



CASE STUDY

**THE ROLE OF LOCAL INSTITUTIONS IN REDUCING
VULNERABILITY TO RECURRENT NATURAL DISASTERS
AND IN SUSTAINABLE LIVELIHOODS DEVELOPMENT**

CASE STUDY: Vietnam

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INTRODUCTION

Background

This case study on the role of local level institutions in reducing vulnerability to recurrent natural disasters and in sustainable livelihoods development in high risk areas is written for the Food and Agriculture Organization (FAO) to contribute to the understanding of the role of local institutions and organizations in the design and implementation of disaster risk management strategies, as well as the role of local authorities in building community social capital for disaster prevention and preparedness. This understanding will provide insight and guidance on how disaster risk management may be integrated into development strategies.

Vietnam, owing to its geographic location, is most prone to typhoons, floods, storms and salinity intrusion. Quang Tri and Thua Thien Hue were selected, as the central provinces are the focus of disaster mitigation efforts by government, donors and NGOs in response to the great flood of 1999. The study sites (Gio Linh and Hai Lang Districts, Quang Tri and Aluoi District, Thua Thien Hue) were selected based on the following criteria:

- The districts represent different agro-ecological environment and production systems that are affected by flood and drought in different ways (Gio Linh and Hai Lang – lowland; Aluoi – highland)
- The districts have different socio-economic structures and capacities
- The researchers have established relations with the local authorities, which is critical to access to information

This study is based on the premise that successful disaster risk mitigation and management, as well as rural development, requires that central government line ministries and departments get better linked with local actors, including traditional authorities and civil society, and that actions and resources are better coordinated and decentralized according to the comparative advantages of local actors. These advantages include local perspectives into policy making and rural development planning, two-way communication with higher policy levels, implementation of rural development activities at local level, mobilizing local participation, and handling emergencies at the local level with conscious links to reconstruction, prevention and preparedness phases of disaster risk management.

Conceptual Framework and Key Definition

Definition of terms and the conceptual framework adopted are:

Natural hazard: the probability of occurrence of potentially damaging natural phenomenon in a given area.

Vulnerability: the propensity of a society to experience damage, disruption and casualties as a result of a hazard.

Disaster risk: a function of the probability of a specific natural hazard event and vulnerability of societal systems.

Capacity: policies and institutional systems at the national, provincial, local and household levels to reduce hazard damaging potentials and reduce vulnerability.

Natural hazards such as earthquakes, hurricanes, floods and droughts spring to mind when the word *disaster* is mentioned. Yet these events are in fact natural *agents* that transform a vulnerable human condition into a disaster. Disaster risk is a product of the frequency and intensity of hazards and the vulnerability of livelihood systems. The role of societal systems in terms of community resilience and management systems could alter the hazard characteristics and reduce vulnerability through systematic interventions. Hence, the capacity of societal systems could act as a denominator in the disaster risk equation to determine the levels of risks. This is illustrated in the diagram below:

$$\text{Disaster Risk} = \frac{\text{Natural Hazard} \times \text{Vulnerability}}{\text{Capacity of Societal System}}$$

Methodology

In accordance with the Terms of Reference for the case study, the following methodology was followed:

1. Information gathering on the types of organizations and committees existing at the local level, their resources and the risk prevention activities they undertake. Minutes of meetings, government records and reports, including financial records and records of transaction with the central government were accessed.
2. Focus group discussions with disaster victims on their experiences, their perceptions and definition of risk, the resources at their disposal, including social capital and capacity to manage risks. Visits to specific households in the study sites were undertaken to observe their physical vulnerability, as well as interview and interact with family members.
3. Interviews with the local government unit at the provincial, district and commune levels, leaders of mass organizations, other stakeholders, highly vulnerable groups in the selected sites, and government officials at the national level.

This study draws heavily from the following previous studies:

1. Living with the Floods: Coping and Adaptation Strategies of Households and Local Institutions in Central Vietnam (Beckman et al, 2002)
2. Environment, Livelihoods and Local Institutions (Dubar et al, 2002)
3. Social Assessment of the MARD/WB Natural Disaster Mitigation Project (Paireaudeau et al, 2003)

The local institutional response, particularly, in respect of recovery in the context of 1999 floods in Central Vietnam is drawn from the field study mentioned in reference number 1.

Analysis of the information gathered was undertaken within the following framework:

1. Assessment of the existing framework within the selected communities, and the nature, constraints, incentives and capacities within the existing institutions.
2. Review of :
 - The process of social capital consolidation and institutional capacity building before the impact of a hazard (during prevention and preparedness)
 - The role of social capital and institutions in managing the emergency after the impact of the hazard (response and reconstruction), and how that role can be strengthened during the prevention and preparedness phases
 - The comparative advantages of decentralized, local level, trans-sectoral and multi-disciplinary institutions vis-à-vis central, sector-specific mono-disciplinary institutions in dealing with both pre- and post-impact of the hazard.
3. Identification of participatory approaches, concrete actions and possible institutional innovations that have strengthened or will strengthen local level capacities for disaster risk management and long-term development in high risk areas.

Structure of the Report

The report is structured into four sections:

Section 1 provides an overview of local institutions, hazards, vulnerability and disaster management, and risk dimensions.

Section 2 describes the role of local institutions in managing the 1999 floods.

Section 3 assesses the role of local institutions in managing disasters.

Section 4 gives the conclusions and recommendations.

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ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
ADPC	Asian Disaster Preparedness Center
CBDM	Community Based Disaster Management
CCFSC	Central Committee for Flood and Storm Control
CECI	Canadian Centre for International Studies
CFSC	Committee for Flood and Storm Control
CPV	Communist Party of Vietnam
DARD	Department of Agriculture and Rural Development
DDMFC	Department of Dyke Management and Flood Control
DMU	Disaster Management Unit
DPC	District People's Committee
HCYU	Ho Chi Minh Communist Youth Union
HMS	Hydro-Meteorological Service
HYP0	Ho Chi Minh Young Pioneers Organisation
IDNDR	International Decade for Natural Disaster Reduction
IFRC	International Federation of Red Cross and Red Crescent Societies
MARD	Ministry of Agriculture and Rural Development
MOLISA	Ministry of Labour, War Invalids and Social Affairs
NCYE	National Council of Young Entrepreneurs
NGO	Non-Government Organization
PC	People's Committee
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
VAS	Vietnam Association of Students
VBARD	Vietnam Bank for Agriculture and Rural Development
VNRC	Vietnam Red Cross
VFF	Vietnam Fatherland Front
VYF	Vietnam Youth Federation
WB	World Bank

THE ROLE OF LOCAL INSTITUTIONS IN REDUCING VULNERABILITY TO NATURAL DISASTERS, AND LONG-TERM SUSTAINABLE LIVELIHOOD DEVELOPMENT IN HIGH RISK AREAS: VIETNAM CASE STUDY

1. OVERVIEW

1.1 Study Area and Location Specific Hazard Profiles

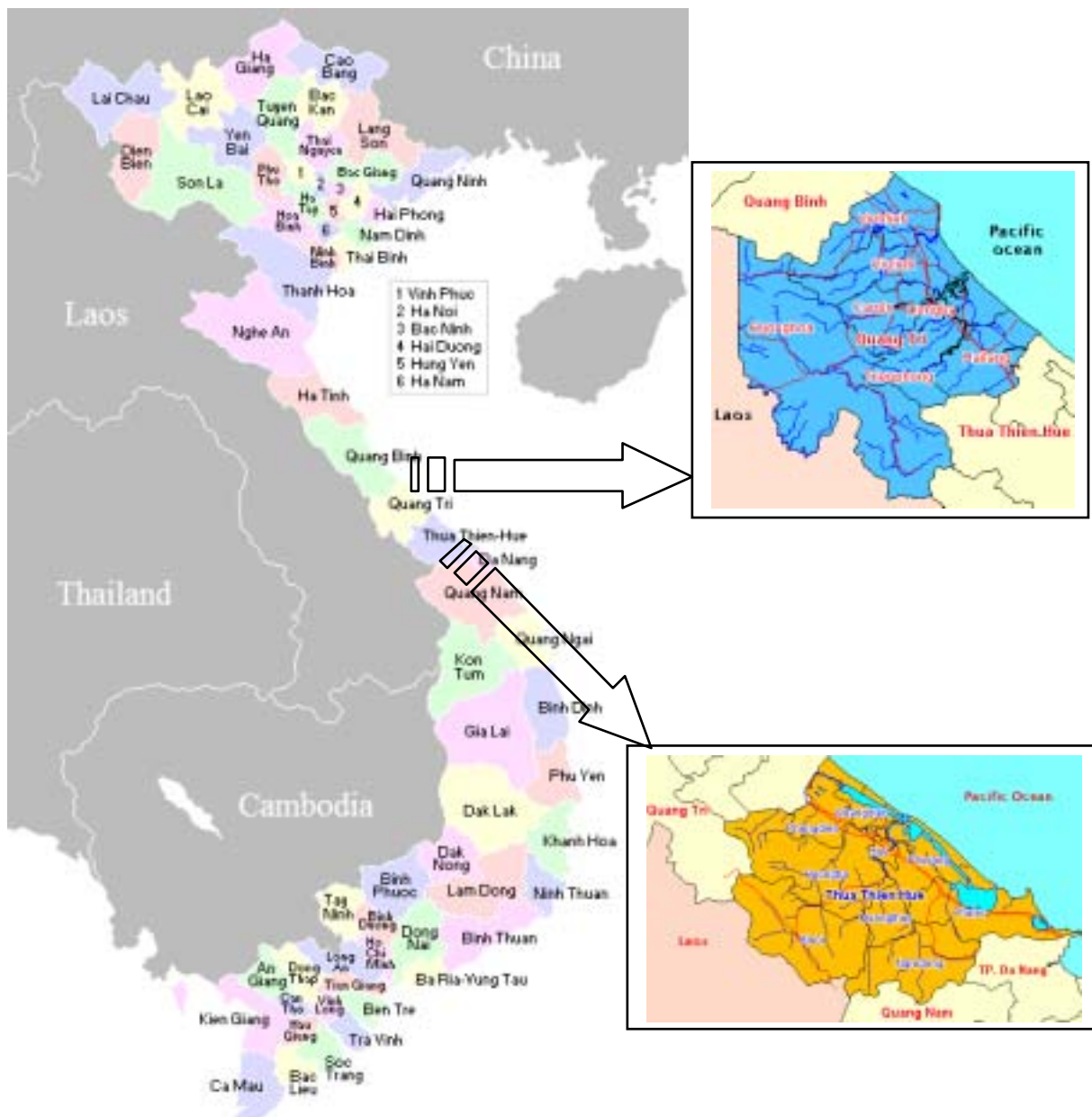


Figure 1. Location of study sites

1.1.1 Quang Tri Province

Quang Tri, located in the central part of Vietnam, is bound by Quang Binh Province in the north, the province of Thua Thien Hue in the south, Lao PDR in the west, and China Sea in the east (Figure 1). It has 9 administrative districts, two of which are the townships of Dong Ha and Quang Tri. Though its land area is not very large, Quang Tri's terrain is relatively diverse, sloping from the west to the east, creating four natural geographical regions: mountainous, midland, plain and coastal. Its mountains, with elevation from about 200 to 2000 m above sea level, form part of the Truong Son range. Of its total land area of 470,000 hectares, about 57,000 hectares are devoted to agriculture. Coastline is 71 km long.

Its three major rivers have a total length of 1,095 km, with a total basin area of about 3,640 sq km. These rivers are relatively short, but highly sloped from west to east, which, combined with its high flow rate, would be ideal for building reservoirs and hydroelectric plants. The hydroelectric power potential of Ben Hai River is estimated at 834 million kWh, the My Chanh River, 376 million kWh, and the Thach Han River, 1,800 million kWh. The provincial profile is presented in Table 1.

About 65% of Quang Tri's more than 60,000 population are engaged in agriculture. Crop production predominantly depends on the climate, and, being most vulnerable to climate variability and the El Nino Southern Oscillation, is very much unstable.

Table 1. Provincial profile, Quang Tri

Province	Quang Tri
Capital	Dong Ha
Population (2001)	588,600 people
Total land area	470,000 hectares
Hills and mountains	81%; elevation: 200-2,000 m above sea level
Flatland	11.5%; elevation: 3 m below sea level to 50 m above sea level
Coastal	7.5%; elevation: 0-3 m above sea level
Land use	
Agriculture	57,000 ha
Forestry	72,000 ha
Graze land	4,000 ha
Unused	270,000 ha
Major rivers	
Ben Hai	963 sq km
My Chanh	847 sq km
Thach Han	2,800 sq km
Climate	Dry season (Mar-Aug), rainy (Sep-Jan)
Average temperature	25°C (hottest recorded was 40°C)
Average annual rain fall	2,000 – 2,700 mm
Cropping season	Winter-spring crop: Dec-Apr Summer-autumn crop: May-Sep

Source: Central Committee on Flood and Storm Control – Quang Tri Province

Climate

Quang Tri's climate is relatively harsh, mainly influenced by the hot dry southwest wind, storms and heavy rainfall. The province lies in the tropical monsoon zone influenced by the convergent climate of the subtropical North and the tropical South. There are two distinct seasons: the rainy season, with storms and tropical cyclones characterized by heavy rainfall and strong winds, from September to January; and the dry season, with little rain, from March to August. Hot dry wind blows from the southwest for about 40 to 60 days a year.

Annual average rainfall is about 2,000-2,700 mm; annual average temperature is 25°C. Average monthly humidity is from 85% to 90%.

Hazards

The provincial Department of Dyke Management and Flood Control (DDMFC) ranks hazards in Quang Tri according to decreasing severity of impact as follows:

- 1) Drought
- 2) Saltwater intrusion
- 3) Inundation
- 4) Flooding
- 5) Typhoon
- 6) Tornado

Drought. The plains are most vulnerable. During the dry season, flows of small streams are not adequate to supply reservoirs for domestic use, requiring transportation of water from other provinces. The El Nino-induced drought in 1998 was the most severe, when small streams dried and large river systems experienced the lowest flow at 1.5 m/s. Reservoirs dried, and caused a water crisis. Dong Ha's 60,000 people and about 20,000 from other areas were without drinking water. The 2003 drought is similar but with less severe impacts to the 1998 drought due to the intervention by mass organizations and the government.

Saltwater intrusion. Seawater flow 20-30 km inland through the rivers, affecting river quality and ecology. The problem is most pronounced during drought conditions, when river flow is not enough to flush saline water to the sea.

Inundation. Sand dunes that form near the mouths of rivers impede drainage to the sea, causing inundation in the plains. Average depth of inundation is 2-3 m, with the lowest areas at about 4m. Hai Hoa commune in Hai Lang District is most vulnerable. The canal system that runs along the sand dykes helps in draining water to the sea.

Flooding. Floods are typically brought by storms and tropical depressions that bring rain from the South China Sea. Steep rivers cause floodwaters to arrive quickly in the plains. The flood season begins in September and lasts till November. Hai Lang District, with an elevation of 1 – 0.5 m below sea level, is flood-prone. Residents often evacuate to higher grounds. The 1999 flood is the most severe, causing 56 deaths. Of the 4,000 mm rainfall for the year, 3,000 mm fell in just 9 days.

The river dyke system protects the plains from the floods that come in the beginning of the rainy season, and enables farmers to harvest their dry season crop.

Typhoon. Typhoons bring heavy rain accompanied by strong winds and high waves along the coast. The worst typhoon event was in 1985. Gio Linh was one of the districts that suffered heavy damage when about 70% of dwellings were destroyed. Many international organizations provided assistance during the recovery period.

Tornado. Tornados affect the mountainous areas, usually at the beginning of the rainy season.

Others. Sand deposition caused by strong winds is a grave concern, as it renders agricultural lands infertile. Sand dykes provide relief, and prevents seawater from moving inland. River bank erosion is also a problem, forcing residents to move to other locations.

Gio My Commune, Gio Linh District

Gio Linh District has 20 communes, of which 3 are coastal and prone to cyclones and saltwater intrusion, 6 are lowland and prone to inundation and drought, and 11 are upland and prone to drought. District officials reported that every year, an average of 2-3 cyclones hit the district, and 4-5 flood events occur.

Gio My commune is located in a lowland area between the mouths of 2 rivers. Sand dunes, 21-38 m above sea level, line its coast to the east. Of its 3,000 ha land area, 1,300 ha are used for agriculture. A communal reservoir irrigates 300 ha of farmlands; the remaining 1,000 ha are rainfed. Farm productivity is 2.2 tons rice/ha. Groundwater can be accessed during the dry season if rainfall during the preceding wet season is sufficient to replenish the aquifer.

There are about 1,200 households, with an average size of 4 people per household. Average landholding per household is 600 sq m. Majority of the population are engaged in subsistence farming. Rice is the main farm crop; other crops include cassava, sweet potato, chili, watermelon, and soy and mung beans. Most households raise pigs and chickens. Most young people, more than 80% of which are women, migrate to the cities to work in factories. Others are engaged in small businesses that cater to the community. More than 20% of the population is below poverty.

Because of its location, Gio My is prone to inundation during the wet season, affecting households about 2-4 times a year. The first rice crop (winter-spring crop) is planted in December to avoid early floods, at the same time to take advantage of rains towards the end of the wet season. This crop is also prone to pest/ plant disease. Farmers said that in the last 10 years, they lost their first crop 4 times. During the dry season, most of its farmlands that rely solely on rains are prone to drought. Hence the second crop, planted in May and harvested in September (summer-autumn crop), is highly vulnerable to water shortage. Commune officials remember the impact of the 1998 drought when farmers lost 1,000 ha of the summer-autumn rice. This year (2003), of the 400 ha planted, 180 ha were lost to and 100 ha were affected by drought.

Forests, which protected the lowland against sand carried by the wind from the sand dunes, were destroyed during the Vietnam War. Commune officials said that about 6 ha of land are covered by sand after each storm, rendering vulnerable farmlands infertile. They recognize the need to reforest as a prevention measure.

Saltwater intrusion is also a problem, but minimized by a gate installed in one of the rivers.

Hai Hoa Commune, Hai Lang District

Hai Hoa Commune, bound by 3 sub-rivers of the Hai Lao River, is located in the lowest area (elevation of 50 cm below sea level) of Hai Lang District. The commune has 5 villages, 3 of which are centrally located, and the other 2 are kilometers away from the center, which, according to commune officials, makes administration difficult. Population is 6,300 from 1,004 households.

Of its 912 ha land area, 686 ha is agricultural land, 655 ha of which is paddy. Productivity is 5 tons rice/ha. Most households each has an average of 50 heads of ducks/ chickens and 4 heads of pigs. Most have backyard gardens planted with chili, nuts, etc. Non-farm activities include wage labour (about 350 construction labourers migrate to Hue) and fertilizer production (60 households are involved in small-scale compost making). The commune has a public market built 2 years ago. Most households store paddy for their annual consumption. Poverty level is at 15.8%, an improvement from the 2001 figure of 22%.

