The Sustainable Mekong Research Network

SCIENTIFIC REPORT

Project No 6591

STUDY ON LOCAL COMMUNITY INSTITUTIONS TO COPE WITH THE FLOOD SITUATION OF THE MEKONG REGION

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Abbreviations

ADPC	Asian Disaster Preparedness Center
CCDM	Commune Committee for Disaster Management
CCFSC	Central Committee for Flood and Storm Control
CCK	Chamreun Chiet Khmer
CDM	Committee for Disaster Management
CFED	Center for Enterprise Development
CFSC	Committee for Flood and Storm Control
CWS	Church World Service
DARD	Department of Agriculture and Rural Development
DCDM	District Committee for Disaster Management
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
LMB	Lower Mekong Basin
MARD	Ministry of Agriculture and Rural Development
MRC	Mekong River Commission
MOST	Ministry of Science and Technology
NCDM	National Committee for Disaster Management
NCSR	National Committee for Research and Rescue
NGOs	Non-Governmental Organisations
PC	People's Committee
PCDM	Provincial Committee for Disaster Management
RGC	Royal Government of Cambodia
RHAC	Reproductive Health Association of Cambodia
UNDP	The United Nations Development Programme
UNFPA	The United Nations Population Fund
UNICEF	The United Nations Children's Fund
WFP	World Food Programme
WHO	World Health Organization

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EXECUTIVE SUMMARY

Annual flooding is an integral part of the nature of the Mekong River systems. Floods bring benefits to human-being. Severe floods however, if not being well managed, might cause tremendous damages to people's lives through destructive impacts on infrastructure and ecological environment as well as disturbance to livelihood activities of inhabitants living in flood-prone areas. Cambodia and Vietnam are located in the most downstream of the Lower Mekong Basin and share a large fraction of the Basin's flood-prone area. Hydrological regimes in Cambodian and Vietnamese Mekong floodplains are inter-related. Moreover, there are commonalities in physical and social-economic settings between the two floodplains. Getting understanding on local institutions in flood coping is of great importance to strategic solutions to trans-boundary flood management in the lower Mekong Basin. A study, which was carried out in flood-prone areas in Cambodia and Viet Nam, aimed to:

(i) Evaluate the current institutional framework and activities of the Committee for Disaster Management (Cambodia) and the Committee for Flood and Storm Control (Viet Nam) to flood coping at different administrative levels;

(ii) Propose appropriate institutional framework and policies to flood coping, giving special attention to real needs of local communities in flood-prone areas; and

(3) Increase exchange knowledge and experience in flood coping among policy makers, governmental officials and researchers of the two countries and hence establish a partnership in trans-boundary flood management in Cambodian and Vietnamese Mekong delta.

The study was undertaken in 2008 in bordering flood-prone areas between Cambodia and Viet Nam, covering four provinces: Takeo, Svey Rieng (Cambodia) and their adjacent An Giang and Dong Thap (Viet Nam). Each province, one indicative district was selected, where two representative communes were identified as the study sites. Participatory approaches were applied, including participatory workshops with local stakeholders at different administrative levels, focus group discussions with different social groups at community level and verification of results with local authorities.

Results of the study focus on four main issues and are summarised as follows:

1. Institutional framework and activities of the Cambodian CDM and the Vietnamese CFSC

Key findings:

- The CDM and the CFSC take in charge of flood and disaster management. The agencies are set up from national, provincial, district to commune levels. In Viet Nam, at hamlet level Flood Security Teams are organised.
- At each level, the CDM and the CFSC are composed of several functional agencies. The coordination, planning, implementing and evaluating processes are undertaken in both vertical and horizontal directions. In Viet Nam, at provincial and district levels, the CFSC is divided into functional sub-committees in order to avoid overlapping roles and responsibilities among line agencies.
- Improvements in the institution and strategies to flood and disaster management in both Cambodia and Viet Nam are: (1) organizational structure, coordination and preparedness planning of the CDM and the CFSC, and (2) integration of short-term

flood management into long-term objectives of sustainable development. In Viet Nam, point of view of adapting rather sole copping and the important role of local community in flood management are recognised: (1) the concept "*living with floods*" and (2) the "*four-on-site principle*" - the centralization to community.

- Roles and responsibilities of functional agencies differ with flood periods, particularly in Viet Nam, allowing to improved effectiveness of flood preparedness planning and to reduced overlap of line agencies' duties.

Recommendations:

- For Cambodia, further improvement of the structure and coordination of the CDM, particularly at local level, needs to be considered. The institutions and the approach to flood management of Vietnamese CFSC could be the lessons learnt.
- For Viet Nam, the structure of the CFSC at provincial, district and commune levels needs to be improved to minimise overlap of tasks of the CFSC's member line agencies in different flood periods.
- Preparedness planning, especially in medium- and long-term plans, needs to be paid more attention, emphasizing combined structural and non-structural measures, flood adaptation strategies and roles of local community in both countries.

2. Impacts of the CDM's and CSFC's institutional framework and their activities in flood coping

Key findings:

- Improvement of institutional framework and activities of the CDM and the CFSC has resulted in enhanced institutional mechanisms at local level, increased participation of local community and reduced damages to vulnerable people.
- The combination of structural and non-structural measures in flood coping as well as adaptation is recognized.
- The concept "*living with floods*" has been implemented successfully in Viet Nam, allowing both reduced risks and damages to people by floods and increased livelihoods of vulnerable groups.
- Decentralization of flood response to local community has been implemented in Viet Nam through the "*four-on-site principle*".
- Functions and roles of both local authorities and internal as well as external NGOs are be enhanced, particularly in Viet Nam.

Recommendations:

- For Cambodia, improvement of institutional mechanism and human capacity at local level and an appropriate approach to flood and disaster management would be necessary in order to increase functioning of the CDM.
- For Viet Nam, further improvement of physical and human capacity at local community is of great importance, enabling their participation in all processes of flood management..

3. Floods and local contexts

Key findings:

- Flood impacts and flood copping by local communities are determined by physical, agro-ecological and socio-economic settings.
- The level of flood coping by households and their livelihoods are closely linked. Better-off people tend to adapt to floods while worse-off people do not cope with

floods at all. Livelihood capitals determine vulnerability of household to deal with floods.

Recommendations:

- Livelihood-based approaches need to be considered for flood and disaster management strategies.
- The establishment of flood maps for more effective and efficient structural and non-structural measures to addressing specific needs of local communities is essential.
- For Cambodia, integrated solutions are essential; including adequate institutional framework at all levels, effective disaster management policies and appropriate approaches to flood management. Vietnamese achievements in flood coping could be lessons learnt.
- For Viet Nam, further improvements would be advisable: (1) improving the organizational structure of the CFSC at local level, (2) improving flood preparedness planning, evaluating and reporting processes, considering livelihood niches of local people, and (4) increasing investments for flood prevention and response.

4. Sharing knowledge and experiences between two countries

Key findings:

- Commonalities of the two countries are: floods, local contexts and flood impacts. Differences are: the institutions and the level of coordination of the CDM or the CFSC at all levels, the investments of physical, human and financial capitals, and approaches to flood coping.
- Information sharing and development of a partnership in flood management in specific conditions are greatly important.
- Trans-boundary flood management is essential to improve effectiveness of flood forecasting, to minimise negative impacts while maximising benefits from floods.

Recommendations:

- Policy dialogues and institutional mechanisms for the trans-boundary of flood management between the two countries need to be considered annually.
- Flood and disaster management should be involved in periodical meetings of bordering provinces and districts of the two countries.

5. Further research

- Flood mapping for improved early flood warning and structural and non-structural measure strategies.
- Vulnerability assessments and adaptive strategies of local community to floods and storms in particular and climate change in general in the whole delta, including upstream, midstream and downstream areas in both Cambodian and Vietnamese Mekong deltas.

1. Introduction

1.1 Background of the study

In 2008, the Sustainable Mekong Research Network (Sumernet) launched the Sustainable Mekong Programme. The purpose of the programme is to catalyze the transition to sustainability in the Mekong region through actions that will lead to the sustained production of independent, policy-relevant knowledge on key dimensions of sustainable development, especially on regional and trans-boundary issues. A project on "*Study on Local Community Institutions to Cope with the Flood Situation of the Mekong Region*" funded by Sumernet aimed to bring a community of policy makers, local managers and researchers of both Vietnam and Cambodia getting together to solve common problems of floods in the region.

To reduce flood damages, the national strategy for flood-related disaster risk reduction of both Vietnam and Cambodia should have a solid reputation for flood response, which is coordinated at the national level by the Central Committee for Flood and Storm Control (CCFSC) in Viet Nam and by the National Committee for Disaster Management (NCDM) in Cambodia, then delegated responsibility to provincial, district, village and community levels.

The methods of implementation of flood reduction efforts vary from place to place due to different forms of local governance and capacity of local community. In Viet Nam, the government has many activities in promotion of grassroots democracy that stipulate the rights of people to be informed and involved in decision-making and activities of flood control. These bring positive effects but have not been evaluated yet and brought into mainstream. Inhabitants living in the severe flood affected communes or villages with limited resources can be faced real risks even during 'mild' flood season, which poses a locally based approach is required. This research aims to ensure that the response is locally based in terms of organization and management, and that policies, other services and relief delivery is more effective responsive to the needs of communities in flood zones.

1.2. Project objectives

The general objective of the project is to evaluate and enhance the capacity of grass-root communities in dealing with the flood damage reduction processes. The purpose of the project is to evaluate and enhance the current institutional framework and policies for planning and responding to floods that contributes to reduce flood damages and improve people livelihood in the flood zones. The specific objectives are:

(i) To get understanding of institutional framework and activities of the Committee for Flood and Storm Control (CFSC) and the Committee for Disaster Management (CDM) at different administrative levels in planning for flood management;

(ii) To assess the impact of the CSFC and the CDM framework and activities in flood coping;

(iii) To develop an appropriate institutional framework and activities of CSFC and CDM in addressing real needs of local community; and

(iv) To share knowledge and experiences and to develop partnerships between Cambodian and Vietnamese researchers, policy makers and local authorities in trans-boundary Mekong delta's flood management.

1.3 Research questions

Practically the project clusters its research into two "sub-project based", local institutions sub-project in Vietnam and local institutions sub-project in Cambodia, which broadly linked to the project proposal. In order to achieve the objectives, each sub-project focused on critical research questions, which were developed by the project team. The following are major research questions which used in this research:

- What is the current institutional framework of the Committees for Flood and Storm Control (CFSC for Viet Nam) and the Committees for Disaster Management (CDM for Cambodia)?
- What are institutional and policy changes related to flood control and damage reduction in recent years?
- How can the Committees for Flood and Storm Control (CFSC for Viet Nam) and the Committees for Disaster Management (CDM for Cambodia) function well to flood management?
- What are major determinants of the flood coping by local communities?
- What are effectiveness and limitations of the current institutions and policies for meeting real needs of local communities?
- What are recommendations and solutions to flood management in Cambodia and Viet Nam in the future?

This study focus on the assessment of the current institutional framework and policies for planning and responding to floods coping and to learn how the local community at grass-root level dealing with floods. The study also emphasised on the activities of the CFSC and the CDM at different levels, and the contexts of vulnerable groups in flood-prone areas. The strategies to flood impact reduction and to people's livelihood improvement are also described.

2. The Research Context

2.1. Mekong delta and floods

The Mekong river stretches about 4,800 km to the East Sea of Vietnam (South China Sea), flowing through the six countries of China, Myanma, Lao PDR, Thailand, Cambodia and Vietnam (Fig. 2.1). As the Mekong enters Cambodia over 95% of the flows have already joined the river. During the flood season, water flows up the Tonle Sap from the Mekong mainstream into the Great Lake. When the water decreases in the mainstream, water flows out of the Tonle Sap down into the Mekong mainstream. This seasonal storage of water in the Great Lake acts as a big natural regulator for water flows downstream of the Tonle Sap – Mekong at Phnom Penh. This provides significant advantages in terms of the seasonal distribution of flows in the Vietnamese Mekong Delta. As stored water flows out of the lake back to the mainstream during the dry season, that make the low flows in the Mekong river increases, providing more water for irrigation and reduction of salt water intrusion into the Mekong Delta of Vietnam. On one hand flood water brings benefits to the people in the Mekong region as it provides abundant aquatic and fishery resources, makes better soil fertility, and on the other hand it also causes damages to vulnerable groups, especially the rural poor farmers.

There are over 60 million inhabitants live in the Lower Mekong Basin (MRC, 2006a). Cambodia constitutes 25% and the Vietnamese Mekong delta shares 33% of the total basin's population. Most of the population still heavily depends on natural resources for their livelihoods, and around 79% of the labour force works in the agricultural and fishery sectors (ibid.). In the Vietnamese Mekong delta, livelihoods of about 79% of the population highly depend on rice production, aquaculture and fishing (GSO, 2007), and while the corresponding figure is about 70% in Tonle Sap area (cited in Keskinen, 2008). Since 1995, the economics in the Lower Mekong Basin (LMB) have rapidly developed but in general the GDP per capita in basin is relatively low. In Cambodia, Lao and Viet Nam, around 40% of population live below the poverty line; the GDP per capita of the riparian countries ranges between US$ 511 for Cambodia, US$ 723 for Viet Nam to US$ 3,252 for Thailand (MRC, 2004).

Floods are an integral part of nature of the Mekong River system. They have existed and will continue to exist. People who live in flood-prone counties in the Lower Mekong Basin benefit as well as suffer from floods. The most flood-prone region is located in both Cambodian and Vietnamese Mekong floodplains, where hydrological conditions are strongly determined by the Mekong's flows and the Great Lake's water storage. If being well managed, floods brings a lot of benefits to the human well-being by enhancing the ecological diversity and productivity as well as inspiring water festivals and other cultural phenomena of the Mekong region (Nikula, 2008). However, severe floods, if not to be well managed, pose a major threat to people's lives and properties through destructive impacts on infrastructure and environment as well as disturbance to socio-economic activities of people living in flood-prone areas (MRC, 2004). About 4 million hectares in Cambodia and 2.7 million hectares in Viet Nam are flood-prone areas. In 2000, severe floods created massive destruction. In Cambodia, about 760,000 households suffered and 347 people (mostly children) lost their lives due to the flood and economic damages were estimated at US$ 161 million (RGC, 2001). The 2001 flood also caused damages for around 1.5 million peoples and 60,000 ha of agricultural land (NCDM, 2002). In the Vietnamese Mekong Delta, the 2000 and 2001 floods also caused serious damages to human and properties. There were several provinces and thousand of families in the delta affected by floods. For example, in An Giang province the 2000 flood killed 134 people, damaged in economic about US$ 50 million (Provincial CFSC of An Giang, 2007). The 2001 flood was also caused several people dead (killed 135 people, of which 104 were children; ibid.). In 2005

through 2007, although floods were considered "mild", they brought about negative effects in some areas in Cambodia (i.e. damages to roads, dykes, canals, pagodas, houses, 31,000 ha of rice, and human losses; CNDM, 2007). In recent years, many efforts from local authorities and international organizations have been devoted to flood management but people living in Cambodian and Vietnamese flood-prone areas have still suffered from floods. Therefore, flood management has been set as one of the top priorities in many water resources management policies in the region (MRC, 2004). The flood management should be done in a manner of optimising the mutual benefits while minimising the negative impacts.

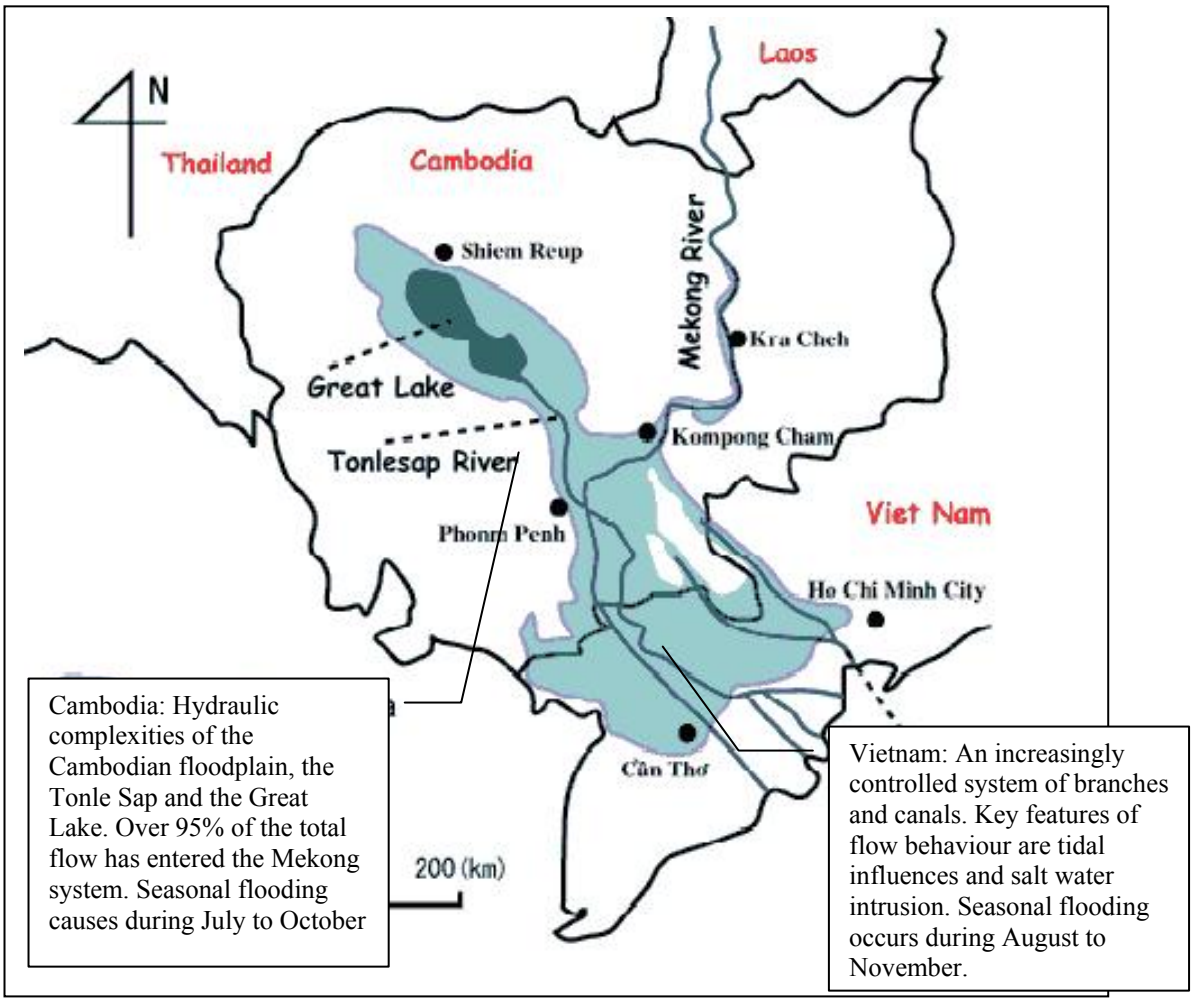


Figure 2.1 The Lower Mekong Basin

2.2. Structural and non-structural measures in flood management

Modern water resources management strategies, which generally follow the principles of Integrated Water Resources Management (IWRM) paradigm, are promoted in the Mekong Basin (Nikula, 2008). The IWRM paradigm focuses on coordinated management of water and other related resources to maximise the resultant economic and social welfare without compromising sustainability of vital ecosystems (Global Water Partnership, 2000). So far, the coping strategies with floods have been quite different between Cambodia and Viet Nam. Flood coping measures in Cambodia have been quite modest (Mao, 2005) while extensive structural construction has been given a special attention in Viet Nam (Tinh and Hang, 2003). The Vietnamese government has emphasised structural solutions, i.e.

hydraulic systems, as an important driver of flood management. Data on flood water flows of historical floods over the past 41 years (from 1961), however, reveal that hydrological and hydraulic regimes have significantly changed due to human interventions in the upper and lower parts of the Vietnamese delta, which mostly determine flood control scenarios for the delta (Tham, 2006). Since 2002, the Vietnamese government and the Central CFSC have changed their points of view in flood control with the strategy of "*living with floods*", promoting the combination of structural and non-structural measures to adapt to floods (Be et al., 2004; Sanh et al., 2004). Accordingly, flood control in the delta must be both structural and non-structural measures. Non-structural measures are to minimise harmful effects of floods, such as building human capacity in flood management, improving long- and short-term flood forecast, building communication systems, establishing relief distribution, arranging agricultural production and local people's livelihood activities in order to develop socio-economics while securing the environment in flood-prone areas. A combination of structural and non-structural measures is considered more efficient and long-term sustainable to flood management (Tham, 2006; Nikula, 2008).

From changing the points of view to flood management by both Cambodian and Vietnamese governments as well as international organisation and NGOs, integrated strategies and inter-disciplinary projects to flood management in the Lower Mekong Basin have been developed, focusing on flood control, capacity building for flood forecasting and warning, enhancing the committees for flood management, building community capacity for flood coping and reducing vulnerability of children, woman and poor. More and more government agencies, private sectors and international donors and non-government organisations (NGOs) were also involved in assisting the poor communities in the flood zones of these two countries (Be et al, 2004; Sanh et al., 2004; Perwaiz, 2006; Win, 2006). Recently, both Cambodian and Vietnamese governments have paid more attention to the importance of non-structural measures and linkages between flood coping with long-term socio-economic development processes and ecological environment protection in flood-prone communities. For Cambodia, the national government and international organisations have recognised an increasing need to improve capacity and institution in water resources management in Tonle Sap Basin (Middleton and Tola, 2008). The Asian Development Bank, for example, has collaborated with the Cambodian government to establish a Tonle Sap Basin Management Organisation aiming to an improved planning and coordination system at national and sub-national levels (ibid.). For Viet Nam, this is reflected by the decree 172/2007/QĐ TTg upon strategies to disaster coping, prevention and reduction until to 2020. There are 34 projects belonging seven programmes for these strategies (MARD, 2007): (1) updating and improving the legal of flood control and disaster reduction, (2) improving the Committee for Flood and Storm Control at the different administrative levels, (3) improving plan making for flood control and disaster reduction, (4) building capacity for flood forecasting and warning, (5) increasing community awareness of disasters and building capacity of local community for flood management, (6) reforesting upstreams of main rivers, and (7) developing applied sciences and technologies in disaster management. In both Cambodia and Viet Nam, in general, the biggest challenge for the success of the aforementioned strategies and projects is underlying capacities of authorities and limited resources to undertake implementation of priority activities (Perwaiz, 2006).

2.3. Institutional mechanism for flood management

In Cambodia and Vietnam, flood control and disaster management are undertaken by the Committee for Flood and Storm Control (CFSC, for Viet Nam) or the Committee for Disaster Management (CDM, for Cambodia). The CFSC and CDM are also set up at provincial, district and commune levels. Institutional mechanism is of great importance to the success of flood management from national, sub-national to local

levels. Flood management is legally mandated within the larger institutional framework of multi-hazard disaster management, which define the relationships and locations of the organizations and institutions assigned with roles and responsibilities. National institutions should be the main ones responsible for creating policies, institution and coordination mechanisms while provincial, district and commune agencies should be to implement planning and to undertake response and mitigation. In both Cambodia and Viet Nam, lacking systematic flood preparedness planning process and weak coordination among CFSC's or CDM's line agencies at different administrative levels one of important constraints of flood and disaster management (Win, 2006; Be et al., 2004; Sanh et al., 2004).

