

7. Vietnam

7.1 Background

The Socialist Republic of Vietnam spans a total area of 329,560 sq. km. sharing borders with Laos and Cambodia in the west and China in the north. Being in the tropical region, it enjoys an abundance of water resources. Vietnam is basically an agrarian economy relying on its rivers. Therefore most of the settlements are found along rivers; the Red River in the north and the Mekong River in the south.



Because of its geographic location, Vietnam is most prone to typhoons, floods, storms, and salinity intrusion. With environmental degradation, droughts and forest fires have also become a regular occurrence. Uneven distribution of rainfall is one of the main causes for the flooding of rivers. Situated close to the typhoon center of the South China Sea, Vietnam is vulnerable to typhoons. It is hit by an average of four to six typhoons per year.

Floods

The Mekong River forms a fertile and productive delta, which is hydraulically influenced by tidal effects from the South China Sea, by the discharge of the Mekong River from Cambodia, and by the heavy rain from monsoons and typhoons.

The flooding in the year 2000 occurred approximately one month earlier than usual, in early July, reaching its first peak in August and the second peak in September. The second flood peak was higher than the floods that occurred in 1937 and 1961. The worst of these water disasters are caused by typhoons that raise sea levels and send storm surges up estuaries to inundate valuable croplands.



Figure 7.1 A flood scene in Vietnam: The year 2000 flood caused the most severe damage Vietnam has experienced in the last 70 years. Estimated losses and damage was about US\$ 286 million.

Tropical cyclones

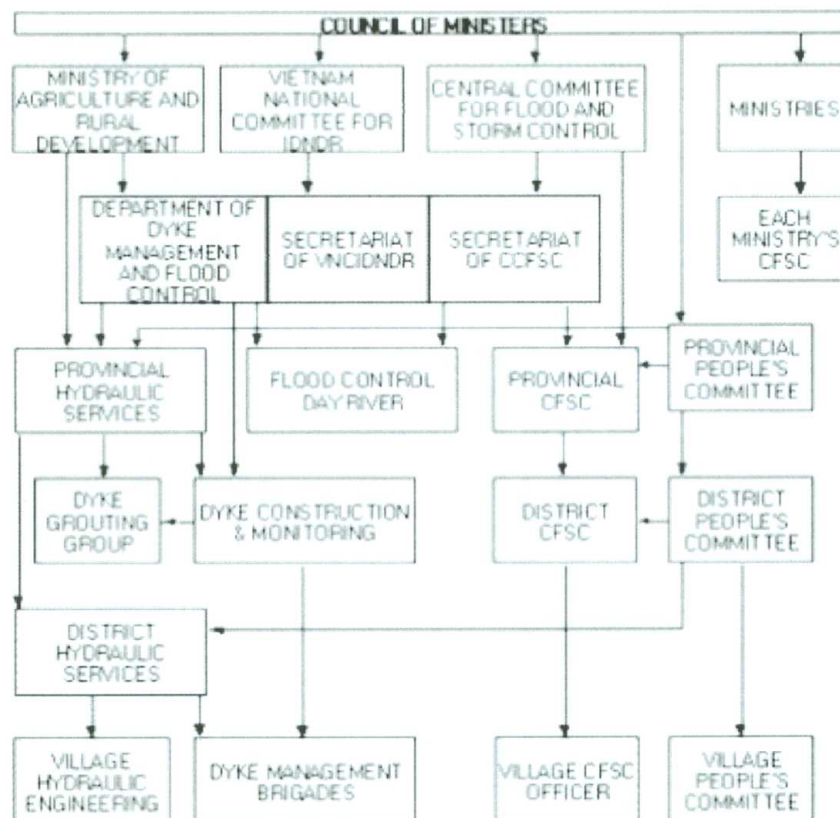
Vietnam is highly prone to tropical cyclones with an average of six cyclones occurring every year. The main cyclone season in Vietnam covers the six months from June to November.

ENSO effects on Vietnam's climate

During the past El Niño and La Niña periods, some striking weather events have occurred in Vietnam. One of them was the Typhoon Linda in November 1997. Though rare during that month it caused heavy loss of life and devastation. In 1998 La Niña, the southwest monsoon was replaced by north easterlies a month earlier than usual. Conversely, in the Southern and Central Highland regions, the southwest monsoon continued for a month beyond its normal termination. The 1999 rainy season arrived earlier than usual.