Because of its location, Hai Hoa is prone to inundation during the rainy season. Farmers rent motors to pump water out of the plots to support rice crop during the rainy season. This contributes to high production costs, which, in addition to processing and transportation costs, has reduced farmers' net income to 35% of his 3,600,000 VND (USD 240) gross income per capita per year. The commune has an ongoing program to reduce production cost by shifting paddy cultivation from 2 to 1 cropping and using the freed plots for fish and lotus plants during the wet season when areas are water logged.

During an intense rainfall upstream, the commune is prone to floods brought by the rushing waters of the steep Hai Lao River. The floodwaters arrive quickly, but drains poorly due to the elevation of the area. Residents, however, have developed a sense of when the floodwaters will come, based on observation of rainfall and river depth.

Saltwater intrusion is a problem during the dry season, when river flow is not enough to flush the saltwater.



Photo 1. Taken during the visit to Hai Hoa in 25 September 2003. Residents said that it had been raining for 3 days, and if the rains continue, they expect an overflow by nighttime.

1.1.2 Impact of Natural Disasters in the Lowlands of Central Vietnam

For farmers in the lowlands of Central Vietnam, flood and inundation have the most impact. The second rice crop is vulnerable. Farmers attribute poor yields or crop losses either to floods arriving too early and damaging crops or to inadequate flood control structures. Like in the midlands, their success rate is poor in harvesting the second rice crop. Respondents said that flooding has become almost an annual event.

Damage from more serious floods depends upon the nature of the flooding. Floods with strong currents are characteristic of many areas in both the north central and central coastal regions. These are aggravated by dyke breach, high winds and sea surges, and are a danger to human life and property, as well as to irrigation and public infrastructure. Livestock (particularly smaller livestock such as pigs and chickens) may be drowned or washed away. Sea surges caused by storms pose a hazard to farmers whose dwellings or farmlands are near the coast.

Floods that are less violent but inundate large areas over long periods of time are less immediately devastating. However, they have severe economic and social impacts. Damage to crops and property occurs as a result of fields and houses standing in water for long periods of time. Articles for household use may be rendered unusable, and the house structure may be weakened. Losses of food stocks stored in the house (as well as crops on the land) may threaten food security until the next harvest season. Livestock that survive the flooding may succumb to epidemics that occur following the flood.

Floods of long duration can cause severe social impacts during the flood itself. Health, particularly of the elderly and disabled family members living in poor conditions with limited food stocks, unclean water sources and poor sanitation, is a grave concern of people interviewed. Schooling can be disrupted for long periods, especially when buildings require repairs. Children are most at risk from flooding. While more than swimming skills are needed to save even the strongest adults from strong currents, it was disturbing in the field interviews to hear of people who had died in relatively calm waters simply because they could not swim.

Drought and saltwater intrusion during a drier dry season also affect the second rice crop.

1.1.3 Thua Thien Hue Province

Thua Thien Hue is bordered by Quang Tri Province to the north, Da Nang City and Quang Nam Province to the south, Lao PDR to the west, and over 120 km of coast to the east (Figure 1). As in Quang Tri, the land slopes from the west to the east. About 70% of its land area of 5,009 sq km is mountains and forests. The Truong Son range (800-1000 m elevation) stretches about 60 km along the Lao border. The Bach Ma Cao (1,444 m high) and Hai Van mountains (1,160 m elevation) form part of the 70 km range along Quang Nam and Da Nang. The midland is hilly, accounting for a quarter of Hue's land area. The coastal central plain is narrow but long, stretching along the northwest and the southeast. Sand dunes, 5-30 m high, run along the coast. Hue's population of 1,050,000 (1997) occupy 1.5% of the land.

Hue's main rivers are Huong, O Lau, Bo, Truoi and Cau Hai, running eastward across the province. Most originate from the mountain ranges, passing the plains through marshes and ponds to the sea. The Huong (perfume) River is the largest, with a basin of 300 sq km. All rivers drain into the lagoon, with an area of 20,000 ha and 70 million cu m reservoir capacity. Because of the sloping topography, floodwaters run quick and fast eastward. Its 168 km dyke system can only control early flooding.

Climate

Thua Thien Hue's climate system is similar to Quang Tri, with two distinct seasons: the rainy season from September to December, and the dry season from March to August. The rainy season receives about 70% of the total yearly rainfall, with the lowlands receiving twice the highland rainfall. Storms and tropical cyclones come mostly in September and October. Hot dry wind blows from Laos during the dry season, while cool air prevails in December till January. Annual average temperature is 25°C; annual average humidity is 84%. Average rainfall reaches 2,750 mm per year.

Hazards

According to the Chief of the Standing Office of the provincial Committee for Flood and Storm Control (CFSC), hazards in Thua Thien Hue include floods, cyclones, erosion, landslide, drought and saltwater intrusion. The 1999 flood was the worst, which inundated 90% of the lowlands. The province was isolated, and the only access was by air. The flood, which lasted for 1 week, broke 5 new floodgates and created a new river mouth near the lagoon. The heavy rainfall in the uplands caused landslides at various locations. The flood cost was 352 deaths and 1,700 billion VND (about USD 113 million) in damages. In mountainous areas, flooding in main rivers is a problem when the river overflows its banks and flood and inundate low-lying areas.

The most recent drought episode in the province occurred this year (2003). About 20% agricultural productivity was lost. Because of the significantly reduced river flow, seawater flowed inland for about 30 km and rendered the river water unfit for domestic use.

Hong Ha Commune, Aluoi District

Located west of Thua Thien Hue Province, on a branch of the former "Ho Chi Minh Trail" (a military supply route used by the North Vietnamese Army in the 1960s and 1970s), Hong Ha is the poorest of the 21 communes of Aluoi District. Of the commune's 4,100 ha of land, 1,100 ha is forest and 296 ha is agricultural land. About 100 ha is planted to rice (20 ha under wet cultivation), the rest is with cassava, sweet potatoes, vegetables, etc. The main cultivation area is the flat land between the river and the hill slopes. The commune has 1,257 people in 446 households from 5 ethnic minority groups. Only 50% of the population derive income from their agricultural production, which they have to bring down for more than 50 km to Hue City. High input cost and low market price of produce is a current problem of farmers.

The commune has many creeks and rivers, including the watershed of the Bo River, which supplies the agricultural plain of Thua Thien Hue. The destruction of Hong Ha's natural forest cover by chemical defoliants and bombs during the war has adversely affected the

hydrology of the area. River water levels during the dry season are from 0.5-3 m, while during the rainy season are from 5-7 m, sometimes rising up to 10 m, bringing devastating floods both in Aluoi District and in downstream areas. The force of the river also erodes land from the riverbanks. Past events recalled by residents are the floods in 1953, 1975, 1983 and 1999. They said that the 1953 flood was greater in magnitude than the recent 1999 episode. Some creeks dry up during the dry season

Deforestation has also made some areas landslide-prone. Respondents noted that landslides started to occur after the war in 1975. The native vegetation has been replaced by the invasive *imperata* grasses, which has made cultivation difficult. The People's Committee Chairman recognizes that reforestation will reduce vulnerability to floods and landslides, and have thus requested the planting of indigenous species. Hong Ha's forest has been placed under the protection of the Ministry of Agriculture and Rural Development.



Photo 2. Only the foundations remain of the Hong Ha bridge over the Bo River that was swept away in the 1999 flood.

Hong Ha's population is a delicate balance of 5 ethnic minority groups. Their way of life is different from those in the lowlands. For example, very few are engaged in monocrop; most would plant rice, tubers, vegetables, etc. They do not store food either. They collect only the things that they need for the next 3 days supply, such that most experienced hunger during the 1999 flood when the floodwaters wiped out their crops.

Electricity came in 1998, with 70% of the population currently connected. Other facilities include a primary school and a health care center. The Chairman of the People's Committee said that malaria and digestive diseases are common.

In line with the government's economic reform (*doi moi*¹), the commune government opened its doors and welcomes foreign initiatives. One of these is an ADB project on poverty reduction, to address the 70% poverty level in the commune. The commune is also considering opening its 2 dams/ reservoirs and waterfalls to eco-tourism.

¹ The *doi moi* reform, instituted in 1986 to address Vietnam's economic crisis, consisted of 6 major policy changes: 1) the decentralization of state economic management, which allowed state industries some local autonomy; 2) replacement of administrative measures by economic ones, including a market oriented monetary policy, which helped to control inflation; 3) adoption of an outward orientated policy in external economic relations –(exchange rates and interest rates were allowed to respond to the market); 4) agricultural policies that allowed for long-term land use rights and greater freedom to buy inputs and market products; 5) reliance on the private sector as an engine of economic growth; and 6) letting state and privately owned industries deal directly with the foreign market for both import and export purposes [5].

1.1.4 Impact of Natural Disasters in the Highlands of Central Vietnam

The most damaging hazard experienced in the highlands is flashflood, as it occurs with little warning. People, property and livestock may be washed away. Crops planted on the hillsides are better protected than staple crops planted in river valleys, such as cassava, on which poorer farmers rely between paddy harvests. High dependence on subsistence farming renders highland populations vulnerable to hunger during the flood season. Floods from swollen rivers can cut off villages for days or weeks, which could result in food shortages.

Floods with strong currents cause permanent damage to fields, washing away the topsoil. Floodwaters also deposit rock and gravel onto fields. Heavy rains trigger landslides that cut off roads and communication networks.

1.2 Vulnerability Profile and Strengths and Weaknesses of Existing Coping Strategies

Livelihoods in the plains and lowland areas centre on irrigated rice cultivation, cultivation of secondary crops and livestock raising. While these patterns are broadly similar to other lowland areas of the country, low living standards in the lowland and coastal parts of the central provinces are generally attributed to the extreme weather and frequent occurrence of natural disasters. Agricultural production is limited by poor, insufficient tracts of land, and inadequate irrigation. Unlike the fertile Mekong delta, farmers in the central provinces struggle to harvest two crops of rice. Those interviewed at the study sites continue to plant two rice crops but report losing part or the entire second crop on an annual basis. Even farmers who have made relatively successful investment in agriculture and livestock raising acknowledge that they do not "get ahead" by agriculture alone.

Having capital to invest has been one of the keys for households to improve their livelihoods in the last decade. Those who have been able to diversify sources of household income have had an advantage. For example, the ability to make investments in aquaculture (households along the coast) or to increase livestock herds and to commercialise handicraft production (Cham communities in the dry plains of Ninh Thuan and Binh Thuan), have been important factors in improving household well being and in absorbing shocks caused by natural hazards [4].

However, the poorest households in lowland and coastal (agricultural) areas lack the resources to improve their economic well-being, and are particularly vulnerable to economic shocks. Those households lacking capital to invest in agricultural production are among the poorer households in these areas. In addition, households in lowland and coastal areas must cover the costs for education and healthcare, which poorer households struggle to meet. Expenditures to treat sudden illness or chronic ill health in the family are a severe drain on the resources of such households. The poorest households in lowland areas are likely to be *indebted*, and to resort to strategies such as land mortgaging to cope, thus reinforcing the *cycle* of debt.

An increasingly common strategy in the central regions is for young people to migrate, either temporarily or long-term, in search of work. They go to Ho Chi Minh City, other urban centres, or the Central highlands, and nowadays even take up overseas labour contracts. Such is the extent of these movements that, nationally, central coastal and northern central regions have the highest rates of out-migration to other parts of the country (see Annex 1 on net migration rates by region).

The migrants are both men and women. In Gio My, Gio Linh District alone, 80% of the young migrant workers are women. About 10% of women in the commune have left their families and husbands behind to farm while they take up work as maids in Ho Chi Minh City (HCMC), or on contracts overseas in Malaysia, Taiwan, or Japan. Some families have become women-headed, as men have left to take up work elsewhere. While for many of the families migration is temporary (money is sent home and the family member eventually returns), there are situations in which vulnerable women-headed households are created, as men have left home ostensibly to find work, but have effectively abandoned the wife and family.

There is also evidence that natural disaster is a strong motive for migration. In a study conducted in the central provinces in early 2000, respondents in Thua Thien-Hue stated that migration to the south had become even more popular in the wake of the severe floods in November 1999.

In general, lowland communities tend to have been long established at the sites where they live. Although many of these communities have experienced outward movements of population and (particularly in better-off families) now have wide networks of relatives, the communities themselves continue to be made up of related families who have lived in the areas for generations. Unlike the situation in the uplands, the site on which the village is located may not have changed for centuries.

In the hill land, swidden cultivation, although almost out of practice, still exists, but hidden, and is resorted to in cases of emergency. Hong Ha's forest, now under MARD protection, is closely monitored by the Forestry Department. People are generally scared of the consequences of fire spreading from the swidden fields. Conversion of hill land for cultivation is very restricted. Though it is possible to get permission from the Forest Department, many households do not invest in the land because it can be claimed by the State for forest plantation with short notice. Large areas of hill land, which households have access to, are covered by imperata grass, which have spreading, tough root system that make cultivation difficult. People then return to old paddy fields, which are left fallow and have very low productivity.

Table 2 gives a summary of the hazards and existing coping strategies in the study sites.

Table 2. Hazards and current coping strategies in the study sites

	Exposure of agricultural system	Hazards and public safety
General features		
Rainy season: Sep- Jan	1 st crop (winter-spring): Dec- Apr	
Dry season: Mar- Aug	2 nd crop (summer-autumn): May- Sep	
Gio My, Gio Linh District		
Lowland 1,300 ha in agriculture	Rainfed 2 nd crop at risk to drought and saltwater intrusion during drier than dry season Coping strategy: gate installed in one of the rivers to keep saltwater out	Flooding/ inundation Typhoon
	Damage to 2 nd crop when floods come early	Drought impact on potable water availability
	Sand deposition Coping strategy: reforestation/ aforestation for wind break	
	Coping strategies/ livelihood options: crop diversification, migration to cities, borrowing	
Hai Hoa, Hai Lang District		
Lowland Elevation 0.5 m below sea level 655 ha planted to rice	1 st crop vulnerable to inundation, requiring pumping water out of fields Coping strategy: 1 cropping to avoid flood season. Engage in fish culture and lotus plants during wet season.	Flooding with strong current Inundation
	2 nd crop at risk to saltwater intrusion Coping strategy: shifting of cropping pattern as above	
	Livelihood option: livestock raising	
Hong Ha, Aloui District		
Highland 100 ha planted to rice 196 ha to tubers, vegetables	Livelihood option: eco-tourism	Floods, landslides Coping strategy: reforestation with indigenous species

1.3 Institutions for Disaster Risk Management

Vietnam has well-developed institutional, political and social structures for mitigating water disasters, which evolved over centuries since they exploited the great river deltas for agriculture. The building of dykes for protection against floods began in the 11th century. Today, there are about 5,000 km of river dykes and 3,000 km of sea and estuary dykes, mostly located in the North and Central Vietnam, protecting people, property and infrastructure, and making agriculture possible.

1.3.1 Government

Department of Dyke Management and Flood Control

Since 1971, the body responsible for managing this elaborate system of dykes is the Department of Dyke Management and Flood Control of the Ministry of Agriculture and Rural Development (MARD). The central office sets and reviews overall targets, while the provincial department is responsible for allocating funds based on proposals from the districts. At the district level, officers evaluate the feasibility of new initiatives and monitor the condition of existing dykes. The commune level has a field engineer on staff and is responsible for organizing local participation, in the form of dyke management brigades who provide labour for dyke construction and maintenance. This division of responsibility, from national to commune levels, mirrors the overall political organization of Vietnam.

Central Committee for Flood and Storm Control

The Central Committee for Flood and Storm Control (CCFSC), and the committees at provincial, district and commune levels, was established in 1990 by decree (No. 168) of the Council of Ministers² (now called the Government). It is an inter-agency committee responsible for disaster management in Vietnam. It reports to the Government and is comprised of the following ministries and agencies:

- Ministry of Agriculture and Rural Development (Minister as Chair, Vice Minister as Standing Vice Chair)
- Government Office (Vice Chair)
- Ministry of Interior (Vice Chair)
- Ministry of Planning and Investment
- Ministry of Finance
- Ministry of Industry
- Ministry of Trade
- Ministry of Science and Technology
- Ministry of Natural Resources and Environment
- Hydrometeorology Service
- Ministry of Health
- Ministry of Construction
- Ministry of Communication and Transport
- Ministry of Posts and Telecommunications
- Ministry of Public Security
- Ministry of Labour, War Invalids and Social Affairs
- Voice of Vietnam
- Television of Vietnam

² The Council of Ministers (now called the Government) is the highest executive body in Vietnam, and is responsible for the management of the economy and of the State. It is composed of the Prime Minister, Deputy Prime Ministers, Ministers and the Chairmen of the various State Committees and the Governor of the State Bank. The Prime Minister is elected and may be removed by the National Assembly, the supreme representative and legislative body, which determines both domestic and foreign policy. The Deputy Prime Ministers and the Ministers are selected by the Prime Minister, but must be approved by the National Assembly. The Prime Minister is a member of the National Assembly; other members of the Government may not necessarily be. Decisions on major issues are taken on a majority basis.

Its tasks include:

- encourage and check with sectors and localities that plans are formulated and carried out annually for the purpose of prevention and control of floods and storms
- issue orders for mobilization of human resources and funds to provide timely support to urgent situations, that sectors and localities are unable to solve
- direct localities on how to overcome consequences of floods and storms
- sum up performance of tasks to prevent and control floods and storms; introduce experiences and scientific and technological innovations in prevention, and control of floods and storms to sectors and localities.

The headquarters is at MARD. The Disaster Management Center acts as its Secretariat. It receives and disseminates warning, receives information on damages, and, as necessary, mobilizes resources in addition to the general fund allocated to each province for immediate relief. The Disaster Management Unit, a UNDP and USAID supported project, acts as an information node, securing and processing reliable and timely data from the nationwide network of CFSCs .

CCFSC's operational budget is allocated from the annual budget of MARD. The Committee meets on a daily basis in the flood season and reviews the reports prepared by district and provincial offices the previous night.

