

Conclusion Report

Action Plan toward Effective Flood Hazard Mapping in Thailand

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A. The role of flood hazard maps to mitigate flood damages in Thailand

A-1) The flood status in Thailand

General back ground

Thailand is a Southeast Asia country comprising 76 provinces with population 60 million people and altitude in the tropical zone by latitude 5°37' N and 20° 27' N ,longitude 97°22' E .The country area covers an 514,000 km²

Topographically, Thailand is characterized by mountains in the north which continue to the south-east, flat alluvial plains

Major cause of flood in Thailand

Floods in Thailand are normally caused by tropical storms and depressions, rarely by typhoons. The tropical storm season is from May to December . Normally during the first two months rainfall will begin in the north region and northeast region later and then in the upper central plain in July and rainfall comes down to the central plain in August and September , the last two months toward to the south of Thailand

The most common storm track is westward from the north-east of Thailand. It causes heavy rainfall in its passage over land. The low-lying areas of the Central Plains usually have the flood condition according to the intensity of rainfall during the storm season.

In 1995, Thailand experienced very severe floods caused by the combination of tropical storm Lois, the southwest monsoon and low pressure systems. They caused major floods in upper Thailand including Bangkok Metropolitan and adjacent areas during the period from mid-July to the end of September. A total of 64 provinces were flooded. It was estimated that about 1.7 million hectares of farmland were damaged, which affected 1.4 million families or 5 million persons were affected. The total damage in upper Thailand, excluding the Bangkok Metropolitan area, was estimated at around 10,545 million baht.

Besides the major cause of floods described above, the other causes that aggravate flood problems in flood plain areas include insufficient capacity of rivers and canals, no storage areas, destruction of forest, poor management of land use and inadequacy reservoirs. Especially for the Bangkok Metropolitan area, flooding in urban areas is due to heavy rainfall downpour in the area, tidal effect superimposed on the flood wave of the Choa Phraya River, land subsidence which is due to ground water abstraction, obstruction water way by extension of the urbanization .

.In the year 2006 ,the low pressure had occurred so many times by starting

in the north region and down to lower northern part region during May, 2006 and had occurred river flood in the north and continued to lower northern region and during June-July, 2006 low pressure occurred again in the north. September, 2006 had rainfall in Bangkok and adjacent areas around Bangkok and effected to inundation in some place not much, but still had run-off from the north and upper part of central region which had accumulated run-off and some base flow in highest observed discharge start from 2,000 cubic meter per second up to peak discharge 5,960 cubic meter per second in October 18, 2006 at C2 hydrology station of Nakhon-sawan Province in the Choa Phraya River basin and discharge flew to central plain until reached to upper Bangkok by that time it was tidal peak period 3 times at October 7, 2006; October 27, 2006 and the last one was 10 November, 2006, therefore Royal Irrigation Department disseminated flood water to other areas for storage these some amount of peak flood to mitigate flood disaster in west and east lower of Cho Phraya River basin and still had discharge left around 3,500 cubic meter per second pass to Bangkok. Until now water flood was in the paddy field in the west lower of Cho Phraya River basin and in central region around 250,000 acres but in the east of Cho Phraya River basin was not flood damage and the Bangkok Metropolitan too.

A-2) The outline of the present countermeasures for mitigating flood damages in Thailand.

The present countermeasures are two types for mitigating flood damages as:

1. Structural measures

Government organizations responsible for flood control and mitigation have proposed many flood control projects. However a few projects are completed due to lack of the budget. The examples of structural-measure projects are dam constructions, weir constructions, embankment and levee constructions, etc.

The evidence of the effectiveness of structural measures was on 1995 flood. Due to the severe damage caused by flooding in Bangkok in 1980, several measures were implemented for flood protection. Flood protection works for the Bangkok Metropolitan included the construction of embankments, improvement of drainage canals, and provision of drainage pumps, dikes and zoning. The effect of the project was studied and a diversion canal was built to discharge excess flow directly to the sea, together with preventing tidal effects by building a sea barrier. It is effectively protect the city core of Bangkok from major flooding in 1995.

2. Non-structural measures

Many nonstructural measures, e.g. rainfall and flood forecasting, flood warning, and historical flood maps are implemented. However, the implementation are not well enough due to lack of modern instruments such as the real time rainfall and runoff recorder, the coordination between concerned organizations is not good enough, and the attitude of the people in flood plain to countermeasures.