7.2 Institutional Arrangements

Vietnam has one of the world's most well developed institutional, political and social structures for mitigating water disasters. These structures have evolved over centuries as the Vietnamese population developed the agricultural potential of its great river deltas. Since the great floods of 1971 in the Red River Delta, the work of managing the water-disaster infrastructure of Vietnam has become a continuous task under the direction of the Department of Dyke Management and Flood Control (DDMFC) of the Ministry of Agriculture and Rural Development. The institutional structure is illustrated below (Figure 7.2)



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Figure 7.2 Institutional structure for water disaster management in Vietnam

7.3 Hazard Detection

The National Hydrometeorological Services (NHMS) is the national agency authorized to prepare severe weather and flood forecasts over the country. The NHMS operates a high resolution satellite image receiving system at the National Center for Hydrometeorological Forecasting (NCHMF) and five radar systems installed in different parts of the country: in Phu Lien (Hai Phong), Vinh (Nghe An), Tam Ky (Quang Nam), Viet Tri (Phu Tho), and Nha Trang (Khanh Hoa). There are two regional hydrometeorological centers that perform forecasting in the Mekong Basin:

- Southern Region Hydrometeorological Center located at Ho Chi Minh
- Highland Region Hydrometeorological Center located at Pleiku City

Forecasting

The forecasts are required to cover a range of time scales, from a few hours (now casting), through short period forecasts for 2-3 days, to extended period forecasts for a week or more. The short-range forecasts in Vietnam achieve an accuracy of 75-80%, unless the weather is abnormal. Advisories and warnings of tropical storms and typhoons are issued 48 and 24 hours in advance, respectively. Three to five day forecasts of heavy rain can only be made in general terms: moderate, heavy and very heavy.

Medium range forecasts are not quantitative and they do not meet the needs of many users, particularly for agriculture and disaster preparedness and prevention. Forecasts of the arrival of winter cold fronts in the Red River delta issued 5-10 days ahead have a probability of 80 percent. However, medium-term range forecasts do not predict long-term warm spells in winter. Monthly forecasts of rain and temperature are made in quantitative terms, indicating the expected relationship to the normal climate, i.e. above, approximate to, or below average. Seasonal forecasts are made for two seasons each year: the rainy and dry season. The method of forecasting is still very quantitative and not numeric, and relies on identifying the appropriate forecasting models.

Proposed projects

UNDP and USAID are joining hands in financially assisting the Government of Vietnam on a project entitled "Support to the Disaster Management System in Vietnam". The objectives of the project are two-fold:

- To prepare disaster zoning maps to identify areas and populations at most risk of flooding in the seven central provinces of Quang Binh, Quang Tei, Thua Thien Hue, Da Nang, Quang Nam, Quang Ngai, and Binh Dinh. The map will show areas that are safe from flooding, locations where flood refuge buildings are needed and areas where disaster warnings are most urgently required.
- To install flood alert systems on the river basins in the region most prone to flash floods. These systems will provide up to 12-hour advance warning of imminent flash flooding to help protect lives, property and livelihoods. One of the systems will be installed in the Perfume (Huong) River Basin, to protect the City of Hue.

7.4 Hazard Warning and Dissemination

The Provincial Dyke Management, Flood Control and Storm Preparedness (PDMFCSP) undertake a key role in disaster forecasting, warning and preparedness. It also informs the Chief of People's Village Committee of any impending flood, rise in floodwater or river water level. Flood warning is disseminated to the community through village radio communications. Loud speakers are attached to poles to ensure that the community hears the warning. The boat is a fixture in villages located in areas that normally get flooded. It serves a double purpose: for fishing and as transportation mode during evacuation.



Figure 7.3. A typical Vietnamese village near a river demonstrating flood preparedness measures

The proposed UNDP and USAID project would provide valuable resources for dissemination of disaster warnings. A computer graphics-based disaster warning and severe storms information system will be installed on national TV networks to disseminate disaster warnings to the largest possible number of people in the disaster-prone areas of Vietnam. This will provide real-time information, warnings and disaster preparedness training for the population of Vietnam. Training will be provided for local disaster officials and grassroots communities to ensure effective utilization of warnings.

In some villages, especially the more recently established ones; the past flooding events have been used as an important feedback for village planning and also for preparing the villagers to respond to flooding. Flood markers installed in the villages provide the level of past flooding in the area, indicating the risk to flooding. The flood level marks also provide an important indicator for constructing houses.



Figure 7.4 Flood level marker in a Vietnamese village