Committee for Flood and Storm Control in Ministries, State Committees and General Departments

Each Ministry, State Committee, General Department has a committee for flood and storm control, chaired by its official. The committee is tasked to assist the Minister, Head of State Committee, Head of General Department to:

- build and implement sectoral plans for prevention and control of flood and storm
- maintain law and order
- manage funds
- timely provide supplies, facilities and means needed for relief as required by the CCFSC
- rehabilitation and reconstruction
- document experiences and lessons learned for sharing at all levels in all sectors

Committee for Flood and Storm Control at provincial, district and commune levels

The committees for flood and storm control of provinces, districts and communes are established by the Chair of the People's Councils³ at the same level. The committees are comprised of:

³ Below the Government are the People's Councils, the authority of the State at the provincial/city, district and commune levels. Members are elected or may be removed by the local people. (Candidates for election are selected by the Fatherland Front or are self-nominated. The final list of candidates is drawn by the Fatherland Front.) The People's Council is accountable to the people and the superior State bodies. At the provincial and district levels, the Council has a Standing Committee, composed of the Chair and Vice-Chair of the People's Council elected from among the members of the Council, and a number of Special Committees. The

- Chair of the local People's Committee (Chair)
- Head of DDMFC (Standing Vice-Chair)
- Heads/ Deputy Heads of departments concerned with prevention and control of floods and storms of the locality

Operational budget comes from the provincial Government. The tasks of the local committees include:

- assist the People's Committee of the same level to set up plans for the prevention and control of floods and storms and guide their implementation in their localities
- monitoring maintenance of dykes
- activities towards prevention of and protection of residential and commercial areas from floods and storms
- issue early warning of hazard
- receive feedback from lower level committees on actions done to prepare for an impending hazard and, based on this information, give instruction on further action
- mobilize personnel and resources for emergency response
- relief and rehabilitation
- prepare damage and needs assessment report for sending to higher level committees

People's Committees

The People's Committee is elected by the People's Council and acts as its executive body, and the Government's administrative agency at the local level. It has responsibility for implementation of the constitution, laws, directives of upper government agencies and resolutions of the People's Council. It has a Chair, a Vice-Chair, and a varying number of members (9-11 at the provincial level, 7-9 at district level, 5-7 at commune level). The Chair comes from the People's Council; others need not. He also chairs the Committee on Flood and Storm Control. The task areas of the People's Committee include planning, budget and finance; agriculture, forestry, fisheries, water conservancy and land; industry, small industries and handicraft; communications and transport; urban development, construction and management; trade, service and tourism; education and training; culture, information, physical training and sport; social affairs and life; science, technology and the environment, national defense; public security, social order and safety; implementation of policies for nationalities and religion; law enforcement; building of the local administration and managing of the administrative boundary of the locality; and special tasks for offshore districts. There are Special Committees on economics and budget, and on cultural and social life, and a Judicial Committee.

commune People's Council does not have a Standing Committee or Special Committees, but has a Chair and Vice-Chair. The People's Council is responsible for ensuring strict local observance of the Constitution and laws and for ruling on local plans and budgets. Its task areas include economics; culture, education and social affairs; science, technology and the environment; defense, security, social order and safety; implementation of policies for nationalities and religion; law enforcement; building of the local administration and managing administrative boundary of the locality; supervision of other organizations; special tasks for offshore districts; discharge and planning; and urban development. Operational budgets come from the revenues of each locality, supplemented by allocations from the central budget.

The Commune People’s Committee is the lowest political institution in contact with communities. It receives citizens’ complaints, denunciations, proposals, and opinions on issues related to the Communist Party’s lines and policies, State legislation and management of agencies and units. Meetings for this purpose are held at least twice a week, compared to at least once a month at the district level, stressing the importance of grassroots presence of public administration [].

Coordination between these government institutions is shown in Figure 2.

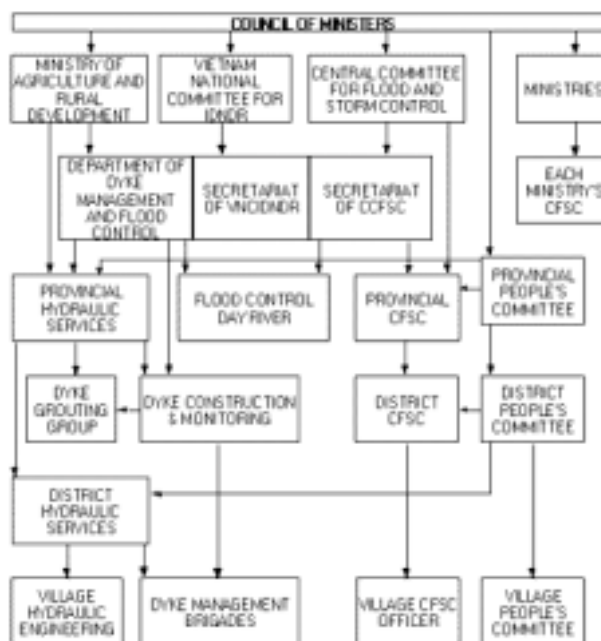


Figure 2. Government institutions for prevention and control of floods and storms

The Office for the International Decade for Natural Disaster Reduction (IDNDR) undertakes information dissemination and preparedness training.

1.3.2 Mass Organizations

Mass organizations bridge the Communist Party, the Government and the people. They are far-reaching and therefore have a great effect on social and community structures. They sit as members of sub-committees of local CFSCs.

Vietnam Fatherland Front

The Vietnam Fatherland Front was established by the Communist Party of Vietnam and President Ho Chi Minh on 18 November 1930 under the name Vietnam National United Front to raise the spirit of patriotism and unity, the decisive factors in gaining national independence.

The present Vietnam Fatherland Front is a political alliance organization, a voluntary federation of political organizations, socio-political organizations, social organizations, and outstanding individuals representing various social classes and strata, ethnic groups, religions and overseas Vietnamese. It is a venue in advocating patriotism, national pride, sense of self-reliance, and unity of all Vietnamese at home and abroad, irrespective of social standing and nationality, past and present ideology, and religion and belief, who approve the cause of renewal to strengthen national independence, unity, sovereignty and territorial integrity, and strives for the eradication of poverty and backwardness, aiming to be a prosperous people, a strong country, and a just and civilized society to realize President Ho Chi Minh's vision of "building a country, which is peaceful, unified, independent, democratic and rich enough".

The Vietnam Fatherland Front is a part of the political system of the Socialist Republic of Vietnam, under the leadership of the Communist Party of Vietnam. It:

- provides a political base for the people's Administration
- reflects the people's will and aspirations, building the block of national unity
- advocates consultation, coordination and unity of action of its member organizations.

Its tasks are to:

- gather and build the block of national unity
- strengthen unanimity of spirit and politics among people
- propagandize and encourage the people to exercise their right to be their own masters
- realize the lines, advocacy and policies of the Party, and strictly execute the Constitution and Laws
- supervise the activities of the State bodies, elected deputies and State officers and functionaries
- collect people's opinions and their recommendations
- reflect and propose to the Party and the State
- participate in the building and enforcement of the people's Administration
- together with the State, take care of and protect people's legitimate interests, and
- take part in the development of relations and cooperation between the Vietnamese and the people in the regions and in the world.

The Vietnam Fatherland Front selects candidates for the People's Councils for election by the people. The People's Councils in turn elects the People's Committees whose Chairs are also Chairs of the local Committees for Flood and Storm Control.

In times of disasters, the Fatherland Front calls for and channels emergency supply donations and coordinates with the mass media at central and local levels.

Women's Union

Established in 1930, the Women's Union advocates gender equality and the legal right of all women in the country, and takes part in the State Management. Organized at the central, provincial, district, commune and group levels, the Women's Union carries out education

activities to increase women knowledge and skills, supports poverty alleviation for poor women, and promotes mother and children health. Its tasks are:

- policy implementation
- development of household economy
- training, education activities, knowledge and skills for women
- strengthening of the Women's Union structure
- family planning implementation
- establishing cultural families
- supervision and control of all women's activities
- coordination with other agencies and organizations

The Women's Union is actively involved in disaster preparedness, relief and rehabilitation through the following activities:

- advise members to prepare emergency food
- cooking at evacuation centers
- assist the Commune Sub-committee on Flood and Storm Control on logistical requirements for response
- assess local conditions as basis for distribution of relief goods and assistance
- rebuilding of houses
- extending credit to members at a very minimal interest rate.
- training courses to enhance women's skills and provide livelihood options

The Women's Union manages a fund from member contributions. In Gio My, members contribute 5,000-10,000 VND each. Current fund available is 17 million VND (about USD 1,100) in Gio My, and 300 million VND (USD 20,000) in Hai Hoa. Members can borrow a specific amount according to level of fund. In Hai Hoa, members can borrow as much as 2 million VND (about USD 133) each for investment in livelihood projects. Payment is by installment.

Youth Union

The Youth Union includes 4 organizations:

- Ho Chi Minh Communist Youth Union (HCYU)
- Vietnam Youth Federation (VYF)
- Vietnam Association of Students (VAS), and
- National Council of Young Entrepreneurs (NCYE)

However, at the local level, only two are operating: the Ho Chi Minh Communist Youth Union (HCYU) and the Vietnam Youth Federation (VYF). Their functions are as follows:

The Ho Chi Minh Communist Youth Union

The HCYU was established on 26 March 1931, as the Indochinese Communist Youth Union. Its functions are:

- reliable reserve force for the Communist Party of Vietnam (CPV)

- as the socialist school for the youth, enables them to take part in activities beneficial to the country, and helps them grow and make contributions to the nation.
- representative and protector of the legitimate and lawful rights of the youth.
- member in the Party's political system under the framework of the Constitution and other laws. In this system, the CPV is the leader, with HCYU as one of its members.

Operating under the direct leadership of the CPV, the HCYU is the reliable reserve force for the Party, supplying it with personnel to the requirements of its political tasks. The HCYU is the reliable mainstay of the State in the course of building socialism and defending the socialist country. The HCYU associates and coordinates with other agencies and mass organisations so as to achieve an aggregate synergy in educating, training, protecting and forging the younger generations.

The HCYU plays the core role in the organisation and operation of VYF, VAS and other collective members of the VYF. In charge of the Ho Chi Minh Young Pioneers Organisation (HYPO), the Union builds this organisation, selecting, training and fostering the cadres working with small children, and assisting financial and other facilities to the HYPO's operation.

Vietnam Youth Federation

The VYF is a broad social organisation of Vietnamese youths and youth organisations. All Vietnamese youths aged 15 to 30 can be members. Membership can be individual (not associated with other youth organizations) or collective. Current individual membership is 2.5 million, and collective members include the:

- Ho Chi Minh Communist Youth Union
- Vietnam Association of Students
- National Council of Young Entrepreneurs

The VYF operates under the principles of volunteerism, democratic consultation, self-management, coordinated and united action for common objectives, with the key role played by the HCYU. These principles also constitute the basis for the VYF's consolidation and development. The VYF has a legal state, an account and a seal of its own.

Following are the main functions and tasks of the VYF:

- provide guidance and facilities for its members to develop and perfect their personality to become good citizens, and to motivate them and other youths to participate in activities beneficial to the country, to families and to all those who can benefit from them.
- represent and protect its members' legitimate interests; cooperate with state agencies and social organisations to ensure the youth's legitimate rights; and organise practical activities aimed to meet reasonable needs of its members and the youth in general.
- achieve solidarity and cooperation with international and national youth organisations in promoting friendship, mutual understanding and cooperation

for the sake of peace, national independence, democracy, social progress, and for the happy future of youths.

During disaster times, members of the Youth Union help in dissemination of warning, evacuation and rescue in close coordination with local authorities, and provides labour in rebuilding damaged houses.

In Hai Hoa, the Youth Union was established in 1975, with sub-teams at the primary and secondary school levels. Membership is voluntary (currently at 160 of the total 520 young people).

Veterans Association

The Veterans Association was established in 1989 for those who served in the army and now retired or moved to other sectors. It is a political organization with the following functions:

- advise the Communist Party and local authorities
- contribute to stability and socio-economic development
- implement the resolutions and policies of the Party and Government
- collaborate with other mass organizations in implementing all activities
- encourage and help members who face difficulties

Economic development of the commune is a priority task. In times of disasters, the Veterans Association:

- assists in damage assessment
- extends credit to members

Fund is set up from contributions of members – each member contributes 300 kg rice, or its monetary equivalent. In Hai Hoa, additional funds are raised from exploiting unused agricultural land, with permission from the local People's Committee. The Hai Hoa Veterans Association has current funds amounting to 20 million VND. Members can borrow as much as VND 300,000 each as seed money for livelihood projects, economic assistance for families undergoing financial difficulty, or assistance in house repair/strengthening.

Farmers Association

Established in October 1930, the Farmers Association is a voluntary organization operating from the central to the grassroots levels. Through its activities, the Association has contributed significantly to the development of Vietnam's agriculture, despite the overall trend toward industrialization. It also launched emulation movements to encourage farmers to implement economic restructuring in agriculture, improve productivity and product quality, as well as increase competitiveness in domestic and foreign markets. The Association now enjoys the participation of nearly 10 million rural households across the country.

Together with the Party and State, the Farmers Association has helped reduce poverty in the country. Farmers can:

- obtain loans from local authorities to develop their businesses
- receive instruction on more efficient ways to do business
- apply advanced technologies to their production

The Farmers Association aims at:

- production development alongside environmental protection
- maintain and increase the prestige of Vietnamese agricultural products on the market
- build democratic mechanisms at the grassroots level through building a model of cultural families and cultural villages.

As a member of the Commune Sub-Committee for Flood and Storm Control, the Farmers Association undertakes the following preparedness, response and rehabilitation activities:

- assist in dissemination of early warning
- assist in evacuation and advises members where to move livestock
- participate in rescue
- assist in reconstruction of dwellings
- facilitate mobilization of farmers' assistance to those who are most affected (e.g. exchange of seeds for some other commodity)
- advise farmers to plant cash crops for immediate food supply

Agriculture Cooperative

The Agriculture Cooperative is an economic institution for channeling agricultural credit to farmers.

Vietnam Red Cross

The Vietnam Red Cross (VNRC) was established in 1946, with Ho Chi Minh as honorary president. Currently, the State President is an honorary president of VNRC.

During the war, when it was founded, VNRC's main tasks include undertaking relief operation, first aid and treatment of wounded soldiers. In 1957, VNRC was recognized by the International Federation of Red Cross Societies (IFRC). In 1975, it became independent from the Ministry of Health. During the same year, the Red Cross in the North and in the South united as the VNRC of today, with the following areas of focus:

- support to disaster victims, which is its first priority
- primary health care
- institutional/ staff development
- humanitarian values development

Right after the Vietnam War, VNRC expanded to the grassroots level to help the victims of agent orange and dioxin, especially at the mountainous areas. Currently, its structure covers the national, provincial, district and commune levels. It has offices in 61 provinces and 500 districts, with volunteers in 90% of the total number of communes. Its volunteers currently number at 10 million.

The Government of Vietnam financially supports VNRC activities, and personnel at national, provincial and district levels (support for Chairmen of People's Committees at the commune level is currently being worked out). External support funds programs and projects as well. IFRC, in addition to providing technical support to VNRC, joins VNRC in launching international appeals in times of disaster, when VNRC is unable to meet emergency requirements.

VNRC is involved not only in relief work, which it does with a high degree of effectiveness utilizing its nation-wide network, but also in disaster preparedness. Activities being undertaken include:

Prevention and preparedness:

- planting mangroves along coastal dykes. At end of 2003, 20,000 ha have been planted in 8 coastal provinces.
- operation of about 40 disaster preparedness centers (Figure 3), used as base for relief operations and fund raising. Some of these centers also deliver emergency care and medicines free of charge for the very poor. Each center has a store of basic relief items.
- shock brigades of 20-50 members each, trained on how to prepare for disasters, first aid and emergency relief in more than 4,000 communes. They are on call during emergencies in the communes.
- training for primary schools in the central provinces on how to prepare for disasters
- public education and awareness raising in communes through campaigns and posters
- two major relief warehouses (in the North and South), holding emergency food, clothing, first aid kits, etc available for rapid distribution during disasters
- building of flood shelters which are used as classrooms at normal times
- equipping of 3 hospital boats



Figure 3. Location of Red Cross Disaster Preparedness Centers [6]

Response, relief and rehabilitation

- evacuation, rescue and relief in coordination with local authorities
- administering first aid
- preparation of needs assessment report
- reinforcing houses, building of typhoon-resistant houses

Red Cross volunteers in the communes:

- assist in evacuation, rescue and relief
- assist in cleaning up operation
- help in repair of damaged houses

Other Mass Organizations

Other mass organizations in Vietnam include:

- Education Promotion Association whose main task is to promote education in society
- Old Peoples Association, whose membership includes those who have retired from government work, and farmers aging over 55. Their activities are:
 - Protecting the rights of old people.
 - Implementing and disseminating policies to members
 - Contributing in recovery and conservation of traditional customs

1.3.3 Non-government Organizations

Assistance provided by international NGOs cover preparedness, relief and rehabilitation. If disasters affect areas where they are present, implementing long-term development projects, they are able to provide direct relief/ rehabilitation assistance [3]. In areas where they are not present, response is based on an appeal by the government or IFRC and information obtained from the Disaster Management Unit (DMU), IFRC, or directly from local agencies. Funds and relief assistance are channeled through IFRC, VNRC or local organizations (e.g. People's Committee, Women's Union). These international NGOs include CARE International, Catholic Relief Services, CECI, CISP, Cooperation Internationale pour le Development et la Solidarite (CIDSE), Malteser, Oxfam, Save the Children Alliance, World Vision International, etc. Assistance provided include:

Preparedness and mitigation:

- integrated in long-term development projects in the field of education, agriculture, health
- preparedness training
- setting up early warning systems
- reforestation/ aforestation
- building of hospital boats
- building water supply storages

Relief:

- provision of food, shelter items, health kits

Rehabilitation:

- repair/ rebuilding of houses
- rebuilding of clinics, schools
- rebuilding of bridges
- provision of fishing boats, fish nets, seeds, fertilizers
- micro-finance

1.4 Disaster Management at Local Level

1.4.1 Preparedness

Being prone to inundation and drought, people are aware of the hazards that come with the seasons. Households and local authorities engage in a whole series of activities at least a month before the storm and flood season. People would usually undertake repairs of dwellings, reinforcing pillars and roofs. Banks of paddy fields are shored up to avert damage and losses. Harvested paddy is kept on elevated storage. Animals are moved to safer grounds. Emergency food (e.g. noodles), firewood and medicine are stocked. Local authorities as well as mass organizations, like the Women's Union and Farmers Association, may play a role in encouraging households to make such preparations.



Photo 3. Platform for storing paddy in households

In some villages, people fetch bamboo to make rafts; sometimes banana trunks are put aside for the same purpose. Households who own boats have these at the ready, perhaps bringing them on to land nearer the house, in case they are needed when it floods. Preparation of drinking water depends on the available sources. In some villages, water tanks set high above the ground are one way to ensure the domestic water supply is protected from flooding. These tanks are not that popular as yet however, despite their benefits, because the cost remains prohibitive for many households (and some were concerned they attract mosquitoes). Households that rely on well water may prepare stores of water in advance of the flood season.

