

### 3.2.2 Typhoon Chedeng, May 2003

On 25 May 2003, a low pressure area located west of the Luzon Island (northeastern South China Sea) intensified into tropical storm Linfa (locally named “Chedeng”) and gained strength as it moved eastward across northern Luzon, exiting at the northern border of the Philippine Area of Responsibility on 29 May 2003 (Figure 12). Although Chedeng developed during the early southwest monsoon season, it enhanced the southwest flow, dumping significant amounts of rainfall along the western parts of the country that triggered flashfloods in some areas in Iloilo province. Satellite imagery taken on 27 May 2003 revealed the large band of clouds associated with the disturbance and with the southwest flow that covered Panay Island (Figure 13).

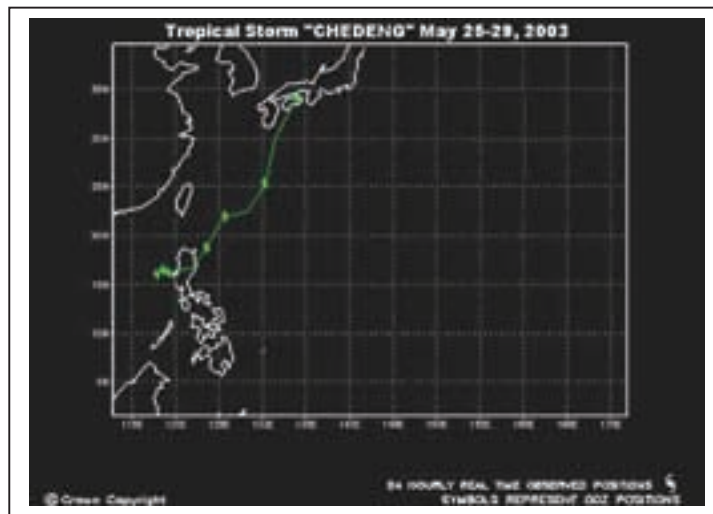


Figure 12. Track of Typhoon Chedeng, May 2003

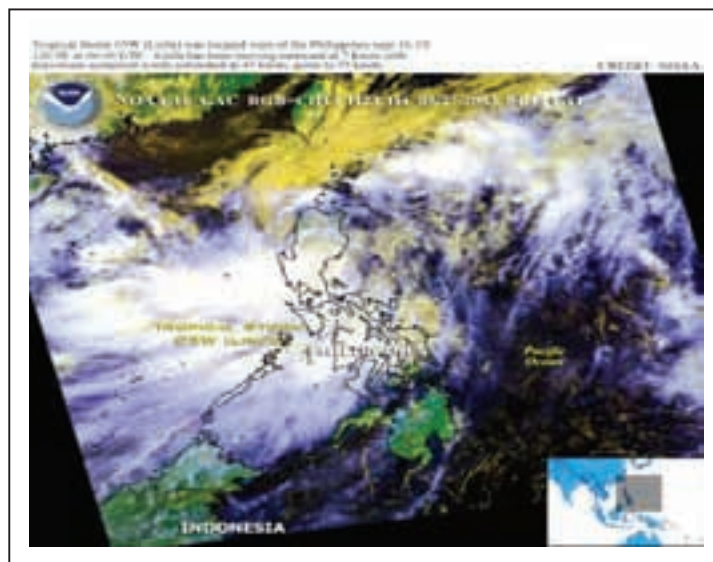


Figure 13. Cloud band associated with Typhoon Chedeng and the enhanced southwest flow.

Comparison of the average and daily rainfall values from 25–30 May 2003 with the long-term average rainfall values for Dumangas indicate that the six-day rainfall episode was

anomalous and responsible for the flashflood that occurred in some areas in Iloilo, especially Dumangas, on 28 May 2003 (Figure 14). Comparison of rainfall in Dumangas and Iloilo City during this period further points to the localized rainfall anomaly as shown in Figure 15. Twenty-five *barangays* in the municipality were submerged in floodwaters, affecting 377 families (2 244 people) and damaging crops and infrastructure.

There was no indication of an impending flood since the dry season had just ended water and water levels at the Jalaur River and the irrigation canals were relatively low. Farmers had sealed their plots to catch the early rains. This proved detrimental however, when continuous rains, which started on 24 May and peaked on 28 May, inundated the farms.