In 2004, Kandal, Pre Veng (Cambodia), An Giang and Dong Thap (Viet Nam) provinces were selected as the first provinces implement flood preparedness planning, with financial support from GTZ (Bakker, 2007). Major components of a flood preparedness plan are: (1) need assessment (annual and 5-year term), (2) institutional mechanism for implementation of the plan, (3) early warning and resopons systems, (4) resource mobilization and allocation, (5) communication systems, and (6) sectoral components (Perwaiz, 2006). In both Cambodia and Viet Nam, the most important problem to develop and to implement a preparedness plan is lacking capacities and resources. Local capacities and resource are often overlooked and linkages between flood management and the socio-economic development processes are often ignored, resulting in creating risks in already flood-prone communities (Perwaiz, 2006). Lessons learnt about effective institutional mechanism in flood management are drawn from the provincial CFSC of An Giang and Dong Thap (2005, 2008), Be et al. (2004), Sanh et al. (2004), GTZ, MRC and ADPC. Accordingly, the successful execution of the CFSCs and their line agencies' functions highly depends upon:

- An effective coordination mechanism among various agencies at all levels given by CFSCs and People's Committee;
- Clear roles and responsibilities of the agencies, with limited overlapped tasks, for different flood periods (i.e. before-, during- and after-flood periods);
- Effective arrangement for collaboration and complement between: (1) agencies at local level, (2) local and national systems, and (3) local systems with linkages with others in adjacent areas or NGOs;
- Building legal relationships and avoiding conflicts of interests between line agencies or management bodies.

So far, little effort has been given on exploring institutions, particularly local institutions, for flood and disaster management in the Lower Mekong Basin (Middleton and Tola, 2008). An understanding of local institutions would significantly contribute to successfully scaling up flood preparedness planning in Cambodian and Vietnamese Mekong delta.

3. METHODOLOGIES

3.1 Study approach

A participatory approach was used in this study. Participatory approaches were applied in previous flood-related projects in Viet Nam (Be et al., 2004; Sanh et al, 1995, 2004). The project was implemented by the Can Tho University team, in collaboration with its colleagues from the National Institute for Science and Technology Policy and Strategy Studies (Ministry of Science and technology of Viet Nam), the Cambodia National Mekong Committee, and the Cambodia Ministry of Agriculture, Forestry and Fisheries. During the study implementation, the coordination and consultancy were given from Dr. Bach Tan Sinh, policy engagement coordinator of SUMERNET in linking research with policy, and Dr. Fiona Miller, a research fellow at the University of Melbourne (Australia).

In each country, Cambodia and Viet Nam, the study was carried out through three major steps (Figure 3.1): (1) secondary data collection and literature reviews, (2) group and in-depth interviews with staff members of Committees for Flood and Storm Control at provincial, district and commune level, and (3) group discussions with target communities. The first step was done to get general understanding on existing policies, decrees and guidelines, and structure and coordination of the Committee for Flood and Storm Control (CFSC) or the Committee for Disaster Management (CDM) at different level for flood preparedness, response and mitigation, allowing to understand the existing institutional mechanism in flood management of the CFSC or CDM at different levels. Subsequently, stakeholder meetings or workshops were held in study areas to introduce the project, to select study sites, to refine project objectives and activities and to make study plan to staff members of the CFSC or CDM. In addition, during the workshops in-depth interviews were also conducted with at least three staff members (a manager and two staff members) from selected government stakeholders such as the Department of Agricultural and Rural Development, the Red Cross, the Woman Union, the Farmer Association, and the Department of Education and Training, getting knowledge on roles and activities of different stakeholders. The final step focused down on contexts of local target communities through group discussions, to assess impacts of the CFSC/CDM's activities dealing with floods on people's livelihood and to understand how the people cope as well as their needs to deal with floods. In each country, case studies were carried out in two representative provinces. In each province, one indicative district was identified for the study.

3.2 Study site selection

In Cambodia, Takeo and Svay Rieng provinces were selected. Svey Rieng province is located in the eastern part while Takeo province in southern part of Cambodia. Angkor Borei (Takeo province) and Svay Chrum (Svay Rieng province) districts were selected for investigation.

In Viet Nam, study sites selected are An Giang and Dong Thap provinces. The provinces are located in the upper Mekong Delta of Vietnam. An Giang province is adjacent to Takeo province of Cambodia and Dong Thap province is bordered by Svey Rieng of Cambodia. An Phu (An Giang province) and Hong Ngu (Dong Thap province), which are considered most vulnerable to floods, were selected as target study areas (Figure 3.2). The districts belong to severe flood-prone areas, where inhabitants' livelihoods totally depend on flood impacts annually.

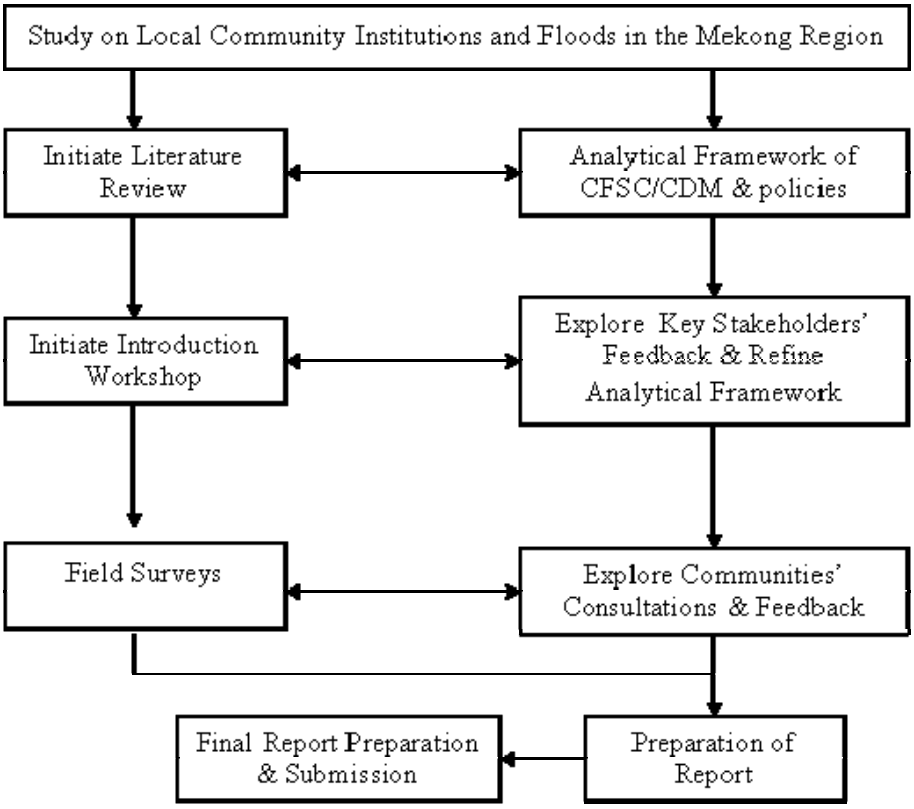


Figure 3.1. Research methodology

In both Cambodia and Viet Nam, each district two indicative communes were identified: (1) a "favourable" and (2) a "less favourable" commune, in respect with infrastructure, governance and external supports. The favourable communes have relatively higher topography and better flood control systems, and are supported with external NGOs' projects on local capacity building for flood management, and hence better governance in flood and storm control, compared to less favourable communes within the same district. In each commune, two hamlets (or villages in Cambodian case) were selected as study sites. The study sites are presented in Table 3.1.

3.3. Data collection and analysis

Both qualitative and quantitative information were collected. The qualitative information include:

- Roles and tasks of actors related to flood management at different administrative levels and interactions among them;
- Agro-ecological and socio settings at community level;
- Major flood events over time;
- Seasonal calendar of target communities;
- Institutions and networking;
- Characteristics of major local groups related to flood coping

Quantitative data collected include: hydrological data, land use characteristics of target communities and major socio-economic features of individual households characteristics.

Standard methods and tools of Participatory Rural Appraisals (PRA) applied. Details of information collected and tools used are described in Appendices 1.

With qualitative data, information collected were grouped into categories or ranked in order of importance during the focus group discussions. With quantitative data, multivariate factor analysis and discriminant analysis were applied to identify major factors of people livelihoods and characterised investigated groups, respectively.

Figure 3.2. Location of the research sites

4. MAJOR FINDINGS

4.1 Changes in flood coping approach

Flooding is a natural event in the Lower Mekong Basin. Inhabitants in the region have lived with flooding for a long time. However, floods have become more severe and unpredictable. Losses caused by floods become more and more greater, in terms of materials and people's lives. Beside the government of the regional countries, therefore, more and more external governmental and non-governmental organizations have involved in assisting people in flood-prone areas to cope with floods, contributing to changing approaches in flood management towards integrated measures for long-term sustainable development, building capacity of government staff and local community, and trans-boundary management. Through activities of Mekong River Commission and International donors (e.g. AuSAID), policy dialogues for trans-boundary water management and flood control among the countries along the Mekong River have been organised. Particularly for Cambodia and Viet Nam, experience exchanges in flood control and disaster management between the two countries, for example between the national CFSC and CDM or between neighbouring provinces have been done yearly. This cooperation is of great importance to improve trans-boundary flood management of the two countries in the future. Institutional and policy changes and approach to flood coping in Cambodia and Viet Nam are described in details below.

Table 3.1: Study sites selected for Cambodian and Vietnamese case studies

Provinces	Districts	Communes	Hamlets/villages
Cambodia:			
Takeo	Angkor Borei	Kok Thlork	Prek Da Prek Ta Phar
		Prey Phkarm	Prey Phkram Kor Trung Phum
Svey Rieng	Svay Chrum	Prey Bassac	Bayab Svay Taphlor
		Chambak	Ta Nou Prek Tuol
Viet Nam:			
An Giang	An Phu	Phu Hoi	Phu Nhon Phu Huu
		Vinh Hau	Vinh Linh Vinh Thuan
Dong Thap	Hong Ngu	An Binh B	Ap 3 Ap 4
		Thuong Phuoc 1	Ap 1 Ap 2

4.1.1 The Cambodian Case

Key institutions involved in flood management – functions and responsibilities

At national level, the agency involved in flood management is the National Committee for Disaster Management (NCDM), which was first established in 1995 by the

Royal Government of Cambodia (RGC). In 2004, this agency was re-established and amended by King Majesty of Kingdom of Cambodia, according to the Royal degree No SN/RKT/0804/236. Organizational structure of the NCDM is presented in Figure 4.1.

The NCDM leads and coordinates emergency response and risk reduction and management of disasters, including flooding. The NCDM is chaired by Prime Minister and composed of 20 staff members from different ministries and government agencies. The NCDM is responsible for the following activities:

- Coordinate emergency management at national and sub-national levels;
- Promote the development of national legislations and national policies for emergency management;
- Promote the development of plans and procedures for emergency management;
- Strengthen institutional and human resources for emergency management;
- Promote the development of programmes for public education, public awareness and community participation in emergency management;
- Promote the collection, analysis and dissemination of information related to emergencies and disasters.

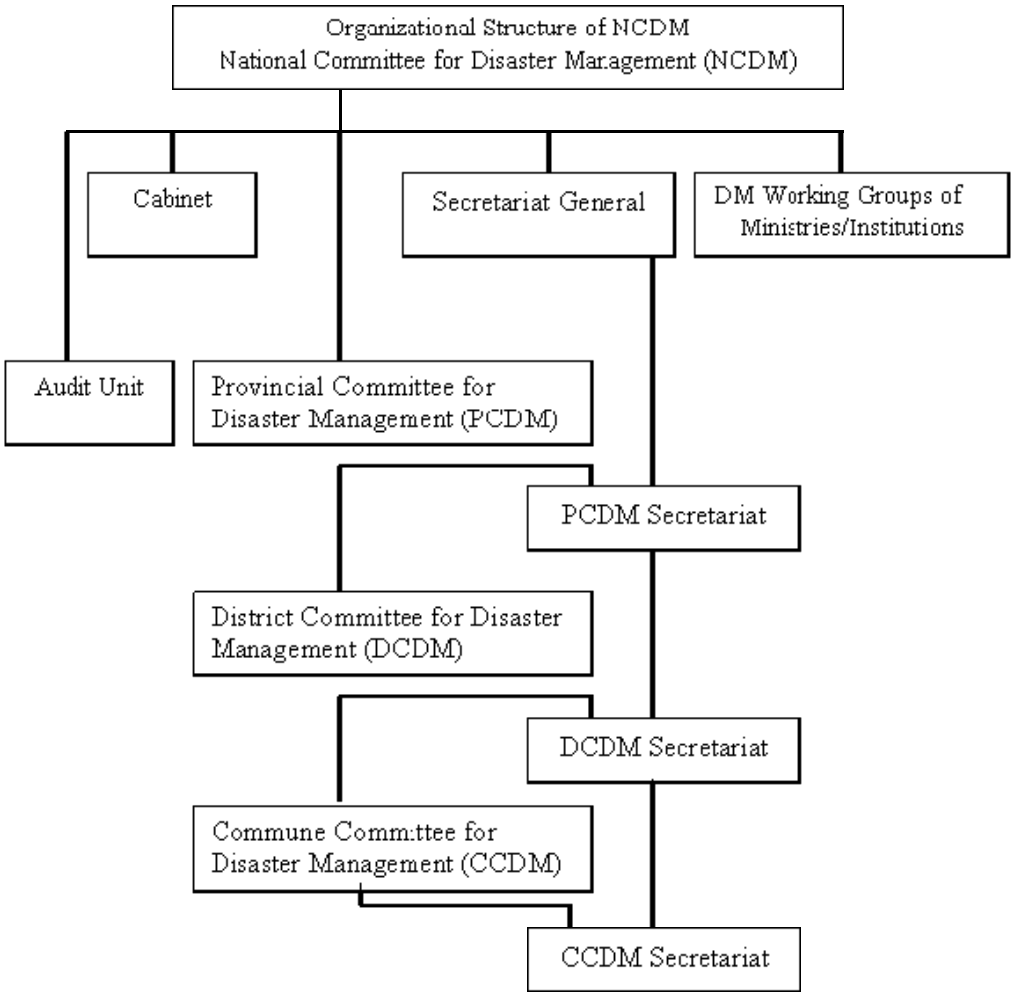


Figure 4.1. Organizational structure of NCDM of Cambodia (Source: GTZ, MRC and ADPC)

The NCDM's memberships are as follows:

- Prime Minister — President
- High Ranking Official (Senior Minister) — Vice President
- Minister of the Ministry of Interior — Vice President

- Minister of the Ministry of National Defence — Vice President
- Minister in charge of the Office of the Council of Ministers — Member
- Minister of the Ministry of Economy and Finance — Member
- Minister of the Ministry of Foreign Affairs — Member
- Minister of the Ministry of Environment — Member
- Minister of the Ministry of Water Resources and Meteorology — Member
- Minister of the Ministry of Agricultural, Forestry and Fisheries — Member
- Minister of the Ministry of Commerce — Member
- Minister of the Ministry of Health — Member
- Minister of the Ministry of Rural Development — Member
- Minister of the Ministry of Industry Mine and Energy — Member
- Minister of the Ministry of Social Affair, Veterans' and Youth — Member
- Minister of the Ministry of Public Works and Transport — Member
- Minister of the Ministry of Education, Youth and Sports — Member
- Minister of the Ministry of Women' Affair — Member
- Representative of the Commander in Chief of the Royal Cambodian Armed Forces — Member
- Representative of the Chairman of the National Society of Cambodian Red Cross — Member
- Secretary of State of the State Secretariat of Civil aviation — Member

Moreover, other organizations participating in flood and disaster management are: (1) The Cambodia National Mekong Committee, (2) Department of Water Resources Management and Conservation, (3) Department of Hydrology and River works, and (4) The United Nations Disaster Management Team. Roles and responsibilities of the NCDM's line members and organizations are showed in Appendices 2.

The General Secretariat plays a role of headquarters of the NCDM. It has five departments: (1) Administration and Finance, (2) Information and Relations, (3) Emergency Response and Rehabilitations, (4) Preparedness and Training, and (5) Search and Rescue. Roles and responsibilities of the General Secretariat and its department are presented in GTZ, MRC and ADPC.

Institutional and policy changes to flood coping

The NCDM had undergone revisions since 2004 by King Majesty of Kingdom of Cambodia (degree No SN/RKT/0804/234 dated 31 September 2004 and sub-degree of RGC No. 35 dated on 27 June 2007). Based on sub-degree of RGC No. 35 (2007), the National for emergency management was developed for defined roles and responsibilities of NCDM and its line ministries and agencies for disaster risk reduction and management, including flood management. Each NCDM's ministry and agency established the Unit for Disaster Management (UDM) involved in disaster risk reduction and management.

Recently, the NCDM has received supports from many international agencies to improve its function and role. United Nations Organizations based in Cambodia have established the United Nations Disaster Management Team (UNDMT) lead by United Nation President in Cambodia and it members are from UNDP, FAO, WFP, WHO, UNICEF and UNFPA. UNDMT cooperates and works with NCDM and other development partners and international agencies for disaster risk reduction and management.

The NCDM has developed a top-down structure from national through provincial, district and commune level to manage disaster risks and emergency responses. Furthermore, it has developed action plan for disaster risk reduction and management at national level. Most of provinces, districts or communes, however, have no action plan yet for disaster risk

reduction and management. Only few provinces such as Svay Rieng and Prey Veng provinces have three-year action plans for disaster risk reduction and management through external support from ADB project TA4574 CAM, CWS and Asian Disaster Preparedness Centre (ADPC) and the Ministry of Water Resources and Meteorology.

The National Law and the National Policy on water or water resources, including flood management and mitigation, were approved by the National Assembly in June 2007. The Law and Policy have been signed and promulgated by King Majesty and implemented by the Ministry of Water Resources and Meteorology. Related line ministries and agencies will coordinate in implementing flood risk reduction and management, providing timely early warning to all people.

Since 2005, the NCDM, in collaboration with MRC, has implemented a project component namely "*Flood Emergency Management Strengthening*", a part of the project "*Flood Management and Mitigation Programme*". The project component focuses on three major activities: (1) preparation and implementation of flood preparedness programmes, (2) development of national capacities and regional knowledge sharing, and (3) facilitation of trans-boundary emergency between provinces. The project has been implemented in pilot provinces Prey Veng and Kandal, significantly contributing to building capacity of NCDM and local CDM and communities in flood management, and to improved flood early warning system. Progress and achievements of the project are given in details in Baker (2007).

4.1.2 The Vietnamese Case

Key institutions involved in flood management – their functions and responsibilities

At the national level, flood and storm management is coordinated by the Central Committee for Flood and Storm Control (CCFSC). The CCFSC was established by the Prime Minister and is led under the Government office. It is chaired by the Minister of Agriculture and Rural Development and is composed by heads (vice-heads) of relevant ministries and agencies. The CCFSC is composed of 15 permanent memberships as follows and organized as showed in Figure 3.2 (Dieu, 2007):

- Minister of the Ministry of Agricultural and Rural Development — Head
- Government Office Chief — Vice Head
- Minister of the Ministry of Natural Resources and Environment — Member
- Minister of the Ministry of National Defence — Vice Head
- Minister of the Ministry of Police — Member
- Minister of the Ministry of Post and Telecommunication — Member
- Minister of the Ministry of Transport — Member
- Minister of the Ministry of Trade and Industry — Member
- Minister of the Ministry of Construction — Member
- Minister of the Ministry of Finance — Member
- Minister of the Ministry of Planning and Investment — Member
- Minister of the Ministry of Education and Training — Member
- Minister of the Ministry of Health — Member
- Minister of the Ministry of Labour, Invalids and Social Works — Member
- Television and Radio of Vietnam — Member

The CCFSC undertakes coordination that covers the complete spectrum of disaster management from preparedness planning, response, to recovery and mitigation from a disaster (GTZ, MRC and APDC). Functions and roles of the CCFSC's member line agencies are described in details in Appendices 3. The Committee for Flood and Storm Control (CFSC) is extended to provincial, district and commune level. At the local level,

administratively, CFSCs are set up by the respective People's Committees (PCs). The vice chairman of PC is the chairman of the CFSC, the director of DARD is vice-chairman and its members are directors (chief) or vice-directors (vice-chief) of sectors related to flood and storm control work at the local levels. In 2007, the CFSC of An Giang and Dong Thap provinces includes 23 members from different line departments. DARD is the standing organisation and Department of Water Resources Management (DWRM – belong to DARD) is the CFSC' standing office. At provincial and district level, the CFSC consists of 3 sub-committees: (1) Sub-Committee for Disasters Control and Mitigation (SCDCM), (2) Sub-Committee for Fire and Explosion Control and Security (SCFEC), and (3) Sub-Committee for Social Policy (SCSP). At commune level, the CFSC is not organised with sub-committees. Its members include 21-23 staff from different administrative units and mass organizations. The CFSC at all levels plays a roles and takes responsibility to assist the PCs to develop and direct the implementation of flood and storm management measures, and to coordinate tasks from preparedness planning, response to recovery and mitigation work.

The planning process of the CFSCs includes (GTZ, MRC and ADPC):

- General and long-term plans for disaster preparedness and mitigation;
- Annual plans for flood and storm control and disaster mitigation;
- Early warning and decision making for urgent response;
- Recovery and rehabilitation.

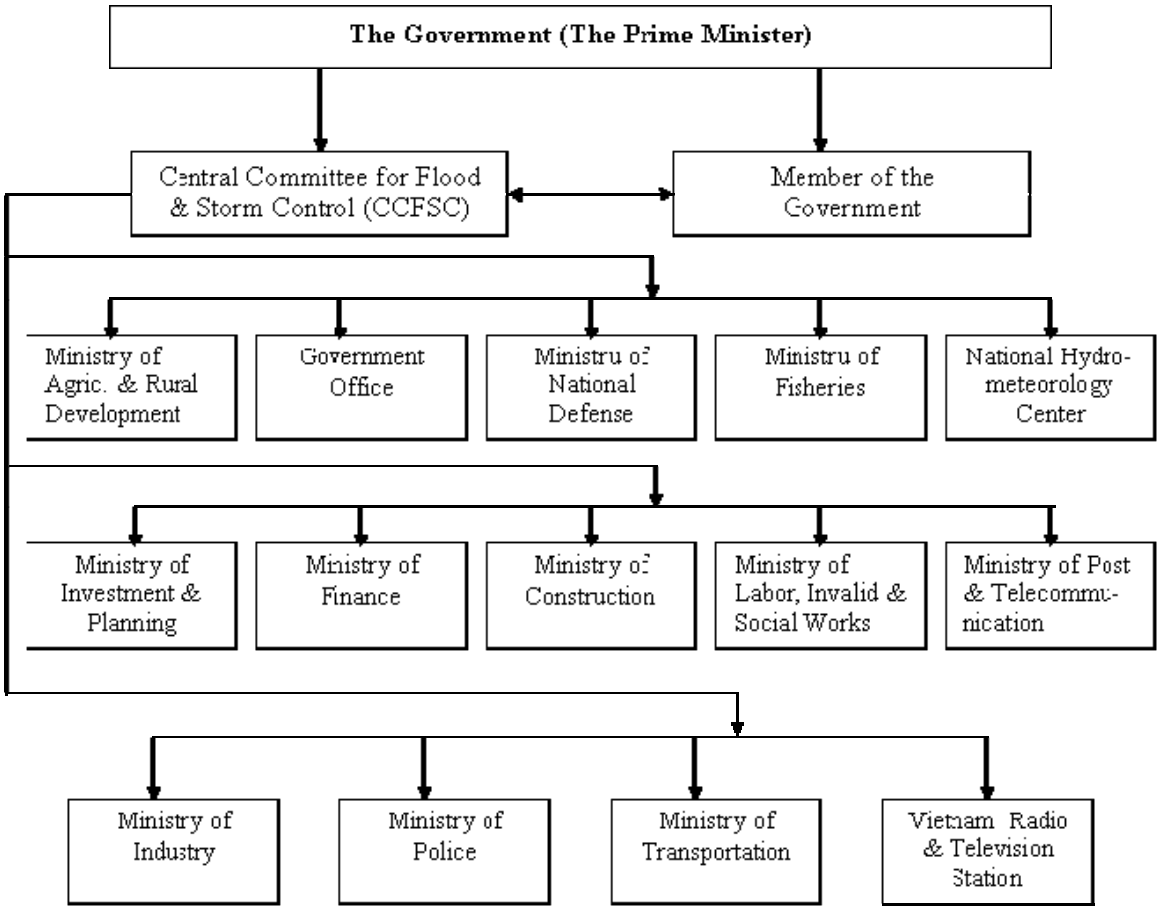


Figure 4.2. Organizational structure of the CCFSC of Vietnam (Source: Dieu, 2007).