The communes visited have existing disaster preparedness plans, prepared with participation by mass organizations, detailing tasks of its sub-committees in addressing prevention and preparedness, response and rehabilitation. For example, Hai Hoa's disaster preparedness plan was drawn in 2000 by an 8-member committee. The plan was finalized in a meeting with commune officials, with inputs from lessons learned from the 1999 experience. Simulation exercises were conducted in 2000, with financial assistance from the province. Three plans were drawn addressing:

- 1) Protection of agricultural production
- 2) Protection of infrastructure
- 3) Evacuation, and search and rescue

The plan on food security provided strategies such as crop rotation, early harvest, and emergency preparations such as moving crops to higher area. Four thousand tons of rice are stockpiled in the commune hall, and renewed each year. The plan to safeguard infrastructure included measures for electricity supply, canals, etc. The plan on evacuation and search and rescue identified sites for the evacuation of groups of households. Emergency health care was also given importance: the commune hall was designated as the emergency health station, able to administer primary health care and handle emergency

births. Sanitation was given priority, with a clean up operation undertaken after each flooding episode, as the commune receives all kinds of debris and dead animals brought by the rushing floodwaters of the Hai Lao River.

In 2002, village sub-committees for flood and storm control were established. Members report to the Chair of the commune CFSC. An organizational chart clearly delineates roles and functions of each member of the commune and village sub-committees. These sub-committees each have 5 units that oversee health care and the environment, infrastructure, evacuation and search and rescue, relief, and logistics.

The sub-committee tasked on relief ensures that all emergency requirements such as food supply, logistics and personnel are available on site. (A national policy that resulted from the great flood of 1999 is self-help by communes, recognizing that they are the first ones to respond to a disaster. External assistance is extended upon their request, when they are unable to meet their emergency requirements.) A control room in the commune hall transmits early warning information by radio.

As part of the Central Government's policy on living with floods, the school calendar was shifted to enable children to stay with their families during the flood season.

1.4.2 Response, Relief and Rehabilitation

The provincial office of the Hydrometeorological Service (HMS) of Vietnam provides warning for an impending cyclone, flood or drought. In Quang Tri, hydrometeorological data from observation stations at 5 locations are used to generate forecast. Additional 5 stations operate during the flood season to monitor water levels in rivers. The provincial forecasting center (HMS) is also networked with other provincial centers in the Central Region.

Flood forecasts issued by HMS have 4-6 hours lead time, allowing adequate time for evacuation. (People are already on alert mode during the flood season.) Communication of flood warning is by high frequency radio, while cyclone warning is through the mass media (TV, radio and newspapers).

Warning of an approaching hazard is received by the district CFSC, and is then relayed to commune CFSCs by radio. This triggers a flurry of activities in the communes. A member of the commune CFSC sub-committee on early warning goes around informing people using a loudspeaker. Members of the Youth Union and Farmers' Association assist in the dissemination of early warning. They and Red Cross volunteers also help in evacuation. Evacuation is started when the floodwaters start to rise. Shelters at the sand dunes and commune halls, which are built with second floors, are used as evacuation centers. Dwellings with second floor also accommodate neighbors who are in distress.

Rescue at the commune level is undertaken by a CFSC sub-committee, with assistance from the Youth Union, Farmers Association, Farmers Cooperative and trained Red Cross volunteers. (Part of the commune CFSC preparatory activities is the identification of able-bodied men who can assist in rescue operation.) External rescue assistance from the province involves the army, police and the coast/ border guard. The Red Cross and district

health clinics provide emergency health services. Some members of the Women's Union are also trained to assist in emergency deliveries of babies.

The commune CFSC undertakes relief activities with assistance from the Women's Union and the Red Cross. Members of the Women's Union cook food at the evacuation centers. Relief goods are usually distributed equally since, according to CFSC officials, it is difficult to determine the extent of damage per household in an emergency situation. Rehabilitation assistance however is based on household needs. Emergency goods come from the CFSC store as well as from the Red Cross. In the 1999 flood, relief goods from non-government organizations flooded the communes, such that commune CFSCs had difficulty coordinating distribution.

A rapid needs and damage assessment is conducted by the CFSC, with assistance from the Veterans Association, Women's Union and Agriculture Cooperative, as well as the Red Cross, to provide basis for rehabilitation assistance.

Compensation

Levels of compensation for households affected by disasters are, in principle, set by official government guidelines. These are issued through the Ministry of Labour, War Invalids and Social Affairs (MOLISA). They establish minimum levels of compensation for a death or injury in the family, and for damages to or losses of property and crops. According to MOLISA representatives in Hanoi, each province must put aside a yearly budget to enable it to compensate households at least to these minimum levels. Actual levels of compensation are established at the discretion of each province according to its budgetary ability. If the province cannot meet the requirements, it may ask the centre for budgetary assistance.

In practice, better-off provinces may budget for much higher levels of compensation, while poorer provinces may not be able to offer compensation to people affected by natural disaster at levels established in national guidelines. Provincial representatives of MOLISA in the relatively wealthy province of Tien Giang reported that levels of compensation given from that province to people suffering losses and damages during the floods of 2000 and 2001 were twice as high as those established by the national guidelines. By contrast, in provinces in the north central region, little reference was made to established government levels of compensation, and local people did not refer to these guidelines when discussing relief assistance received from the State.

1.5 Resources for Disaster Management

1.5.1 Financial Resources

The law on water resource (No. 8/1998/QH10) passed in May 1998 provides that funds for prevention, response, rehabilitation and reconstruction activities for water-related emergencies (flood, drought, saltwater intrusion, hail and acid rain) would come from the State budget, the reserve State budget, local funds contributed by the populace as prescribed by the Government, and assistance from foreign organizations and individuals.

The provincial CFSC receives an annual allocation from the CCFSC for relief operations based on previous annual budget. Additional fund from the Central Government may be accessed for special projects. Funds are provided to districts according to need.

People are asked to contribute one kilogram of paddy per labourer annually (or its cash equivalent of 5000 VND). Amounts raised are sent up to higher levels (percentages retained at district and provincial levels) to be used for relief, rehabilitation and reconstruction following floods and storms. The commune does not retain any percentage.

At the field sites visited, actual levels of contribution to this fund and amounts collected varied. Contributions were being made at the stated level in some villages, but in other villages people said that poorer families were permitted to contribute 5000 VND per household (rather than per labourer). In one commune, local authorities said the level of contribution in that commune had been recently reduced from 5000 VND to 3000 VND per labourer. Respondents in another commune said that as a whole, the commune had not made its full contribution to the fund in the previous year because they were too poor.

The Red Cross makes a call to people through its local branches to donate for disaster relief in other localities in response to a specific event. Funds are sent through the Red Cross to the area in need, to be used for *relief only*.

Some local Red Cross units also raise their own social support reserve funds, to be used *within* the commune or village to help victims of disaster (or people otherwise in need). These funds were found to be more prevalent in better-off villages, in lowland areas, and particularly in places where out-migration was high and migrants returning to visit could be called upon to make a contribution. Village Red Cross units in Quang Phuc Commune, (Quang Trach District, Quang Binh) had managed to build reserve funds of up to 8 million VND. While this type of fund is often collected by the local Red Cross, some communes and villages collect similar funds which are called 'humanitarian' or 'friendship' funds and are not associated with the Red Cross.

Local level fund for disaster relief and household social assistance are also raised by mass organizations such as the Women's Union, Veterans' Association and Agricultural Cooperative through contribution of members. These however may be accessed by members only. These funds are less common in upland areas than in lowland and coastal areas. Where they exist in the uplands, amounts raised tend to be lower than in the relatively better-off lowland communes. In those villages and communes that did not collect such local reserve funds, it was either said that people were too poor to do so or that they preferred to contribute only in response to a specific event.

Donations for disaster relief from the international community are received by the Vietnam Fatherland Front, Vietnam Red Cross and the Aid Recipient Unit of the Finance Ministry, as designated by the Government.

1.5.2 Training

Key personnel of the Disaster Management Center and some provincial CFSCs have received training in disaster management from regional centers such as the Asian Disaster Preparedness Center (ADPC). Currently, a program is being worked out to train provincial

and district CFSC officials in disaster management. Funding proves to be the main constraint in operationalizing this.

The Red Cross and various international NGOs have training as well as public awareness programs at the commune level. Red Cross offices at district or provincial levels train Red Cross leaders at the commune level in preparing for disasters, first aid and emergency relief. They, in turn, train local volunteers. In April 2001, VNRC, assisted by IFRC, developed an action plan to make its disaster preparedness program more community-based. Part of this plan is the training of provincial and district VNRC staff on community-based disaster management (CBDM)⁴. (Some VNRC staff have been sent to ADPC to receiving training in disaster management (Disaster Management Course and CBDM) since 1998.) In the same year (2001) ADPC adapted its regional CBDM course and developed and delivered a national training course in Vietnamese language for VNRC. More than 20 trainers were trained on CBDM.

In Hue, the Canadian Centre for International Studies (CECI) has adapted this CBDM course to integrate climate change impacts on and adaptation strategies for floods. An adapted CBDM course has been tested in several communes.

⁴ The CBDM course includes modules in participatory community risk assessment, identification of risk reduction measures and action planning.

2. LOCAL INSTITUTIONS RESPONSE TO 1999 FLOOD EVENT IN CENTRAL VIETNAM

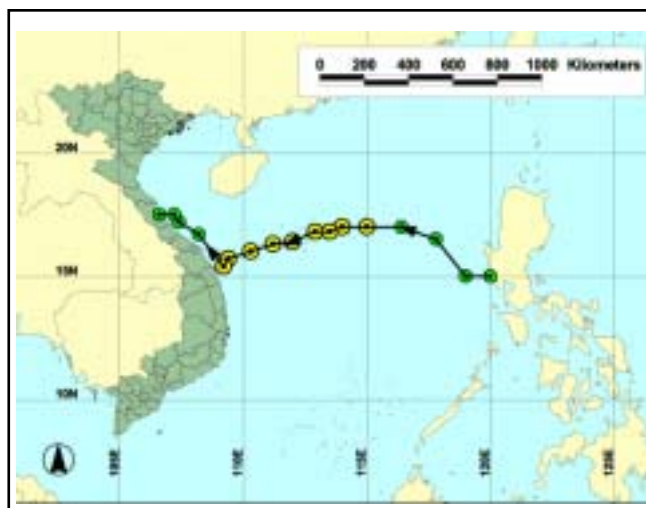
2.1 November 1999 Flood Event

The 1-6 November 1999 flood is one of the most severe flood events in Central Vietnam. The DMC reported that it affected 6 coastal provinces (from Quang Binh to Binh Dinh) and caused more than 600 deaths and missing and nearly USD 300 million loss of property. This event is said to be of greater magnitude and impact than the historic floods of 1886, 1924, 1953 and 1983.

2.1.1 Synoptic Conditions

In the latter half of October 1999, the central region experienced more than normal rainfall due to the influence of tropical storm Eve (Figure 4). Provinces from Ha Tinh to Quang Ngai had heavy to very heavy rains. These rains were the first in a series of heavy rain events that lasted from 2-3 weeks.

At 7:00 a.m. on 20 October 1999, these provinces had received from 100 mm to 470 mm of rainfall, exceeding their monthly averages. The highest recorded was in Ky Anh District, Ha Tinh province at 470 mm. Hue City recorded 289 mm rainfall.



Source: HMS-Vietnam

Figure 4. Tract of tropical storm Eve, 20 October 1999

Floodwater levels on rivers in Quang Binh and Quang Tri provinces and downstream of the Thu Bon River (Quang Nam Province) as well as Thua Thien Hue Province reached their highest levels. The floodwater level on the Kien Giang River at the Le Thuy gauging station

(Quang Binh) was at 2.05 m (above the Alarm Level II)⁵; on the Quang Tri River at the Thach Han gauging station was at 2.69 m (above Alarm Level I); on the Thu Bon River at Cau Lau gauging station was at 1.75 m (0.35m below Alarm Level I).

From 1-6 November, the combined effect of a low pressure area over the South China Sea and the tail end of the cold front caused heavy precipitations over the central region, severely flooding provinces from Quang Binh to Binh Dinh. Figure 5 shows the band of cloudiness over Central Vietnam.

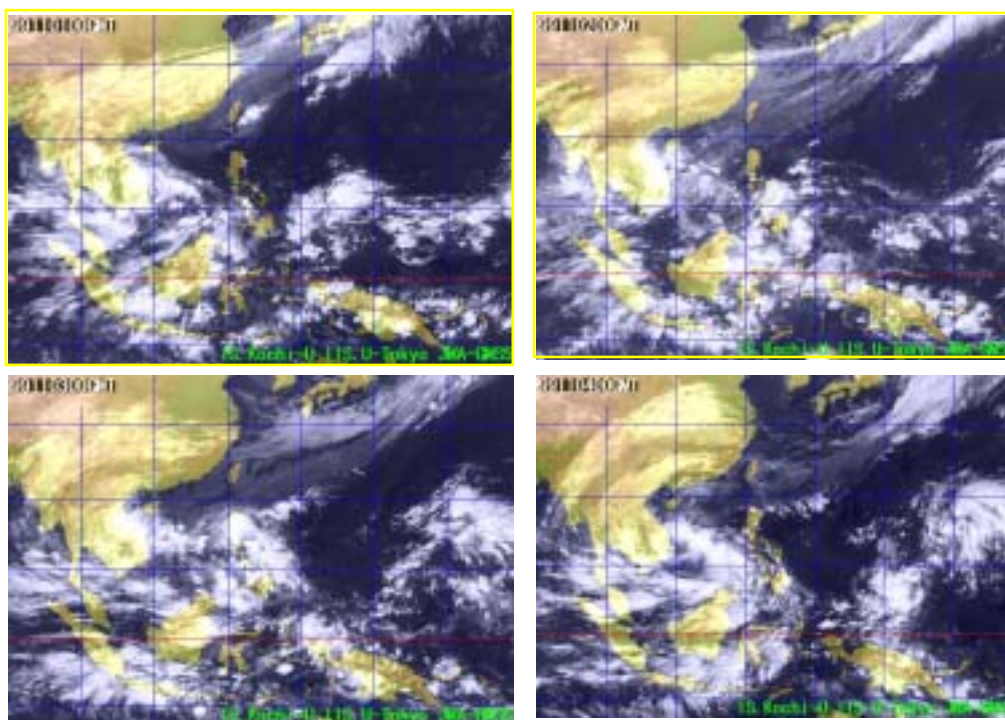
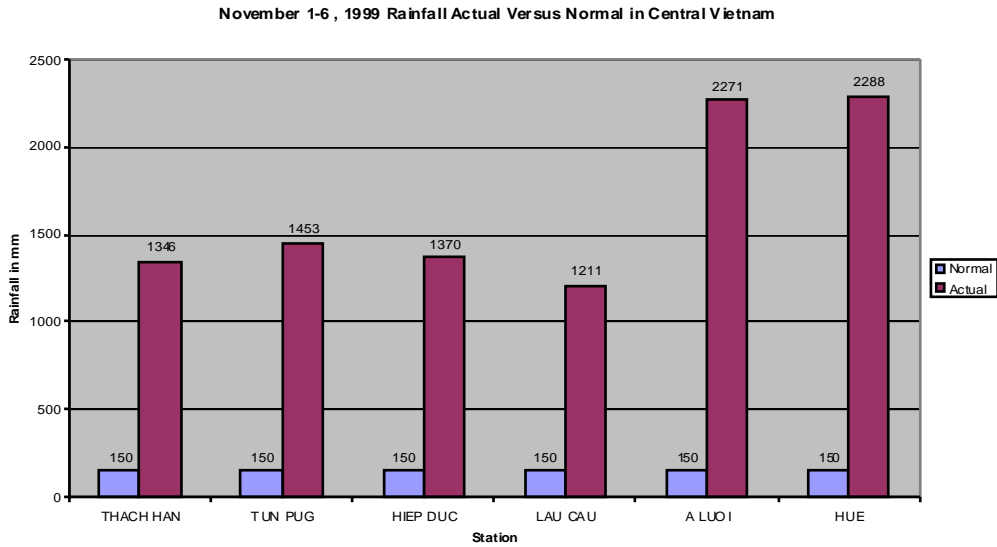


Figure 5. Band of cloudiness over Central Vietnam from 1-4 November 1999 associated with a low pressure area

Heavy rainfall from 600 to over 1,000 mm was experienced in these provinces. Total recorded rainfalls compared to normal averages over this period at various gauging stations in the central provinces are shown in Figure 6. The rains occurred on a large scale and concentrated in a short period. In Hue City alone, mean rainfall reached 1,384 mm, the highest level in the city in 100 years since 1886.

⁵ *Alarm Level I: Possible flood condition* - River water level is high; threat to low height embankments; flooding of very low lying areas; infrastructure safe. *Alarm Level II: Dangerous flood condition* - Floodplain inundation expected; towns and cities still generally protected by flood defences; high velocity river flows pose danger of bank and dyke erosion; bridge foundations at risk from scour; infrastructure generally safe. *Alarm Level III: Very dangerous flood condition* - All low lying areas submerged, including low lying areas in cities and towns; safety of river protection dykes in jeopardy; damage to infrastructure begins. *Alarm Level III+ Emergency flood condition* - General and wide spread uncontrollable flooding; dyke failure a certainty and probably uncontrollable; damage to infrastructure severe.



Source: HMS-Vietnam

Figure 6. Actual vs. normal rainfall in Central Vietnam, 1-6 November 1999

In Quang Tri, total cumulative rainfall recorded at Dong Ha station along the eastern coastal region of the province (Figure 7), from 1-4 November was about 800 mm, compared to the long-term average of only 100 mm for the same period. Over Khesanh station, along the mountainous region of the province, observed rainfall during this period was also above average (Figure 8).