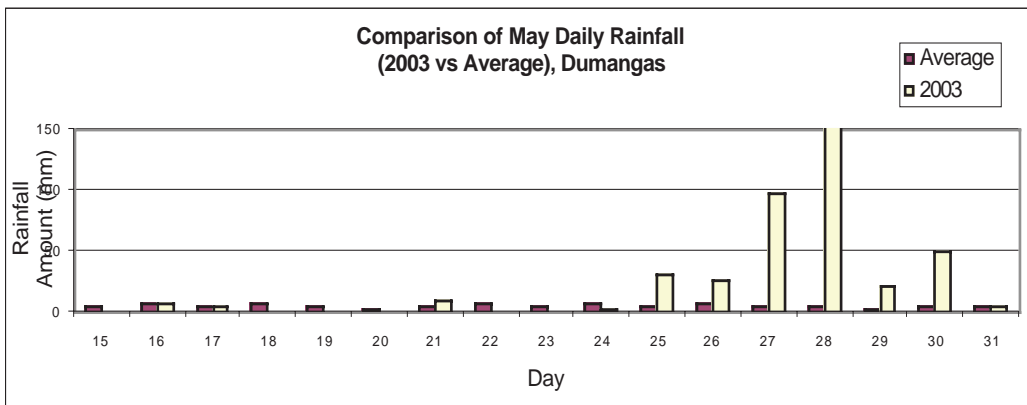


Figure 14. Daily vs. long-term average rainfall for May, Dumangas, Iloilo

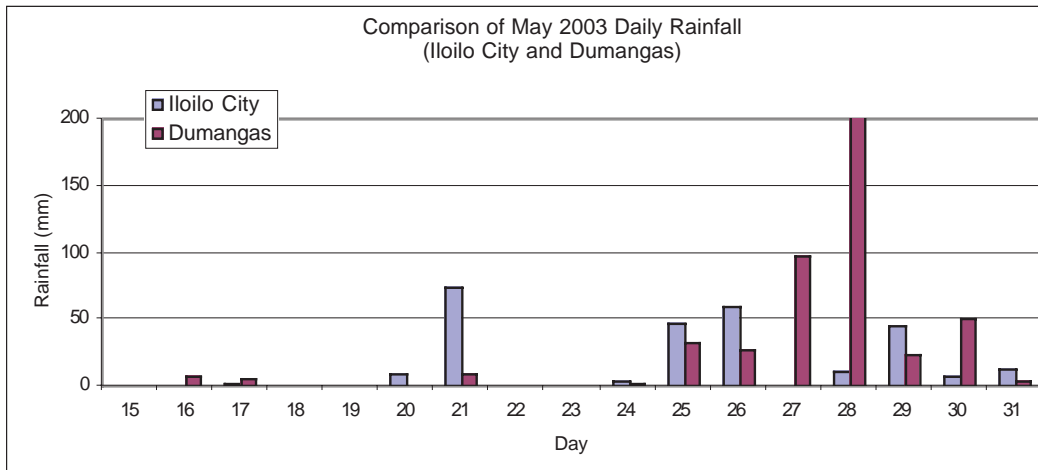


Figure 15. Daily rainfall in Iloilo City and Dumangas, May 2003

### 3.2.3 Institutional responses

Below is the account of the municipal government's and the community's activities in response to the flood disaster (Table 14).