Institutional and policy changes to flood coping

In Viet Nam, flood management has a long history, particularly in the north. The strategies to flood management have been developed since the Ly's Dynasty with constructing embankments of the Red River in the north. The legality and institutions for flood management work were established 200 years ago, including organizational structure, responsibilities of line agencies, investment policies, and raising awareness of communities for flood coping.

Policies and strategies related to flood prevention, control and mitigation have focused on not only minimising flood damages but also improving people's livelihoods in flood areas. Construction and upgrading of infrastructure, improvement of vulnerable people's livelihoods and security of children are important issues. Recently, the government have applied two new concepts to flood control and disaster management in the Vietnamese Mekong delta: (1) "*living with floods*" and (2) the "*four-on-site principle*". The concept of "*living with floods*", which was implemented since 2002, is considered an important strategy to minimize negative impacts and to take opportunities of advantages of floods for long-term sustainable development. According to Be et al. (2004), Sanh et al (2004) and Dieu (2007), major measures of the government to this strategy are:

- Constructing residential clusters (or lines) and embankment dyke for densely-populated areas or for commercially intensive agricultural production;
- Upgrading schools, clinics and other public structure;
- Upgrading facilities and improving methods of flood forecast;
- Organizing child care centres and children safety training during flood periods;
- Shifting cropping calendars, applying farming systems and improving opportunities of income generation of poor people during flood season;
- Increasing food storage, medicine and water-born disease prevention at hamlet level;
- Upgrading facilities and human capacity for life security;
- Increasing people's awareness and knowledge in flood prevention and control; and
- Protecting ecosystems in flood-prone areas.

The concept "*four-on-site-principle*" means (1) command on-site, (2) means on-site, (3) forces on-site and (4) logistics on-site. This concept is actually the decentralization to local authorities and communities and the enhancement of public awareness in flood response and control. Accordingly, local authorities (commune and hamlet levels) and communities, with their already forces, can make decisions and use their own means and logistics to prevent and control flooding, and to mitigate flood damages, especially in emergency.

In recent years, the Government Office and the CCFSC of Vietnam have issued several directives on flood and storm control, covering all aspects from forecasting and warning, response, search and rescue, recovery and rehabilitation in order to reduce disaster risks. The recent directives issued relevant to flood and storm management are as the following descriptions (see details in Appendices 4):

- *Directives on flood and storm prevention.* The government always pays attention and sets priority to provide the national budget source for building, repairing and reinforcing of facilities or infrastructure related to prevention and control of floods and storms. At the beginning of each storm and flood season, the Prime Minister

promulgates directive on floods and storms prevention, control, search and rescue and entrusts concrete missions concerned sectors, local authorities and armed forces.

- *Directives on flood and storm forecasting and warning.* During storm or flood periods, weather forecast is timely given to the Party leaders, the government, the CCFSC and NCSR by the Central Hydro-Meteorological Forecasting Center so that these organizations can give timely warnings and issue timely orders for the implementation of preventive measures and response. Early and relatively accurate flood warnings in Mekong River over the last years resulting from close cooperation between the southern office of CCFSC and Vietnam's National Mekong Committee and between the Central Hydro-Meteorological Forecasting Centre and southern hydro-meteorological stations, enabling the government and the CCFSC to issue bulletins, direct and instruct the CFSC at all levels and local communities to implement effectively and properly the plans for flood and storm prevention and control. The mass media announces timely news on forecasts, warnings and directives from the government, the CCFSC, the National Committee for Search and Rescue (NCSR) and authorities at all levels to people so that they can prepare and respond for natural disasters proactively.
- *Directives on flood and storm response.* Whenever there are serious storms and floods, the Prime Minister or Deputy Prime Minister directly chairs the meeting with the CCFSC, makes decisions on urgent measures to cope with the situations. In special situations, the Prime Minister can establish front headquarters directed by a Deputy Prime Minister at the centre of areas prone to serious disaster. The CCFSC and NCSR are on duty 24 hours a day during the storm and flood season. They have thorough grasps of situations and opportunely tackle all the problems in accordance with their competence and authority. When there is a risk of serious situations beyond their preventive capability the local authorities have to opportunely consult about and propose special measures to the Prime Minister to deal with the situations. The CCFSC and NCSR have recently agreed on the issue of a general directive electronic mail system to avoid overlapping directions. Thus, directives from the two organisms to ministries, sectors, local authorities and local CFSC and local Committee for Search and Rescue are transmitted faster and more propitiously.
- *Directives on search and rescue.* Whenever there are storms and floods, the army, side by side with ministries, sectors, local authorities and local people, rescues people, facilities, dyke, and reservoirs, and evacuates people to safe areas. Thus, damages are much reduced. The Ministry of Foreign Affairs has cooperated with other countries and regions sharing the same sea with Vietnam so that they let Vietnamese fishermen find a shelter whenever there are storms or tropical low pressures.
- *Directives on flood and storm recovery and mitigation.* Whenever there are serious disasters, the government directs the overcoming of flood and storm consequences in person, makes decisions on urgent budget funding to provide victims with enough food and medicine, treat environmental pollution, repair houses, restore schools, hospitals, offices, transportation and irrigational works, and provide seeds and breeds for production revivification. Mass organizations, economic and social organizations and Vietnamese people living inside and outside Vietnam have brought into play the tradition of mutual affection and care by actively raising money for and helping victims of disasters so that they can overcome difficulties, stabilize their lives and production.
- *Directives on comprehensive socio-economic development under the context "living with floods".* National and provincial government have issued and implemented

strategies to disaster reduction in the Mekong delta. Accordingly, the strategies integrate short-term flood control plans with long-term objectives of flood adaptation to stimulate socio-economic development and environmental protection in flood-prone areas in line with developing trends in sustainable rural development. The government of An Giang and Dong Thap provinces have implemented these strategies through development programmes on flood-adapting agricultural production, increased opportunities for employment generation during the flood season, professional training and promoting local markets for agricultural productions.

Like Cambodia, since 2005 the CCFSC, in collaboration with MRC, has implemented the project component namely "*Flood Emergency Management Strengthening*", a part of the project "*Flood Management and Mitigation Programme*" in An Giang and Dong Thap provinces (Baker, 2007).. Through the project, capacity of the CFSC's staff at different levels and local communities in flood management has been improved. Flood preparedness plans at provincial and district level has been developed at the pilot provinces An Giang and Dong Thap. In addition, skills in safety measures have been strengthened and public awareness has been increased.

Comments with respect to institutional and policy changes

Cambodian case:

- Disaster management is also a burdensome, difficulty but only five departments with more responsibility to disaster management. Many ministries member are not clarity of roles and duties, restricting functions of the CDM's line agencies.
- Several stakeholders, including international agencies, NGOs involved in disaster management, significantly contributing to reduced flood risks.
- National policies and guidelines to flood management are still limited. From year 2000 onwards, however, it has been recognized that the roles and actions of the Prime Minister and provincial governors are of great importance to the mobilization of local resources to cope with flood, particularly after the Sub-degree of RGC No. 35 dated on 27 June 2007.

Vietnamese case:

- Flood and storm management is a difficult and complicated task. However, the CCFSC has actively overcome difficulties to fulfill tasks assigned by the Prime Minister of directing, guiding, supervising and speeding up active prevention and control, violently fighting with disasters and overcoming the consequences of floods and storms. Consequently, damages by floods have gradually reduced and people's livelihoods in flood zones have been improved in recent years.
- The coordination of CFSCs and the cooperation among CFSCs' member line agencies at different levels (both horizontal and vertical directions) have become more effective through: (1) the division of sub-committees with specific function of line agencies to avoide overlapping tasks, (2) the concept " living with floods", integrating flood management with long-term development strategies, (3) the "*four-on-site principles*" in flood coping in emergency and (4) the combination of structural and non-structural measures in flood management. These are good lessons learnt for Cambodia.
- The CCFSC is strong with concerned deputy ministers as members, close regulations, and specific tasks for its members. However, the cooperation among agencies is not always close and smooth.

- The NCSR is legally competent enough to implement tasks but it lacks experts and professional facilities. The available facilities devices are not safe and quickly operating enough to be used in targeted areas in all weather conditions, leading to ineffective rescue work.
- Two State agencies related to flood and storm listed as: the CCFSC and NCSR. Each agency takes charge of roles and responsibilities of either the former or the later. Plans and tasks of the CCFSC and NCSR are overlapping.

4.2 Relationships between stakeholders and communities involved

4.2.1 The Cambodian case

Relationship among local stakeholders, sub-national and national level organisations

The CDM exists at all administrative levels, from national, provincial, district to commune levels. At each level, the committee consists of many member line departments. This agency is organised and coordinated in both horizontal and vertical systems (Figure 4.1). At the national level, the Secretariat General plays a role of headquarters on the NCDM, coordinating and direct implementation of disaster management activities with CDM Secretariats at provincial, district and commune levels.

The provincial CDM undertakes activities associated with implementation of policies and guidelines for disaster management, development of guidelines and giving support to district committee, provision of feedbacks to the NCDM, collaboration and coordination among NCDM's line agencies in evacuation and relief distribution.

The district CDM undertakes activities related to implementation of policies and guidelines for disaster management, development of guidelines and giving support to commune committee for disaster management, reporting to the provincial CDM, making preparedness planning, cooperation among its line agencies.

The commune CDM, which is composed of commune council members and headed by the commune chief, develops planning for disaster management, directly implements disaster management works (including providing emergency relief, evacuation, health care and other response), collaborates with Cambodian Red Cross and with internal and external NGOs for disaster management and risk reduction.

Beside governmental agencies, there are several non-government organisations (NGOs) collaborating and working closely with CDM at all administrative levels on flood management at all flood stages: preparedness, responses, rehabilitation and mitigation. The United Nations Disaster Management Team (UNDMT) works closely with the NCDM and contributes significantly to disaster management in Cambodia. This agency is composed of FAO, UNDP, WFP, WHO, UNICEF, UNFPA and other UN agencies working in Cambodia. Other international NGOs, including Oxfam UK, Oxfam Australia, CWS, CARE-Cambodia, World Vision-Cambodia, CCK, Action Aid Cambodia, RHAC, ADEFE, CFED, and micro-finance institutions are also involved in floods response and mitigation.

Relationships between local stakeholders and communities in regards to floods

The CDM's member line departments are Departments of Agriculture, Water Resources and Meteorology, Health, Women Affairs, Education, etc. These line departments work on flood preparedness planning, response and mitigation. The relationships between the departments and the community are showed in Figures 4.3 and 4.4.

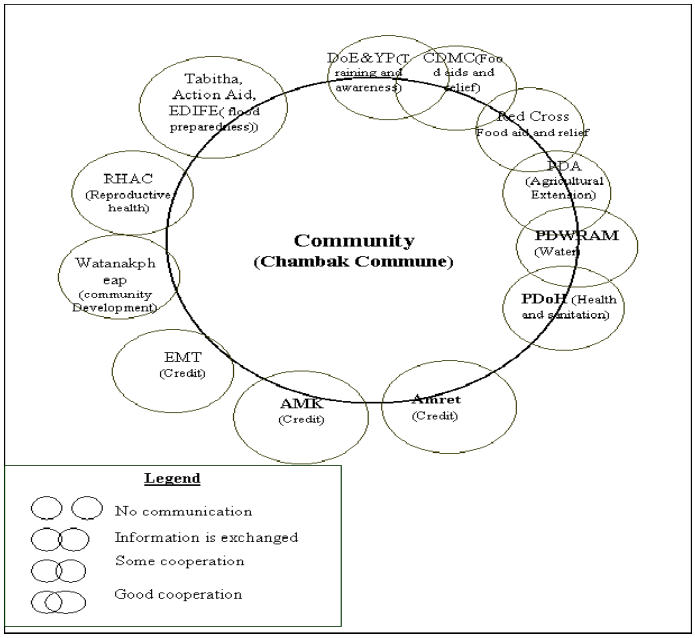


Figure 4.3: A Venn diagram showing relationship among local institutions and with the community in Chambak Commune as perceived by villagers (redrawn from a diagram made by villagers).

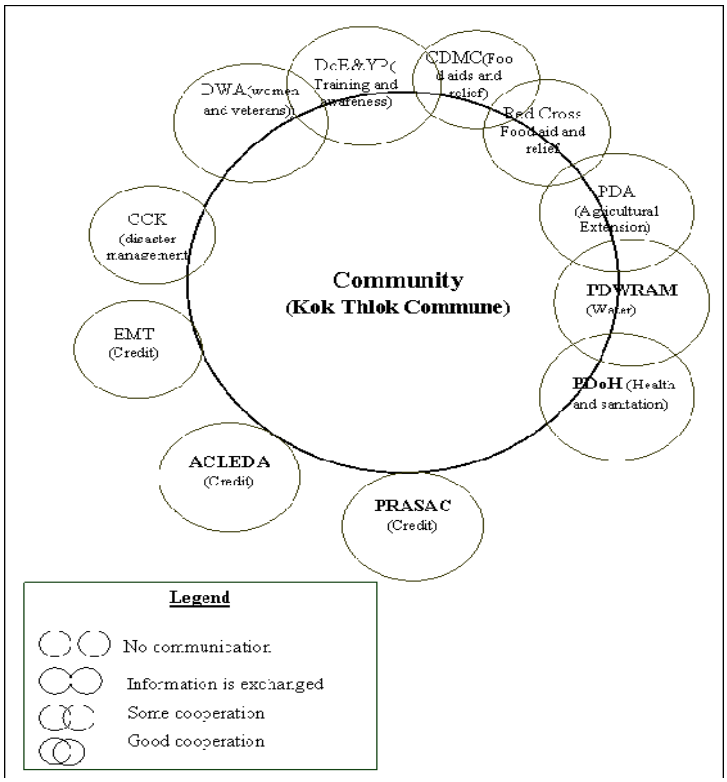


Figure 4.4: A Venn diagram showing relationship among local institutions and with the community in Kok Thlok Commune (redrawn from a diagram made by villagers).

In both communes Chambak and Kok Thlok, most of stakeholders involved were perceived to be good relationship with communities regarding to flood control and damage reduction, particularly those related to training and raised awareness, food aid and relief, agricultural extension, clean water supply, health and sanitation. Agencies involved in

credit supply, disaster preparedness planning and management and were perceived less important to the community or weak in collaboration with others in solving problems at the community level.

The commune council and CDM's members give early warnings and advice to the hamlet chief, from where villagers can know about potential flood status and effects then. However, poorly equipped facilities and financial budgets constrain roles and responsibility the commune authorities take. Local people often receive information on floods through weather forecasts given by radio and TV, or through their neighbours. The commune CDM and local authorities mobilize locally available human power and means to build shelters and evacuate villagers. Affected people receive relief like food, drinking water and health cares from the Cambodian Red Cross, the commune CDM, CDM's line departments or NGOs. The relief and assistance, however, are limited and do not meet real demands.

After flood receding by late October or early November, most of households do flood recovery tasks. They repair their houses and start to establish the rice crop or to raise livestock. After floods, environmental pollution and the resultant disease occurrence on human and animal is perceived an important problem. Poor households often face shortages of food, rice and livestock seeds. The Cambodian Red Cross, CDM and its members line agencies at provincial and district levels provide relieves like food, clothes, farm equipments, plan and animal seeds, and agricultural materials to disadvantaged households.

Group discussions show that constructing deep wells or reservoirs at safe places used as flood shelter to provide safe water for domestic uses is necessary. In addition, transportation facilities used for evacuation, food and fire materials and health cares during floods are perceived important. Moreover, good maintenance and improvement of water structure for agricultural production, and the provision of plant and livestock seeds are considered important for flood recovery and mitigation.

4.2.2 The Vietnamese Case

Relationship among local stakeholders, sub-national and national level organisations

As described above, the commonality of Cambodia and Vietnam is that the CDM and CFSC are set up at four levels: national, provincial, district and commune. These agencies work and link among each other with other different GO and NGO actors to reduce disaster risks

At the national level, the CFSC takes charge of two main tasks: (1) formulating preparedness related policies and issuance of government decrees and (2) forecasting and disseminating flood events to local government and non-government organisations.

At the provincial and district levels, the CFSC have responsibilities of (1) implementing the national policies, (2) coordinating line agencies at the respective level, (3) giving feedback to improve institutional mechanism to the national CFSC on the basis of what the local level needs for flood management. Therefore, improvement of the CFSC activities at these levels is of great importance to enhancing institutional mechanism for flood management.

At the community level, the CFSC exists at commune level and the Flood and Storm Security Teams are set up at hamlet level. Both these agencies play a role in resource mobilization and organization for flood coping. The important role these agencies play is reflected by the "*four-on-site principle*" for flood coping in emergency.

The CFSC at all administrative levels is structurally organised and coordinated in both horizontal and vertical systems (Figure 4.5). Like its organisational structure, the coordination, planning, monitoring and reporting process of the CFSC is both vertical and

horizontal (Figure 4.2). At the national level, the Prime Minister's Office (PMO) directs the provincial PC (vertical direction), the CCFSC, the Southern office of CCFSC and the CCFSC's member line ministries/departments (horizontal direction) for flood and storm preparedness planning, response and mitigation. At provincial level, the CFSC and its Standing office closely work with the CCFSC, the NCRR and the Southern Centre of Hydro-Meteorology to monitor hydro-meteorological data, to inform flood status, and guidance from the CCFSC and the provincial PC to its member line departments, district authorities and local communities. The provincial CFSC also gives specific duties to its functional member agencies, monitors and evaluates flood management tasks (horizontal coordination). The provincial CFSC and its member line departments also give specific direction and duties to the district CFSC and its respective line agencies (vertical coordination). The coordination at district level is as same as that done at the provincial level. The CFSC at district and commune levels directly implement flood preparedness planning, response and mitigation activities.

Coordination mechanism is both vertical (national – province – district – commune) and horizontal (PC – CFSC – line departments). The Provincial CFSC coordinates all activities and makes decisions for yearly and periodically general plans. On behalf of the CFSC' head, executive vice head of the CFSC (director of DARD) direct and monitor activities assigned to provincial and district departments. Chief of secretary of the CFSC' standing office takes in charge of administrative work and consultancy for the CFSC. The participation of CFSC or the CFSC standing office in flood preparedness planning and control was plurality, but this duty was as important as their assigned professional ones.

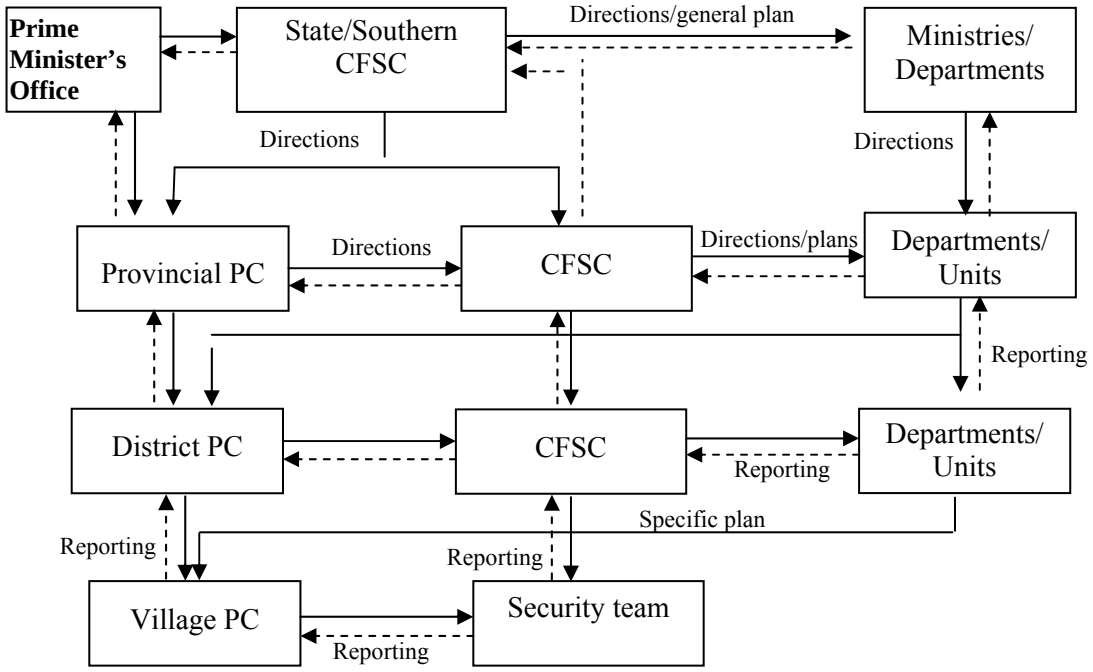


Figure 4.5 Organisational structure and planning and reporting process of the CFSC at various levels In An Giang and Dong Thap provinces (CFSC: Committee for Flood and Storm Control; PC: People Committee).

At hamlet level of An Giang and Dong Thap province, the commune PC and CFSC organize community's Flood and Storm Security Team (FSST), 1 or 2 team(s) per hamlet. Each team is composed 12-18 members, including hamlet staff and other voluntarily local people. The FSST directly implements all activities related to flood response and recovery

(stages 2 and 3). The commune and CFSC, based on the FSST' resources, can make urgent decisions first with the "*four-on-site principle*" (see description in earlier). At community level, in addition, charitable (religious) or humanitarian organizations exist. The charitable organizations cooperate with the commune PC and CFSC and the TFSS to gather relief from NGOs and then to distribute the relief to poor households.

Relationships between local stakeholders and communities in regards to floods

The important and the influence of stakeholders and their responsibilities related to floods were identified and ranked by local people through group discussions. Many actors were perceived important and influential by the villagers of Phu Nhon commune. The hamlet authority, Red Cross, commune urgent reaction team, local benefactor and commune clinic were considered important and influential in assisting community to deal with floods, while the commune authority, district authority, CARE organization, and women union were considered influential but less important. In contrast, district bank for policy and social affairs, commune youth union, and veteran union were perceived both less important and less influential in helping the community (Figure 4.6A).

Similarly, local people of Vinh Hau commune ranked the hamlet authority, commune CSFC, commune Farmer Association, commune clinic and Red Cross as more importance and influential, whereas commune benefactor, hamlet Red Cross, commune police and women union are considered less important but influential in assisting community coping with floods (Figure 4.6B).

Relationship between the community and local agencies involved in flood management in An Binh B and Thuong Phuoc 1 communes of Dong Thap province as perceived by better-off, medium and women groups (Figures 4.7A & 4.7B). According to the key informants from the target groups, the neighbours, hamlet and commune authorities, and reaction team are perceived more important and influential in supporting the community to cope with floods. Other local organizations such as military and mass organizations were thought less important and influential.

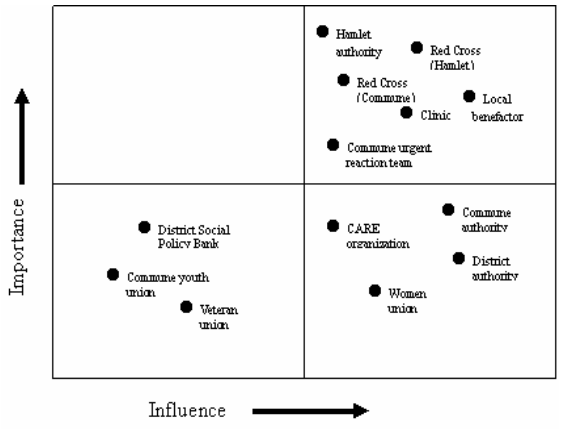


Figure 4.6A The importance and influence matrix showing relationship between community and local institutions regarding coping with floods in Phu Nhon commune.