Figure 7. Location of rainfall monitoring stations at Quang Tri Province

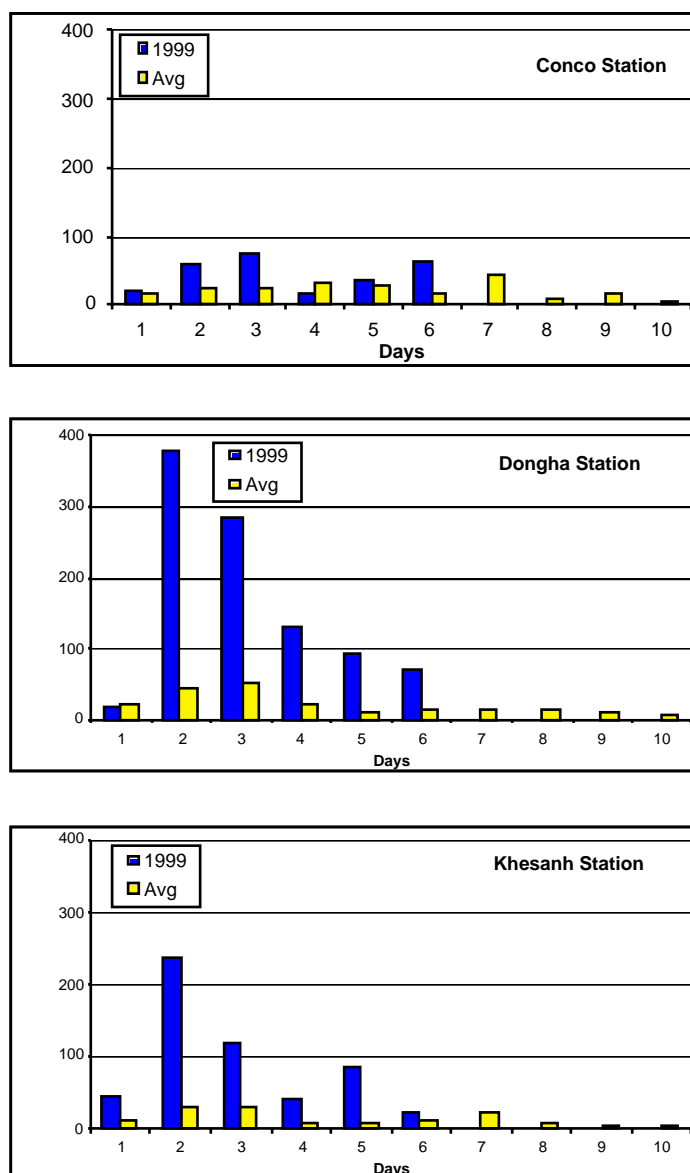


Figure 8. Actual daily rainfall (1-10 November 1999) vs. long-term average (1975-2000), Quang Tri Province

By 2 November, rivers in the affected provinces started to overflow. River levels exceeded Alarm Level III by 0.3 to almost 3 m (Table 3). The level of the Huong River in Hue reached 5.94 m, surpassing its historic 1983 flood level by 1.06 m. All districts of Thua Thien Hue Province and many districts of Quang Tri, Quang Nam, Quang Ngai, Quang Binh, Da Nang, and Binh Dinh provinces were deeply inundated: 20 districts in the region were 2-4 m under water. The streets of Hue ran with water 1-3 m deep. Eleven communes in Phu Loc and Phu Vang Districts were isolated. Ten ships, 2 patrol canoes and hundreds of houses were swept away.

Uncontrollable flooding combined with landslides inflicted severe damage on roads, dykes and infrastructure. National Highway 1A was 2 m under water. Transportation from the North to the South was blocked for many days. Many households lost their main food

supply and income for the next 6 months until the next rice harvest in April/ May. In the hilly areas, many long-term investment in pepper were lost.

Table 3: Water level (m) of rivers in Central Vietnam, 1-6 November 1999

Station	Name of River	Water Level 1-6 Nov 1999	Level above Alarm Level III	Level above 1983 level
Ai Nghia	Vu Gia	10.27	1.47	NA
Lau Cau	Thu Bon	5.23	1.53	NA
Tra Khuc	Tra Khuc	7.77	0.27	NA
Ve	Ve	5.40	1.57	NA
Quang Tri	Thach Han	7.29	NA	0.18
Phu Oc	Bo	5.18	NA	0.29
Hue	Huong	5.94	2.94	1.06

Note: NA- not available

Source: Central Committee for Flood and Storm Control, Vietnam

2.1.2 Response by Local Institutions

Tables 4 and 5 give an account of the daily flood situation, community responses and local institution actions during the 1-6 November 1999 flood in Quang Tri and Hue. Information was obtained from CFSC documents and from interviews in the study sites.

Table 4. Community responses and local institution actions during the 1-6 November 1999 flood, Quang Tri* (*Word in italics – Action by Provincial Government Level*)

Date	Community activities	Government activities
Pre-disaster phase		
17 May 1999		<i>Provincial CFSC issued Instruction No. 9/1999/CT-UB, in conformance with the Prime Minister's Instruction No. 7/1999/CT-TT on flood preparedness, assigning specific tasks to branches at all levels to draw up necessary plans to cope with floods.</i>
31 May 1999		<i>Provincial CFSC reported that all branches and levels have deployed active plans against natural calamity, conducted on site inspections and necessary repair/strengthening of reservoirs, dykes, dams and drains, and stockpiled materials for any unexpected breakdown of these structures. Tasks of local CFSCs have been divided, telecommunication systems and hydro-</i>

		<i>graphic station lines strengthened, rescue groups established, evacuation sites prepared.</i>
August 1999	A month before the onset of the rainy season, people store food, water and salt.	
20 October 1999 Heavy rains due to effect of tropical storm Eve		
31 October 1999 17:00 Rains started		
1 November 1999 Medium to heavy rains		Heavy rains predicted, but possible impact was not
Disaster phase		
2 November 1999		
07:00 Mean rainfall recorded was 100-200 mm (265 mm in My Chanh River) Floodwater level on Ben Hai River at Giao Vong was at 8.91 m (0.91 m above Alarm Level II) Floodwater level at Hieu River at Dong Ha station was at 2.97 m (alarm Level II)		<i>Chairman of provincial CFSC received report of flooding in upstream mountainous area and went to check the situation. He ensured measures were taken to control the situation.</i>
10:00 Floodwater level on Thach Han River at Quang Tri station was at 6.20 m (0.70 m below Alarm Level III)		
13:00		<i>Chairman came back to Dong Ha and found area already flooded. He immediately mobilized the provincial CFSC, deployed plans for flood control and gave instructions to district CFSCs for evacuation. Missions were sent to localities to directly deploy rescue plans.</i>
15:00	Floodwaters start coming into houses. Families received warning and advised to evacuate. Most stayed put, thinking that flood will be of same magnitude as past events. Started raising paddy to elevated platforms. In Hai Hoa, residents observed that water level in the main river	Commune CFSC officials issued warning (by bells, loudspeaker, radio) about impending flood and advised residents to evacuate.

	was still low.	
17:00	Wind was fairly strong, waves were high at coastal areas. People moved to sand dunes, commune/ district halls and houses with upper floors, others to platforms close to ceilings of houses. Most brought basic items only thinking that they can return in 3 days.	Evacuation started, using small rowboats and rafts made from banana trunks.
21:00	Floodwaters rose to 1 m. In Hai Hoa, floodwaters came quickly, inundating the area up to 1.6 m deep.	<i>Provincial CFSC informed CCFSC of situation and request for assistance</i>
3 November 1999		
07:00 Mean rainfall recorded was 300-500 mm, even over 500 mm in some areas	Floodwaters rose to about 2 m in most areas. Those who stayed in their houses moved to top of roofs. Villages isolated by strong floodwaters had to provide for food themselves. Gio My was isolated for a week.	Rescue limited by current of floodwater. Local CFSC provided food at evacuation sites. Distribution to villages isolated by strong currents was not possible.
11:00		<i>Central government began to mobilize relevant ministries and departments to respond to emergency</i>
17:00		<i>Emergency supplies gathered at airports in Hanoi and Ho Chi Minh for delivery by helicopters to flood-affected areas</i>
4 November 1999	Food supply in isolated villages was running out.	<i>Bad weather prevented airlifting of food. Central Government relief operations initially focused on Hue which was worst affected</i>
5 November 1999	Relief supply received from helicopters	<i>Provincial People's Committee established a department to receive and distribute relief for affected households.</i>
6 November 1999	Food aid received from commune CCFSC	<i>Hanoi-Hue road passable. Improved weather condition allowed access for emergency aid from various NGOs. Working groups and armed forces from the province were sent to provide food and assistance to local people.</i>
7 November 1999	Relief assistance received from NGOs	District and commune CFSCs found coordination of

		distribution difficult.
8-9 November 1999	People stayed in evacuation centers for a week	
Post disaster phase		
10 November 1999 onwards	<p>Floodwaters receded. Residents started to return to homes. Most found their paddy swept away or soaked. Others who found their huts swept away stayed with relatives. Neighbors helped each other in providing food. Rebuilding of houses was assisted by mass organizations (e.g. Youth Union).</p> <p>In Hai Hoa, everybody took part in the cleaning up of their environs from mud, debris and dead animals. (There was enough time for post disaster activities as it was a month before the planting season.)</p>	<p>Water purification tablets were distributed to residents. Local CFSC provided bamboo, galvanized iron sheets. <i>Army and police helped in cleaning up the environs. Provincial People's Committee established a steering committee to direct immediate recovery of essential infrastructure, repair/reconstruction of damaged houses, recover production, prepare for winter-spring growing season, and ensure education for flood-affected children.</i> <i>Health department initiated environmental sanitation program</i></p>
December 1999	Farmers planted half of their paddy fields with vegetables.	Gio Linh People's Committee provided 10 tons of paddy and vegetable seeds.
Early 2000	Relief grant and borrowing from government and mass organizations, as well as informal sources enabled farmers to invest in livestock raising	<p>In Gio My, the Central Government provided 1.2 billion VND (USD 80,000) fund for credit scheme at 0.3% monthly interest. Intensive vaccination of animals.</p>

Note: * for verification

Table 5. Community responses and local institution actions during the 1-6 November 1999 flood, Thua Thien Hue*

Date	Community activities	Government activities
Pre-disaster phase		
31 October 1999 17:00 Rains started		
1 November 1999 Medium to heavy rains	Residents did not expect the flood magnitude	
Disaster phase		
2 November 1999		
07:00 Mean rainfall recorded was at 100-200 mm (884 mm in Aluoi)		<i>Provincial CFSC officials mobilized. Information of impending flood disseminated to districts.</i> Hong Ha CFSC did not receive any information about impending flood, as communication system was very poor.
09:00 Floodwater level on Huong River at Hue station was at 5.38 m and continues to rise Floodwater on Bo River at Phu Oc station was at 5.00 m. Most areas inundated. HMS announced that weather situation will continue to deteriorate		In lowland, evacuation to higher ground started.
11:00	People in lowlands started to move to house roofs	Rescue efforts began in the lowland
13:30	In Hong Ha, everything was washed away – food, clothes, all belongings, even houses were swept away.	Flash flood in Aluoi. Hong Ha cut off by washed away bridge. Commune CFSC mobilized.
14:00 Floodwater at Huong River at Hue station peaked at 5.94 m (1.06 m above historical flood level in 1983) Whole province under 1-3 m of water		Rescue efforts in Hong Ha proved difficult as floodwater current was very strong. Entire communication system in the province was paralysed. Whole province without electricity
3 November 1999		
07:00 Short respite in rain reduced floodwater level by 0.20 m		
11:00	People in Hong Ha relied on whatever food was available – wet or floating. People didn't	<i>Central government began to mobilize relevant ministries and department to respond to</i>

	have much choice.	<p><i>emergency</i></p> <ul style="list-style-type: none"> • <i>National Committee for Search and Rescue to send more than 30 boats and ships to Hue</i> • <i>Ministry of Defense to send emergency supply (life buoys, noodles, etc.) by helicopter to Hue</i> • <i>Ministry of Health to provide medicine</i>
12:00 Floodwaters started rising again due to continuous rains upstream		
17:00		<p><i>Emergency supplies gathered at airports in Hanoi and Ho Chi Minh for delivery by helicopters to flood-affected areas</i></p> <p>Strong floodwater current caused difficulty in rescue and relief</p>
19:00		Communication between Hue and CCFSC restored
21:00 Floodwater levels upstream fell by 0.4-0.6 m		
4 November 1999		
09:00	Hong Ha commune ran out of food	<p><i>Ministry of Communication and Transport started clearing roads and railway.</i></p> <p><i>In Hanoi, Fatherland Front coordinated food aid; VNRC donated USD 30,000; international organizations provided relief assistance</i></p>
11:00		Only one helicopter with relief supply reached Hue City due to bad weather.
13:00 Floodwater levels on Huong River at Hue station fell to 3.81 m		Delegation appointed by the Government to help manage the emergency in Hue arrived.
19:00 Floodwater level on Huong River at Hue station rose to 4.14 m		
5 November 1999 Floodwater level on Huong River at Hue station at 04:00 up to 4.36 m	Hong Ha experienced hunger	Hong Ha ran out of food; no external assistance coming. Commune CFSC Chair set on foot to Hue, 50 km away, to seek food and relief assistance.

6 November 1999 Floodwater level on Huong River at Hue station rose again	External assistance, particularly food, had not arrived.	CFSC Chair promised the provincial CFSC not to return until food and relief assistance to Hong Ha is sent.
7-9 November 2003	Food arrived 7 days after the flood.	Food and clothing air lifted to Hong Ha
Post-disaster phase		
10 November onwards	Received rice support from the commune People's Committee	Hong Ha People's Committee, Party leaders and mass organizations continued to mobilize support for the commune

Note: * for verification

Role of mass organizations

Table 6 summarizes the activities of mass organizations in Quang Tri in response to the November 1999 disaster, and their important role in rehabilitation.

Table 6. Activities undertaken by mass organizations in Quang Tri during the November 1999 flood

Activities	Mass organization involved
Pre-disaster	
1. Assist in dissemination of early warning	Farmers Association, Agriculture Cooperative
During disaster	
1. Assist in evacuation	Farmers Association, Agriculture Cooperative, Red Cross volunteers, Youth Union
2. Participate in rescue operation	Farmers Association, Agriculture Cooperative, Red Cross volunteers, Youth Union
3. Tend to needs at evacuation centers (cook food, attend to the sick, etc.)	Women's Union
4. Assist in relief operation	Red Cross volunteers
Post disaster	
1. Assessment of social condition as basis for relief distribution and rehabilitation assistance/ damage and needs assessment	Women's Union, Agriculture Cooperative, Veterans Association, Red Cross volunteers
2. Repair/ reconstruction of damaged dwellings	Farmers Association, Women's Union, Youth Union
3. Assist in clean-up operation	Agriculture Cooperative
4. Extension of credit to members	Women's Union, Agriculture Cooperative

2.1.3 Flood Impacts

The impacts of the November 1999 floods were most severe, as the floods came right after harvest, at a magnitude that was unexpected. For the lowland population, the largest blow to the household economy was the loss of and damage to rice that they had stored in their houses, depriving them of both food security and main income for the year. People lost between one and five tons of rice per household. The dike and canal system was damaged which caused increased insecurity in production. The second most important source of income, animal husbandry, was badly affected. Almost all households lost pigs and poultry in the floods and in the epidemics after the floods.

In the highland, though the floods were more flash flood in character, the inundation damage was still severe and caused large losses of garden crops, such as pepper, fruit trees and cassava. The loss of income from pepper constituted the largest loss for many households. Cattle died both in the floods and of diseases after the floods, which also undermined the resource base of many households.

In Hong Ha, Aluoi District, floodwaters transported sand and stone to the productive land. Paddies were worst affected, as they were the most low-lying land. In some places, over 2 m of sand and stone settled on the land. People spent many months digging to recover their fields. Two of the 16 ha of paddy could not be recovered from the stone. Loss of paddy had the most serious long-term impact.

The loss of growing cassava had the most serious short-term impact. Most of the cassava is grown on flat land close to the river, instead of on the hill slopes as previously. Most of the 20 ha of cassava were inundated, and the roots rotted and became inedible. Cassava is normally the main source of food during the seven months between the harvest of the autumn paddy and the spring paddy. After replanting, cassava was not available again until September 2000.

Banana is another important food crop damaged by the floods. The continuous rain also caused more banana pests (yellow leaf fungi) than normal. There were very few local sources of food until the rice harvest in June. The food security situation was thus more threatened by the 1999 flood than previous floods, as the hill land does not get inundated and damaged as badly as the flat land.

2.1.4 Household Coping Strategies and Capacity to Recover

Food security

The most pressing issue that households were faced with is access to food for the next six months until the rice harvest in April/ May. Relief assistance from the Government and foreign organizations, in cash and in kind, enabled local CFSCs to extend assistance during the rehabilitation and recovery period. Rice support was distributed in several batches. The first delivery was distributed equally to all. Subsequent deliveries were distributed according to classification of households, conducted at village meetings, into three groups depending on how badly they had been affected by the floods. Each household received between 150-250 kg of rice, which lasted two to three months.

The remaining period before harvest was handled with a large degree of mutual support between the households. People lent or gave food to each other. Vegetables were planted immediately with seed support from the district. Many households, especially in the lowland communes, took loans of rice to be repaid after harvest.

In Hong Ha, the Hue University of Agriculture and Forestry provided seed support for planting various vegetables and beans. Because of the large effort required to recover the paddy fields, the winter- spring crop was not planted until March. This postponed the harvest period of the summer crop until mid-October. People were worried about not being able to harvest in time before the floods, but luckily there were no major floods in this area in 2000.

Livelihoods

In the lowland communes, people have few alternative income sources to rice. Individual household efforts and the whole institutional structure are concentrated on securing the rice harvest. Recovery of rice production was supported by infrastructure investments, credit for inputs and subsidised seed from the district. People are very vulnerable to failures in rice harvest. There was hardly any surplus from rice production in 2000 because of the high production costs for drainage and replanting. Heavy rains in January and February caused inundation of the newly planted fields and people had to replant two, and in some areas even three times. The rice price in 2000 was lower than normal (1,200 VND/kg in Hai Lang). The crop in May 2001 was 30% down in quantity and quality because of heavy rains and flooding one week before harvest. It will probably take many rice harvests before people have recovered fully.

Almost all households immediately bought new piglets, either with relief grants or credit. There was however a very high level of animal epidemics after the floods. The pigs died, people invested again and the pigs died again. It took almost a year before the animal health situation had stabilised. This was despite intensive efforts by the veterinary services to vaccinate all animals after the floods. The environment was extremely polluted by manure, excrement and cadavers floating around. The army and police force helped people in a massive action to bury the animals and clean the environment.

A major part of household coping strategies in the hill land are related to securing access to land. Land available for production has decreased due to the floods and to restrictions on the use of the hill land. People used a patchwork of opportunities to supplement their paddy production. They collected firewood to sell or worked as day labourers. They borrowed from each other and used marginal areas, which are risk-prone and not meant for production.

