladesh



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Bangladesh



Delegation of Intercooperation

House # 2F NE (D). Road # 73 (G)
Gulshan -2, Dhaka 1212
Phone : (880)-2- 881 56 88, 882 76 33, 882 92 08
(880)-1715-181-062
E-mail : intercooperation.bangladesh@intercooperation-bd.org
Web : www.intercooperation-bd.org

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House B31, Road 18, Banani,
Dhaka -1213, Bangladesh
Tel : (880)-2-881 40 99, (880)-2-881 43 96
E-mail : dhaka@sdc.net
Web : www.sdc.org.bd