5. Lao PDR

5.1 Background

Lao PDR is a landlocked country situated in Southeast Asia between latitudes 14°00' north and 22°00' north and from longitudes 100 ° 00'east and 108°00'east. Having a total area of 236,800 sq km, Laos shares its borders with Thailand, Burma, China, Cambodia, and Vietnam. Topographically, most of the country is mountainous, with elevations above 500 meters, characterized by steep terrain and narrow river valleys. The Mekong River and its twelve tributaries are the main life source. Laos enjoys a tropical climate with a cold dry season from November through February, a hot dry period from March to April and heavy and frequent rains from May to October. The mean annual rainfall ranges from 900 mm to 3,500 mm.

Floods

Floods are by far the most damaging of all the natural hazards that strike Laos. The central and southern regions are the most frequently affected. The country suffers from annual flooding caused by high rainfall from typhoons and the southwest monsoon. Flooding occurs in four main areas:

- Vientiane plain
- Khammoune Province (Thakhek Town)
- Savannakhet Province
- Champasak Province (Pakse Town)

Eighty percent of rural flooding and 20 percent of urban flooding are directly caused by the overflow of the Mekong River and its mainstream tributaries. There are 28 important tributaries on the left bank of the Mekong with a drainage area of more than 1,000 sq. km. Flooding may also be caused by the release of water from Nam Ngum Dam. Flooding downstream of the dam, along the length of Nam Ngum River, is dependent on the water level at River Nam Lik.

5.2 Institutional Arrangements

The development of disaster management institutions in Lao PDR goes back to the Prime Minister's Decree No. 150, issued on 23 August 1999, which created the National Disaster Management Committee (NDMC). In addition, an official letter from the Chairman of NDMC to Provincial Governors was proposed to establish disaster management committees at the provincial level, for special regions and at the municipality level. The NDMC is supported by the National Disaster Management Office (NDMO), which in coordination with provincial departments, recommends appropriate candidates for Provincial Disaster Management Committees to the provincial cabinets and Labour and Social Welfare Offices.

From the provincial to the district levels, sub-national disaster management committees (DMC) have been created with functions that are similar to that of the national level DMC. The NDMO helps the provincial DMCs and district DMCs to identify the location of disaster, focal points and contact persons within the provincial administration, and assist in drafting cooperation and coordination procedures.

Figure 5.1 Release of water from Nam Ngum Dam, Lao PDR

5.3 Hazard Detection

The Department of Meteorology and Hydrology (DMH) and the Waterways Administration Division (WAD) are responsible for hydrological and meteorological data collection. DMH is assigned to provide hydrometeorological and advisory services to the Minister of Agriculture and Forestry.

DMH operates 74 hydrological stations, 86 rainfall stations and 34 meteorological stations while the WAD operates 64 hydrological stations and 23 rainfall stations, all installed along the Mekong River and its tributaries. The hydrological and meteorological networks are those that are supported by the MRCS. Please refer to Annex 9 for a sample of a daily report on rainfall and water level in Mekong and its tributaries.

Meteorological and hydrological data are transmitted from the observation stations to the central and regional centers by:

- Manual collection
- Public post, telephone or high frequency transceiver
- Computer network (e-mail)

For flood forecasting purposes, the real-time data received at the WAD are forwarded to the MRCS by e-mail every morning. Data received at DMH and WAD is fed into computers for processing.

The World Area Forecast Center in Bracknell, U.K. and the Regional Specialized Meteorological Center (RSMC) in Tokyo supply weather forecasts and additional information used for preparing typhoon warnings through the Bangkok communication node. A low-resolution meteorological satellite receiver receives satellite photographs from the Japanese Geo-stationary Meteorological Satellite (GMS-5).

5.4 Hazard Warning

The Meteorology Department is capable of preparing and issuing daily weather forecasts and long-range forecasts such as seven- and ten-day weather forecasts. During the rainy months from June to September, the weather forecast is issued twice a day, and during inclement weather, three times a day.