Labour

Labour opportunities are an important part of the coping strategies of poor households. In the hilly areas, many poor households work as day labour for other households in the commune. It is easy to find work: in the rice harvest, digging fishponds, in forestry etc. The Bo River Watershed Management Board, under the provincial Department of Agriculture and Rural Development, allocated 58 ha of 172 ha designated for forest planting in 2000. (The rest is contracted to private individuals and organizations, who, in turn, contract

households (also from other communes) to plant and tend the forest on a day labour basis.) Planting contracts are offered to the villages. All households in that village, who register for planting, can get a planting contract divided equally and according to labour capacity. The households who don't plant are mainly the ones who lack labour. As an advance for planting 300,000 VND/ha is offered, but people prefer one transfer of 1,068,000 VND/ha (about USD 70) later, in order to have funds for investment in something more substantial. After the floods, many people also went to work in the sugarcane areas in Thua Thien Hue province.

In the lowland areas, there are not as many day labour opportunities, except in the rice harvest, and the poor are often busy with their own rice. During the slack period between the crops, many people go to work in Khe Sanh in the rubber and coffee plantations, or migrate seasonally to take part in the coffee harvest in Dak Lak province.

Community work is not normally seen in the context of employment creation. Labour contribution to local investments is more often considered as the part that local people can contribute to infrastructure investments where the Government (and donor) contributes the fiscal support for material costs. Likewise after the floods, the Government provided material support for reconstruction and the community provided labour. In cases where labour is contracted for a salary, it is up to the construction company to hire the labour as they see fit. In many cases, migrant labourers from other provinces have been prepared to work for lower salaries than the local population.

Housing

The experience of the floods was most traumatic to the lowland population, especially to those who did not have anywhere to go when the water level rose right up to the roofs of their houses. The strong wind caused fierce waves, which made mobility difficult. A common reaction was to take out loans to repair and strengthen the houses, in order to feel less vulnerable to future floods. People with employment and a stable income obtain bank credit for housing. For the normal rural population who have less secure incomes, private loans are easier to access. These however have high interest rates and, if production after the flood is not stable, difficulties in quickly settling such debts arise. Housing assistance from the Government, the Red Cross and NGOs were extended to the most poor – the latter two supported the building of a few hundred new stable houses.

Health

There were no epidemics among people after the floods, which was impressive. The district health centre, commune clinics and the Red Cross distributed medicine and disinfectants to purify the water. The clinics provided chemicals and monitored sanitary conditions. There is however a continuing health problem because of the polluted river water, which worsened after the floods. Neither of the villages in this study have clean water systems.

Education

Education has not been seriously affected, despite significant material damage. Most families still kept their children in school, despite the difficult economic situation. The commune People's Committee and the district Education Section jointly invested in the

repair of school buildings and in the replacement of lost furniture and school materials. Teachers worked extra without pay to help pupils catch up the time they lost during the floods. Pupils shared books and helped each other to dry or replace wet books.

Table 7 lists factors that respondents said would contribute or limit their capacity to recover from disasters.

Table 7. Factors influencing capacity to recover from disasters in the study sites

Contributing factors	Limiting factors
Diversified income structure	Dependency on mono-culture of rice
Secure production conditions (e.g. good water control systems)	Risky production conditions (e.g. insufficient floodwater control systems)
Capital buffers (e.g. buffalo)	High levels of indebtedness through private loans with high interest
High sanitation standard for animal husbandry (no big disease problems)	A series of failed production investments because of diseases in animal husbandry
Possibilities of small daily income from collecting minor forest products	High household expenses, such as medical costs
Access to labour income	
Being part of a cooperative with well-functioning input supply and credit	

Compared to lowland communities, people in hill land communes generally recovered better from the floods. They have more diverse sources of income from forest planting, minor forest products, buffalo raising and day labour. These sources of income, spread out over the year, make them less vulnerable, minimizing the need to take private loans for sustenance.

2.1.5 Initiatives by Local Institutions for Rice Production Recovery

Government

Immediately after the floods the Government made strong efforts at all levels to quickly rehabilitate production conditions and to provide possibilities for people to rehabilitate their economy. The primary strategy was to rehabilitate rice production. The water management infrastructure needed to be repaired in order to reduce risks of inundation on the lower fields and ensure irrigation on the higher fields. The district and province supported the repairs with funds for materials, and the villagers contributed labour. The most urgent infrastructure repairs have been done, but there are still major repairs and upgrading needed for long-term production security.

As soon as the floodwater receded, cooperatives and production groups held meetings to quantify losses and identify requirements for the coming production season, both for crops and animal husbandry. Seed supplies for the coming cropping season were the most urgent need. Leaders of the People's Committee and the Agriculture Section had to make several journeys to other provinces in order to secure the rice seed supply, especially since large areas had to be replanted several times. The Agriculture Section distributed seed and

planting material for sweet potato, vegetables and other short-term crops. The People's Committee plans to build the capacity of the Agriculture Cooperative to do this task.

Credit was provided to enable people to reinvest in production. The Vietnam Bank for Agriculture and Rural Development (VBARD) allocated 20 billion VND (approx. USD 1.3 million) of credit to Hai Lang District, which was distributed as one-year credit with 0.3% interest for rice farmers for the short-term recovery of production. The decision to emphasize the short-term needs was partly an administrative convenience matter. The process of handling individual credit applications from 15,000 households at once would have been difficult. At commune level, the procedures were further simplified by the decision to distribute credit to each family, based on area of paddy land. This meant that almost everybody did access credit, including poor households who normally would have difficulties in obtaining bank credit. It however excluded people without paddy land, such as the fishermen in Van Tri village, and a few poor households who do not have paddy.

There was an expectation of additional funds for medium-term credit, which did not materialize. Such credit would have benefited the hill land communes, as they are dependent on long-term production investments for pepper, fruit trees, cattle and fish raising. Also people in the lowland communes need support to diversify production and income generation.

Agriculture Cooperatives

Many agriculture cooperatives have input supply services. They sign a credit contract with a supply company for fertilizer, which is delivered through the cooperative to the farmers, who pay after harvest. Production inputs for the winter-spring crop were needed in December-January after the floods. The State credit was not available until March 2000. The cooperatives were able to bridge that gap by buying inputs on credit contracts for delivery to farmers.

3. ROLE OF LOCAL INSTITUTIONS IN MANAGING RECENT DISASTERS: AN ASSESSMENT

3.1 Conceptual Framework

An assessment of local institutional responses to recent disasters was undertaken with reference to each major phase of the disaster management cycle. While detailed analysis is given in the succeeding paragraphs, the highlights of the assessment are shown in Figure 9. While local institutional response with regard to disaster preparedness is adequate to manage annual routine floods, these were inadequate in the event of severe floods like the November 1999 flood. Based on the experience of the 1999 flood, the local institutions could articulate the disaster prevention and mitigation strategies, which could reduce the impacts of floods. However, due to paucity of resources, the disaster mitigation and prevention measures are yet to be incorporated into development planning process at the local level.

This section is structured to provide the assessment of the performance and perceptions of local institutions in the context of the 1999 flood in respect of preparedness, response, recovery and development phases of the disaster management cycle.

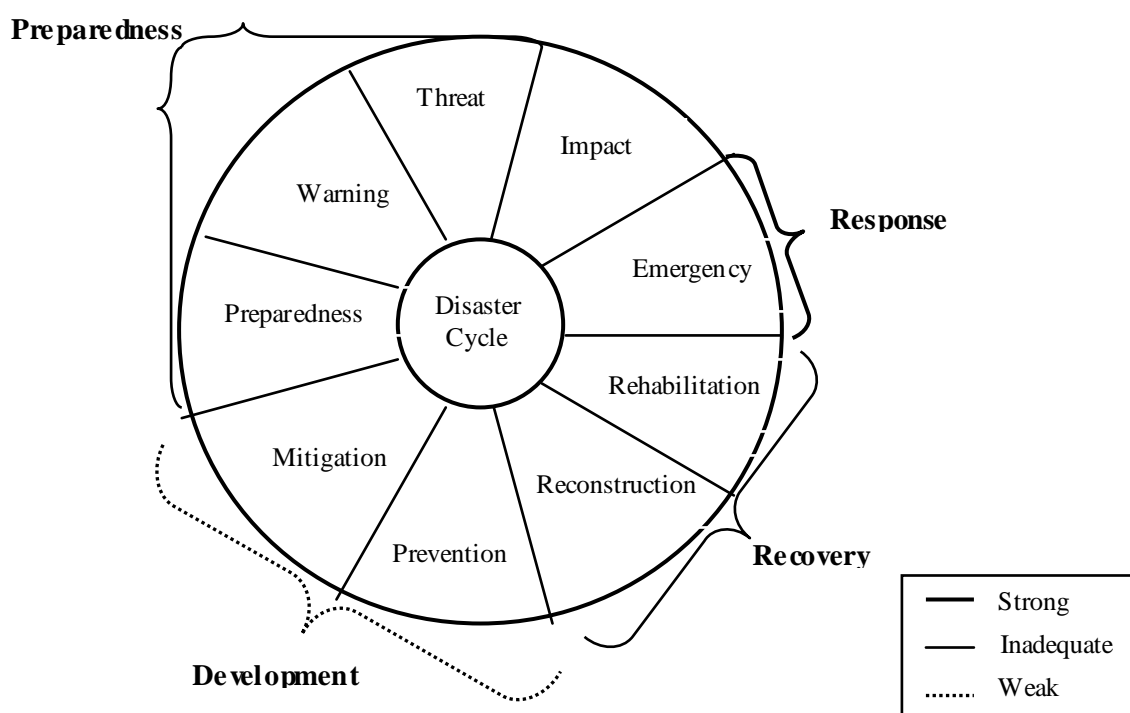


Figure 9. The disaster management cycle

3.2 Preparedness

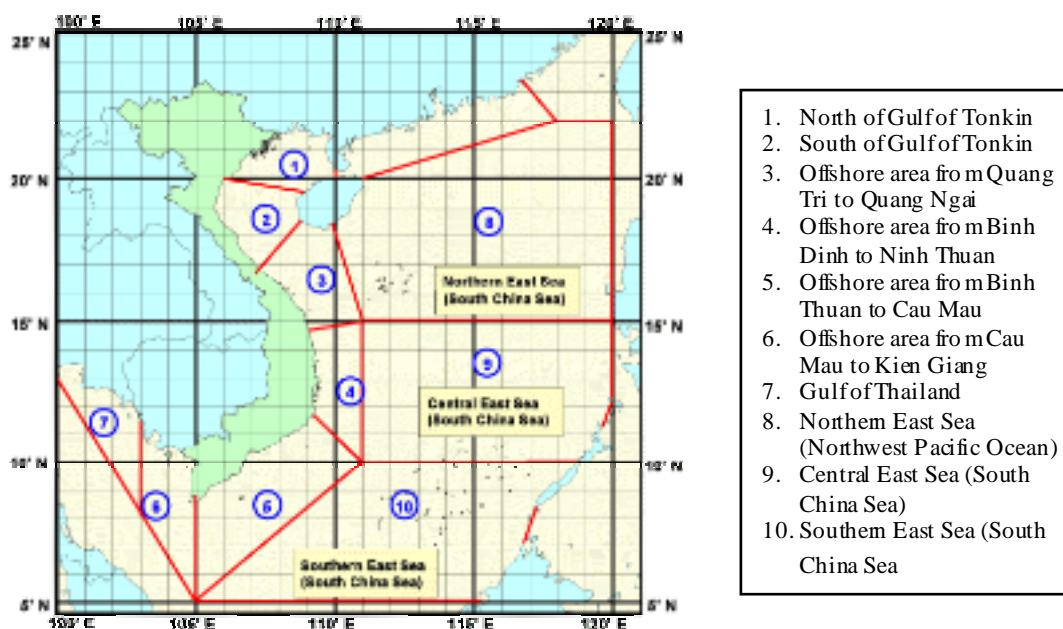
Household preparations

Although people could observe that floods are becoming worse, they prepare at a level commensurate with the worst disaster they experienced, and not at a level that might exceed their experience. In the 1999 flood, people's preparation for and local institution perception about the flood were all based on their past experience.

Some families do not begin to make any preparations until the floods are virtually upon them. Elderly, young couples with small children, and women-headed households in particular may not have enough labour to undertake thorough preparations.

Early warning

Vietnam has a good network of climatological observation stations as well as river level monitoring (Figure 10 and Table 8). The November 1999 flood was predicted 24 hours in advance, but there was no indication of the magnitude of the flood. On 20 October 1999, the region experienced heavy rains, and 10 days thereafter there was a serious weather disturbance indicating the potential possibilities of the heaviest flood during the first week of November. It would have been possible to give an indication of the magnitude of the flood based on climatological history and river behavior with reference to the 1953 and 1983 floods. As the magnitude of the flood was not predicted, people and local institutions prepared only for routine annual floods and not against the 1999 flood. Hence, most of the preparedness proved to be inadequate.



Source: HMS Vietnam

Figure 10. Offshore climatological forecasting zones - Vietnam

Table 8. Rivers for which floods are officially announced on the Voice of Vietnam and Vietnam Television by the General Department of Hydro-Meteorology

No.	River Name	Hydrostations	Water level (m) at alarm level			Proposed time		
			I	II	III			
1	Red River	Hanoi	9.5	10.5	11.5	24 h	36 h	48 h
2	Da River	Hoa Binh	21.0	22.0	23.0	12 h	24 h	
3	Thao River	Phu Tho	17.5	18.2	19.9	12 h	24 h	
4	Lo River	Tuyen Quang	22.0	24.0	26.0	12 h	24 h	
5	Thai Binh River	Pha Lai	3.5	4.5	5.5	24 h	36 h	
6	Cau River	Dap cau	3.8	4.8	5.8	24 h		
7	Thuong River	Phu Lang Thuong	3.8	4.8	5.8	24 h		
8	Luc Nam River	Luc Nam	3.8	4.8	5.8	24 h		
9	Hoang Long River	Ben De	3.0	3.5	4.0	24 h		
10	Ma River	Gang	3.5	5.0	6.5	24 h		
11	Ca River	Nam Dan	5.4	6.9	7.9	24 h		
12	La River	Linh Cam	4.0	5.0	6.0	12 h	24 h	
13	Gianh River	Mai Hoa	3.0	5.0	6.0	12 h	24 h	
14	Huong River*	Hue	0.5	1.5	3.0	12 h	24 h	
15	Thu Bon River*	Cau Lau	2.1	3.1	3.7	12 h	24 h	
16	Tra Khuc River*	Tra Khuc	2.0	4.2	5.7	12 h	24 h	
17	Con River*	Tan An	5.5	6.5	7.5	12 h	24 h	
18	Da Rang River*	Tuy Hoa (Phu Lam)	2.0	2.8	3.5	12 h	24 h	
19	Tien River	Tan Chau	3	3.6	4.2	3 - 5 days		
20	Hau River	Chau Doc	2.5	3.0	3.5	3 - 5 days		

Note: Alarm Level applicable from 1 January 1995

Source: HMS Vietnam

Provision of Climate and Hydrological Information by the Hydro-Meteorological Service, Quang Tri Province

The Hydro-Meteorological Service (HMS) of Vietnam maintains a network of regional and provincial forecasting centers that provide weather, climate and hydrological information at various time scales (daily, ten-day, monthly and six-month period). The provincial forecasting office in Quang Tri makes use of real time rainfall and water level information from eight monitoring stations, and satellite images and synoptic analysis (both surface and upper air) from international forecasting centers for a global view of existing weather conditions. Forecasting centers in the central provinces are networked to provide additional information for the preparation of localized forecasts. The centers are equipped with fax machines, telephones and internet access for information exchange.

Seasonal outlook is issued in October for the winter-spring cropping season, and in April for the summer-autumn season. Dissemination of farm advisory, based on this information, to farmers is through the extension offices of MARD.

Another main shortcoming was with flood warning interpretation. Local people, with their own grassroots experience of disasters, do not always respond to warnings. Also, there is a lack of understanding by local institutions on the interpretation and communication of flood warnings to potential victims. There is a need to develop a community-based flood warning system with appropriate capacity building at the local community-based institutions, and provincial and national meteorological forecast information providers.

3.3 Response

There was quick and comprehensive action from the Government at all levels, as well as from local organizations, in response to the crisis. Immediate action was taken for rescue operations and food distribution by the local CFSC, mass organizations and the Red Cross. District leaders were in boats during the whole flood, organizing rescue operations and food distribution. As action was urgent, more power was delegated to the District People's Committee (DPC) than normal. The DPC took the main initiative in organizing both the immediate emergency response and the longer-term efforts for recovery. The budget had to be thoroughly revised and the DPC was active in designing a strategy and in organizing resources for recovery.

At the commune level, the CFSC sub-committees involving the People's Committee and mass organizations provided rescue, evacuation, relief, assessment of damage and rehabilitation measures. At all levels, sub-committees for the Management and Distribution of Support for Flood Relief were established, with representatives of key district sections and organizations. Sub-committees for Flood and Storm Protection were responsible for the planning and coordination of disaster mitigation efforts.

The role of the village leader is greater during crisis than under 'normal' conditions. The village leader has the overview of all the activities undertaken by the various organizations and support directed to the village. Community decision-making is strengthened regarding the distribution of support from outside. Village meetings were frequent in order to decide on the distribution of Red Cross housing support, who was in extra need of food support, and so on. The village-based cooperative organizations played an important role in increasing self-reliance of the village. They built the capacity for producing the seed that the village needed, organized the storage of emergency supplies, and organized credit funds.

The Fatherland Front, Farmers Association, Women's Union, Youth Union, Veterans Association, Agriculture Cooperative, the Vietnam Red Cross, and the Buddhist community all took part in the organization of activities for repairing houses and infrastructure, cleaning up the environment, burying dead animals and replacing losses. People organized labour teams to help each other to recover the land. There were frequent village meetings on how to handle the crisis, and people in the village looked out for and supported each other.

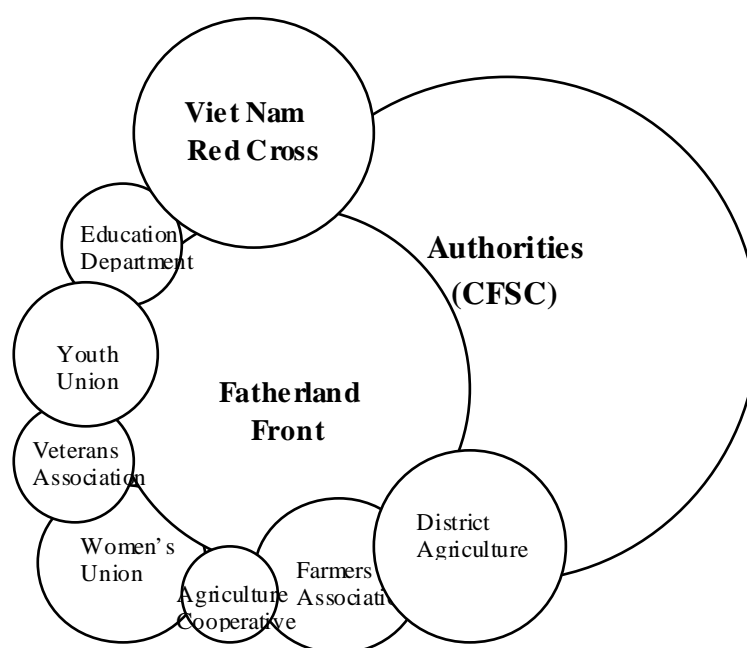
Mass organizations, village and commune leaders spent a lot of time on social visits, supporting people, finding out about what damage people had suffered and how people were coping. It is socially very important that leaders of the village and commune organizations visit as many households as possible to see how they are, and show that they care. During the interviews, people would always specify which leaders of organizations

had visited them to enquire about their situation. The cases where commune or village staff failed in these social commitments were seen as a serious problem, impacting on their credibility to continue in their positions. Table 9 shows how respondents assess the role of mass organizations after the November 1999 flood.