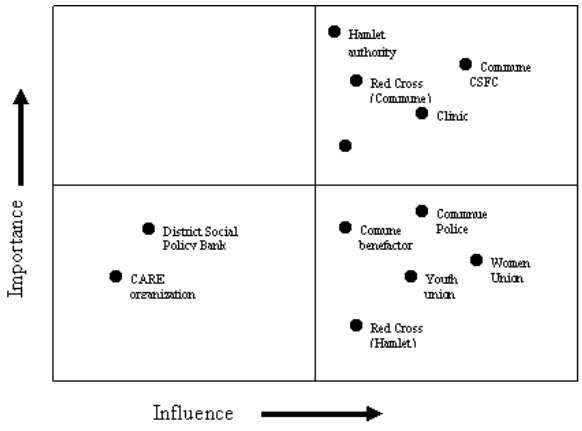


Figure 4.6B The importance and influence matrix relationship between community and local institutions regarding floods in Vinh Hau commune.

Figure 4.7A: Venn diagram of relationship between community and local institutions regarding coping with floods in An Binh B commune (Note: Size of circle – degree of importance; distance of circle – degree of influence).

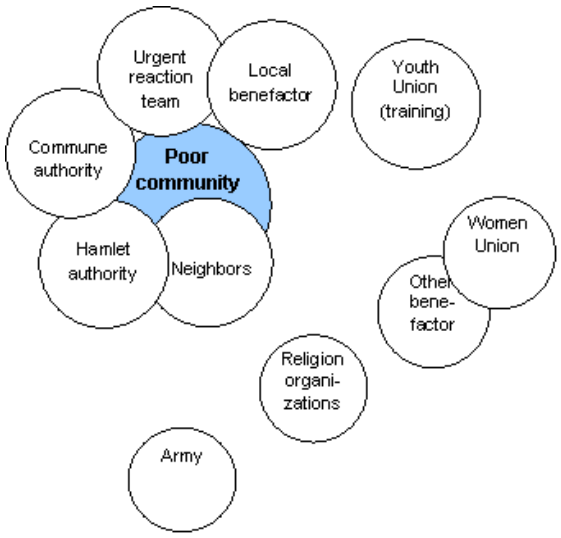


Figure 4.7B: Venn diagram of relationship between community and local institutions regarding coping with floods in Thuong Phuoc No1 commune (Note: Size of circle – degree of importance; distance of circle – degree of influence).

General comments and recommendations

For CFSC's member line departments, not only leading officials but also staff should have clear roles and responsibilities and know their own duties in flood control and mitigation in a certain flood period. Collaboration among government agencies, considering real needs of local communities, strategic and integrated solutions, considering local people's livelihoods, with inter-disciplinary rather than single-disciplinary approach are of great importance. To achieve this, the CFSC from national, provincial, district to commune levels, particularly its standing member, should play a role as "a conductor of an orchestra" in flood preparedness planning, implementation, monitoring, evaluation and suggestion for further improvement. In addition, promoting active participation and improved capacity of local communities (included local government at village and district levels) in evaluating, monitoring, reporting and planning are also of great importance.

For local institutions, strategies of households to cope with floods are closely linked with their livelihood's contexts. Local innovations such as "children care centres", the "four-on-site principle" and children safety training present to be effective and meet local needs. Raising local communities' awareness of flood management plays a crucial role. Doing so, "warning zone" mapping and dissemination of guideline posters and leaflets to all local people would be advisable. Hence, local people can be ware of risks and impacts of floods to which they are exposed and then they are active to take right actions once the warning is given. The findings from this study show that integration of structural and non-structural measures needs to be paid much attention in flood management strategy planning.

4.3. Activities of stakeholders involved in flood management

4.3.1 The Cambodian Case

Activities of local stakeholders regarding flood coping

Previous knowledge and findings from the PRA studies show that both internal and external NGOs like Cambodia Red Cross, CARE, CWS, World Vision, Oxfam-UK and Oxfam-Australia have implemented a bottom-up model in flood management: community-based disaster preparedness planning, community-based flood risk management programme, and community-based first aid in pilot communes. Main activities of these projects include:

- Capacity building of local authority and villagers on disaster preparedness, community leadership, gender and disaster risk reduction, rescue and relief, awareness on flood early warning, health and sanitation;
- Capacity building on community-based disaster risk management strategies and practices;
- Establishment of village Committee for disaster management and saving groups;
- Establishment of early warning systems in the community; and
- Mitigation, preparedness and emergency relief and responses to flood risks.

Support activities

Community-based approaches for flood management is based on participatory risk and vulnerability assessment and planning processes. Support activities often focus on facilitating dialogue about local concerns and helping people to define risk reduction priorities with capacity building and training. Community-based flood risk reduction and management measures might include practical flood mitigation measures, such as building dams or polders, safe hills; forming emergency response committees in villages and community; developing community based-early warning systems and practical response and evacuation; advocating at the local and authority for integrating flood risk reduction and management in commune planning and for policy change in favour of preventive action; and enacting measures to reinforce the livelihoods of most vulnerable groups.

A number of key elements for processes aiming at supporting flood risk reduction and management at the community level are emerging from Red Cross and the commune CDM and NGOs works with farmers, fishers, agricultural extension workers and line departments. They include:

- Assessing flood damages, food insecurity and people affected by flood, and training needs including in-depth assessments of livelihoods strategies, flood management practices, natural resources management practices, farming systems and institutional set-up;
- Formulating and strengthening flood risk reduction and management in community by institutional set-up in communes and villages.
- Identifying and validating flood risk management and adaptation options and related technical capacity building on a per demand basis;
- Promoting response and relief for affected people by flood;
- Promoting local empowerment processes such as community mobilization, awareness raising and policy dialogue;
- Sharing knowledge and advocating for scaling-up on lesson learned of community experiences and local institutions on flood risk reduction and management;

- Introducing simple technology, information and tools to ensure community being manageable at local level and to improve targeting groups, and to ensure community ownership of response actions;
- Risk mitigation approaches need to be promoted and implemented through existing community institutions such as the commune CDM, Village Voluntary Red-Cross, Village Association, local NGOs, schools and elders.

4.3.2 The Vietnamese Case

Activities of local stakeholders involved in flood management

Head of the CFSC, its Sub-Committees and member line agencies can make decisions. Planning and implementing of a certain department depend on its functions, responsibilities and local needs. At provincial level, 5-year and annual plans are made while annual plan is made at district and commune level. The process and activities of the CFSC are mostly the same all the provincial and district levels, focusing on planning making while those at the commune level emphasize on planning implementation. The activities vary with various flood phases and flood control can be divided into three phases: (1) activities before flood (i.e. preparation), (2) activities during flood (i.e. response), and (3) activities after flood (i.e. recovery).

At the provincial and district level, flood control activities include:

- Before flooding (1st January - 30th June; phase 1: flood prevention): It is the most important phase, deciding for the success of the CFSC's role and responsibilities. Main activities emphasising on planning and giving directions:
    - Organising workshop to evaluate flood management work in the last year, to implement planning of CFSC, to give specific tasks to each CFSC's members in the present year;
    - Strengthening or improving CFSC's organisational structure at all levels and security forces (army, police, border guards), monitoring the plan implementation of relevant departments, and reporting to the respective PC in order to get right decisions and directions;
    - Repairing damages caused by last year flood, promoting and monitoring infrastructure construction for prevention activities;
    - Monitoring weather data to forecast flood situation and to give early warning;
    - Planning specific measures and coordinating the preparation work for flood response (locations, facilities, human and financial resources, relief, etc.);
    - Protecting agricultural and aquaculture production;
    - Organising training on searching and rescuing, children security, first aids, health cares, sanitation, flood information collection and damage evaluation;
    - Establishing and strengthening rescue stations and teams at hamlet levels and evacuating vulnerable people to a safe place;
    - Strengthening the information propaganda and transmission in order to raise awareness within the community of flood prevention and control;
    - Organising campaigns to raise funds for relief or to join in rescue work;
    - At the end of the phase, evaluating results and drawing experiences from phase 1 and making a specific plan for phase 2.

- During flooding (1st July - 31st October; phase 2: flood response): This is a coordinative and collaborative phase among CFSC's member line agencies, local government and non-government organizations to deal with flood. The main task in this phase is to protect human lives and infrastructure and to secure socio-economic situations in flood areas. The task includes:
    - Protecting human lives and properties, including rescue work, children care, evacuation of vulnerable to safe places and pupil security;
    - Protecting agricultural and aquaculture production, production services and infrastructure;
    - Mobilising available resources to deal with and recover consequences of floods with the "*four-on-site principle*";
    - Mobilising assistances and supports if disaster occurring, and coordinating relief distribution to target people;
    - Monitoring the plan implementation of relevant departments, supervising and solving timely emergent problems, reporting to the respective PC in order to get prompt directions; particularly for the Steering Committee members who are assigned to specific tasks and locations.
- After flooding (1st November - 31st December; phase 3: flood recovery): relevant departments and authorities participate in recovering flood consequences and in helping local people get back their normal life:
    - Making assessments on flood damages and planning for flood recovery;
    - Repairing infrastructure damaged by floods and rehabilitating the agricultural production;
    - Assisting evacuated people to return their old place and to stabilise their livelihoods;
    - Coordinating and conducting relief distribution to target people;
    - Performing environmental sanitation, health cares;
    - Evaluating tasks of flood prevention, response, recovery and mitigation by line agencies, reporting and developing plans for next year.

For general planning and implementing, heads of CFSC and its sub-committees make decisions and coordination. Specifically, heads of member line agencies make decisions and coordinate their approved activities. The planning and plan implementing become flexible with big floods and in emergency.

The process of planning, monitor and evaluation are both vertical (village - district - province) and horizontal (member line agencies - the CFSC – the PC). For horizontal direction, departments report their specific plans, monitoring and evaluation to both the CFSC and the PC at the same level. For vertical direction, the departments, the CFSC and the PC report those to their authorities at the direct higher level. The CFSC and the PC, therefore, receive specific plans and reports from both the departments at the same level and the CFSC and PC at the direct lower level. Reporting frequency differs among the stages:

- Before flooding: reporting frequency according to requirements;
- During flooding: reporting twice a month or weekly (normal flooding), daily, being on the alert (big flooding).
- After flooding: Monthly reporting.

At the commune level, the CSFC plays very important role to directly implementing plans and to mobilizing all local resources for flood coping. In both An Phu (An Giang province) and Hong Ngu district (Dong Thap), activities of the commune CSFC before, during and after flooding are mostly similar. Major tasks are as the following:

- *Before flooding:*
    - Assessing the tasks in the last year flood, planning for the current year and assigning specific tasks to functional agencies and staff, including Flood Security Teams;
    - Organising and mobilising available resources for flood prevention activities;
    - Increasing the information propaganda in different ways to raise awareness within the community of flood prevention and control;
    - Providing training on basic rescue for the commune CFSC member line staff and Flood Security Team members
    - Organizing swimming courses for pupils at primary schools and stabilising children care centres
    - Broadcasting news about floods to local communities and delivering leafless (supported by NGOs) on flood response and mitigation;
    - Making poor/vulnerable household inventory for flood response and mitigation planning in emergency;
    - Reporting flood preparedness tasks to the district CFSC.
- *During flooding:*
    - Monitoring and supervising tasks of the CFSC members and the Flood Security Team;
    - Increasing the information propaganda within the community of flood prevention and control;
    - Organising flood response and rescue work (in 24 hours);
    - Organising health care for villagers by mobile physician teams (1-3 times/flood season), to bring primary and secondary pupils to school (within 2 months of flood peak periods);
    - Collaborating with other agencies to distribute relief to disadvantaged households, difficult family. (by Red Cross,…);
    - Reporting flood management situations to the district CFSC frequently.
- *After flooding:*
    - Preventing water-related diseases like diarrhoea, eye or skin diseases;
    - Assessing damages by flooding and planning for flood recovery;
    - Supplying relief to affected households and assisting local people to establish agricultural production and to stabilise their lives;
    - Evaluating flood control and mitigation tasks by the commune CSFC, planning for the next year and reporting to the district CSFC.

The major difference in flood management activities of the CFSC between “vulnerable” and “less vulnerable” communes is the organisation and mobilisation of available resources for flood control activities. The “less vulnerable” communes Vinh Hau and Thuong Phuoc 1 organize and mobilise available resources better. For example:

- The number of volunteer members participating in the Flood Security Team, based on hamlet population or area, is greater, poor or vulnerable household inventories are annual made.
- More locally charitable groups are formed to participate in flood prevention, response and mitigation activities; e.g. strengthening and repairing bridges and roads, creating food storage fund and distributing relieves, evacuation, free-of-charge children care, free-of-charge carrying elementary pupils to schools, etc.

Financial budget, facilities and relief

At provincial level, financial resources for flood control and mitigation are from:

- Provincial fund for providing against flood/storm and other disaster control: The budget is used for: (1) the coordinative activities of the CFSC from the provincial to the commune level, and (2) security and evacuation work. In Dong Thap province, for example, the fund is about 200 million VND per year.
- Budget of the CFSC's member line agencies: it derives from annually approved plans. It is used for their own professional activities related to flood prevention and control.
- National budget: it is used for the construction and maintenance of large-scale infrastructure and for rehabilitation of recovery from damages by severe floods.
- Relief from internal and external individuals and NGOs: it is in-cash or in-kind. Internal NGOs are local religious and charitable organisations, and enterprises. Common external NGOs consist of UNICEF, CARE, Oxfam, International Crescent Moon Agency, International Red Cross, etc.

Facilities for flood control and mitigation, in general, are poorly equipped. The Standing CFSC offices at the provincial and district level are equipped with computers (connected with internet), fax, telephone, motorboats and life-jackets. The CFSC's member line departments use their own professional equipments. For example, in 2007, the Central CFSC provided An Giang province 2 floating boats, 10 tents, 200 life-buoys and 2 motorboats. In An Phu and Hong Ngu districts, per hamlet equipments supplied from the CFSC for flood security teams include: 0-3 motorboats, 4-17 life-jackets and 2-10 life-buoys.

According to officers of the the Standing Office of An Giang and Dong Thap CFSC, more equipments provided to the CFSC's member line departments at district and commune level are necessary: hydro-metric equipments, health care boats, health care equipments for hamlet clinics, informative facilities (fax, computer, telephone, network), transportation means (motor boats for implementing, monitoring and evaluating during flooding phases), and information materials (booklets, leaflets) for raising local people's awareness in flood and storm control.

Public services and relief can be classified into structural and non-structural measures. The services and relief are different with different flooding phases, due to different needs of communities (Table 4.1). Non-structural services and relief given during the flooding phase are set higher priority to poor and vulnerable households. The hamlet people's committee holds community meetings to make an inventory of relief recipients and send the inventory to the commune people's committee. Basing on the suggested inventory, the Sub-Committee for Social Policy at district level, in cooperation with the commune people's committee, distributes relief to communities. However, limitations of mitigation programs are: (1) relief sources from government and other donors (State and other provinces/cities, internal and external NGOs) were not enough for demand, (2) financial budgets from the

government for structural measures are usually delayed (in the wet season, instead of in the dry season), (3) relief is not very suitable in type and not very good in quality (i.e. boat, fishing nets and clothes), (4) measures of environmental sanitation is untimely done (during flooding, in stead of flood receding), (5) relief provision is unpredictable, and (6) recipient selection more and less had a bias from passion or family bonds. However, these problems have been gradually improved recently.

Increasing human capacity and encouraging staff to participate actively in flood prevention, control and mitigation are important. Annually, the commune CFSC's members participate in TOT (training of trainers) training courses on first-aid, security, swimming training for children, etc. They become trainers of the hamlet Flood Security Teams members. However, CFCS's officers at provincial, district and commune suggested that more training courses or workshops related to on planning, implementing, monitoring and evaluation are necessary:

- Methods and skills of participatory planning;
- Community development;
- Information collection and analysis;
- Community's need and damage assessment;
- Communication skills;
- Organising workshops and visits to adjacent provinces to share knowledge and experiences.

Table 4.1 Public services and relief given in different stages

Stages	Services and relief	Beneficiaries
Before flooding	- Structural measures: child care centres, infrastructure construction and upgrading (including water supply station)	- Communities
	- Non-structural measures: mobilisation and propagation for raising people's awareness in flood control and management, training on swimming for children	- Communities
During flooding	- Structural measures: strengthening and repairing infrastructure (dykes, boundary embankments, bridges, roads, schools, health care stations, etc.)	- Communities
	- Non-structural measures: migration, food, clothes, means for livelihoods, health care, drinking water, environmental sanitation, security	- The poor, households being highly deserving, short of manpower, and poor-marginal; and communities
After flooding	- Structural measures: repairing infra-structure	- Communities
	- Non-structural measures: health care, environmental sanitation, rice seed, etc.	- The poor and communities

4.4 Community contexts

4.4.1 The Cambodian Case

Hydro-meteorological features and floods

In both Svay Rieng and Takeo provinces, information on hydro-metrological features and floods are limited, due to unavailability of hydro-meteorological station. According to records and observations of investigated communes' staff, flood water levels range from 2 to 4 m high. Local people have to live over water for 3 months during the monsoon flood periods. This is more serious in Kok Thlok commune in Takeo province and Basak in Svay Rieng province, where elevation is low. Impacts of floods, positively or negatively, on local people's livelihoods much vary with eco-logical areas, poverty status and gender.

Historical information of floods in Kok Thlok commune was obtained from semi-structured interviews with key informants during group discussions. There is a clear trend of flood problems during the past 30 years. In year 1984, 1993, 1996, 2000 and 2001, floods were most severe, negatively influencing all hamlets of the commune. Such floods caused flooding over the hamlets with a water level ranging 1.5-2.5 m, and 7-10 m in the Great Lake.

Experiences from the past and recently years, floods occur in the communes under investigation during September and October, exceptionally to November. Floods often caused damages to village infrastructures (e.g. roads, canals, housing, schools and assets of villagers), crops and livestock, and negatively affected human health and sanitation. During floods, local authorities and CDM at district and commune level and Red Cross assisted local people and livestock moving to safe places. With external supports from CCDM and Red Cross, local authorities provided food, drinking water and health services, and CCK-Oxfam provided shelters to villagers. During floods, commune and hamlet authorities advised villagers to prepare safe hills as shelters or to move to safe places like pagodas or schools.

Agro-ecological features and floods

Annually monsoon floods of the Mekong River usually start in July and end in December. During flood periods, flood water level raises up to 1.5-2.0 m high, exceptionally to 4 m high for big floods. In such condition, local farmers cannot grow crops or livestock. In recent years, floods usually recede slowly, resulting in delayed cropping calendar. Constructing dams and reservoirs in downstreams could be a reason of slow recession of floods. According to key informants, during floods soil erosions occur along river banks, particularly on rainy days with rain water run-off. Consequently, in the flood region, inhabitants living along river banks suffer more from the flood than those living in other locations.

Kok Thlok commune has three major ecological areas: (1) lakes and wetlands, (2) rice farming area and (3) residential and upland crop areas. Each area could be divided into sub-areas with prevailing land uses and farming system typologies. Major characteristics of Kok Thlok commune is presented in Table 4.2.

Lakes and wetlands. Lakes and wetlands, a plat floodplain, cover almost the hamlet and the rice growing area. They connect with Angkor Borei lake and stretch through Basac river and the border with Viet Nam. Hydrological regimes are strongly affected by the Mekong and Basac flows from Angkor Borei River during July and December. Monsoon floods provide rich habitats for aquatic wild life. During the flood season, livelihoods of most of villagers highly rely on fish catching for both food and income generation. The area also serves as navigation way and provides irrigation water for crop production in the dry season. However, the habitats and biodiversity of the area have been declined, due to the expansion of rice production and over-fishing. Village participants identified major problems of their livelihoods as follows (in order of the importance):

- High levels of monsoon floods (5-6 m in the lake and 1.5-2 m in the wetlands);

- Decline of biodiversity and natural aquatic resources;
- Heavy use of chemicals for rice production the dry season;
- Flood-forest clearance for rice production.

Table 4.2 Major characteristics of Kok Thlok commune, Angkor Borei District Takeo province

Description	**Lake/wetlands**	**Rice area**	**Residential and upland crop areas**
General description	Flooding from July to December with 6-7 m high, water available throughout the year.	Flood season lasting 6-7 months, rice as the main crop and only grown in the dry season	Flood season lasting 6-7 months, people dwelling in elevated places and upland crops grown in home gardens and along river banks
Topography/soil types	Flood plains with silty or alluvial soils	Flat lowland with alluvial soils	Upland and upper terrace lands with clay loam soils
Water resources	Flood water flowing in during July to December from the Mekong river, inundation year round	Inundation from July to December, water for domestic uses and for rice from irrigation canals.	Water for domestic uses and for crops from rainfall and irrigation canals
Natural ecology	Floodplain ecosystem with wetland habitats.	Lowland rice ecosystem, grasses and aquatic plants	Trees, cash crops and vegetables
Wildlife	Fishes, crustacea, macro-phytes, flood forests and wild birds	Fishes, crustacea, frogs, wild birds and snakes	Rats and birds
Crops/plants	Floodplain trees and macro-phytes	Rice and macro-phytes	Fruit and upland crops
Livestock	Cattle, poultry	Cattle, poultry	Pig, poultry, cattle
Other uses	Navigation	Fishing, macro-phytes collection, animal-feed grass farming.	Fuel wood and home garden

Source of data: PRA study in July 2008

Rice area. In the past ten years, this area was the flood forest and fishing areas. Since then, however, local people has developed dry-season rice farming, due to lower flood depths and increased food demand from population growth. The rice area covers 5,843 ha, where a rice crop is practiced during November to March. Major problems were identified and ranked in order of the importance by villagers as follows:

- Poor irrigation systems and water shortage for rice farming in the dry season;
- The decline of soil fertility and heavy applications of agro-chemicals to rice culture;
- Underdevelopment of draft animals;
- Small-scale rice production;
- Rice damage by brown plant hopper;
- Lack of labour force for agriculture.

Residential and upland crop areas. The areas are located in the centre of commune, where is considered as the safe place for local inhabitants during flood periods. Local

schools and pagodas were used as shelters for local people during severe floods. In 1988, 1996 and 2000 floods, the commune was almost completely flooded, causing damages to transportation roads, irrigation canals and crop production. Villagers perceived major problems to their livelihoods and ranked them in order of the importance:

- Immigration of people from other flood areas;
- Lack of drinking water during the flood season and the dry season;
- Lack of irrigation water for crop production in the dry season;
- High incidence of water-related human diseases during- and after-flood periods;
- High incidence of animal diseases and lack of shelters for animals during flood periods;
- Poor farm equipment and transportation means;
- Poor road and irrigation systems from damages by floods and poor maintenance;
- Lack of capital for rice farming;
- Poor sanitation conditions; and
- Increased proportion of landless households.

Socio-economic features and floods

In the study villages, local authorities classified local households into there three major wealth groups: (1) poor households (55-57%), (2) medium households (31-33%) and (3) rich households (12%). Major characteristics of different wealth groups are closely interrelated, resulting in chronic poverty, food and livelihood insecurity (Table 4.2). In general, poor households, accounting for half of total households, are landless or small land holders with wage labour as the major livelihood activity. They have poor house amenities, limited transportation and communication means, poor access to safe water for domestic uses, low educational attainment of children and receive supports and relief from the government. The contrary occurs with rich households. Negative impacts of floods in the past are one of the causes of the already existing vulnerability, particularly with poor people (Nikular, 2008).