Typhoons that reach Lao PDR after crossing over from Vietnam have a lower intensity, but they bring enormous amount of rain. The typhoon warning is issued to warn the public

of its threat. The Meteorological Department gets assistance from other regional meteorological offices to locate the position of a typhoon. Data is transmitted from Vietnam, Japan and Bracknell and then used in the preparation of the typhoon warning. The typhoon warning contains the typhoon characteristics, the risk that the typhoon poses on the public and the recommended action to prevent and mitigate the disastrous effects of typhoon.

5.5 Warning Dissemination

The typhoon warning is simultaneously sent to a number of interested parties and the dissemination media to reach the public. Figure 5.2 illustrates the flow of warning to the public.

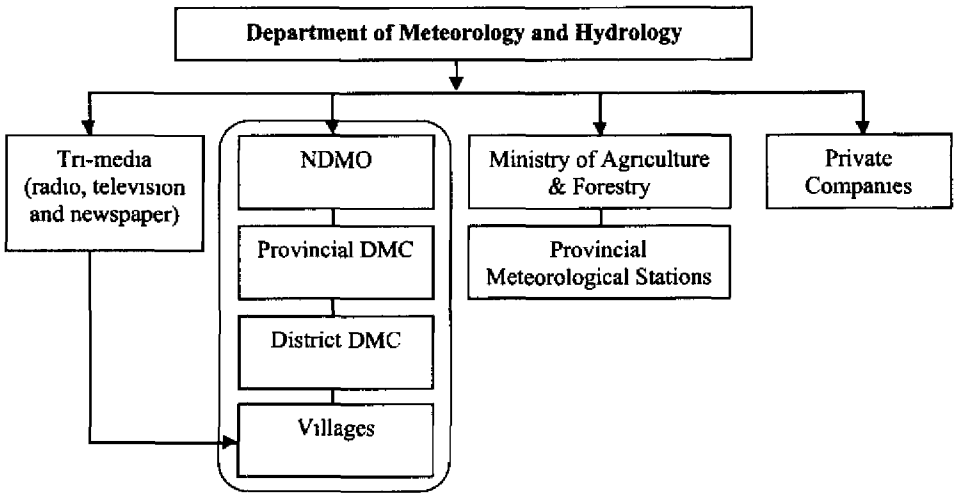

Figure 5.2. Flow of warning from the Department of Meteorology and Hydrology to the public in Lao PDR

The NDMO has established the communication system for effective dissemination of information from the national down to the village levels. Upon receipt of warning from the meteorological department, the NDMO follows the protocol as illustrated in Figure 5.3.

For a speedy warning dissemination, the DMCs use mobile phones and high-frequency radio transceivers. If, for some reason, dissemination fails, a messenger sends the warning. The warning is sent simultaneously to the Chairman of the DMCs and the identified focal point for disaster response at the sub-national level.

5.6 Community Response

Bane Sanedin is an agricultural village downstream of the Nam Ngun Dam with a population of 1,044. The village is bounded by the River Nam Ngum on one side and traversed by an irrigation canal that serves as a flood mitigation/control structure. There are about 200 houses located along the River Nam Ngum.

Flood is the only hazard that affects the village Flood occurs once a year during the monsoon season from August to September. The average flood height is around one meter

and all houses in the village are affected. The construction of irrigation canal has resulted in considerable decline in flood levels.