Table 14. Community and municipal government account of the May 2003 flood

Date	Community activities: <i>barangay</i> Barasan	Government activities
<b>Pre-disaster phase</b>		
27 May 2003	Three days of rain but no indication of any flooding. Farmlands were not planted yet. Fish in fish farms were ready for harvest.	Water in both the Jalaur River and the irrigation canals relatively low. No indication of impending flood.
<b>Disaster Phase</b>		
28 May 2003, 00:30		Reports that water levels in the municipality's rivers were rising fast. Called on all Punong <i>barangays</i> to check their areas for rise in flood-waters and inform their constituents of the situation. Those in most vulnerable locations urged to move immediately to evacuation centres.
01:30		Received reports that some <i>barangays</i> were already underwater. Ordered all Punong <i>barangays</i> to wake people up for transfer to evacuation centres, and salvage whatever property possible.
03:30		Initiated MDCC for action. Deployed DREAM to <i>barangays</i> to check situation and assess damage. Asked all driver-employees to report to Municipal Hall immediately for deployment of vehicles to affected <i>barangays</i> .
08:00	Farmlands were inundated – no damage as they were not planted yet. All fishponds were washed out and all stocks lost.	Municipal Council declares State of Calamity.
09:00	School building and <i>barangay</i> hall used as evacuation centres.	State of Calamity declaration officially reported to Office of Civil Defense.
09:30		Called the Economic Council for the acquisition of goods on loan
12:00		Distributed goods and provided potable water to affected areas.
<b>Post disaster phase</b>		
29-31 May 2003	Evacuees (about 140 people) stayed at the evacuation centres for three days until floodwaters subsided.  <i>Barangay</i> calamity fund used to buy rice and canned goods. No external assistance was received.  Services received from medical mission sent by the municipal government.  The <i>barangay</i> was without electricity for 5 days.	Finalization of damage assessment. Request various national agencies for financial assistance to address pressing needs of victims. Ordered medical missions to affected <i>barangays</i> . Ordered immediate repair and rehabilitation of municipal and <i>barangay</i> roads.

In Balud, all farmlands were inundated but the rice crop was not yet flowering. No external assistance was received for crop damage so the farmers had to replant from their own resources. The three worst effected households were evacuated to the school building. No other damage was reported. A rubber boat was dispatched to the *barangay*. The respondents noted the improved communication system led to the municipal government's fast delivery of assistance and services. Table 15 indicates that evacuees in Balud were able to provide for themselves.

Table 15. Flood victims served by the Social Welfare Department

<i>Barangay</i>	No. affected		Served inside evacuation centres		Served outside evacuation centres		Total served	
	families	people	families	people	families	people	families	people
Balud	21	142	-	-	-	-	-	-
Maquina (not affected)	-	-	-	-	-	-	-	-
Barasan	25	150	4	24	-	-	4	24
Municipal Total	1 428	8,170	109	797	209	1,257	318	1 746

Early warning for floods is based on the monitoring of water levels at the Jalaur River and the irrigation canals, both in Dumangas and upstream. However, the May 2003 experience demonstrated the need for monitoring conditions at the farmlands as well.

### 3.2.4 Household responses

Awareness in the two flood-prone *barangays* (Balud and Maquina) is high and community members monitor river conditions. Most initiate preparatory actions based on the river conditions they observe, even when an official warning has not been issued by the BDCC. They move animals, family members, agricultural implements, and personal and household belongings to higher grounds and give children and the elderly priority during evacuation. There are some community members, however, who move only when they see the floodwaters coming.

The primary concern of fishpond operators when threatened with strong pressure from rising waters is hiring workers to reinforce the dikes. This is done despite the higher wages demanded by workers. In fishing communities, however, when there is evidence of a typhoon or a typhoon warning, the primary concern is collecting nets and fish traps, reinforcing of unstable houses, moving *bancas* to higher areas of the coastline, and setting up nets at the shoreline to catch fish that overflow from fishponds during flooding.

The BDCC, with its clearly delineated roles, organizes the local management of disasters, from hazard monitoring and warning dissemination to evacuation, relief and rehabilitation.

### 3.2.5 Household adaptive capacity

Communities that must deal with recurring floods, such as Balud and Maquina, have built their adaptive capacities by raising their houses on stilts, building temporary second levels of plywood close to the ceiling, and building new houses with second floors. In Balud, about 20 percent of dwellings have a second floor. Huts in farms of higher elevation are

built to provide refuge in times of flood and sheds for chickens and ducks are raised. Some farmers in Maquina have adapted by acquiring farmland plots in elevated areas to ensure that will have something to harvest, even when there are floods. One farmer interviewed said that he has a 8 000 m<sup>2</sup> farm in the low area and a 2 000 m<sup>2</sup> plot in the higher area.

## ROLE OF LOCAL INSTITUTIONS IN MANAGING RECENT DISASTERS– AN ASSESSMENT

This assessment of local institutional response to recent disasters has been undertaken with reference to each major phase of the disaster management cycle. While detailed analysis is given in the succeeding paragraphs, the highlights of assessments are shown in the figure. It may be observed that the thick line reflects the strong capacity exhibited by local government organizations in undertaking pre-disaster preparedness and response measures. However, due to various constraints, the management of the disaster recovery phase reveals some gaps. Strategies that integrate prevention and mitigation into development planning are at the nascent stage.