Local people perceived that flooding provides them both advantages and disadvantages. First, flooding enriches natural fish resources and soil fertility, flushes out residues of toxic substances and kills pests from agricultural production in the dry season. During the monsoon flood season, floodplain provides good habitats for fish reproduction and growth. Fishing is an important activity for local people's livelihoods, for both food security and income generation. Annual floods deposit huge amounts of alluvial on rice fields, contributing to sustainable rice production. In addition, flooding also gets rid of rats and rice pests. Furthermore, flooding allows to preserve lakes and wetlands and hence minimising land crabbing.

Villagers discussed that big floods cause damages to their common infrastructure, houses, agricultural production and constraints of income generating activities like fishing. Hamlet roads and schools were mostly damaged by big floods. Farmers cannot grow crops or livestock because of unavailability of shelters and feed grasses during flood periods. Slow recession of flood water results in delayed rice cropping season. Villagers also migrate to Phnom Penh city, provincial town or Vietnamese borders to work. Resource-poor people, women and elders are considered most vulnerable to flood negative impacts.

Table 4.2. Major characteristics of wealth groups in Ankor Borie and Svay Chrum districts.

Characteristics	Group		
	Better-off	Medium	Poor
Type of house	Good wooden or concrete house with electricity or batteries/ power generator a source of light	Medium wooden house with electricity or batteries a source of light	Small nippa house using candle or oil lamps as a source of light
Land holding	> 2.5 ha	0.5 – 2.5 ha	< 0.5 ha
Major livelihood activities	Rice farming, livestock production, fishing, small business	Rice farming, livestock production, fishing, wage labour	Rice farming, wage labour
Food security	Surplus	Enough for 9 – 10 months/year	Enough for 3-4 months only
Education of children	High school or higher	Secondary or high school	Primary school
House amenities	TV with DVD players, radio, motorbikes/bicycles, mobile phones, sewing machine, hand tractor, cow carts, rice thresher, small truck, motorboat, 4 – 8 cattle/buffalo	TV, radio, motorbikes/bicycles, cow carts, hand harrower, small boat, 1 – 2 cattle	Bicycles, 1-2 cattle
Water source for domestic uses	Own well	Own or neighbour's well, lake or river	Pond, lake or river
Relief from government	None	Yes	Yes

Livelihoods and flood coping

Through focus group discussions in both provinces Svay Rieng and Takeo, three different flood-coping groups were determined: (1) well coping, (2) just coping and (3) not coping at all (Table 4.3). In general, poor households do not pay attention to flooding, event they are informed about flooding severity from village or commune staff and the commune CDM). They have experienced with flooding and do not cope with floods at all, even for house strengthening before flooding and children and elder people care during high flooding. What the poor set high priority during floods is how to find daily food for family and earn income from non-professional wage labour. In emergency, evacuation is paid much attention. In contrast, rich and medium households with better livelihood assets can well cope with or adapt to floods. They consider strengthening their houses, storing rice and fuel for food security and protecting or repairing before flooding. During flooding, they pay attention to looking for safe shelters, children care, livestock management and looking for opportunities for income generation. Health care and establishment of rice or livestock production are the high priority of better-off households after flooding.

Villagers have some experiences to cope with flood in preparedness planning, response, recovery and rehabilitation. Villagers prepare necessary needs such as food and fuel woods, clothes, equipment and transportation facilities (board, carts…) before flood

water coming, and looking a high and safe place for temporal shelter during the flood season. Village chief and commune council recommend local people place a priority to evacuate elders, children and livestock to safe places in emergency. As flood water approaches the villages, people that have own boats are willing to bring their neighbours to safety places. Commune schools and pagodas located in elevated places can also be used as shelters for local people during flood periods.

Table 4.3. Flood-coping activities of different groups in Svay Chrum and Angkor Borie districts[1]

Activities	Well coping	Just Coping	Not coping at all
Children/elder people care	+++	+++	+/-
Livestock management	+++	++	-
House strengthening	+++	+++	-
House amenity management	+++	++	-
Food security	+++	+++	-/+
Evacuation	-	+	+++
Health care	+++	++	-
Agricultural production	+++	++	-/+
Income generation	+++	++	-/+
Fishing	-	+++	+

[1] priority level: - (no attention), + (low), ++ (medium), +++ (high)

During flood periods, villagers faced water-related diseases problems such as diarrhoea, malaria, dengue and skin disorders, due to limited disease prevention, poor sanitation conditions and health services. During the evacuation to safe places, poor people and women usually get stressed because of limited opportunities for income creation, food shortage, indebtedness and damages to their houses and livestock. In general, poor people, whole have poor livelihood assets and do not cope with flood, suffer more from floods, particularly with severe flooding. Whereas, the rich, who have capacity and favourable conditions to well cope with flood, would gain more from positive impacts of floods.

4.4.2 The Vietnamese Case

Hydro-meteorological features and floods

The hydro-meteorological features of the study areas of An Giang and Dong Thap provinces is indicated in Figure 4.8, which referred to Tan Chau and Chau Doc Hydrological Station located in An Giang province. The four communes namely Phu Hoi, Vinh Hau (An Phu, An Giang), An Binh B and Thuong Phuoc No1 (Hong Ngu, Dong Thap) are located in most upper part of An Giang and Dong Thap provinces and considered to be the most serious flood areas. During 2000-2007, flood peaks ranged between 3.5 and 5.1 m above mean sea level (Figure 4.8). Peak flood levels in Hong Ngu district were from 0.3 m to 0.5 m higher than those at An Phu district. In 2000, 2001 and 2002, three consecutive flood years, peak flood levels ranged from 4.8 to 5.1 m in Hong Ngu and from 4.5 to 4.7 m in An Phu district. Years 2003 through 2007 are considered as “mild flood” years, when peak flood levels were relatively low. Normally, monsoon flood starts in July, when flood water comes into rice fields, reaches its peak level in mid-September and starts to recede by late October. During July and October, flood water levels daily raise from 1 to 5 cm. Flood dynamics, however, highly depends upon river discharges from the upstream, local rainfall and the tidal effect from the estuary. For example, in 2000, 2001 and 2002, floods came earlier and reached their peak levels in September. Consequently, high flood levels lasted for a month, due to high discharge rates from the upstream. In 2000, 2001, 2002, 2004 and 2005, floods receded slowly, due to heavy rainfall locally in combination with high tide levels from the estuary in October.

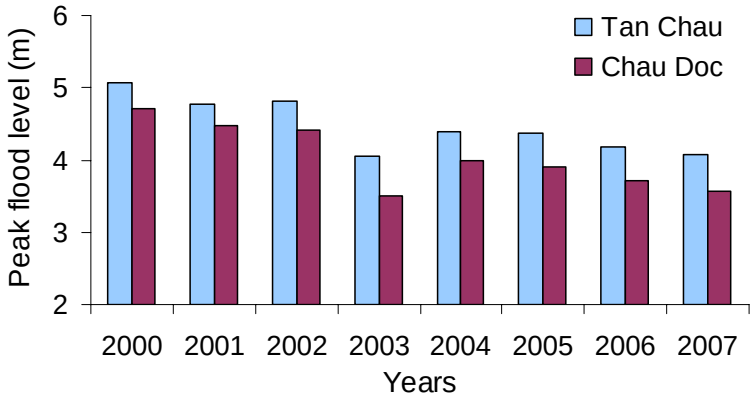


Figure 4.8: Peak flood levels recorded at Tan Chau and Chau Doc Station during 2000-2007.

Annually, preparedness plans for flood and storm control at provincial, district and commune are made in June. During then, the provincial Hydro-Meteorological Centre predicts and informs long-term hydrological situations to local leaders and officials for preparation, based on existing weather data. From June onwards, flood forecasts are done using hydrological data collected in upstreams (Vientiane, Paksé, Kratie and Phnom Penh) as well as in locally.

Key informants reported historical flood events in An Phu and Hong Ngu districts. Accordingly, historically, there were eight big floods occurring during 1961 to 2007 period, such as 1961, 1966, 1978, 1990, 1991, 1994, 1996, 2000 and 2001 floods. During 2002-2007, floods are considered as normal flood. According to key informants, local people predict flood occurrence through indigenous knowledge.

Agro-ecological features and floods

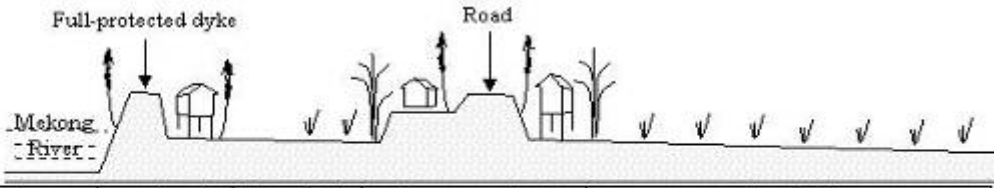
In all the study sites, there are six common agro-ecological nicks (resource systems): (i) main river, (ii) commune/hamlet road or flood control dikes, (iii) homestead, (iv) fish pond, (v) rice fields and (vi) irrigation canal. Soils are alluvial and the soil fertility is annually enriched with sediments of flood water. Water sources are from Mekong and Bassac rivers, deep well and from rainfall. Agricultural production, including aquaculture, highly depends on water from Mekong and Bassac rivers. The favourable communes (i.e. Thuong Phuoc 1 and Vinh Hau) are partly protected from flood damages by water control systems of embankment, dikes and sluice-gates. Major agro-ecological characteristics of representative communes are illustrated in Figures 4.9 & 4.10.

Rice production is the main farming activity in all the study sites. Rice production is strongly influenced by flood duration, depth and flood control structures. About 96-98% agricultural land is devoted to low-land rice farming in the study hamlets, except for Ap 2 hamlet of Thuong Phuoc 1 commune with relatively higher elevation and flood control dikes where rice farming land shares only 67% and upland crops share 30%. With temporal control dikes, most of the rice land is cultivated with 2 crops a year. The dikes are lower than normal peak flood levels and used to prevent the wet-season rice crop damages by flood in the early flood season only. Subsequently, sluice-gates are opened for flood water freely coming into rice fields after harvesting the rice crop. In some areas of Thuong Phuoc 1 and Vinh Hau favourable communes, where elevation is relatively high and full floo-control systems are available, rice is grown with three crops per year. In these areas, dikes are higher than normal peak flood levels and the second wet-season rice crop is completely protected from the flooding. In contrast, a part of Phu Nhon hamlet of Phu Hoi less favourable commune (An Phu district) without the flood control dikes, one high-yielding rice crop is grown in the dry season only. The establishment of the dry-season rice crop

highly depends upon flood recession time. So far, damages of the wet season rice crop by floods have not been significant. For example, agricultural losses, including aquaculture sector, in 2006 and 2007 shared less than 1% of total loss values by floods, compared to 14% for house and other individual properties and 85% for common infrastructures (PCSFC of An Giang and Dong Thap, 2006 & 2007).

Resource systems	River	Fish pond	Commune road	Homestead	Rice fields	Canal	Rice fields
Soil type	Silt	Silt	Clay loam	Clay loam	Clay loam	Silt	Clay loam
Water sources	Rainfall	River, rainfall	River, rainfall	River, rainfall	River, rainfall	River, rainfall	River, rainfall
Plants/crops	Aquatic plants	Aquatic plants	Multi-purpose (MP) trees	Fruit and MP trees	2 rice crops/year	Aquatic plants	2 rice crops/ year
Animals	Indigenous fishes/prawn	Fish (cage/fence culture)		Pig, duck, chicken	Wild fishes, duck	Wild fishes	Fishes, duck
Advantages		Water availability		Alluvial soil	Alluvial soil, water availability		Alluvial soil, water avail.
Problems			Erosion by flood	Flooding	Wet season rice (WSR) damage by early flooding	Sedimen-tation & erosion	Flooding

Figure 4.9 A representative transect showing resource systems of Phu Nhon hamlet (Phu Hoi, a less favourable commune, An Phu district)



Resource systems	River	Road and homestead	Rice fields	Homestead and dikes	Rice fields
Soil	Silt	Clay loam	Clay loam	Clay loam	Clay loam
Water		River, deep well, rainfall	River, rainfall	River, deep well, rainfall	River, rainfall
Plants	Macro-phytes	Fruit and multi-purpose trees, vegetables	Rice	Fruit and multi-purpose trees, vegetables	Rice
Animals		Pig, buffalo, cattle, poultry		Pig, buffalo, cattle, poultry	
Fish	Wild fish	Cultured fish	Wild fish	Cultured fish	Wild fish, snails

Figure 4.10 A representative transect map showing resource systems of Ap 2 hamlet (Thuong Phuoc 1, a favourable commune, Hong Ngu district)

Aquaculture has much developed recently. Aquaculture systems include pond, cage and fence farming. The success of aquaculture is highly affected by flood duration, depth

and flood control structures. Less than 1% of agricultural land in the study sites in An Phu district and about 2-4% of that in Hong Ngu district is devoted to pond culture of catfish (*Pangasius hypophthalmus*) or snakehead fish (*Channa striatus*). This type of farming is practiced in areas with relatively higher revelation or flood control systems (i.e. Thuong Phuoc 1 and Vinh Hau communes). Cage or fence culture of snakehead fish (*Channa striatus*) or freshwater prawn (*Macrobrachium rosenbergii*) are practiced in rice fields during flood periods. Aquaculture activities take use of good water and rich sources of natural fish feed during the flooding season. These aquaculture systems are commercial and require know-how and high capital investments. They are therefore considered as the domain for better-off households mainly.

Fruit, vegetable and livestock production are minor farming activities in all the study sites. During monsoon flood periods, most of resource systems, except for commune roads and residential clusters, are flooded. Consequently, vegetable and livestock production can be practiced during the dry season only. In Ap 2 hamlet (Thuong Phuoc 1 commune), vegetables are grown in highly-elevated or flood-protected areas.

Multi-purpose trees that can tolerate with deep inundation are found commonly along roads, dikes or in homesteads. They are mainly *Sammanea saman*, *Acacia auriculiformis Sarcocephalus cordatus*, *Eucalyptus camaldulensis, Bambusa spp., etc.* The trees can be used for construction, firewood, wind- or wave-stop.

Socio-economic features and floods

In each study hamlet, key informants classified all households into three major social groups: (1) poor household (18-26%), (2) intermediate households (31-74%) and (3) rich households (8-49%). In the favourable communes, proportions of rich households are higher (35-49%) that in the less favourable ones (8-20%). One of important reasons for this would be better physical conditions (embankment dikes, irrigation systems, roads and residential conditions) and higher levels of agricultural intensification (two or three rice crops per years, aquaculture and upland crop production). In general, the wealth groups in the study sites have typical livelihood characteristics of those in the Mekong delta (AusAID, 2005). Poor households are characterized by being landless or small-land holding, residing on disadvantaged places (along river banks or in remote low-land areas), owning a small house with limited amenities, low level of educational attainment of children, depending upon wage labor or exploiting natural resources mainly, and receiving subsidy from the government (Table 4.2).

In the study hamlets, in general, annual net poverty reduction rates are relatively low (0-1%). For example in 2007, in each hamlet about 17-28 poor households escape from the poverty but the same number of households staying above the poverty line fall into the poverty. According to local villagers, the major poverty-related vulnerability factors of households include: unsafe residential place, small nippa house, unhealthy status of household members, lacking labor and income-generating facilities, unskilled off-farm jobs and fishing as the major income sources, big floods and tropical storms.

Households mostly settle along the commune road, secondary or tertiary canal banks with relatively high elevation and easy access to canal water resource and transportation means. Most of the rich households dwell close to main road while poor households reside in residential clusters or lines, along river banks or tertiary canals.

Table 4.2 Major characteristics of wealth groups in An Phu and Hong Ngu districts

Characteristics	Groups		
	Poor	Intermediate	Rich
Type of residence	Temporarily residing on other people's land, along river banks or in residential clusters	Residing along river banks or on own homestead	Own homestead
Land holding (ha)	Landless	< 0.5 ha	> 0.5 ha
Type of house	Small nippa	Small wooden	Wooden or brick
Major livelihood activities	Unskilled wage labour, fishing, small trading	Rice farming, wage labour, small trading, fishing	Rice, aquaculture or livestock farming, skilled off- or non-farm jobs.
Educational of children	Primary level	Primary or secondary	Secondary or higher
House amenities	None	Television, electric fan, electric cooker	Television, DVD player, electric fan, electric/gas cooker
Transportation means	Bicycle, small boat	Bicycle or old motorbikes, small boat	Motorbikes, motorboat
Relief from government	Yes	None	None

Using data collected from individual households participating in focus group discussions, results of multivariate factor analysis show five major characteristics (factors) describing different wealth groups. The major characteristics are: (1) rice farming activity, (2) human resource of households, (3) off- or non-farm job, (4) livestock or aquaculture income, and (5) residing place and fishing activities (Table 4.3). Accordingly, mostly poor households are landless and do not possess homestead, dwelling in residential clusters, along river banks or temporally on other people's land. They earn income from fishing and non-professional wage labour mainly. Results of discriminant analysis quantitatively define the groups (Figure 4.11 and Table 4.4). Livelihood activities of both local better-off and worse-off people are in general characterized by seasonal variation and directly natural resource-base dependence. The rich people could be considered as natural resource users while the poor as natural resource exploiters, being highly sensitive to natural hazards and to environmental externalities.

Fishing is one of the main livelihood activities of the poor in An Phu and Hong Ngu district. However, the natural aquatic resources, both flora and fauna, have been declined year after year. The decline of the resources has resulted from rice intensification, over-exploitation of natural resources and flood control structures (Kakonen, 2008). Many of poor households in Phu Hoi commune (An Phu), bordering with Cambodia, go to Cambodian side to catch fish during flood periods. In big flood years, the fishing activity becomes less productive and risky, due to big waves from high flood water depths and strong winds. The results reveal that poor people's livelihoods are much vulnerable to big floods. In contrast, better-off people might get benefits from the floods through increased productivity of rice and aquaculture from soil fertility enrichment and natural fish-food abundance while living in safe places with stronger houses and good amenities (see descriptions in earlier).

Table 4.3: Major factors of livelihoods of local people in An Phu district, An Giang province[1]

Variables	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Ricefield area	**0.88**	0.13	0.01	0.03	0.07
Homestead area	-0.04	-0.06	-0.04	0.15	**0.86**
Rice income	**0.95**	0.00	0.04	0.01	0.07
Livestock income	0.11	**0.46**	0.25	**-0.56**	0.05
Aquaculture income	0.10	0.21	0.17	**0.83**	0.03
Off-farm income	-0.38	-0.10	**-0.85**	-0.21	0.07
Non-farm income	-0.37	-0.18	**0.79**	-0.13	0.28
Fishing income	-0.27	0.14	-0.23	0.23	**-0.69**
Household size	0.01	**0.87**	-0.17	0.08	-0.18
Household labour	0.11	**0.91**	0.07	0.04	-0.04
Variance explained (%)	24.1	20.7	14.4	11.5	9.6
Factor interpretation	Rice farming activity	Human resource	Off- or non-farm income	Livestock or aquaculture income	Residing place and fishing activities

[1] Data were collected from 64 individual households participating in focus group discussions in two communes. The Table shows factor loadings of variables in different factors. Only loadings >0.5 are used to interpret the factor.

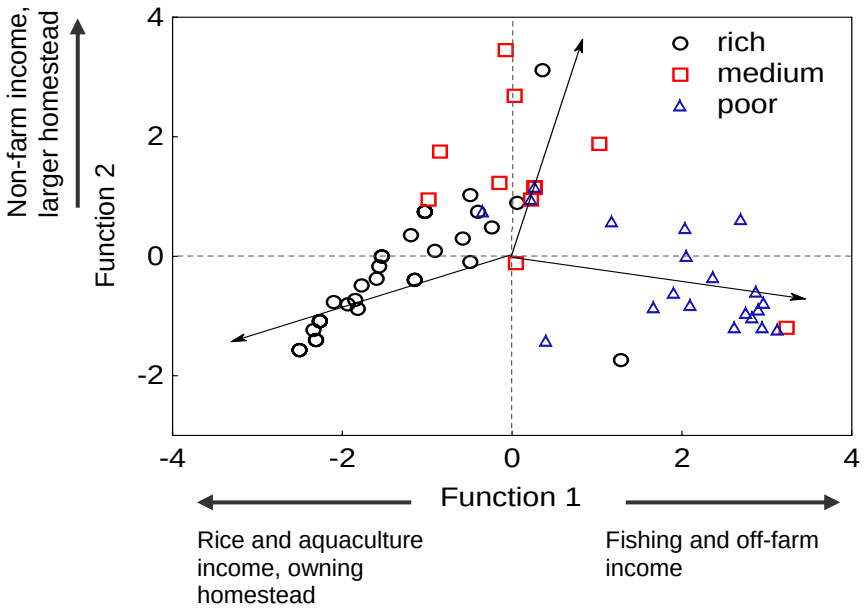


Figure 4.11 Distribution of score means of different wealth groups in discriminant function space.

Table 4.4 Mean (±STD) of major variables discriminating wealth groups in An Phu district, An Giang province[1]

Variables[2]	Wealth groups		
	Poor	Intermediate	Rich
Rice income (%)	0.0 ± 0.0	10.8 ± 29.4	51.0 ± 34.3
Homestead area (m2)	55.0 ± 104.5	109.8 ± 106.7	103.5 ± 29.8
Type of homestead	2.3 ± 1.2	1.0 ± 0.0	1.0 ± 0.0
Aquaculture income (%)	2.2 ± 0.0	0.0 ± 0.0	12.3 ± 18.7
Livestock income (%)	0.0 ± 0.0	4.2 ± 14.4	3.5 ± 10.9
Fishing income (%)	27.3 ± 25.4	2.5 ± 8.7	5.0 ± 11.5
Off-farm income (%)	48.1 ± 33.6	31.3 ± 38.5	4.5 ± 10.0
Non-farm income (%)	22.4 ± 33.4	51.3 ± 43.1	23.8 ± 33.3

[1] Sample size is 64.
[2] Rice, aquaculture, livestock, fishing and non-farm income is calculated as percentage of total household income. Type of homestead is considered as nominal variable (1= own, 2= residential cluster, 3= small tilt-house along river banks, 4= temporarily dwelling on other people' land)

Livelihoods and flood coping

Flood copping groups

Three flood-coping groups are classified: (1) not coping at all, (2) just coping and (3) well coping. Flood-coping activities of the groups are presented in (Table 4.5). Not-coping group pays more attention to fishing and other nonprofessional jobs for their daily subsistence during the flood season. In contrast, just- and well-coping groups consider house strengthening, food storage (before flood season), children care, domestic water treatment, health care (during flood season), agriculture and aquaculture improvement, looking for professional jobs as the major income source and giving relief as high priority, reflecting that they not only actively cope but also tend to adapt with flooding.

Table 4.5 Flood-coping activities of different groups in An Phu and Hong Ngu districts[1]

Activities	Not coping	Just coping	Well coping
House strengthening	-	++	+++
Food storage for flood season	+	+++	+++
Taking care children during flood season	+	+++	+++
Water treatment for domestic uses	-	+	++
Temporary migration	+	+	-
Health care	+	++	++
Improvement of rice and aquaculture	-	+++	+++
Looking for professional jobs	-	++	+++
Looking for unskilled jobs and fishing	+++	+	+
Giving relief	-	-	+++

[1] priority level: - (no attention), + (low), ++ (medium), +++ (high)

Results of discriminant analysis characterise different flood-coping groups (Figure 4.12 and Table 4.6). Not-coping households are those being land less, residing in residential cluster, along river banks or temporally on other people's land with a small homestead area, and highly relying on fishing and unskilled off-farm jobs for subsistence. The opposite

occurs with well-coping group, which owns larger rice land and homestead, and highly depends on income from rice, aquaculture and non-farm activities. Just-coping group is as same as the well coping one but has no rice land, does not practice aquaculture and mainly depends on off- and non-farm activities. Matching the results of wealth and flood-coping classification show that well-coping group includes better-off households (the rich and intermediate) while not- and just-coping one including worse-off households (the poor or the intermediate just staying above poverty line). Results show that 80-95% poor households seem not to cope with floods at all. They consider livelihood activities for daily subsistence as high priority, due to limited livelihood assets.