Practically, Thai central government assigns the flood control and mitigation system into three stages. The stages and tasks in each stage are as follows:

1. Before flood stage;
 - 1.1 Preparation of historical flood map.
 - 1.2 Setting up the special center for flood protection and mitigation.
 - 1.3 Flood defense planning and workshop.
 - 1.4 Preparation of manpower, machines, equipments, and rapid flood alert team.
 - 1.5. Installation of rainfall and runoff recorders, alarming equipments, and assign recording persons at each recording stations.
 - 1.6 Dissemination of rainfall, water level, runoff, and flood risk area.
 - 1.7 Flood Forecast Warning System
 - 1.8 Excavation sediment of canals.
 - 1.9 Eliminate weed in canals
2. During flood stage;
 - 2.1 Evacuation of people and properties to the safe area.
 - 2.2 Distribution of emergency food.
 - 2.3 Damage investigation and offering of the first aids.
 - 2.4 Set up the security system.
 - 2.5 Monitor and Report the situation until it is recovered
3. After flood stage;
 - 3.1 Setting up the mitigation unit.
 - 3.2 Provision of the temporary residences, food, clothes clean water, and treatment of injurers.
 - 3.3 Investigation of the damages and losses in detail.
 - 3.4 Disposal of rubbish, removing mud, restoration of household and public goods.
 - 3.5 Distribution of relief funds.
 - 3.6 Restoration of affected facilities.
 - 3.7 Provision of jobs for jobless people who are affected from flood.

Many organizations are assigned to act on flood control and mitigation, e.g. Land Development Department, Water Resources Department, Disaster Prevention and

mitigation Department, Meteorological Department, Royal Irrigation Department, Provincial Office, army forces in flood area, and the private organizations. As mention above, historical flood maps are used as nonstructural measures on flood control and mitigation in Thailand. The role of these maps is to provide the warning to the people who live in the past flood area. However, the usefulness of these maps is limited because no relation between flood area and amount of rainfall or flow in the river is shown in these maps. Hence, it will be better if we have flood hazard maps which show such relation. These maps can be used effectively for flood warning and evacuation purposes.

A-3) Do you think flood hazard maps will be useful in Thailand ? Why ?

I think that flood hazard maps can be useful in some area of Thailand such as in the north region which concerns with land slide , flash flood and some area in central plain region that flood hazard maps can be informed and warned to those residents in that flood risk areas .

B) The allocation of roles in making flood hazard maps in Thailand

B-1) Which organization should hold the main responsibility for making a fundamental map such as an anticipated inundation area map ?

Ministry of Agricultural and Cooperative
Royal Irrigation Department as
Hydrology and Water Management Office
Survey and Geology Office
Regional Irrigation Office

B-2) Which organization should hold the main responsibility for making and disseminating flood hazard maps ?

Ministry of Interior
Department of Disaster prevention and mitigation

C) The Action Plan of making flood hazard maps in Thailand

C-1) Which area do you choose for the target river basin area ? Why ?

The central plain region area will be the target of Choa Phraya River Basin Because this target is in my Regional Irrigation office area that I should take care and response in water management and flood management .

C-2) What do you think is necessary to make flood hazard maps in the chosen area ? Do you have data, maps, or budgets necessary for making flood hazard maps?

That area is flood plain area to storage water flood during flood season in central plain region .

I have only raw data of water level, observed discharge and rainfall, for maps belong to other office and some private sector , for budget should present the proposal to Department for making flood hazard maps

C-3) Propose your own “Action Plan” within the next five years

The action plan within the next five years is shown in the table 1.

Table 1. The action plan of making flood hazard maps in Thailand

No	Action Plan	Year				
		1	2	3	4	5
1	Learning of how to make the FHM	—				
2	Collection of data and information	—				
3	Composition of anticipated inundation map		—			
4	Proposition and evaluation of anticipated inundation map		—			
5	Ground survey including socio-economic information			—		
6	Proposition of draft FHM			—	—	
7	Composition of FHM				—	—

C-4) What seems a problem in making flood hazard maps in your country ?

Problem in Making flood hazard maps in Thailand

The following issues are the main problems found in making flood hazard maps in Thailand:

1. New non-structure measure
2. Lack of knowledge how to composite data
 - Topographic data
 - Arial photograph maps
 - Topography maps
 - Hydrology data
3. Lack of planning and budgeting
4. People do not like to evacuate

D) My own Flood hazard map on Ise city”

D-1) What is the improvement from the FHM on Ise city currently available?

- Add the sign of Refuge more around Evacuation Centers and remove the obstruction of sign as branch of tree
- Add the sign risk spots during evacuate route in flood hazard maps
- Add temporary shelters in some area that Evacuate Center is so far away to reach .
- Promoting information of Flood hazard Maps by medias to making more easy to understand which can evacuate quickly and smoothly.
- Keep updating information in flood hazard maps if changes are made in inundation risk area or other information
- As picture attach