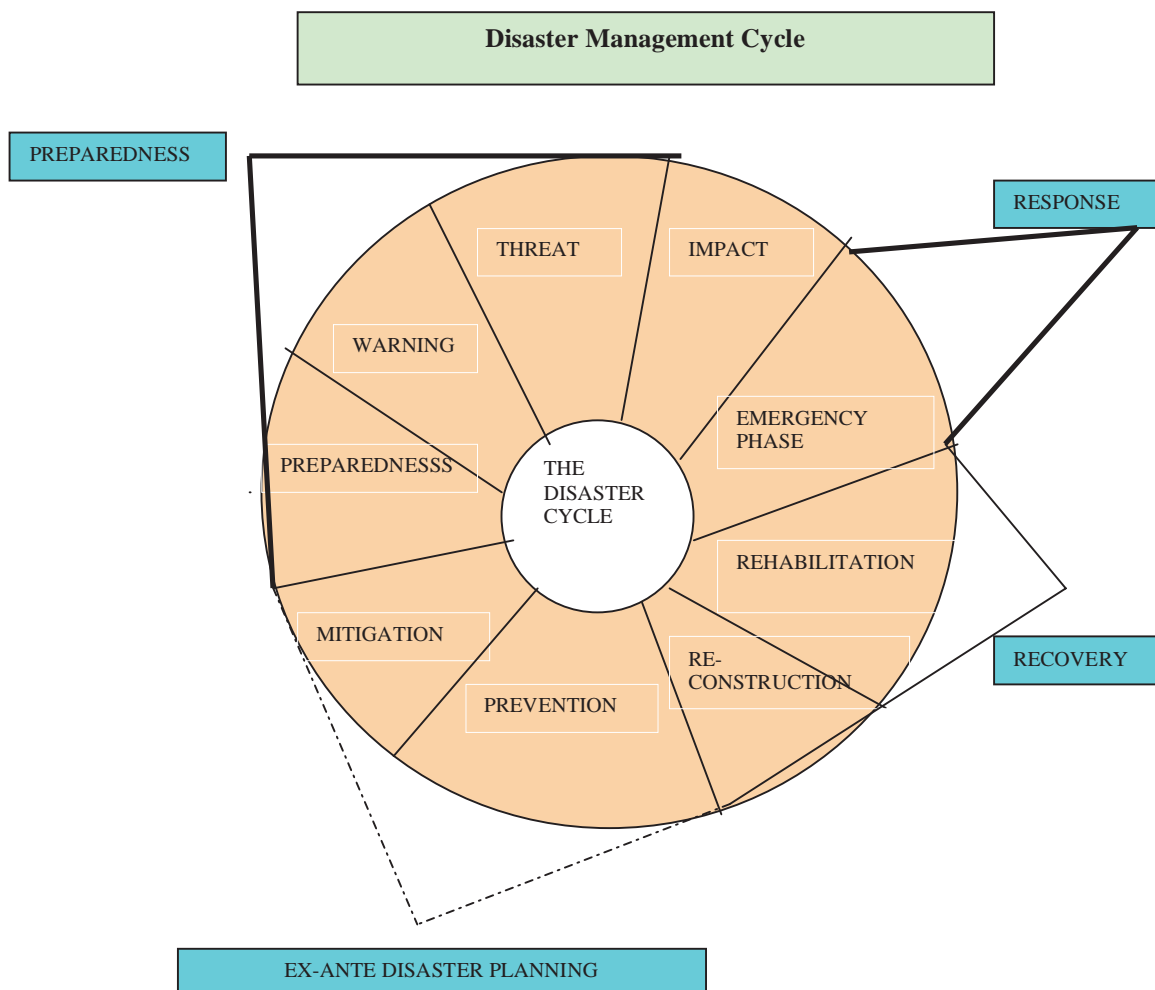
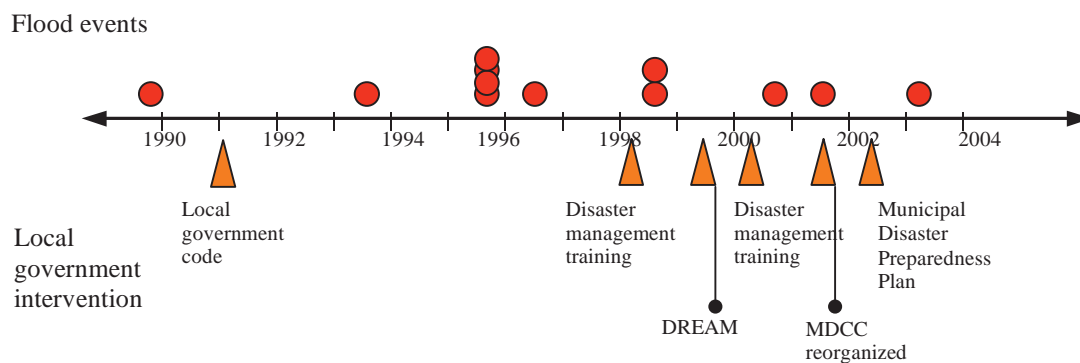