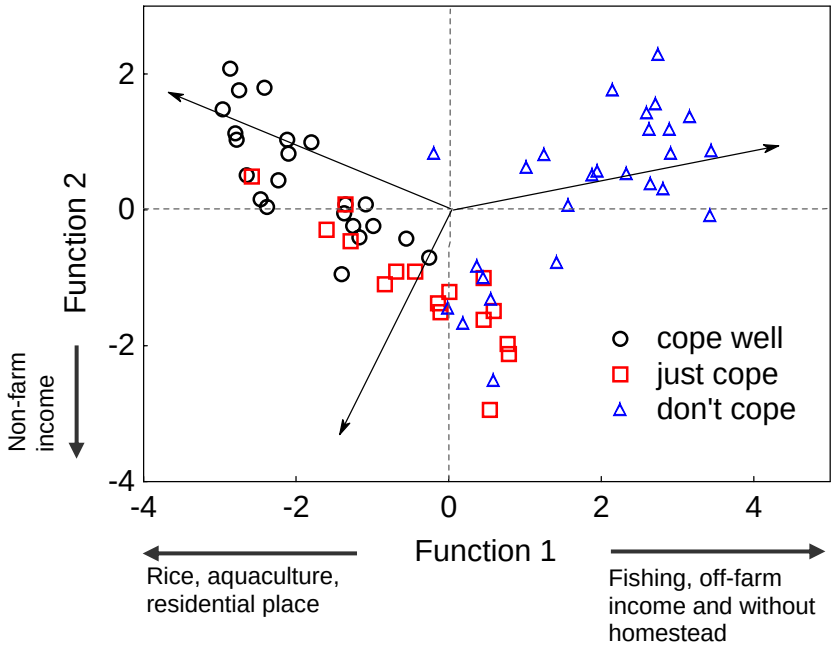


Figure 4.12 Distribution of score means of different flood-coping groups in discriminant function space

Flood coping activities of households

For better-off households who well cope with floods

In general, households cope with floods actively and try to adapt with flooding. Major activities before, during and after floods are as follows:

- *Before flooding (1 Jan–30 June):* in April, construction and maintenance of regional/community flood control dike systems to protect the wet season rice crop, rice harvest of the wet season crop, land preparation, rice storage in safe places, house strengthening, float collection;
- *During flooding (1 Junly-31 October):* Fishing, finding jobs in other towns or provinces (i.e. Long Xuyen, Ho Chi Minh city and Binh Duong), small-scale trading within the community;
- *After flooding (01November-31 December):* Preparation of rice field dikes, land preparation for rice crop establishing, rice seeding and crop care, selling labour.

For worse-off households who do not or just cope with floods

Worse-off households are vulnerable to flood risks. Their livelihoods highly rely on natural resource base and they cope with flood passively. Major activities before, during and after flooding are as follows:

- *Before flooding:* House strengthening, maintenance of boat and fishing devices, snail catching, selling labour, peddling;
- *During flooding:* Evacuation to safe places, receiving relives from local governmental agencies or NGOs, fishing, aquatic vegetable collection, selling labour;
- *After* flooding*:* Preparation of rice field dikes for rice crop establishment, fishing, aquatic vegetable collection, rice seeding and care, selling labour.

Major problems of households

Major problems that local people face in coping with floods are:

- Poor sanitation and environmental pollution result in water-born disease incidence such as diarrhoea, malaria, dengue, skin and eye diseases, which mostly occur after flood recession (October-December).
- Houses of poor people, who reside in unsafe places, are not strong enough with big floods.
- Unemployment frequently occurs during January and February, particularly for poor people. Consequently, households getting in debt are hardly to pay loan back.

Residential clusters or lines are still lacking and still a large proportion of poor households and households highly vulnerable to flood risks are staying in unsafe places.According to villagers, major vulnerable factors for local people to deal with floods include:

- Small land holding and degradation of bio-resources (i.e. natural resource);
- Labour unavailability, unskilled work and unhealthy status (i.e. human resource);
- Unsafe residential places, a small house with poor amenities (i.e. physical resource)
- Limited opportunities for employment and low income (i.e. capital resource)
- Weak connections within the community (i.e. social resource)

It is clearly that the vulnerable factors to deal with floods and livelihood factors are closely linked. This would suggest that improved livelihoods of local people would allow to increased capacity of people to cope with floods.

Table 4.6 Mean (±STD) of major variables discriminating flood-coping groups in An Phu district, An Giang province[1]

Variables[2]	Groups		
	Not coping	Just coping	Well coping
Rice income (%)	0.0 ± 0.0	0.0 ± 0.0	44.2 ± 37.1
Homestead area (m2)	32.3 ± 31.5	107.5 ± 108.1	117.7 ± 82.3
Type of homestead	2.5 ± 1.2	1.5 ± 0.9	1.0 ± 0.0
Aquaculture income (%)	0.0 ± 0.0	0.0 ± 0.0	12.1 ± 20.7
Fishing income (%)	32.3 ± 25.6	8.3 ± 18.3	6.2 ± 12.4
Off-farm income (%)	55.5 ± 32.9	36.3 ± 37.7	7.9 ± 14.3
Non-farm income (%)	12.3 ± 22.9	52.4 ± 42.1	26.9 ± 35.4

[1]Sample size is 64.
[2] units and type of variables are same as those in Table 4.4

4.5 Effectiveness of institutional and policy improvements

Cambodian and Vietnamese Mekong delta is one of the most natural flood-prone areas of the Mekong Basin. Therefore, flood control and disaster reduction are put at a high priority by the governments. As mentioned early in this report, the government of both Cambodia and Viet Nam have invested efforts in improving institutions and policies to flood control and disaster reduction in flood-prone areas. The institutional and policy improvement become effective if it matches well with ecological and socio-economic contexts of local communities. Achievements and suggestions for further improvement are identified for both Cambodian and Vietnamese cases below.

4.5.1 The Cambodian Case

Achievements

- The CDM through its institutional arrangements at provincial and district levels has made some headway in flood control and reduction.
- Several internal (i.e. Red Cross) and international organisations have been involved in flood response and mitigation through the effective collaboration of the national CDM.
- Flood management and mitigation programme has been implemented successfully in two pilot provinces Prey Veng and Kandal, allowing to scalling up successful results obtained from the programme to other flood-prone provinces.

Improvements

- An adequate institutional framework and effective flood management policy need to be developed in order to further improve human and material resources of the CDM in planning and coordination of disaster management, particularly for local levels from province, district to commune.
- Integration of short-term disaster management into a long-term development planning need to be established.
- Both structural and non-structural measures need to be developed adequately to help poor communities to cope well with floods.
- Roles and responsibilities of line agencies should be clear cut to enable them function well.
- Establishment of disaster management team at the village level would be advisable for effective response to flood in emergency.

4.5.2 The Vietnamese Case

Achievements

- Institutional and policy improvement presents to be effective to flood control and mitigation.
- Annual flood preparedness planning, coordination, monitoring and evaluation of the CFSC from the provincial to commune level have become more effective. The planning is done by early each year, considering infrastructures for transportation, irrigation/drainage and peope's welfare.
- The concept "*living with floods*" and the "*four-on-site principle*" have been applied successfully through effective coordination and cooperation of the CFSC and its line members, increased awareness and effective mobilisation of available resources of local communities.

- The combination of structural and non-structural measures has been applied successfully by the CFSC from provincial, district to commune levels. Consequently, local transportation, services and agricultural productivity have been improved; children insecurity during flooding has been minimised; a range of 65-80% of poor households have been resided in safer places of residential clusters; people's awareness in flood prevention and coping has been raised, etc.
- Integration of short-term disaster management into a long-term development process has been established and implemented. Agricultural development plans at provincial scale is an example for this achievement.
- Flood management and mitigation programme have been implemented successfully in two pilot provinces An Giang and Dong Thap, allowing to scalling up successful results obtained from the programme to other flood-prone provinces.

Improvements

- The structure of the CFSC at provincial and district levels needs to be improved so that roles and responsibilities of line agencies become clearer, particularly at lower level, and hence they can function better in emergency. Accordingly, the CFSC could be composed of four sub-committees, in stead of three as the current situation, like: (1) sub-committee for infrastructure and agriculture, (2) sub-committee for searching and security, (3) sub-committee for social policy and (4) sub-committee for health, education and environment.
- Flood preparedness planning plays a vital role in disaster management. However, the planning process should be done on time with a combination of bottom-up and top-down approaches, allowing investments meeting real needs of local communities
- Financial investments from the government for flood prevention and response should be increased, considering large-scale structures, facilities and accident insurance for members of the Team for Flood and Storm Security.
- Medium-term (5-year) and long-term flood preparedness planning should be developed. The planning needs to be based on a livelihood framework of different local wealth groups.
- Flood preparedness planning, evaluating and reporting should be standardised with clear indicators, strategic and integrated solutions.

4.6 Strategies for flood coping

4.6.1 The Cambodia case

Recommendations and solutions for improvement of flood coping and damage reduction include:

- *Emergency preparedness:* This is an essential activity, particularly with severe floods and low-capacity community dealing with floods. The activity focuses on emergency response which includes building capacity on identification of target areas and groups and areas, security exercises and community-based early warning systems.
- *Structural mitigation:* It includes construction and preparation of safe shelters, flood water drainage, sack bag preparation, house strengthening, domestic water supply, boat and other rescue equipment repairing.
- *Livelihood:* Food supply, basic health care and sanitation are important aspects. Promoting food production and food stock reserved, creating income generation in community and providing awareness on basic health care and sanitation during flooding are of great importance.

- *Capacity building:* Building capacity of local community, including organizing community-based flood risk reduction and management groups, training, and awareness raising of community members on flood preparedness and response need to be considered, importantly for local administrative levels.

Flood risk reduction and management at the community level has focused on emergency response and recovery as well as awareness of prevention. Local institutions should consider organization of self-help groups and sodality groups at the community level in order to well respond and give supports during flooding. Important activities are (1) creating community assets like community's safe places used as the temporary shelters for villagers and their livestock in cases of emergency, and (2) establishing a simple early warning system such as local authority announcement, local volunteer shouting or informing by megaphone to warn people about floods and storm status.

The CCDM and local community mobilize resources for disseminating flood and storm information and provide early warnings to ensure people in flood-prone areas well accessing to information and responding to flooding on time. At community level, in order to respond to flood and storm more effectively, possible measures need to be considered as follows:

- Further mobilizing resources to develop flood preparedness planning at community level, integrating with local socio-economic development plans through supports from government and non-government organizations;
- Strengthening coordination and linkages between the commune CDM with line departments and NGOs;
- Forming disaster response volunteers at the community level;
- Providing training programmes on community-based flood risk reduction and management, first aids, and on reporting methods for security volunteers, commune council's and CDM's members, and the village chief;
- Organizing regular meetings within villagers to raise awareness on flood risks and impacts;
- Setting up a regular monitoring system, allowing the commune CDM and villagers to improve effectiveness and efficiency for flood risk management; and
- Strengthening water control and management systems to improve agricultural land uses and to reduce dependency of people livelihoods on natural conditions.

4.6.2 The Vietnamese case

Recommendations and solutions for improvement of flood coping and damage reduction are:

- Planning and coordination: Recently, the planning and coordination in flood and storm management of the CFSC at all the levels in An Giang and Dong Thap provinces have been more effective and efficient. However, there are still problems remaining (see Appendices 4). For more effective planning and coordination in the future, recommendations are as the followings (Figure 4.13):
    - Planning, combining "top-down" and "bottom-up" approaches, should be much more detailed and be set priorities;
    - Provincial CFSC' plans need to consider real needs of local communities, standardised evaluation criteria, short-term and medium-and/or long-term with

strategic and integrated solutions, so that all resources can be mobilized for human capacity building and livelihood development;

- Raising people's awareness in coping with flood should be more widespread;
- Structural measures need to matched with non-structural measures, paying more attention to local people's livelihoods;

- Monitoring and evaluation are mainly based on reports from the people's committees and the CFSC at the commune and district level, and some practical observations. However, the evaluation lacks details, assessment criteria and community's or household's participation. Financial resources given to monitoring and evaluation work are limited. The evaluation is usually paid more focuses on infrastructural and agricultural losses and little attention to people livelihood and environmental aspects, particularly to vulnerable groups. Evaluation and final reports needs more details with strategic and integrated solutions for flood control and management, and sustainable development.
- Safe residential clusters/lines and temporary shelters need to be further developed, particularly for vulnerable people in flood-related insecure areas.
- The "*four-on-site principle*" presents an effective and efficient way in flood coping at the community level. This principle needs to be extended and enhanced, mobilizing all available resources locally to cope with flood in emergency.
- The *model* of "children-care centre" during flooding needs to be promoted and further supported. Integration of appropriate educational programmes on flood management into this model would be advisable.

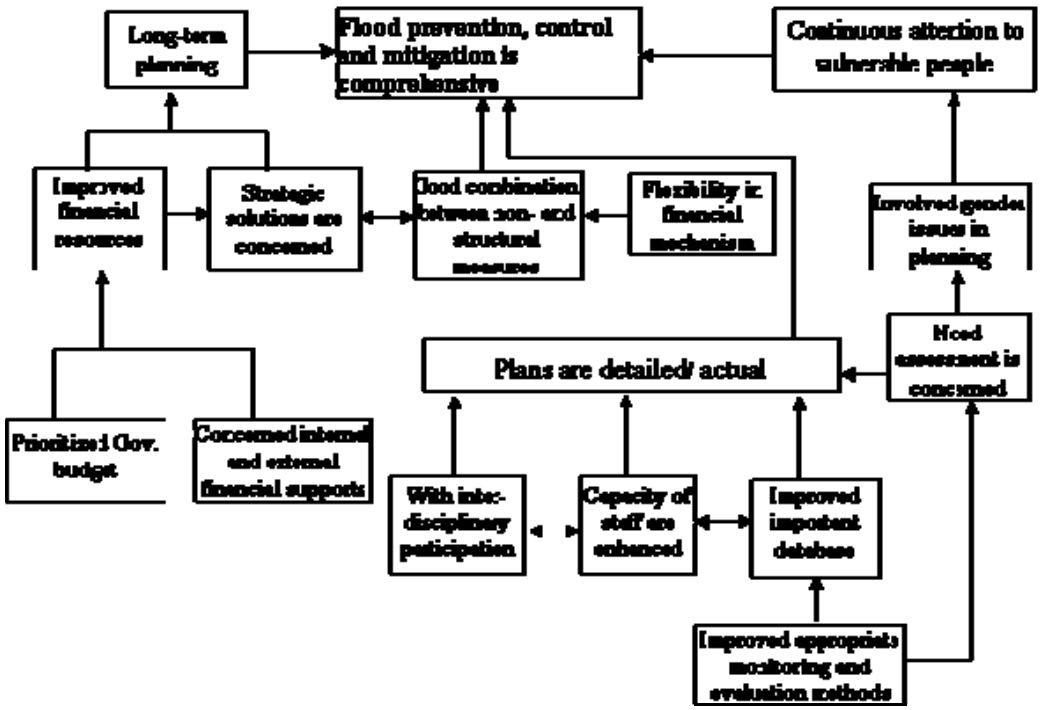


Figure 4.13 Solutions for the flood control and mitigation in An Giang and Dong Thap.

4.7 Partnership establishment in trans-boundary flood management

A stakeholder workshop, which was held at Mekong Delta Development Research Institute (Can Tho University, Viet Nam) on December 13-14th 2008, aimed to:

- Verify findings from the study with local stakeholders, particularly local CFSC's and CDM's officials;
- To collect additional information for completing the final report;
- To share knowledge and experiences among governmental officials and researchers, and to establish a partnership for future collaboration in trans-boundary flood management in Cambodian and Vietnamese Mekong delta.

Workshop participants were from (see Appendices 6 and 7):

Cambodian side:

1. Cambodia National Mekong Committee
2. Ministry of Water Resources and Meteorology, a member of the NCDM;
3. Ministry of Agriculture, Forestry and Fisheries, a member of the NCDM; and
4. Svey Rieng Province

Vietnamese side:

1. National Institute for Science and Technology Policy and Strategy Studies (Ministry of Science and Technology);
2. Standing Office of the CFSC of An Giang and Dong Thap provinces;
3. Department of Agriculture and Rural Development, a permanent member of the provincial CFSC, of An Giang and Dong Thap provinces; and
4. Mekong Delta Development Research Institute (Can Tho University, Viet Nam).

The workshop also included a field day to An Phu district of An Giang province to share practical experiences of residential cluster models in a flood-prove area between Cambodian and Vietnamese sides.

During the workshop, commonalities and differences in flood coping between Cambodia and Viet Nam were discussed. Major lessons learnt and issues discussed during the workshop included:

- Institutional frameworks of the CFSC and the CDM, and their linkages between administrative levels and with the national government; organization and strong linkages among the CFSC's members line agencies could be lessons learnt for Cambodia.
- Integrated solutions to disaster management, a combination between structural and non-structural measures, and integration a short-term flood control planning with long-term development objectives; this could be a lesson learnt for Cambodia.
- The *"four-on-site principle",* a decentralization to local community in flood coping in emergency in Viet Nam; this is a lesson learnt for Cambodia.
- Integration of establishment of safe residential clusters with improvement of poor people's livelihoods in flood areas of Viet Nam; this could be a lesson learnt for Cambodia.

- Human capacity and coordination and cooperation of the CFSC and its line departments at all administrative levels being considered important in successful flood preparedness planning and implementation;
- The involvement of internal and external NGOs in flood coping, an achievement of Cambodia;
- Approaches used for flood preparedness planning, implementation, monitoring and evaluation;
- Perception and action of local people, flood mapping and early warning systems in flood management; and
- Establishment a partnership for information sharing and possible cooperation in trans-boundary flood management in the Mekong delta of Cambodia and Viet Nam in the future.
- Establishment a flood warning system in Cambodia; this could be a lesson learnt for Viet Nam.

5. CONCLUSIONS AND RECOMMENDATIONS

Institutional framework and activities of the Cambodian CDM and the Vietnamese CFSC

Major findings:

Floods and disaster management are undertaken by the CDM (for Cambodia) and CFSC (for Viet Nam), from flood preparedness, response, recover and rehabilitation. The CDM and CFSC are set up from national, provincial, district to commune levels. At each level, these organizations are composed of several functional agencies. In Viet Nam at hamlet level, Flood Security Teams are officially organised to help their communities to successfully cope with floods, whereas such official units do not exit in Cambodia. The coordination, planning, implementing and evaluating processes of the CDM and the CFSC are undertaken in both vertical (between administrative levels) and horizontal directions (among line agencies at the same level). At provincial and district levels, sub-committees of the CFSC are set up in order to avoid overlapping roles and responsibilities among line agencies while they are not available in the Cambodian case.

There have been improvements in the institution and strategies to flood and disaster management in both Cambodia and Viet Nam, emphasising on organizational structure, systems preparedness and coordination of the CDM and the CFSC, and on integration of short-term flood management into long-term objectives of sustainable development. In addition, the concept "*living with floods*" and the "*four-on-site principle*" - the centralization to community - present to be effective in Viet Nam, reflecting the point of view of adapting rather sole copping and the important role of local community in flood management.

Roles and responsibilities of functional agencies differ with flood periods, particularly in Viet Nam. This implies the importance of flood preparedness process and the limited overlapped duties of the agencies.

Recommendations:

- For Cambodia, the structure and coordination of the CDM need to be improved, and roles and duties of line agencies should be clear, particularly at local level, in different flood periods. The model of the CFSC at local levels and the approach to flood management of Viet Nam could be the lessons learnt.
- For Viet Nam, the CFSC sub-committees need to be re-organised to minimise overlapped tasks of the CFSC's member line agencies at different levels in different flood periods.
- In both countries, flood response and recover activities have been emphasised. Systems preparedness planning, especially in medium- and long-term plans, needs to be paid more attention, emphasizing combined structural and non-structural measures, flood adaptation strategies and roles of local community.

Impacts of the CDM's and CSFC's institutional framework and their activities in flood coping

Major findings:

Changes in strategies and approaches to flood management have resulted in improvement of institutional framework and activities of the CDM and the CFSC. The improvement is reflected by enhanced institutional mechanism, particularly at local level (i.e. commune and hamlet), increased participation of local community and reduced damages to vulnerable people. In addition, information exchanges in flood management among Mekong River Basin countries and International organizations are of great

importance to improve institutional framework, approaches and to build human capacity of the CDM and CFSC at all levels in both countries.

The combination of structural and non-structural measures in flood coping as well as adaptation is recognized. More projects and interventions associated with non-structure measures and the concept "*living with floods*" were implemented successfully in Viet Nam, allowing both reduced risks and damages to people by floods and increased livelihoods of vulnerable groups.

Local community institutions play a crucial role to flood copping at local level, especially with severe floods. If local institutional structure and mechanism exist, functions and roles of both local authorities and internal as well as external NGOs will be enhanced. This is reflected with the Vietnamese case.

Recommendations:

- For Cambodia, further improvement of institutional mechanism and human capacity at local level and an appropriate approach to flood and disaster management would be advisable to increase effectiveness of functions and roles of the CDM. The concept "*living with floods*", the "*four-on-site principle*", organisation of the Team for Flood and Storm Security at hamlet level, the combination of structural and non-structural measures, and strong linkages between internal and external actors in solving flood problems in Viet Nam could be lessons learnt.
- For Viet Nam, further building capacity of local community is of great importance, ensuring that they can well participate in flood management from preparedness planning, response to cover and rehabilitation. In addition, providing enough facilities for the Team for Flood and Storm Security at hamlet level and enabling this agency participating in all processes of flood management are essential.

Floods and local contexts

Major findings:

At community level, flood impacts and copping by local communities differ with hydrological, agro-ecological and socio-economic settings in flood areas. Subsequently, these local settings strongly influence inhabitants' livelihoods and wealth status. Structural interventions (i.e. flood control structures and residential clusters), local community structure and supports from externals actors are major factors of flood coping by local people.

At household level, the level of flood coping by households and their livelihoods are closely linked. Better-off people with better livelihood capitals cope well with and tend to adapt to floods. The opposite occurs with the worse-off group, who try to survive over flood periods and do not cope with floods at all. Livelihood capitals determine vulnerability of household to deal with floods.

Recommendations:

- In both countries, livelihood-based approaches need to be considered for flood and disaster management strategies. Flood and disaster measures should pay more attention to improving livelihood of poor people, not only during and after flooding but also before flooding periods. In addition, the establishment of flood maps for more effective and efficient structural and non-structural measures to addressing specific needs of local communities is essential.
- For Cambodia, to meet real needs of local community, integrated solutions are essential; including adequate institutional framework at all levels, effective disaster management policies and appropriate approaches to flood management. Vietnamese achievements in flood coping could be valuable lessons learnt.

- For Viet Nam, even through remarkable achievements in flood management in recently, there are still rooms for further improvements: (1) improving the organizational structure of the CFSC at local level in order to minimise overlapped tasks of functional agencies, (2) improving flood preparedness planning, evaluating and reporting processes, considering livelihood niches of local people, and (4) increasing investments for flood prevention and response.

Sharing knowledge and experiences between two countries

Major findings:

The realization of commonalities and differences in flood management would suggest the necessity of future co-operations between Cambodia and Viet Nam. Floods, local contexts and flood impacts probably seem to be similar between countries. However, differences are the institutions and the level of coordination of the CDM or the CFSC at all levels, the investments of physical, human and financial capitals, and approaches to flood coping. Therefore, information sharing and development of a partnership in flood management in specific conditions are greatly important. Furthermore, it is realized that trans-boundary flood management is essential to improve effectiveness of flood forecasting, to minimise negative impacts while maximising benefits from floods.