Table 9. Assessment of the role of commune and district organizations after the floods, Hong Ha Commune [1]

Organisation	Scoring	Activity	Comments and Proposals
District and provincial organizations			
Red Cross	10	Relief support (housing, food, water, blankets, mosquito nets)	Should target the support better, and concentrate on the households who need it most
Welfare organizations (Buddhist and Christian)	10	Relief support (food, medicine, clothes, money)	The clothes should be clean and not worn out Hesitant on whether there are “strings attached” to the support
District Agriculture Section	10	Seed, technical support	Very valuable seed support
District Women’s Union	7	Rice and milk for women and children; schoolbooks	Very little physical presence from the district Women’s Union at village level
Hue Agriculture University	10	Relief support of food, seed, fertilizer, funds	Very valuable support.
Vietnam Bank for Agriculture and Rural Development	6	Credit for recovery of production	Should have more clear information regarding what it is possible to get credit for, and about credit procedures Medium- and long-term credit needed. One-year credit is too risky.
Bo River Watershed Management Board	8	Labour opportunities in tree planting	Planting sites are too far, so not so many households registered for planting
Commune organizations			
Commune People’s Committee	10	<ul style="list-style-type: none"> • Mobilized support from outside. • Distribution of support according to need. • Mobilized people to recover production. • Support for the poor for Tet (New Year) holidays 	“Without the People’s Committee we wouldn’t have any commune at all.” The PC should establish a welfare fund
Farmers Association	10	<ul style="list-style-type: none"> • Mobilized people to support each other • Fund – 5,000 VND/ household • Direct visit to the households 	
Fatherland Front	8	<ul style="list-style-type: none"> • Coordinate and encourage the work of the other organizations • Visit households in trouble 	“They should take the lead, more than they do today.”
Village	10	<ul style="list-style-type: none"> • Guide everything in the village. • Organise how people help each other. 	“We need a better meeting room, with more seats. Often we are so many, that many have to stand.”

There is some diversity as to who took the lead on response among the mass organizations in different localities. In almost all cases, VNRC played a key role; in some cases the members of the Women's Union; and in other cases, the Farmers Association. In all cases, there was much collaboration between them and with others, including the Fatherland Front, Veterans Association, Youth Union, etc. These organisations divided responsibilities according to their mandates, and led on different aspects of response and recovery. For example, the VNRC led in many localities on safety, rescue and evacuation, and training and information dissemination in this regard; the Women's Union on food preparation. The inter relationship of local institutions with macro level institutions are shown in the Figure 11.



Note: The size of the circles represents the relative importance of the organisation (to local disaster management). Overlap of circles indicates closeness in relationships.

Figure 11. Stakeholders in disaster management, according to officials and staff of mass organizations in Quang Tri Province

3.4 Recovery and Development

Land use

In the mountain areas, land management issues are seen at both the commune and district levels to be the key, both to the immediate capacity to recover from floods, and to long-term development.

Today, the management of the hill land is controlled by the Bo River Watershed Management Board, the Forest Station and the State Forest Enterprise. The Watershed

Management Board designates which area to plant and with which species, without consulting either district or commune authorities. Households do not take initiatives to develop the sloping land for fear that it will be claimed for forest planting in mid-crop season.

The main provincial level strategy for improving access to land is through a resettlement programme to open up new areas for cultivation along the Bo River Valley. Thirty-five households have already moved there. The development strategy is mainly based on the cultivation of fruit trees and pepper. The new area is less at risk from flooding but the development strategy involves other risks especially initially, because of lack of experience, lack of market channels and market information, and insufficient development of input supply networks.

In the case of Hong Ha commune, there seems to be unused potential in the development of natural resources available. The management structures are not meant for the use and development of the hill land resources, they are meant for protection. Commune and district authorities are arguing for a revision of land use planning and land management with the following purpose:

- Make a detailed assessment of the protection needs in the watershed and assess what kind of ground cover is required, and in which areas. The existing plan is too general and defines practically the whole area as protected land.
- Analyze which land, presently defined as forest land, could be developed for agriculture or agro-forestry purposes.
- Increase district and commune capacity for the development of agro-forestry, which would fulfill the multiple purposes of environment protection, sources of income and sources of food.
- Include bamboo planting along the river as part of the tree planting program.

Institutionally, this would involve:

- Increased resources for the district and commune to conduct land use analysis and land use planning.
- Clarification of commune and household rights regarding the hill land close to the settlement area.
- Allocation of hill land to the commune and households for agro-forestry development.
- Redefinition of the mandate of the Province Watershed Management Board to involve the district and commune authorities in the planning and management process.
- The use of personnel resources of the Forest Inspection System to support the commune and households in forest development and management.
- State support for commune management of bamboo planting for reduced riverbank erosion and flooding.

Credit system

In the lowland and hill land areas of Hai Lang District, the main institutional issues regarding recovery concern credit and insurance systems. The credit requirements include:

- Community management of savings and credit funds which can partly replace the need to take out private loans to bridge seasonal gaps.
- Long-term credit for flood recovery, which is paid back in installments.
- Improved capacity for the cooperative management of input supply credit.
- Credit and insurance systems which enable people to take more risks in the process of developing new lines of income generation for diversification.
- Insurance policies protecting against harvest losses and damage to property.
- Special credit and extension support programmes to help poor households who are deeply in debt to gradually stabilize their economic situation.
- Health insurance policies.

In the communes studied, the credit for flood recovery has not been sufficient for recovery. The credit was largely used to replace lost resources, mainly rice, and did not contribute to the accumulation of new resources. It is therefore difficult for many people to repay. In order to be effective for recovery, the repayment term needs to be longer, with repayments made in installments relative to the harvest seasons.

The combination of old debts, which were difficult to pay back after the floods, and new debts, both formal and informal, put some households in a situation of negative debt spiral, which is difficult to get out of. These households would need special attention to help them out of their difficulties. The Government is generally reluctant to cancel debts despite of a ruling to cancel bank debts if the investment loss in the floods exceeded 80% of the loan value. The State has been more liberal in granting prolongation of a loan period, rather than cancelling debts.

Normally VBARD does not give new loans if the old loans are not yet repaid. The Bank also does not allow loans to be used to repay private debt. A special programme would thus be required for households caught in this debt spiral, with a combination of credit to service old debts and provide for income generation. They would need special extension support to make sure that the income generation efforts payoff. They would also need support with overall household economic planning over a long time period. This could possibly be a role for the mass organizations at commune level, with support from household economic expertise from the district planning section and finance section.

Much of the rice, which was lost in the floods was supposed to be used to pay back the input credit to the cooperative for the summer-autumn crop (1999). When the State credit for recovery of production arrived in March, it was in many cases used to pay back that previous debt to the cooperatives. The flood recovery credit was thus necessary for the whole input supply system to function. Without it people would not have been able to repay the debt to the cooperatives, and the cooperatives would have become bankrupt. Vice versa, without the cooperative input credit, the State credit would have come too late to be useful for the winter crop after the floods.

Allocation of the State credit in Hai Lang District was based on area of paddy production. This was mainly a practical decision, in order to be able to administer the quick distribution, and for the credit to reach a vast majority of the households. The credit was mainly used to secure inputs for rice production, but was also used for other production purposes. Those who lacked resources for recovery were groups such as fishermen, who don't have any paddy. Most of the hill land population have a little paddy land.

For the mountain commune, credit was restricted to recovery of losses sustained in fish raising, the main source of income generation that was affected by the floods. Very few households in Hong Ha commune had access to credit. The type of losses in the mountain areas (land fertility, cassava, banana) was not defined as economic resources (in the sense that they had not been bought nor were to be sold) and this influenced decisions on credit allocation, reportedly made as a result of province directives.

Private loans

Private loans are a common way for poor people to bridge the food gap during the months before the harvest of the winter-spring crop. These loans are paid back directly after harvest, and are normally not a big problem if they do not accumulate. The problem with private loans was decreasing before the 1999 flood because of increased availability of other sources of credit. After the floods, the situation became more difficult, as people have taken out more private loans than usual. Income during the years after the floods has been low and people have had difficulties repaying the loans.

The local money-lenders are often local traders or more well-off households in the community or neighbouring communes. There is a degree of social pressure on these households not to claim too high interest rates. But there is little open discussion about the problem at commune level. Households who take out loans do not normally talk about it. Loans from traders are more difficult to control, as they are outside community social pressure.

Resources for recovery

Apart from the food relief and production credit, the third large area of emergency support was the provision of subsidized seed. Local government and local organizations expended great efforts in purchasing seed, both for rehabilitation of normal production, and for planting emergency crops of vegetables and tubers.

In the mountain commune, people struggled hard to recover their land from sand and stone. Many people were digging full-time for two months. Their access to land is very limited and mainly restricted to the low-lying land close to the river. Much of the land was cultivated with sugarcane, which could not be sold, so a great deal of effort went into clearing that land for food crop production. Access to hill land for cultivation is limited either by rules protecting forestland or because the land is covered with imperata grass, which makes cultivation difficult. Resources for recovery are therefore scarce.

There were large sanitation problems after the floods, causing epidemics of animal husbandry diseases. Many people, who reinvested in pigs and poultry after the floods, were

again faced with losses. There were however no human disease epidemics, due to massive disinfecting efforts with chlorine added to all drinking water.

The poor have experienced the greatest difficulties in recovering due to four main factors:

- 1) The poor have houses of poorer quality, which therefore sustained greater damage than the houses belonging to the better-off. The poor used more resources to repair and strengthen their houses in proportion to their total resources.
- 2) The poor had a higher degree of production failure in animal husbandry due to diseases caused by lower standards in sanitation and less production knowledge.
- 3) The poor have a less diversified household economy and are more dependent on paddy production (lowland) and cassava (mountain area).
- 4) The poor often have lower labour capacity and poorer health conditions. The recovery process is often very labour-demanding.

The households in Hong Ha commune are very articulate in their assessment of the work of the commune and district organizations, and they have clear demands and expectations of the services that these organizations should provide (Table 10).

Table 10. Perspectives on organizational relations for long-term development
Hong Ha Commune [1]

Organisation	Scoring	Activity	Comments and Proposals
District and provincial organizations			
Red Cross	10	Mobilise mutual support groups. Mobilise annual member contributions.	Many people take part and contribute. The Red Cross pays continuous attention to the situation in the village.
District Agriculture Section	6	Extension and seed supply.	Should have more direct guidance at household level and more often. An input supply service at local level is needed. Seed received is according to the plan of the district. People do not know how much they will get.
District Women's Union	7	Family planning. Credit.	Too little presence at village level. More credit with low interest rate is needed for crops and animal husbandry.
Hue Agriculture University	10	Guidance directly to the households. Training, trails and inputs.	High commitment and high sense of responsibility. A lot of positive production changes because of the university. "But what happens when the project finishes? Will you still come and see us?" Advice on garden development and help with the marketing are needed. More research on hill land development is also needed.
Bank for Agriculture and Rural Development	8	Credit for production.	Long-term credit and more guidance on credit use are needed.
Fixed Cultivation and Sedentarization	10	Managing the "135 programme".	The road investments have not been good enough. Not enough drainage structures.

Department		Development of the “new area”.	Need more stable irrigation investments.
Bo River Watershed Management Board	8	Labour opportunities.	“We hope to get income from harvest of the forest also, but probably we won’t.” Advance information on land use and tree planting plans is needed. Change the forest land planted close to the residential area to a mixed cropping system.
District Forest Station	8	Guidance and permissions on exploitation of wood for housing and areas for swidden cultivation.	“They should not be so suspicious of us. They always think we have the wrong purpose.” “They are not interested in our livelihood situation, only in the forest.” “The past 3 years we have not received any guidance on where we can cultivate.” “They should reduce the fees for extracting wood for housing.” There is a lot of paperwork and procedures to cultivate land that people have cultivated traditionally for a long time. “They are very slow at reacting when we discover outsiders extracting wood.” “They should not make a profit from the wood that they confiscate.”
Commune organizations			
Commune People’s Committee			The PC should give even more attention specifically to the poor and handicapped people on production issues. The PC should use and encourage peoples’ cultural capacity more.

CFSC focus on preparedness and mitigation

After the 1999 floods, the central provinces have put greater importance on preparedness and mitigation. In Thua Thien Hue, the following have been achieved after 1999:

- disaster preparedness was enhanced, with the identification of most vulnerable areas
- disaster management plan drawn down to district and commune levels
- rescue teams created at the commune level

In Quang Tri Province, the following projects have been prioritized by the provincial CFSC to mitigate and prepare for disasters:

Early warning:

- Additional observation stations to support forecasting activities
- Improvement of communication system from observation stations to the provincial HMS station

Preparedness:

- Preparation of inundation risk map
- Community-based disaster management training
- Setting up evacuation plans in vulnerable communes

- Infrastructure for evacuation

Mitigation

- Reforestation (currently has 36% forest cover). This will also help address the drought problem.
- Upgrading of the river dyke system
- Construction of an upstream reservoir for flood control during the rainy season, and for water storage during the dry season

Currently, the Ministry of Science and the Environment is implementing a demonstration project to shift the cropping calendar to adapt to floods, while the Ministry of Construction is pursuing the design of cyclone and flood resistant houses. Funding is, however, a constraint, as funds from the Central Government are not sufficient to support these prioritized projects.

In Gio Linh District, officials reported that the Central Government, as well as some NGOs, has provided assistance in upgrading infrastructure, such as elevating dwellings in communes prone to inundation and reinforcing houses in communes prone to cyclones. Projects, which they have prioritized for funding assistance from the Central Government and other organizations, for disaster mitigation and preparedness are:

- Local level training on agronomics
- Fishery extension center
- Potable water supply system
- Small-scale irrigation scheme for upland areas
- Riverbank works to prevent bank collapse
- Strengthening of evacuation sites
- Reforestation

In Hai Hoa, the CFSC has also identified priority projects to enhance its capacities for emergency response, as well as to mitigate and prepare for disasters. These are:

- Boats for search and rescue
- Construction of elevated latrines
- Post harvest facility to dry paddy
- Digging of canals necessary in the shift from winter-spring rice to fish and lotus
- Construction of dykes to protect the commune from flooding

4. CONCLUSIONS AND RECOMMENDATIONS

Evolution of vulnerability and changing role of local institutions

Vulnerability is changing in the following fronts:

- *Community involvement in dyke and infrastructure maintenance.* Historically, thousands of trained water professionals and millions of labourers have worked annually to maintain the flood infrastructure. Economic pressure on government and alternating economic opportunities for labourers are increasingly making this level of human resource commitment difficult. For example, only a few decades ago, people protected by the dykes were required to donate 20 workdays per year to maintain the dykes. In 1993, the commitment had fallen to only 10 days, and is likely to fall again in future. There is a need to understand this trend and redefine the role of local institutions, with appropriate financial mechanism to maintain the dykes.
- *Changing cropping pattern and practices.* The main reason for the reduction in crop losses in the lowlands in 1999 is due to the shift in the cropping calendar. The summer-autumn harvest is now well timed, and the entire harvest is done before the onset of the flood season in September. However, the stocks of rice are kept at homes and the floods like 1999 either carried away the stored rice or damaged it beyond human consumption. Hence, food security for the community till the harvest of the winter-spring crop in May-June 2000 was a serious concern. Farmers were reluctant to dispose of surplus stock due to falling prices. Local institutions, based on the 1999 flood management experiences, could devise appropriate mechanisms to either store the surplus stock in safe areas or devise suitable financial incentives for marketing surplus stocks.

In mountainous areas, the recent practice of cultivating food crops like cassava on riverbanks instead of hilly slopes rendered cassava vulnerable to floods. There is a need to revert back to a traditional crop growing practice.

- *House construction practices.* Fifteen years ago, typical villages in Central Vietnam were a cluster of houses with thatched roofs, a pole or bamboo frame, and bamboo mat walls. Most, if not all, of the materials came from the locality, and many of these materials could be gathered. Capital investment in the home was very low and few inputs were monetary, even though families have always set social importance on getting, if they could, a good timber roof frame. Although many houses were frail and easily destroyed by typhoons, recovery could be achieved at relatively low cost and depended significantly on family and neighbour support. Once the immediate effects of a typhoon had subsided, village reconstruction took place quickly.

By the mid 1980's families began improving their homes. New and purchased materials, such as cement, fired bricks and roof sheets, came into more widespread use. But along with these changes in building practice many of the storm resistant features of traditional housing, that, for example, had tied the roof down and held the structure together, have been neglected. The result is

that along with investments in improvement and new building, there is also more materials, investment and effort, which are at great risk of being lost and destroyed.

It is a paradox that the very real improvements that have been made in building have contributed to increased vulnerability to loss, when this loss is considered in terms of the cost to the family of recovery and rebuilding a damaged or destroyed home after a disaster. Because more time and money has been invested in the home, this cost has become considerable. Vulnerability has in effect increased. Redesigning affordable houses with appropriate technologies with new financial mechanisms require a group effort. Local institutions could play a critical role in building resilient homes

- *Environmental degradation.* Along the coast, mangroves and coral reefs have been removed, exposing coastal settlements to more cyclonic wind and waves than ever before. In the hills and mountains, removal of trees due to war and human development has increased erosion and run off. Hence flood levels are becoming higher than before. At the same time, with a less and less water infiltrating into the ground, dry season flows are reduced and there are emerging problems such as severe water shortage and salt intrusion. Involvement of community and local institutions in natural resource management, considering the grave disaster risks, could address this emerging risk.

Community-based early warning system

The generation, interpretation, translation and communication of flood warning information requires an in-depth assessment of community perception and of the role of local institutions in this regard.

Community-based disaster risk reduction

Decisions about the use of Government stocks and reserve funds for rice are centralized. Larger amounts can only be released through permission from the Prime Minister's Office or delegated officials in the Ministry of Finance. This means that decisions take time, and once a decision is made it is possible that market prices have gone up, and amendments in the quantity of rice or requested funds need to be made, leading to further delays. Some officials and staff of mass organizations recommend that decision-making about the use of reserve funds and rice stocks should be decentralized, probably to the commune and in some cases possibly to the district level.