Figure 16: Disaster management cycle

The next section looks at the evolution of institutional responses since 1950s. Subsequently, the weaknesses discernable in recovery and mitigation phases of the disaster management cycle are discussed. This section also captures the recent initiatives of Dumangas local government to address these gaps.

#### 4.1 Evolution of institutional response

Figure 17 shows the timeline of disaster events, with the corresponding government intervention.



##### 4.1.1 Developments up to 1990s

After independence (1950) and until the mid-1960s, the communities recall severe hardships due to typhoons, flooding and other weather risks. They organized Disaster Brigades to save lives during floods. Later, from mid-1970s through the 1980s, the Disaster Brigades were transformed into Mountain Tigers. The Mountain Tigers received professional training in search and rescue operations through a provincial NGO. While this development could instill confidence and minimize the loss of lives, due to inadequate early warning and communication systems, disaster-related losses continued to seriously impair livelihood systems in terms of loss of houses, household assets, livestock and crop losses.

##### 4.1.2 Developments during early 1990s

People could vividly recall discernable improvements in the 1990s when local governments were established with decentralized powers. The organizational arrangements at the municipal and *barangay* levels were systematically reorganized based on lessons learned during the periodic natural hazard events. Every natural hazard event triggered institutional changes for managing subsequent disasters better.

Prior to November 1998, the institutional arrangements for monitoring hazard and emergency situations were weak. The local government relied on PAGASA weather updates and typhoon advisories broadcast from commercial radio stations, police reports on any flood-related incident, and motorists' information on impassable roads.

### 4.1.3 Developments since late 1990s

A response system was organized in response to the impacts of Typhoon Loling in November 1998. Training in disaster management received by MDCC staff and *Liga ng mga barangay* in March 1998 proved helpful. Arrangements were made with various agencies for early warning, disaster monitoring and response. Volunteers were trained in search and rescue in 1999 and, in 2000, BDCC staff and *barangay tanods* received training in disaster management. In July, 1999, the municipal government encouraged an NGO, called the Dumangas Rescue and Emergency Assistance Movement, to ensure quick response and monitoring and reporting of disaster situation. This movement was built upon the earlier experience of Disaster Brigades and Mountain Tigers. An NGO radio communicators group (Kabalikat Civicom Association, Inc.) was formed in January 2000, to provide hazard monitoring, emergency situation monitoring and relief assistance support to the MDCC. A Memorandum of Agreement signed with the National Food Authority allowed provision of 50 sacks of rice for relief operations. The Municipal Economic Council, a private sector business consortium, was established in 2000 to support disaster relief requirements (see box) This response system was tested in the flood that accompanied Typhoon Ulpiang in December 2000.

***Economic Council fills relief gaps***

*The Economic Council was established to eliminate delays in providing relief assistance in terms of food and other essential items to flood victims. The government code allows commitment of resources from the calamity relief fund only after the formal declaration of disaster in a given area. The disaster impact assessment is a prerequisite for declaring a disaster area. This procedure would normally take at least a week. The Council's private sector members are authorized to release, on credit, food and other essential items to flood victims immediately. The municipal government can then authorize reimbursement after completing formalities relating to formal disaster declarations. This arrangement has ensured quick and decentralized delivery of essential commodities to flood victims. It transparent and has proven to be cost effective as no large-scale emergency foodstuff transport was called for.*

These activities resulted in improved lead-time of more than 48 hours of impending events and enhanced the community and household level preparedness to withstand the impact of natural hazards.