Recommendations:

- Policy dialogues and institutional mechanisms for the trans-boundary of flood management between the two countries need to be considered for the Mekong Basin flood preparedness in the future, based on strategies of MRC.
- Flood and disaster management should be involved in periodical meetings of bordering provinces and districts of the two countries, allowing to increase flood warning and to improve human capacity.

Limitations of the present study and suggestions for further research

The limitation of the present project is mainly focus on local institutions in a limited number of districts in four bordering provinces of Cambodia and Viet Nam. Floods and any interventions in flood management certainly impact on ecological and socio-economic aspects not only in upstreams but also mid- and downstreams. Further studies therefore need to be considered:

- Flood mapping for improved early flood warning and structural and non-structural measure strategies.
- Vulnerability assessments and adaptive strategies of local community to floods and storms in particular and climate change in general in the whole delta, including upstream, midstream and downstream areas in both Cambodian and Vietnamese Mekong deltas.

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APPENDICES

Appendices 1: Main guiding questions for gathering information at local levels

Main guiding question	Information needed	Tools	Type of respondent	Expected output	Gaps
A. LITERATURE REVIEW and RECONNAISSANCE SURVEY					
➢ What knowledge does CSFC/CDM have about flood situation and flood management? ➢ What knowledge do local stakeholders (district/commune level) have about flood situation and flood management? ➢ What knowledge do communities/farmers have about flood situation and flood management?	Organization and framework of CSFC/CDM; activities of CSFC/CDM; policies, decrees or regulations with regards flood management; current planning process of CSFC/CDM; Previous studies about flood management; major projects;	➢ Review of documents		➢ Understanding of CSFC/CDM framework, activities and capacity ➢ Lessons learnt in coping with flood by communities	
➢ Who are the stakeholders involved and what are their interests, mandates, activities, performance and influence in coping with flood?	Name of stakeholders/ institutes; their roles and activities	➢ Review of documents ➢ Interviews	CSFC/CDM and others stakeholders	➢ List of stakeholders, their objectives, interests and activities	

Appendices 1 (cont.)

Main guiding question	Information needed	Tools	Type of respondent	Expected output	Gaps
➢ Where will the study be undertaken?	Agro-ecological zones maps, water resource maps of representative provinces, representative districts/villages	➢ Using maps ➢ Review of documents	CSFC/CDM and others stakeholders	➢ Study site (districts/villages) identified	
➢ Who will be the target groups/ communities?	Communities who cope well with floods, Communities who do not cope well with floods	➢ Review of documents ➢ Interviews	CSFC/CDM and others stakeholders	➢ Factors that determine communities who cope well or do not cope well with floods identified	
B. MEETINGS/ WORKSHOP					
➢ Who are the key stakeholders involved and what are their interests, mandates, activities, performance and influence in coping with flood?	Name of stakeholders/ institutes; their roles and activities	➢ Review of documents ➢ Interviews/ workshop	CSFC/CDM and others stakeholders	➢ Finalized the list of stakeholders, their objectives, interests and activities	
➢ Where will the study be conducted? Who will be the target groups/ communities? ➢ What are the plans for first info gathering (PRA)?	Agro-ecological zones maps, water resource maps of representative provinces, representative districts/villages	➢ Using maps ➢ Review of documents ➢ Workshop	CSFC/CDM and others stakeholders	➢ Finalized study sites, communities who cope well or don't cope well with flood ➢ Plans for in-depth interview, PRA developed	

Appendices 1 (cont.)

Main guiding question	Information needed	Tools	Type of respondent	Expected output	Gaps
C. FIRST INFORMATION GATHERING IN THE FIELD					
➢ What are the essential features of agro-ecological zones in districts/villages under investigation?	Agro-ecological niches, hydrology, topography, land use systems, ...	➢ Transect walk ➢ Interview ➢ Mapping	➢ Farmers/ communities ➢ Extensionist ➢ CSFC/CDM staff	➢ Zonation ➢ Transects ➢ Resource maps	
➢ What are the essential features of hydro-meteorology in districts/villages under investigation?	climates, pattern of rainfall, pattern of flood, other disasters, ...	➢ Interview/ Focus group discussion (FGD) ➢ Seasonal calendar	➢ Farmers/ communities ➢ Extensionist ➢ CSFC/CDM staff	➢ Seasonal calendar of rainfall and disasters	
➢ What are the socio-economic features of the districts/villages under investigation?	Demographic features, including population, population change, age and gender distribution; average incomes; proportion of population classified as poor, middle, wealthy; number of schools, clinics, markets; etc	➢ Interview	➢ Local leaders	➢ Socio-economic data	
➢ What type of farming systems and non-farm activities in order to earn their livelihoods in study areas?	Patterns of farming activities (cropping, fishing,..), non-farm activities, other activities related to flood or affected by flood	➢ Focus group discussion (FGD) ➢ Seasonal calendar	➢ Communities (poor and better-off farmers) ➢ Extensionist ➢ CSFC/CDM staff	➢ Different farming systems and non-farm activities identified for the poor and better-off farmers (for different periods of flooding: before, during and after)	Poor and better-off farmers may have different strategies to cope with flood?

Appendices 1 (cont.)

Main guiding question	Information needed	Tools	Type of respondent	Expected output	Gaps
➢ What are major events and changes in the study areas?	Major events over time (focus on flood events), farming practices, occurrences of crops failure, job opportunities; Changes in policies, changes in farming practices, changes in level of flood damages, flood regimes, changes in livelihoods, ...	➢ FGD ➢ Historical timelines ➢ Trendlines	➢ Farmers/ communities ➢ Extensionist ➢ CSFC/CDM staff	➢ Major events and changes in the study areas over a period of time analyzed	
➢ What are tasks of farmers (men, women, children within HH) regarding farming activities, non-farm activities, other social works?	Farming activities, non-farm activities by men, women and children	➢ FGD ➢ Gender analysis ➢ Daily activity	➢ Communities (poor and better-off farmers) ➢ Extensionist ➢ CSFC/CDM staff	➢ Matrix showing task division by men, women and children within the household	
➢ What are major sources of household income? How does household income and access to key resources influence decision making about strategies to cope with flood?	Sources of income from different activities by household or representative households in community (for a set of key years 1996, 2000, 2004, 2008)	➢ FGD ➢ Pie charts	➢ Communities (poor and better-off farmers) ➢ Extensionist ➢ CSFC/CDM staff	➢ Pie chart showing change over time in proportion of income from different HH activities, that make up HH's livelihood strategies have changed	Data available?

Appendices 1 (cont.)

Main guiding question	Information needed	Tools	Type of respondent	Expected output	Gaps
➢ What are the characteristics of households that 'cope well', 'just cope' or 'don't cope' with floods'?	Discussion on characteristics of households that 'cope well', 'just cope' or 'don't cope' with floods	➢ FGD	➢ Communities (poor and better-off farmers) ➢ Extensionist ➢ CSFC/CDM staff	➢ List under the headings 'cope well', 'just cope' or 'don't cope' with floods the key characteristics of households coping strategies.	
➢ What are the current strategies of the household in coping with flood?	Strategies of household to cope with flood (using of resources, preparations, adapt farming activities, fishing, migration, ...	➢ FGD	➢ Communities (poor and better-off farmers) ➢ Extensionist ➢ CSFC/CDM staff	➢ List of strategies	
➢ What are current constraints and opportunities in coping with flood in the study areas?	Resources and skills that farmers lacking, all things which prevent farmers from making a good living (infrastructures, policies, services)	➢ FGD ➢ Problems and opportunities ranking	➢ Communities (poor and better-off farmers) ➢ Extensionist ➢ CSFC/CDM staff	➢ Farmers/communities situation in the study areas understood	

Appendices 1 (cont.)

Main guiding question	Information needed	Tools	Type of respondent	Expected output	Gaps
➢ What is the level of influence and importance, and kinds of interventions, linkages and impacts of key stakeholders and organizations at community level in coping with flood?	Name of stakeholder, their objectives, interests, activities (including relief), relationship, views regarding to coping with flood	➢ FGD ➢ Venn diagram and linkage matrix	➢ Farmers/ Communities ➢ Related stakeholders	➢ Matrix showing objectives, interests ➢ Matrix showing linkage among stakeholders	
➢ What are their relevant strategies and objectives to increase the efficiency in coping with flood?	Levels of importance and influence of different stakeholders, their relationship	➢ Influence importance matrix/ or Venn diagram	➢ Farmers/ Communities ➢ Related stakeholders	➢ Matrix showing the importance and influence/ or Venn diagram	
➢ What are the options/solutions for coping with flood for the future ?	Options/solutions relating to technical, social, policy, and environmental aspects for reduction of flood damage	➢ FGD	➢ Farmers/ Communities ➢ Related stakeholders	➢ List of options/ solutions ➢ Future scenarios	

Appendices 2: **Roles and responsibilities of the NCDM's member line agencies in Cambodia**

1. The Ministry of Interior and Ministry of National Defence

It plays important role in disaster risk reduction and management by providing internal emergency preparedness planning and training and providing logistic support, assist with search and rescue, provision of security, assist in the repair of roads and bridges and providing security to protect infrastructures.

2. Ministry of Economy and Finance (MEF)

It plays important role in disaster risk reduction and management by allocation and preparation budget and resources for support emergency relief, response and rehabilitation after floods.

3. Ministry of Agriculture, Forestry and Fisheries (MAFF)

It plays important role in disaster risk reduction and management by crop forecasting, risk assessment on crops, livestock and fisheries, preparedness agricultural inputs such as seeds, animal breeds, vaccines, fertilizers, animal drugs, fuel for support to disaster affected people and providing technical training on agricultural production (crops, livestock and farming activities) to farmers.

4. Ministry of Water Resources and Meteorology (MOWRAM)

MOWRAM plays important role in disaster risk reduction and management by preparedness of disaster management facilities (e.g. fuel, pumps, boats…) and providing early warning systems such as hydrology (flood and drought warning) and meteorological information (rainfall, storms and temperatures), dams and dykes protection, flood mitigation, response during disaster events (floods and drought) and rehabilitation hydrology and irrigation systems after flood.

5. Ministry of Health (MOH)

MOH plays important role on disaster risk reduction and management by establishes a national mass casually management plan and epidemic control plan; Organizes facilities for, and monitors the health care of, people living in evacuation centres and emergency Response Teams and Emergency Response Teams in all hospitals, clinics and health institutions; providing guidelines for the provincial, municipal and rural health services to support during emergencies; undertakes necessary measures to detect the occurrence of communicable diseases and other health hazards which may affect the population after an emergency and preparing appropriate warning to the public on the occurrence of epidemics or other health hazards, and providing direct service and/or technical assistance on sanitation.

6. Ministry of Education, Youth and Sport (MEYS)

Ministry of Education plays important role on disaster risk reduction and management by organizing Emergency Response Teams in all schools and institutions of learning; making available suitable school buildings in the affected areas as evacuation centres and assisting in the public education campaign through integration in the school curricula of subjects related to emergency management, hazards and precautionary measures.

7. Ministry of Public Works and Transport (MPWT)

MPWT plays an important role on disaster risk reduction and management by preparing and providing transport facilities during disaster events, protecting and rehabilitated roads, warehouse, bridges and other facilities and structures, made available existing communications facilities for emergency operations, providing transportation

facilities to transport relief supplies, personnel and victims and warning to the public on impending releases of water from dams under its Control.

8. Ministry of Information

The Ministry of Information is provided information of early warning systems through mass media and broadcasting systems, coordinating with public and private mass media about awareness on disaster risk reduction and management strategies.

9. Ministry of Posts and Telecommunications (MPT)

Ministry of Posts and Telecommunication is providing available communication facilities and coordinating public and private agencies to provide available communication facilities for emergency information and emergency operations.

10. Cambodian Red Cross

Cambodian Red Cross plays important role in disaster risk reduction and management including floods. It has countrywide presence through network members in provinces and districts down to commune and village levels. Red Cross establishes and uses Red Cross Volunteer teams at the village levels to undertake certain activities such as dissemination of warning, evacuation, relief, and search and rescue. CRC activities cover all spectrum of disaster management cycle, from preparedness and mitigation o relief and response. Also, the CRC has collaborated with other Red Cross Communities such as American Red Cross to implement a project on flood early warning system with Mekong River Commission which is the flood forecast supported by the MRC.

Cambodian Red Cross also assisted Committee for Disaster Management in developing training program, in damage and need assessment, providing emergency relief to victims and facilities for people living evacuation centres…etc, interfaces its other emergency welfare services (warning, rescue, evacuation, first aid, medical and nursing care, transfusion. ambulance and social services with the activities of member-agencies at all levels.

11. The Cambodia National Mekong Committee (CNMC)

The CNMC has major roles: (i) To Coordination, collaborates, advises, and follows up relevant division of concerned ministries and line agencies to implement all Government decisions towards the Mekong River and its tributaries; (ii) To strengthen the cooperation with respective National Mekong Committee, donors, International organizations in order to research, study, design, develop, manage, and maintain water and related resources, including water quality and to ensue distribution and sharing of data and information which related to flood forecasting; (iii) To facilitate and cooperate with Mekong River Commission and international communities for seeking financial resources to study and develop projects in time with desirable outputs.

12. Department of Water Resources Management and Conservation (DWRMC)

The DWRMC has functions and duties: (i) To develop and carry out the strategic plans in order to serve the multipurpose of development, e.g. hydropower, flood control, irrigation, etc, except the projects which are serving an electric power production is the first priority; (ii) To manage the watershed areas and develop relevant programs for ensuring the exploitation and conservation of water resources in a very effective and sustainable manner; and (iii) To develop necessary policies, legislations, regulation and norms in order to serve water resources conservation for the policy-makers, based on the sustainable sound manner.

13. Department of Hydrology and River Works (DHRW)

The DHRW has functions and duties: (i) To develop the need projects and hydrological stations at designated water areas in order to serve the water resources

development purposes; (ii) To develop the short, medium, and long term plans for erosion, sedimentation, and river bank protection and management; (iii) To observe the hydrological regime both surface and ground by establishment of hydrological stations, as well as collect and analyze data to serve to the sectors related; (iv) To measure and evaluate the water level, discharge, sedimentation and related tasks; (v) To monitor water quality at designated importance hydrological stations, which installed in Mekong River, Tonle Sap Great Lake and their tributaries; (vi) To research and study the hydrological phenomena, hydrological modelling, hydrological calculation, and surface and ground water potential; and (vii) To manage the hydrological information, forecasting, and providing information in advance of flood and water shortage, which may be happened, to be on time of taking action by responsible institutions.

14. The United Nations Disaster Management Team (UNDMT)

The UNDMT works closely with the National Committee for Disaster Management (NCDM) in disaster (flood and drought) coordination, preparedness and response. In the event of a natural disaster such as floods, UNDMT works closely with NCDM to assess the severity of the crisis to identify immediate and medium term relief needs, to coordinate UN-wide response actions, mobilise resources, identify and address geographical and service delivery gaps and overlaps, prepare reports and disseminate information, evaluate actions taken and to plan and mobilise resources for recovery and rehabilitation. UNDMT composes by FAO, UNDP, WFP, WHO, UNICEF, UNFPA and other UN agencies working in Cambodia.

Appendices 3: Roles and responsibilities of the CFSC's member and relevant agencies in Viet Nam

Bach Tan Sinh (Team Leader), Nguyen Van Le & Vu Canh Toan

1. The Steering Committee for Flood and Storm Control

The Steering Committee for Flood and Storm Control takes charge of: (i) supervising the preparation and implementation of annual flood and storm control plans undertaken by different ministries and agencies; (ii) providing flood and storm forecast for the entire country; (iii) mobilizing resources in a timely response in emergency cases where local capacity has run out; (iv) advising the Government to implement flood diversion and flood retard measures where necessary, (v) reporting disaster situations and disaster damages for the Government and propose overcoming solutions; and (vi) transfering knowledge and know-how related to flood and storm control to relevant disaster management practitioners.

2. The Southern Sub-Committee for Flood and Storm Control (SCFSC)

The SCFSC takes charge of: (i) monitor rain and flood situation in southern Vietnam; (ii) helping the Central Steering Committee for Flood and Storm Control in supervising the preparation and the implementation of annual plans for flood and storm control in the Southern provinces of Vietnam; and (iii) supervising the preparation and implementation of annual plans for flood and storm control in their area.

3. Ministry of Agriculture and Rural Development (MARD)

MARD takes charge of: (i) as permanent organization of the CCFSC, (ii) chairing and cooperating with other relavant agenices and local governments to consusult the Government on flood and storm prevention and control the planning and implementing process; (iii) supervising and helping local communities to locate mechanisms for agricultural and fishery production that are appropriate for regions prone to floods and storms; (iv) supervising the management and protection of dyke systems, irrigational works, aquaculture infrastructures and to protect, plant and recover flood prevention forests on higher lands; (v) supervising the planning and implementing of security responses for people and property of fisheries on the seas, rivers and at storm shelters; and (vi) advising the Government to decide the rate of support for crops and domestic animals for localities heavily affected by floods and storms that enables a quick stabilization and revival of people's lives and production.

4. Ministry of National Defense

It takes charge of: (i) supervising the planning and implementing process of the army sector in flood and storm prevention, control and especially overcoming flood and storm consequences; (ii) promulgating and enforcing the legal documents related to the coordination of the army resources in flood and storm prevention, control and overcoming flood and storm consequences, (iii) preparing the resources necessary to maintain the dyke, dam systems as well as flood diversion and flood retardation; (iv) collecting and processing information and data related to floods and storms; (v) supervising search and rescue and urgent situations; and (vi) overcoming flood and storm consequences.

5. Ministry of Natural Resources and Environment

It takes charge of: (i) collecting and processing meteorological and hydrological data and information; (ii) providing timely forecasts and warning of tropical low pressure, floods and storms for the main rivers in Vietnam as well as flash flood warning to the CCFSC, and other relevant agencies at different administrative levels.

6. Ministry of Police

It takes charge of: (i) supervising different agencies of the Ministry to prepare security planning to ensure social security and order during and after flooding, especially in flood diversion and flood retardation areas as well as in dangerous zones next to weak parts of the dyke and dam systems; and (ii) cooperating with the army's resources and other sectors and local authorities in search and rescue and to overcome the consequences of floods and storms.

7. Ministry of Post and Telecommunication

It takes charge of: (i) supervising the planning and implementing process related to telecommunications for disaster management, and (ii) ensuring communication links between the central level and local level remain stable especially during flood.

8. Ministry of Transport

It takes charge of: (i) supervising the planning and implementing process related to transportation development to ensure that is appropriate for flood and storm prevention and control planning, (ii) preparing annual resources, means and materials; (iii) collecting and processing information related to flood forecasting and warning to ensure the safety for maritime, waterway, road, rail and air transport during flood and storm seasons; (iii) timely repairing and overcoming damaged transportation infrastructures such as bridges, roads and ports to ensure traffic flow for the main routes; (iv) preparing the resources, means, and materials to intervene in cases of important damages to the dyke and dam systems and in flood diversion and flood retardation areas.

9. Ministry of Trade and Industry

It takes charge of: (i) supervising the implementation of necessary actions to ensure the absolute safety of reservoirs which generate electricity as well as regulate floods and are managed by the Ministry; (ii) supervising the implementation of necessary actions to ensure the safety of mining zones and electrical and industrial infrastructures managed by the Ministry; and (iii) coordinating with provincial and city People's Committees under the central government before the flood and storm season to prepare necessary resources for areas commonly affected by floods and storms, especially for the remote areas and areas which are submerged frequently and deeply by flooding.

10. Ministry of Construction

It plays a role of: (i) promulgating and regulating implementation policies and rules in accordance with the authorities of the ministry to ensure the safety of the people and construction works that is appropriate for flood and storm prevention and control laws; (ii) supervising and coordinating with local authorities to carry out the implementation of the construction planning and to ensure the safety of works during flood season; and (iii) researching and providing appropriate designs and structure for houses and facilities in accordance with flood and storm characteristics of each particular region.

11. Ministry of Finance

It takes charge of: (i) synthesizing and dispensing the estimated budget in accordance with the State Budget Law for planning, building, repairing and reinforcing of dykes as well as for flood and storm prevention and control facilities managed by the central government and for equipment forecast, warning, and instruction technology on floods and storms prevention, control, search and rescue; and (ii) promulgating and supervising the implementation of policies and rules for financial resource management and the use of flood prevention, control and overcoming the consequences of floods and storms.

12. Ministry of Planning and Investment

It takes charge of: (i) Manage and dispense funds for the building, repairing and reinforcing of dykes and others facilities used for or related to prevention and control of floods as well as for disaster mitigation, (ii) Promulgate and regulate the implementation of legislation and policies for the management of financial resources reserved for flood and storm prevention and control and for overcoming of consequences of flood and storm; investigate and keep a check on implementation of these policies, rules and regulations.

13. Ministry of Education and Training

It takes in charge of: (i) compiling and introducing basic knowledge about flood and storm prevention and control and disaster mitigation into school programs, and (ii) directing the planning and implementing for the building of educational centers that are appropriate for regional flood and storm characteristics to ensure the safety of pupils as well as to avoid the effects of floods and storms.

14. Ministry of Health

It takes charge of: (i) Reserve enough medicine and health equipment for disease prevention and control during the annual flood season, (ii) instructing health officers and communities on basic techniques for rescue, organization of rescue mission, practice of hygiene and disease prevention and control before, during and after floods and storms, and (iii) coordinating with local authorities to timely blockade and stop the source of the epidemic generated in areas heavily affected by disaster and to stop the spread of these diseases.

15. Ministry of Labor, Invalids and Social Works

It takes charge charge of: (i) bbserving and evaluating losses of livelihood and coordinate with concerned ministries and sectors to propose the rate of financial and material support to timely help affected localities in overcoming consequences of flood and storm. This proposition will be submitted to Prime Minister for decision, and (ii) promulgating and regulating implementation policies on social relief for the overcoming of the consequences of flood and storms as well as of other natural disasters; instruct and inspect the implementation of social relief at the localities.

16. Television and Radio of Vietnam:

It takes charge of: (i) Strengthen the communication to announce exactly and timely the forecasts, warnings news relate to floods, storms and disaster, (ii) disseminating relevant experiences and models for rescue, mutual aid of the communities on flood and storm prevention and control as well as overcoming the consequences of floods and storms, and (iii) coordinating with specialized agencies to disseminate and provide instructions, experiences and laws on disaster prevention and control the consequences of floods and storms.

17. The Division Committee for Flood and Storm Control in the South of Vietnam

It is the branch office of CCFSC, which was located in Ho Chi Minh City, in charge of: (i) monitoring rain and flood situation in the Southern provinces of Vietnam, (ii) helping the CCFSC in supervising the preparation and the implementation of annual plans for flood and storm control in the Southern provinces of Vietnam, and (iii) supervising the preparation and implementation of annual plans for flood and storm control in their areas.

Additionally, the National Committee for Search and Rescue (NCSR), established by the Prime Minister, closly collaborate with the CCFSC. The Deputy Prime Minister is the president of the NCSR, whereas five vice presidents are at the deputy ministerial level.

Members of the NCSR are competent authorities in performing search and rescue. Major duties of the committee are:

- Search and rescue disaster affected people, transportation means, state and private assets, response to oil spills;
- Mobilize and coordinate forces and facilities to perform quick and effective search and rescue activities;
- Cooperate with other countries in the region to perform search and rescue activities;
- Supervise and monitor search and rescue activities implemented by different ministries, sectors and agencies;
- Promote cooperation with other countries in the region and in the world to improve search and rescue performance.

Appendices 4: Existing institutional framework and policies related to flood prevention and control and overcoming of the consequences in Vietnam.