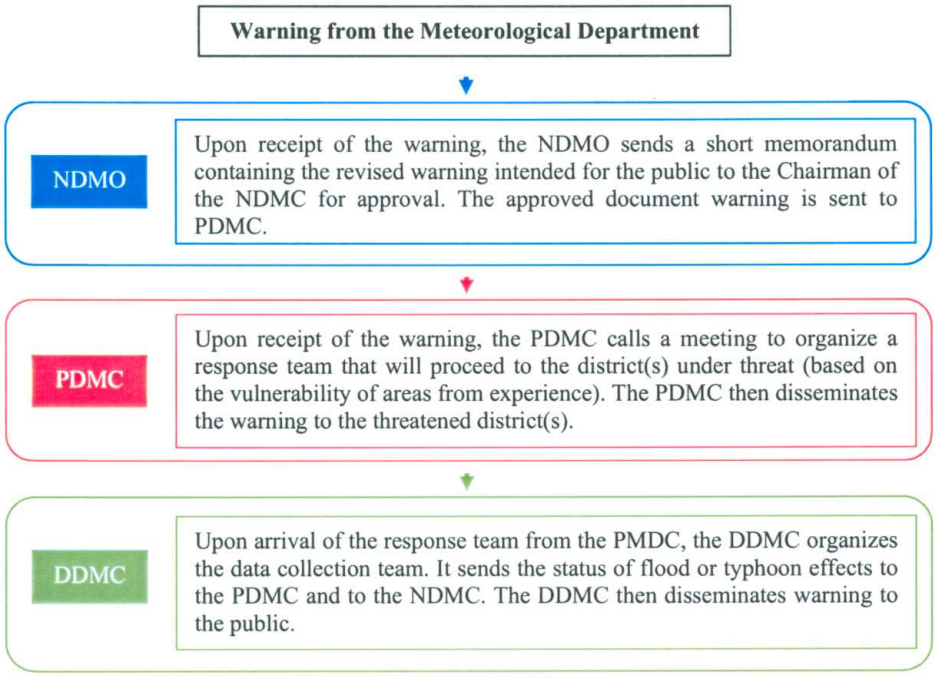

Figure 5.3: The protocol followed by the National Disaster Management Office (NDMO) for disseminating warning from the Meteorological Department, Lao PDR

The village gets flooded from the release of water from the Nam Ngum Dam and intense rainfall. The continuous rain in itself serves as a warning to the community. Despite the well-designed dissemination set-up of the DMCs, the official warning does not reach the Village Chief. Instead, a village member who works at the meteorological department has access to the flood warning, which is passed on to the Village Chief. The employee of the Nam Ngum Dam also provides warning to the village, two to three days before the gates of the dam are opened to release water. On the other hand, the community has its own traditional hazard detection system. It observes water levels against its own indications of danger levels.

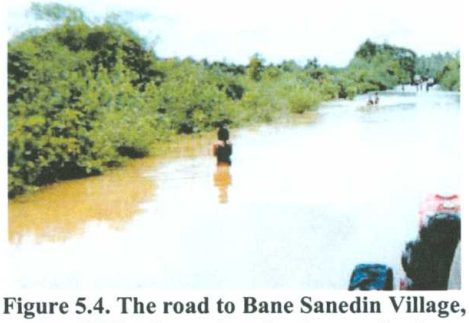

Figure 5.4. The road to Bane Sanedin Village, Lao PDR, after only a few hours of rain

In order to disseminate information or warning to the community, the Village Chief uses the public address system at the temple. A meeting of household heads is also called at the temple to discuss activities that need to be done.

(a) (b)

Figure 5.5 Preparedness measures for flooding in Bane Sanedin, Lao PDR: (a) The river is flowing above the danger level. Corn is harvested and prepared for milling. (b) The harvested corn is milled, as there is still time to do this before shifting the corn to safety.

The combination of warnings coming from the Meteorological Department, the dam warning office and the indigenous indicators provide the community sufficient lead time to implement preparedness measures for flooding. Some of the preparedness activities that are implemented include:

- The harvest of corn, and milling when time allows, else, the corn is shifted to a safe place.
- Preparing an evacuation package containing basic necessities such as rice, mosquito net, candles, and others.
- Evacuation to a pre-identified safe place like the UXO Training Center, assisted by the representatives of the Social Welfare Department and the Red Cross during evacuation.