The establishment of specialized task forces linked to municipal-level local government and NGO and private sector systems with well orchestrated coordination

arrangements has resulted in efficient delivery of disaster management services. For example, relief assistance reached the communities at the evacuation centres within three to six hours. The households were able to preserve not only their lives but also household and livestock assets. An interview conducted with the community members revealed that preserving livestock assets could greatly help faster recovery. The municipal officials mentioned that expenditure on relief has come down significantly to the households in recent years.

The MDCC was reorganized in October 2001 to orient the disaster management approach in a systems mode. Key agencies with resources and functions relevant to the MDCC functions were involved to lead the different MDCC units. For instance, PNP works with the Assistant Chairman, the Disaster Operations Centre and the Intelligence and Disaster Analysis Unit; *Sangguniang Bayan* works with the Resources Unit as their resolution is needed for mobilization of the local calamity fund; DECS works with evacuation since school buildings are used as evacuation centres, etc. The number of task units was reduced

from ten to five, merging units whose functions were inherent in the lead agencies, such as merging relief and rehabilitation with MSWDO, and to improve coordination, such as among transportation, rescue and evacuation. The decrease in the number of households affected in the flood of November 2001, compared to that in the previous event (Table 9), attests to the improved response system and enhanced coordination among agencies.

Table 16 summarizes the improvements made in managing emergencies from the point of view of the municipal government.

Table 16. Improvements in disaster management, Municipality of Dumangas

Before 1998	Present (2003)
<b>A. Community</b>	
People lost their poultry and livestock because of lack of preparation	People have effective ways of securing their poultry and livestock in times of floods
People were hesitant to go to evacuation centres	People readily go to evacuation centres upon the advise of the municipal or <i>barangay</i> officials
Communication was difficult due to the lack or insufficiency of communication media	VHF handheld radios, cellular phones, and presence of organized information dissemination teams both at the <i>barangay</i> and municipal level facilitate speedy communication processes required in times of disasters
Transportation problems due to lack or insufficiency of vehicles	Municipality now owns 3 ambulances, 4 patrol jeeps, 3 dump trucks, 2 utility vehicles, 1 Liga ng mga <i>barangay</i> vehicle, 1 patrol boat and 1 rescue boat. 10-wheeler trucks are readily volunteered by private individuals when needs arise.
<b>B. Municipal government</b>	
Disaster response was not very systematic	The MDCC has a structured organization and an established system for pre-disaster, disaster and post-disaster operations
Insufficiency of communication equipment	All the Punong <i>barangays</i> have handheld radios; the local Philippine National Police, Bureau of Fire Protection and Area Coordination Centre all have handheld radios and official cellular phones; and several volunteer communication groups are actively involved.
Municipal government focused activities on disaster response and not on disaster preparedness/mitigation	The MDCC of Dumangas is composed of various units that have specific functions prior to, during and after disasters. The agromet station is an essential factor in disaster preparation/mitigation. In addition, the municipal government has invested in improving its communication and promoted the concept of disaster preparedness/mitigation through the dissemination and use of climate information and other relevant data.
No established system of relief and rescue operations	The Dumangas MDCC has specific teams handling relief and rescue operations. Rescue operations are handled by DREAM which is composed of highly-skilled members, most of whom are employees of the municipality and officials of the <i>barangays</i> .
Poor linkage with support agencies such as the PNRC, NFA, OCD, etc.	The municipal government has very strong links with various support agencies that extend ready support to the municipality in its pre-disaster, disaster and post-disaster endeavours.



The flood event in May 2003 showed that the system was not able to anticipate an anomalous event. Normally, floods come in October and November, so this flood in May, at the end of the dry season was unexpected. Hazard monitoring had been confined to the observation of water levels at the Jalaur River and in the irrigation canals, which at that time were relatively low. Thus, because hazard monitoring and early warning failed, residents were caught unaware of the flood that came at midnight. This, however, provided an opportunity for systems adjustment. Hazard monitoring now includes rainfall monitoring and the observation of farmland conditions.