Bach Tan Sinh (Team Leader), Nguyen Van Le & Vu Canh Toan

Hanoi, June 2008

1. Institutional framework

1.1. The Development and gradual improvement of the legislations and policies on prevention, response and mitigation of the consequences of floods in Vietnam

The institutions and policies related to flood management have existed since the establishment of the Vietnamese feudal regime. Under this regime, many ordinances on dyke construction and protection issued by the King had equivalent legal validity and enforcement as laws. The Dai Nam Hoi Dien Ha Phong Code is the only early legal document found so far. This Code comprising of guidelines and policies on dyke management and flood prevention was developed during the dynasty of King Gia Long and King Minh Mang (200 years ago).

The Code had only 11 articles but it covered many aspects such as flood control and construction standards, state investment policies, community contribution, compensation schemes, financial investigation, disaster prevention, maintenance work… Especially, the Code had provision for rewards and sanctions, helping to raise public awareness and to ensure legal enforceability.

Up to 2008, Vietnam has had one relatively complex and comprehensive system of legislations and policies related to prevention and control and mitigation of the consequences of floods with 5 Laws, 3 Ordinances, 9 Decrees, 21 Decisions, 3 Circulars and some other Directions of the Prime Minister.

- Among 5 existing laws, the Law on Dyke and the Law on Water Resources concern directly the prevention and control of flood as well as the overcoming of the consequences of flood
- Among 3 existing Ordinances, the Ordinance on Storm and Flood Control and the Ordinance on Emergencies are very important for and concern directly the prevention and control of flood as well as the overcoming of the consequences of flood
- Among 9 existing Decrees, there are: 1 decrees on 6 long-term basic measures for the prevention and control of flood; 3 decrees instructing the implementation of Laws and Ordinances; 3 decrees on organization system; 2 decrees on policy
- Among 21 Decisions, there are: 16 decisions of the Prime Minister (included 11 decisions on organization system or on major policies and socio-economic development plans for long-term or on promulgation of the national strategies and 5 decisions on promulgation of policies); 3 Ministerial decisions (about the regulations on management of some important sectors related to flood and storm prevention and control)
- Among 3 circulars, there are 2 inter-ministerial circulars instructing the implementation of policies and one circular instructing statistics and assessment of the damages caused by flood and storm.
- The revision, complement and improvement process of the legislations and policies:
    - *The Law on Dyke promulgated in 2006* is an inheritance, a modification, a complementary and an improvement from the Regulations on Dyke Protection 1963, Ordinance on Dyke 1989 and Ordinance on Dyke 2000

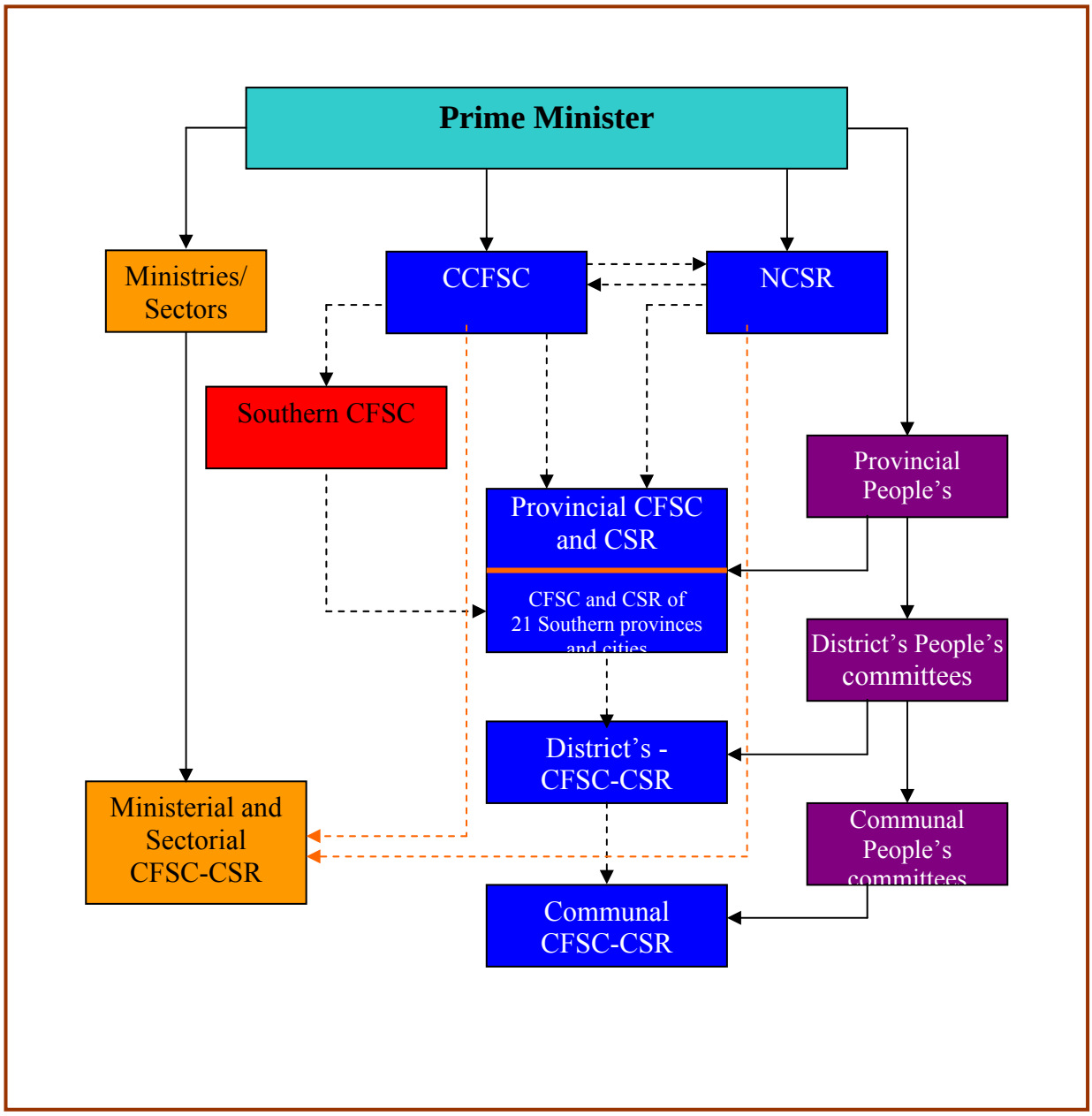
- The Ordinance on Storm and Flood Control 2000 was modified and complemented from the Ordinance on Storm and Flood Control 1993
- The National Strategy for Natural Disaster Prevention, Response and Mitigation to 2020 is an inheritance, a modification, a complement and an improvement from the Strategy and Action Plan for flood mitigation in Vietnam (1994)

1.2. The establishment and gradual consolidation process of the organisational structure systems for flood and storm prevention, response and mitigation at all levels and sectors in Vietnam

- The Vietnamese Government established the National Committee for Dyke Protection (the precursory organization of CCFSC) in 1946, then, the Committees for Dyke Protection were established at all levels in 1948, the Central Steering Committee for Flood Control in 1955, the Committees for Flood Control at all levels in 1956, which became the Committees for Flood and Storm Control in 1957.
- In 1990, the Council of Ministers (the Government, now) promulgated the Decree 169/HDBT regulating the organization and tasks of CCFSC and CFSC at all levels and sectors (which is still applied today)
- In 2002, CCFSC changed the name and became Central Steering Committee for Flood Control in 1955, the Committees for Flood Control and Search and Rescue

The organization system of Steering Committee for Flood and Storm Control at all levels and sectors are described in the chart below:

ORGANIZATION SYSTEM OF STEERING COMMITTEE FOR FLOOD AND STORM CONTROL AT ALL LEVELS AND SECTORS IN VIETNAM



Note :

technical relations

administrative relations

interactive relations

(CFSC : Committee for Flood and Storm Control; CSR : Committee for Search and Rescue)

2. Analysis of some main contents in the key legislations and policies as well as in some other important documents

2.1. Analysis of some main important contents in general legal documents

2.1.1. Law of Water Resources

The Law has two new contents in comparision with the Ordinance on Storm and Flood Control 1993. These contents include the Establishment of standards, plans and projects for flood prevention, response of the basins and planning of rehabilitation, production and infrastructures in flood areas. The integration of these above aspects in a legal document shows clearly the opinion of the Government for an active flood adaptation and prevention to minimize the damages caused by flood.

2.1.2. Law on Dyke

The Law was approved by the Standing Committee of the National Assembly of the SRV in 2006. It's the legal document which has had the highest legal enforcement on dyke management since 1946. The Law has institutionalized innovative approaches in the management, construction investment and use of dyke, for example:

- Apart from flood prevention and control task, dykes are used also for road traffic, environment protection, historical and social monuments preservation and tourism development as well as for fishery sector
- For the first time, the planning about flood prevention and control of the rivers with dyke and the planning of dyke are regulated globally and concretely in a Law
- The Law decides to reduce the width of corridor for dyke protection from 20m on the side of the river and 25m on the side of the field to 5m applied for dykes of special level and level III at the places where dyke goes through residential, urban and tourist zones. That is a new and decisive adjustment aiming to resolve the problems related to the people who have lived nearby from the dyke since the dyke was small.
- The Law assigns the authority and responsibility to the Provincial People's Committees to grant the permission for some activities related to dyke systems at all levels. That is a necessary administrative reform aiming to reduce the inconvenience of the administrative procedures related to the demand of permission for activities related to dyke systems regulated by the Law.

2.1.3. The Ordinance on Storm and Flood Control 2000

Being promulgated before the issuance of the Law on Water Resources, the Ordinance was modified and supplemented after the approval of the Law on Water Resources and exists in parallel with this Law.

The revised Flood and Storm Control Ordinance is prominent in the sense that it provides for a flexible overarching principle for flood and storm control. Accordingly, flood and storm control efforts must be carefully planned; active prevention of and response to flood and storm disasters must be conformable to local conditions; integration of advanced technologies and traditional measures should be highlighted; etc.

- During the period of prevention of flood and storm: The ordinance provides 8 measures for long term prevention of flood and storm and 6 measures for prevention being implemented on an annual basis (see article 10 and article 11 of the Flood and Storm Control Ordinance 2000).
- During flood and storm: The Ordinance provides 7 important activities to be implemented to reduce damage caused by flood and storm (see article 19 of the Flood and Storm Control Ordinance 2000). The ordinance considers that army is the main force during and after flood and storm to overcome the consequences.

- After flood and storm: The ordinance provides 7 important activities to be implemented (see article 25 of the Flood and Storm Control Ordinance 2000).

2.1.4. Ordinance on Emergency Situations

The Ordinance was promulgated in 2000. The decree 71/2002/ND-CP of the Government guiding the implementation of the ordinance provides 3 special measures to be applied for emergency situations induced by tremendous natural or manmade hazards. These include:

- Organize the rescue of victims, move temporary people out of endangered areas; protect property of the state, of organizations and individuals, quickly stabilize people's lives
- To protect and rescue structures used for prevention and control of disasters that are affected or threatened by disaster.
- Flood diversion and retardation to reduce the consequences of disaster

2.1.5. The National Strategy for Natural Disaster Prevention, Response and Mitigation to 2020

The National Strategy for Natural Disaster Prevention, Response and Mitigation to 2020 has much more special and salient points in comparison with the Strategy and Action Plan for flood mitigation in Vietnam 1994, such as:

- The object of the prevention, control and mitigation does not only include the flood and its consequences but also most common disasters in Vietnam;
- The content of the Strategy is relatively completed and comprehensive. Besides the perspectives, directions, objectives, tasks and measures, the Strategy provides a very concrete and practical action plan including 6 programs on improvement of legislations and policies; 3 programs on consolidation of organizational structures; 22 programs to make and review planning; 3 programs on community awareness raising; 2 programs on forestation and protection of upstream forests; 7 programs on strengthening of disaster management capacities and science and technology application; 8 programs on structural measures and some programs on strengthening of disaster warning and forecast capacities;
- Among 6 measures for prevention, control and mitigation of disaster, there are some very new perspectives, for example:
    - "Disaster management includes preparedness, response to and recovery of consequences caused by disasters in order to ensure the sustainable socio-economic development and national security and defence".
    - "Disaster prevention, response and mitigation shall be integrated into socio-economic development master planning and plans of every region, sector, and nation-wide".
    - "Disaster prevention, response and mitigation shall be giving priority to disaster preparedness, keeping studying on impacts of the global climate change, sea level raising and other extreme climate phenomena for appropriate response actions".
- The Strategy stipulates the tasks and measures for not only the whole country but also for each region;
- The principles used for disaster prevention, response and mitigation in Vietnam is the principle "**four-on-the-spot**" (command on the spot, man-power on the spot, materials on the spot and logistics on the spot). These principles were proposed by the CCFSC based on the past experiences on the rescue and control of flood and storm during the decades 1960 and 1970 in the Northern region of Vietnam. This is one of the special experiences of Vietnam reaffirmed in this Strategy (see the concrete

analysis in the full report for the contents and the meaning of each criteria of these principles)

- The principles provided by the Strategy for natural disaster prevention and responses and mitigation applied particularly for the Mekong river delta is the "living with flood" strategy, ensuring safety for a sustainable development; and taking initiatives to prevent storm, thunderstorm, whirlwind, salinity intrusion, drought at the same time (for details see analysis in the full report)
- Social mobilization and highlight the role of the communities by different ways is also a new point of the Strategy (for details see the full report).

2.2. Analysis of some policies related to prevention, Response and Overcoming of the consequences of flood in the Cuu Long delta

2.2.1. Policies related to preparedness stage

In the past, Dong Thap Muoi, Long Xuyen quadrangle and other lowland areas of the Cuu Long delta were often fallowed and thinly populated so the damage caused by flood was negligible. Therefore, since 1975, after the issuance of the policy on reclamation of the Vietnamese government, these areas have become more and more populous and rich. There have been two even three crops per years, so the production of food has achieved a very high output. That contributes to make the Cuu Long delta as the biggest granary of the country. Thus, the region ensures not only the national food security but also exports from two to three millions of tons of rice per year. However, since, the floods, especially big and early floods, have caused many damages for the local people, for example: loss of million tons of food, evacuation of thousands of people during peak floods, the life is upset, children can not go to school, and many people don't have work….

In order to help the most vulnerable communities to cope with flood, the government has issued major decisive policies which shift from the passive responses to the active prevention, for example:

- The Decision on the long-term plan and the development plan for irrigational works, transportation, and infrastructures at rural areas in Cuu Long delta in the period 1996-2000
- The Decision on Socio-economic development plan for the Cuu Long delta in the period 2001-2005
- The decision on the policies about deferred payment loans which enables people living in flooding areas at Cuu Long delta buying a house at the residential clusters.
- The decision on the modification and supplementation of some mechanisms and policies related to the program on construction of residential clusters and housing at provinces commonly affected by flood in the Cuu Long delta to accelerate the implementing progress.

These decisive policies have completely changed the flood prevention and response in the Mekong delta, such as:

- More than 1.7 million of people can live in residential clusters with more security
- The road traffic network has been expanded and upgraded to a higher level than the water level of flood in 2000
- Schools, hospitals, markets and cultural centers have been basically upgraded to a higher level than the water level of flood in 2000. Thus, pupils can go to school during flood season.
- During the last flood seasons (2003-2007), the production and the livelihood of the local people were ensured. The floods still cause losses in people life and property but the level of damages is lower and decreases year by year (for details, see the full report).

- The poor households receive some allowances and borrow soft-loan from the government to develop production, build appropriate flood-resilience houses in order to take benefit from flood water. Thus, their livelihood has relatively improved. The number of poor household has also decreased.

2.2.2. Policies related to preparedness stage

- The initiative on the establishment of the concentrative kindergartens by the Women Union at provinces in the Mekong delta has resolved basically the drowning issues of the children during the absence of their parents in flood season (for details see the full report).
- Apart from professional rescue forces of the State, in 2002, the provinces in Mekong delta established and operated thousand of volunteer rescue teams with more of 14.500 members. Thanks to this force, the rescue has been carried out quickly, timely and effectively.
- Apart from policies related to the reserve of medicines for the areas commonly affected by flood, the Ministry of health coordinates with departments of health at provincial level to organize mobile medical teams, mobile medical boats. This mobile force goes to residential areas for medical examinations, emergency aids and transportation of victims and patients to hospitals at higher level during flood season if it's necessary.
- In 1997, the Government issued the Decree No. 50/CP related to the regulation on the establishment of and the operation of funds contributed by the people for flood and storm prevention and control at local levels. This contribution has not a very high value on money but this shows the obligation and the responsibility of the community with their compatriot living in the places frequently affected by the flood, especially the poor and vulnerable households (see the full report for our analysis about the intention of suppression of this fund).

2.2.3. Policies related to overcoming of the consequences of flood stage

- The policy on social allowance for dead and injured persons, for housing affected by flood and for distribution of food in urgent situations has been reviewed, amended and supplemented timely by the Government to adapt with real situations. That is a sound and appropriate policy on social security which pleases the population.
- The policy giving financial support to poor farmers (the vulnerable subject easily affected by flood). Thanks to this policy, poor farmer can borrow money and by junk and fishing-net. That contributes to improve the livelihood of people during flood and so creates good conditions for the implementation of the policy "living with flood".
- Apart of the policy on social security mentioned above, whenever a big flood arrives, the Government provides hundred tons of cultivated crops seeds to support affected communities restoring their production timely.
- The policy of giving financial support to restore the infrastructures affected by flood: for the infrastructures heavily damaged (such as roads, irrigational works, hospitals, schools…), the Government uses the national contingent fund for the restoration and reparation. In case of insufficiency, the Government uses some advances and deducts this amount from the budget of the investment plan for the following years.

2.3. Analysis of a concrete case – the mutual support tradition

The Vietnamese has long special tradition on mutual support since many generations. Each time, when some regions heavily damaged by natural disasters, most of Vietnamese (living in the country or overseas) have had diverse and efficient ways of supporting disaster affected people and areas. Even the people in the disaster zones also support voluntarily the people more affected in their community in accordance with the tradition

"people less affected help people more affected". Thanks to this precious tradition and to the exceptional interest as well as the timely support of the Government, althoughVietnam has been frequently affected by strong natural disasters such as floods and storms, humanitarian catastrophe due to natural disasters has never happened.

3. Conclusions and recommendations

3.1. Conclusions

Passing thousands of years to cope with natural disasters, especially floods and storms, Vietnamese people has overcome hardships to hardships to survive and develop. During this time, they have accumulated incessantly precious experiences and have transmitted them from generation to generation. These experiences have been consolidated and institutionalised step by step in the system of legal documents and policies.

Vietnam has had a complete and comprehensive system of legislations and polices, includeding Laws, Ordinances, Decrees, Decisions, Directives and Circulars. That covers sufficiently the institutional aspects (legal documents about Strategy on water resources, on dyke, on flood prevention and response, on emergency situations and other texts on steering mechanism for disaster prevention, response and mitigation at all levels) and appropriate policies for 3 stages: prevention, response and overcoming the consequences of the floods and storms.

The system of legal documents developed in accordance with the Law on promulgation of legal documents of Vietnam has been formulated on the basis of traditional experiences of flood control as well as on the characteristics of flood in Vietnam. It also referred to practices commonly adopted in countries having similar climate conditions to those of Vietnam. Therefore, this system brings strongly the specific characteristics of Vietnam and is suitable at the same time with the international normal practices

This system of legal documents has been updated, reviewed, amended and supplemented regularly in order to respond timely the situations and to met the requirements of socio-economic development, of the progress of science and technology and especially of the risk of the global climate change.

3.2. Recommendations

3.2.1 About the supplementation of some financial sanctions to legal documents and to their implementation

The system of legal documents concerning the prevention of floods and storms are generally comprehensives. But the most important gap is the lack of concrete financial sanctions. On other hand, in Vietnam, as the conception of "the law stops at the gate of the village" has existed since the feudal time and has still influenced people, the policies and legal documents is not always abided, especially at local levels. Thus, there is still a distance between legal texts, policies and their implementation.

We recommended that: the competent authorities of the State need to add quickly concrete financial sanctions missing in the existing legal documents and to provide at the same time necessary measures for education, information dissemination, community awareness raising on execution of regulations and policies

The roles of the community in legal documents related to the protection and control of floods and storms (issued before the National Strategy for natural disaster prevention, response and mitigation to 2020) have been relatively vague and missed enforcement power

Thus, the results of the implementation of regulations and policies depend to a large extent on the awareness of the authorities of each level, each locality and of the community.

In reality, the roles of community are very important in all of three stages: prevention, response and overcoming of the consequences of floods but it has not been evaluated correctly and adequately at the annual reports on the prevention and control of floods and storms.

To overcome this gap, we recommend that while revising legal documents related to the protection and control of floods and storms some articles which regulates concretely the obligation and the participatory right of the community need to added as well as the implementation process that obliges the execution of the Government agencies to involve the participation of the community.

And the most important is only when the authorities at all levels really want to hear the opinions of the people, really want involve their participation in accordance with the National Strategy for natural disaster prevention, response and mitigation to 2020: "Adopt socialization policies in disaster prevention, response and mitigation in which favorable conditions are created for the participation of local residents in formulating legislation, plans and programs, in managing and monitoring the implementation of local programs and projects", the participation principle could be come true.

3.2.2. About some policies

We recommended that:

The Government should not abandon the Decree 50/CP and should amend it in the direction that increases the contribution of the enterprises receiving benefits from the investment of the State as well as from the active contribution of the population.

The competent agencies review the list of infrastructures used for flood prevention and control and provide sufficiently the budget for the effective projects in order to ensure the flood control in the Cuu Long delta as regulated in the approved programs.

The competent organisations carry out the global evaluation of phase I of the "The program to construct residential clusters" at the Cuu Long delta with the participation of the localities, especially the participation of the community before the development of the specific plan for the phase II. The Ministry of Construction develops and guide promptly the technical norms for construction of houses with appropriate structure to the population of the Cuu Long delta in order to ensure the safety when floods, storms and whirlwinds arrive. *(this is the experience learned form the Nargis storm which affected the delta of Myanmar recently).*

The Vietnam Bank for Social Policies increases the borrowing rate of differed loan for building houses in residential clusters and should not impose the prefabricated houses which are ugly, monotone and not sustainable, as recently done. The Governments at all levels and related ministries and sectors should discuss, exchange, negotiate with local community to unify the standards and the basic needs for a house to ensure the solid structure, the diversified architecture, the suitability to the landscape and the local costumes in Mekong delta of the houses built.

Concerning the funds for the construction of houses, all the funding sources should be mobilized (from the Government, from the community and from other sources)

The Vietnam Bank for Social Policies reviews and modifies the modalities of loaning in order to ensure more convenience for the poor and vulnerable peoples and extends the beneficiary of loaning as well as increases the rate of loan per household.

Appendices 5: Photos showing stakeholder/focus group discussions at the sudy sites in An Giang and Dong Thap provinces

A stakeholder meeting with the district CFSC in An Phu, An Giang province

A stakeholder meeting with the commune CFSC in Phu Hoi, An Phu, An Giang province

Local people identified major actors involved in flood control and mitigation at hamlet level.

Appendices 6: List of participants at the workshop on

"STUDY ON LOCAL COMMUNITY INSTITUTIONS TO COPE WITH THE FLOOD SITUATION OF THE MEKONG REGION"

Can Tho University, 13-14 December, 2008

1. Cambodia

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Keomonine Sameng	Head of Dept. of Farming Systems	Ministry of Agriculture, Forestry and Fisheries	
Thach Ratana	Chief Office	Svey Rieng Province	

2. Vietnam

Name	Position	Organization	E-mail Address
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Le Van Hung	Secretary of Provincial CFSC	DARD of Dong Thap Province	
Bui Thien Tu	Head of Planning Office	DARD of Dong Thap Province	
15 participants	Researchers	MDI, Can Tho University	

Appendices 7: Photos showing discussions among participants during the workshop held Can Tho University, 13-14 December, 2008

Presentation of major findings from Cambodian and Vietnamese case studies

A field trip to Phuoc Hung commune, An Phu district, An Giang province: experience sharing in the establishment of a residential cluster model between Cambodian and Vietnamese participants