A community-based approach to disaster risk reduction

- allows communities to identify their vulnerabilities and articulate their needs
- allows CFSC sub-committees to work with communities in finding solutions to these needs
- recognizes the strengths of communities

There is a need to identify the list of eligible activities and appropriate management mechanisms, and to entrust these tasks to communes and mass organizations. Table 11 lists some of these activities.

Table 11. Suggested activities for community-based disaster risk reduction [4]

Area	Sample activities
Preparedness	
Strengthening of natural disaster information and planning systems	<ul style="list-style-type: none"> • Floodplain and hazard mapping • Community early warning system • Land use planning • Public visits to forecasting stations, land use planning offices, government offices in charge of design standards and hazard mapping
Storing of local reserves	<ul style="list-style-type: none"> • Food and water • Non-prescription medicine • Reserve fund
Small-scale local infrastructure	<ul style="list-style-type: none"> • Small water-retention dams • Wells, water tanks (water supply) • Sanitary facilities • Stabilization of riverbanks • Bridges and culverts • Raised earth pads • Dykes • Water pumping facilities
Safety measures for children	<ul style="list-style-type: none"> • Integrating disaster management concepts in school curriculum • Lifejackets • Child care centers • Swimming lessons • First aid
Communication of early warning	<ul style="list-style-type: none"> • Telephones (including mobile phones) • Radios
Response	
Training	<ul style="list-style-type: none"> • Rescue methods • Swimming • Management of dam and reservoir breaks, safety checks • Agricultural extension
Rescue	<ul style="list-style-type: none"> • Boats • Lifejackets • Stipends for rescue workers
Hygiene during emergencies	<ul style="list-style-type: none"> • Seminar on combating common health problems during emergencies • Water treatment (e.g. filter, disinfectant) • Portable toilets • Waste disposal facilities
Recovery	
Assistance for livelihood recovery	<ul style="list-style-type: none"> • Advice and skills training • Credit • Grants

Lessons of the 1999 floods could pave way for new policy changes for disaster reduction and natural resource management

Hong Ha commune is affected by the trend in increased local responsibility for development planning in Vietnam. As elsewhere in the country, local institutions are beginning to implement the Grassroots Democracy Program (by Government Decree No. 29, 1998), which calls for increased discussion of development priorities and budgets among local people, and for commune authorities to exercise greater transparency and accountability in their interactions with local communities. Hong Ha is particularly affected by a recent government program (Program 135), which directs development grants to the country's poorest communes. The Program provides grants on an average of US\$ 30,000 per commune for small public infrastructure works and strengthening of local capacity and participatory approaches in development planning (World Bank et al., 2000). This provided additional powers for development decision-making to existing local authorities, along with the funding to carry out their priorities.

In spite of this move toward local empowerment, in the natural resources domain, a significant portion of the assets in Hong Ha commune remain under the strict control of a highly centralized and distant institution, the Bo Watershed Management Board. The Board operates directly under the national Department for Agriculture and Rural Development. The Board controls large swathes of tree-covered land and barren land designated for planting. It develops a design for forest planting bilaterally with a team from DARD and submits this plan to the provincial authorities for approval. Only after this process does the Board inform the district, commune and village of its decision.

Commune authorities have proven highly responsive to villagers' needs and concerns in the immediate aftermath of the 1999 flood disaster. For instance, they ascertained which households were most affected, and successfully mobilized emergency support from numerous outside organizations. Villagers appreciated these organizational efforts, claiming that without the People's Committee, "we wouldn't have a commune at all."

In the longer-term effort to recover livelihoods and production systems, the commune leadership has continued to play a prominent role. Drawing upon the grant resources made available by Program 135 and its new latitude in decision-making over infrastructure development and poverty alleviation at the commune level, the People's Committee has become increasingly active on several fronts. It has taken a greater role in formulating development plans for land use development, organizing input supply, training commune extension workers, and planting bamboo and indigenous species. Together with the local communities, the commune leadership has made agro-forestry development on hill lands a priority in order to alleviate poverty and achieve ecological objectives; such a strategy could reduce villagers' reliance on vulnerable, stony lands in the flood plain.

Villagers credit the institutional shifts as having increased the appropriateness of local development efforts overall. A significant factor in the strong accountability relations of the commune leadership is the enduring social relations that bind the community. The commune leadership is composed of ethnic minority people from the same groups as its constituents, and they share norms of reciprocity, language, and family bonds. The social structure in the commune is not highly differentiated. These factors increase the trust and cooperation between villagers and leaders. The Thua Thien Hue experience also informs

policy discussions of what is the right level to which land use and agricultural development decisions should be devolved. This case argues for the commune as the "right" level because, at this scale, both social bonds and the opportunity for diverse and meaningful community consultation in decision-making exist.

In village discussions, the People's Committee was faulted mostly for failing to spend more time on recognizing and developing the potential of the poor and handicapped. Although socio-economic differentiation in the commune is not great, those at the bottom of the scale, primarily women, still face daunting difficulties in finding the time and energy to attend village meetings. They will require extra attention if they are to share in the benefits of local projects.

To advance local communities' development interests, commune authorities believe they will need to gain more experience and technical expertise in the development of markets. Households seek opportunities for diversifying their production systems to reduce risk. However, the lack of local market institutions is hindering these efforts; people cannot access the range of inputs they require, nor can they sell the range of products they would like to grow. Empowering local institutions to act as intermediary between producers and markets could promote sustainable development in disaster risk-prone areas.

Commune management of savings, credit schemes, inputs, land use planning could be the key to reduce long-term disaster risks

Improved capacity for commune and village management of resources would increase capacity to cope with crises. Community-managed savings and credit schemes would improve access to credit and would be more flexible than the bank in adapting to the conditions of each household. Community management of production and supply of seed and inputs are vital for quick recovery in crisis situations, but also for the normal access of inputs, especially for the poor.

Commune management of the hill land around the settlement area in the mountain communes could have the advantage of increasing flexibility in land use according to changing circumstances. In emergency cases, as in the coping period directly after the floods, there could be a larger tolerance regarding the use of hill land for food production. Loss of land for some households could be temporarily compensated with other land. From the long-term planning perspective, the commune would have more possibilities and incentives to develop forestry and agro-forestry production, including cash crops, food crops, fruit trees, high value forest species and medicinal herbs, and would increase sources of income and reduce vulnerability to crises.

Resources under control by agencies or local institutions outside the commune are perceived as the main constraint for recovery

Hill land villages have the highest capacity to recover due to a more diversified economy, with more access to sources of income from forest planting, collecting firewood and animals grazing in the hills. There are also more labour opportunities all year round in a more diversified production context. The hill land people are thus more flexible and have

more control over their sources of income than both the lowland and the mountain population.

The lowland is largely a monoculture economy, which is dependent on two major points of income each year from the rice harvests. If the harvest fails, or if funds are required at other points in time, there are few options other than taking out loans. Labour opportunities are mainly available during rice planting and harvest. The people in the mountain commune have certain possibilities of solving emergency needs by collecting minor forest products. The remoteness of the commune means fewer labour opportunities, less access to inputs and markets. The main constraint to recovery is perceived as being people's limited access to land and forest, as most of the area is under the control of agencies outside the commune.

Commune and district level local organisations could be sensitive to the needs of different groups of people for effective natural resource management and reduction of disaster risk

The production environment during the years after the disaster also has a large impact on the capacity of people to recover. The immediate coping after the disaster has been solved by various emergency efforts. The risk of severe damage to household livelihood conditions comes from the series of production problems, which constrain the households in their recovery process. In the lowland, these constraints are heavy rains during crop season, reducing the harvest; low rice prices; and animal husbandry diseases. The conclusion would thus be to concentrate development efforts on improved drainage capacity, diversification, marketing efforts and improved veterinary services. To be able to control the drainage and irrigation of the fields, and thereby be less dependent on the weather, is a high priority for people both in the lowland, hill land and the mountains. In the mountains it is also a way to increase access to land. Larger district and commune control over the planning and implementation of water management investments tends to increase the degree of sensitivity to balancing the interests of different groups of people.

Local institutions could appreciate the nuances of individual households' capacity to recover rather than losses suffered, and hence provide direction and targeting of disaster management activities

Policies for recovery have focused more on the absolute value of damage by the floods, and less on relative damage. A consequence of this has been less attention to recovery of household food security in the mountain areas even though the relative impact of the floods for people's livelihoods seems to have been as serious in the mountains as in the lowland. Institutional arrangements, which guarantee that the mountain population have enough land to ensure food production have a high priority. Also in the lowland, there are certain villages and people who have more difficulties in recovering because their overall production and livelihood situation is more difficult. Looking at the capacity to recover rather than at the value of the loss would focus attention to the poor and vulnerable in the support for recovery. This would involve greater attention to non-production aspects of recovery, including the support for secure housing, sustenance and health.

Local institutions have immense social capital to collectively address disaster risks

Social capital that bonds a community is important for the livelihood outcomes of natural resources management. In Thua Thien Hue, such ties increased the responsiveness of local institutions and mass organizations to community concerns. The crisis caused by the floods led to the mobilization of organizations at all levels. The village and commune organizations became more active in organizing mutual support. The community spirit continued, as organizations helped households rebuild and maintain their livelihood systems. The pre-existence of mass organizations (e.g. Farmers Association and Women's Union) helped to mobilize people effectively. Households contributed rice and cash to funds held by these organizations, which were redistributed to the most needy. People organized labour teams to help each other recover land that was buried by sand and stones. Villagers held numerous meetings to establish ways of coping with the crisis and helping each other

Since the floods, and in the context of commune authorities' new responsibilities, the leadership has reached out more often to community members to hear their concerns. Community members are increasingly articulate in their assessment of the commune and district organizations' work, and have clear demands and expectations regarding their roles and the services they should provide.

Local people themselves are their most important resource for rescue, protection, survival and recovery. Their personal experience of floods is their most important source for increased awareness of flood risks to life and property. There is a need to have an in-depth study of social and economic aspects of local institutions and evolve a policy support to streamline functioning of local institutions in this regard.

Local institutions could be motivated to treat climate variability associated risks as a continuous threat to livelihood of communities

Recurring natural disaster risks continue to undermine development efforts and poverty alleviation programmes due to non-integration of location-specific disaster risks into development planning. Empowering communities and local institutions to enable them to treat disaster risks as a continuous threat to livelihoods is hence an imperative need in integrating disaster risks into the planning process at the local level.

Empower local institutions through national policies and translate these to operational programmes

The management of the 1999 flood in Central Vietnam underscored the importance of the role played by local institutions like the People's Committee and mass organizations. Local institutions assisted the communities to a considerable extent during the first three days of the floods. Outside help effectively reached only on the third day. Realizing the role played by the local institutions, the government announced four on-the-spot disaster management policy (*Phuong cham 4 tai cho*):

- 1) Prepare and mobilize "local forces", meaning members of various organizations and shock brigades to help the local people
- 2) Provide conditions so that people can stay where they live
- 3) Support people to earn a livelihood nearby

- 4) Ensure that services such as schools and hospitals, as well as relief goods are available nearby

Translating this policy into practice requires capacity building of local institutions based on systematic assessment of their strengths and weaknesses.

APPENDIX

Anecdotes

A single Mom's story



A single mother and her 16-year old son live in this dwelling made of galvanized iron roof and walls. Her 500 sq m farm provides 0.2 ton of paddy per cropping. She raises pigs and chickens, and plant tubers in her garden. These provide for their food requirement.

Gio My is prone to inundation during the rainy season, which affects this family 2-4 times/ year. Depth of floodwaters is from 1-1.5 m. They move out to the sand dunes when floodwater level reaches 50 cm.

Before the floodwaters came in 1999, they received the warning issued by the village sub-committee from a loudspeaker. The mother elevated her paddy, and stayed put, until floodwaters came into her house at 9:00 pm. By that time, local authorities were already moving people, including the family. They stayed at the sand dunes for a week. Community members helped each other.

She lost all her assets, and since the flooding was worse than previous events, found the paddy that she raised soaked as well. For the next two months, neighbors helped by exchanging rice for her wet paddy, which they used as livestock feed, and provided food. She received seeds from government, and planted half of her plot to paddy, the other half with vegetables (cash crop) to tide her over. She also borrowed VND 2million (about USD 133) from the Vietnam Bank of Agriculture Development and bought piglets and chickens. She was thankful that these were at normal price, a sign that others did not take advantage of the flood victims' situation. She completed paying off her debt in 2002.

As last year, she lost her summer-autumn paddy this year because of drought. She borrowed VND 1million from relatives to make ends meet (this time, she did not borrow from the bank as she was concerned that she might not be able to repay on time). She was also able to access the Women's Union credit fund for VND 50,000 at very low interest.

When asked what she would do had she received a forecast of below normal rainfall for summer-autumn, she said that she could have planted mung bean, and realized an income. For her, farming is her life, and even when given a chance to live her life over again, she said that she would still choose to be a farmer.

Alone, but tough

Duong Thi Gai is 65 years old and living by herself in Hai Hoa Commune. She cultivates 1,000 sq m of paddy, just sufficient to provide for her one-year rice need. Prior to the 1999 flood, she lived in a small hut made of light materials at the river's edge. She reared 6 heads of chicken and 2 pigs for income, to add to the VND 2,000 (USD 0.13) government monthly assistance, for her other basic needs. Inundation occurs every year, but her hut is elevated by about half a meter to keep the waters below.



Duong Thi Gai in her new house with her stock of paddy.

In November 1999, she had just harvested and paid the farm inputs, when the rains came. At 7:00 pm of the third day of continuous rains, water was at her floor level. Knowing that more rains will flood her hut, she painstakingly loaded her paddy on a borrowed rowboat for moving to the commune hall, 500 meters away. She remembered coming back to load the remaining paddy, a blanket and other personal things. She doesn't remember hearing the warning bells from the local authorities, but acted from experience.

The rushing waters carried away her hut, including her chickens and pigs. She stayed in the commune hall for 10 days, and lived with relatives. The People's Committee provided bamboo, galvanized iron sheets for roofing and other materials for a new hut. The Youth Union and other commune associations helped in building her hut. A month after the flood, she was able to move in to her new hut.



Ms. Gai's elevated, concrete house; the river is at the background.

Two months after, the Catholic Relief Services came with the People's Committee, and offered to build her a house made of concrete. They required her to provide an elevated concrete flooring as counterpart contribution, for which she invested a total of 3 million VND, 1 million VND coming from her paddy sales and 2 million VND by borrowing from an informal lending source at 2% monthly interest, which she paid in 3 years. She is not qualified to borrow from the agricultural development bank because of her age and, during that time, the Women's Union ran out of funds for lending.

Now, she's confident that her house can withstand the yearly inundation and flood of the 1999 magnitude. She still tills her paddy, raises chickens, ducks and pigs, and pleased with the increase of government assistance to 52,000 VND (USD 3.5) monthly. She still lives alone, but her neighbor's children come for company. When asked why she did not consider re-settling to a higher ground, she said that she did not have any choice, as the land was provided by the government. Her only worry is when she gets very old and unable to provide for herself.

A little man, with a big heart for his people

The Chairman of Hong Ha People's Committee very well remembers the flood of 1999. He did not receive any warning of an impending flood since the communication system with the district or provincial committees for FSC was very poor. Personally, he was not expecting any flood either, even after more than 7 days continuous rains (the last flood episode in the commune was more than 15 years back).



The Chairman of the People's Committee (at left), with the study team and the children of Hong Ha

When the waters came rushing down the rivers on that second day of November, the commune was flooded, and cut off from the outside world as the waters swept away the bridge that connect the commune to the rest of the province. He immediately convened the Commune Subcommittee for FSC. They did whatever they can to manage the situation.

On the third day of the flood, the commune ran out of food, and none was coming. With resolve, he set on foot to Hue City, more than 50 km away, braving the cold air, mud and rocks from the landslides, the strong river current (the bridge was swept away), and leeches, to get help. It took him one full day to reach the city, which at that time was still under water. He said that he knocked on the door of the house of the Chairman of the Provincial Committee, and refused to leave until help was arranged to be sent to Hong Ha. On 6th November, food was dropped by helicopter. The Ministry of Agriculture and Rural Development sent 20 tons of rice, and the Army sent clothes.

Even now, he could not imagine that a man his size could do such a feat. And a feat it was indeed!

He thought that this flood would be the same as before...

A 50-year old man and head of family with 4 children, Mr. Duong Su is more well-off than his neighbors in Hai Hoa. His house, however, is located near the river, which makes him vulnerable to the yearly inundation and floodwaters that come rushing down the Hai Lao River. He tills 7,000 sqm of paddy, and rears chickens, pigs and ducks in his 600 sq m residential plot.

His house was previously made of wood and built at ground level. It collapsed twice – in 1979 and in 1985. He then re-built an elevated concrete house, with two overhangs – one at 1.5 m above the floor used as sleeping area when floods come, and another at 2.2 m above the floor for paddy storage.



Mr. Su with his family, in their reinforced house.

Before the 1999 flood, his income came from his paddy with productivity at 0.6 tons/ sq m/ cropping, livestock of 4 pigs, 100 heads chickens and 100 heads ducks, a pump that he rents out and provides an income of VND 1.8 million a year, and from the monthly VND 500,000 contribution of his son who was working. Despite this, he had an outstanding bank loan of VND 3 million at 1.5% monthly interest.

He received the warning of the impending flood from the People's Committee, but thought that the flood magnitude would be as the last event. He prepared his small rowboat, and put basic necessities. At 10:00 pm, when he saw the floodwaters rushing into his house, he and his family rowed to the commune hall, but found it crowded with evacuees. He then moved to his father in-law's house, which was at a higher elevation and had a second floor, and stayed there for 5 days. He said that they received relief goods from the People's Committee, as well as from a helicopter that dropped relief packages.

His house was partially damaged and, although still inundated, moved in since they had a sleeping area above the floor. He lost all his livestock, but the paddy was safe, as the flood level came to 20 cm just below the paddy storage. He received rehabilitation assistance from the People's Committee in the form of galvanized iron sheets, 50 kg of rice, and VND 500,000. It took him 1 month to complete repair on his house.

Shortly thereafter, he borrowed VND 5 million from a bank, VND 100,000 from the Women's Union, and VND 3 million from informal sources to invest in farm inputs and livestock. He said that after the flood, productivity of his farmland increased to 0.66 tons/ sq m/ cropping. Now, he has completed paying his loans from the Women's Union and from informal sources.

He said that in the future, he would immediately act on warning issued by the People's Committee. He is now more alert, and watches and listens to weather updates on TV and on radio.

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