## **4.2 Recover, mitigation and prevention – gaps**

### **4.2.1 Recovery from disaster**

Local institutions with favourable national policies and support can establish efficient disaster preparedness and response systems through trial and error over a period of time. However, discussions with affected households reveal that dislocation of agricultural activities and delay in restoring damaged infrastructure continue to be a major concern and affect the recovery of households from disaster impacts. Moreover, the most vulnerable households continue to face risks due to inadequate support to meet their recovery needs.

#### ***4.2.1.1 Rehabilitation of agriculture***

Paddy crop is exposed to risks from weather hazards in varying degrees in all the seasons. The first wet season crop sown in May/June and harvested in August/September is affected by heavy rains at the time of harvest. The floods in November seriously affect the winter crop (planted in October/November and harvested in February/March) at active-tillering stage and sometimes force the farmers to replant. In addition to investment loss, replanting activity forces shifting of crop schedule and exposes the crops to April droughts. Seed assistance is given to land owners and not to tenant farmers. Hence, the investment made by the tenant farmers in terms of labour is not compensated. On an average, farmers get about a third of income from paddy crop after adjusting the remaining income towards payment of loans availed for investment. Losing a portion of net income due to natural hazards increases household vulnerability.

#### ***4.2.1.2 Rehabilitation of most vulnerable households***

While enhanced disaster preparedness and response enables farmers to move livestock such as pigs and cattle to safer places, the assets typically owned by agricultural labourers such as poultry are exposed to water-related diseases. As most vulnerable households depend on income from these sources, any loss of poultry or duck increases vulnerability and delays recovery.

Discussions with most vulnerable households who are very poor and eke out a marginal existence revealed that they suffer disproportionately. The relief assistance for shortages shortage is distributed equally to all affected households. The better off households who receive relief assistance however, will share part of the assistance they receive with the vulnerable households.

There was a consciousness among all respondents that help should be extended in times of disasters and, thus, help is always available for community members in times of disasters. It can be in the form of offering one's house for shelter to those affected by floods, sharing food or cooking areas, helping community members move to designated evacuation areas and rebuild destroyed houses, facilitating access to medical and relief services, and even sharing financial resources. When asked why they were compelled to help, they responded that it was part of their way of life as Filipinos. Simply put, they cannot sleep or eat well with the knowledge that there are members of their community who suffer physical dislocation and are threatened by hunger and cold.

While formal political institutions do not address differential vulnerability of communities, the informal social networks act as conduits to redistribute relief assistance to most vulnerable households. While community help could partially address most vulnerable households during crisis periods, it seldom addresses their recovery needs.

#### **4.2.3 Reconstruction**

The swift reconstruction of basic infrastructure such as bridges, roads, irrigation systems, schools and health clinics following disasters has immediate benefits. The reconstruction of these infrastructure facilities are under the control of sectoral institutions of national government agencies, not of local institutions.

In an interview, the Municipal Mayor who chairs the MDCC identified one of the major constraints as the long process for receiving external assistance from the provincial and national governments. He explained that currently, damage assessment is handled by external evaluators from concerned provincial/national agencies. For example, damage to infrastructure is evaluated by the DPWH, damage to agriculture by the Department of Agriculture, and damage to fisheries by the Bureau of Fisheries and Aquatic Resources.

The Municipal Mayor felt that damage assessment should be done at municipal level and then validated by the Regional Disaster Coordinating Council to expedite the process. He also recommended a definite time frame for processing requests, as delays have an impact on the local economy.

The discussions with community members revealed that any delay in reconstruction affects the recovery process. They suggested that the community could contribute labour and local materials for restoration of damaged infrastructure, and the local and national government departments could provide necessary resources to undertake reconstruction. Immediate undertaking of these activities would provide immediate employment to the population as well as reestablish much needed communication facilities to speed up the recovery process.

#### **4.2.4 Prevention and mitigation**

Interviews with household members indicated they were aware that the recent increase of fishponds to more than 4 000 ha and other inappropriate uses of waterways have contributed to increased incidences of flooding and also increase the impact of floods when they occur. While a few households with fishponds benefit from increased income, most, particularly the most vulnerable households, are exposed to greater risks. Hence, any disaster prevention measure should address risks arising out of these developments.