

CONCLUDING REPORT

On

ACTION PLAN TOWARD EFFECTIVE FLOOD HAZARD MAPPING IN CAMBODIA

Prepared by:

HORN SOVANNA

Chief Office of Hydrology Works
Department of Hydrology and River Works (DHRW)
Ministry of Water Resources and Meteorology (MOWRAM)
Address: #576 N/R No.1, Sangkat Chak Angre Krom, Khan Mean Chey, Phnom
Penh, Cambodia
Email : hydrowork@online.com.kh / dhrw.cambodia@online.com.kh

1- Introduction

The training Program on Flood Hazard Mapping was conducted on 30 November until 2 December 2006 by Public Works Research Institute (PWRI) of Ministry of Land, Infrastructure and Transport Japan International Center for Water Hazard and Management together with the Japan International Cooperation Agency (JICA). A total of 16 participants from 8 countries (Cambodia, China, Indonesia, Lao PDR, Malaysia, Philippines, Thailand and Vietnam) attended the course. During the course, lectures related to flood were given not only by experts throughout Japan . In those lectures, topics related to flood hazard map were discussed comprising history and principal of flood hazard mapping in Japan, numerical simulation to obtain anticipated inundation area, evacuations procedures as well as experiences in producing flood hazard maps throughout Japan. Beside lectures, 3 days of special field work on ‘Town Watching’ was conducted in Mie Prefecture covering Tsu City, Ise City , Miya River and Shonai River with participation from various offices and community group within the area.

A - Role of Flood Hazard Map to Mitigate Flood Damage in Cambodia

1 - Flood status in Cambodia

This chapter basically will discuss on the flood status in Cambodia almost every year is effected by flood, flooding from the rivers and from the Localize rainfall. Many people who live in inundation area are faced to the problems Because of geographical condition, Cambodia had occurred annually Flooding from the rivers and local rainfall. it has impacted seriously for : Flood mitigation requires real-time information on weather and hydrological forecasting, so that [forecasts and warnings along the Mekong River and some Tributary](#) can be issued to people at risk place, for example for merchants who may need to remove goods please to stored at ground to upper level. Forecasts of flooding are now become very interested for stakeholders and local authority and international communities also. In Cambodia, flooding is not restricted to the floodplains towns and rural areas (average flood and minimum flood, inundation), but the subject flash flooding and heavy flood is generally heavy not stability social and national economic losses. Many emergency situations cannot be avoided, it must be took care about flood management and must be ensuring the availability of financial, human and material resources. It is meant needing the help from network, coordinate individuals, agencies and organizations in order to a rapid and effective response. [This is where “ Flood Hazard Mapping ” on going apply.](#)

- a- Death toll : 347
- b- Houses affected: 317,400 houses destroyed 7,000
- c- Education, schools 988 damaged in 13 province
- d- Health, health centers damaged 138
- e- Production
 - Rice crop destroyed 374,000 ha
 - Other crops destroyed 47,000 ha
 - Livestock lost 3900 heads
- f- Infrastructure
 - National and Province road damaged 2,600 km
 - Secondary road damaged 1,500 km
 - Rail road damaged 34 km
 - Bridges 115 sites damaged
 - Wells, culverts 11,900 damaged
 - Irrigation systems damaged 123 sites

COMPARISON OF FLOOD IMPACTS ON POPULATION

Year	Impacts		
	Household	People	Death toll
1996	386,132	2,029,748	169
2000	750,618	3,448,629	347
2001	429,689	2,121,952	62
2002	296,234	1,439,936	29

2 - Outline of present countermeasures for mitigating flood damages in Cambodia

Structural (curative) as well as non-structural (preventive) measures have been proposed to alleviate the flooding problem.

Structural measures

Flood control facilities construction in the Tamok dam, Kobsroy dam, Kompong Tuol dam and National road # 6 belong the Tonle Sap River. This very importance around Phnom Penh Capital City of Cambodia.

3 - Flood hazard maps will be useful in Cambodia

Flood Hazard Map is very useful to be implemented in Cambodia. With regards of the Flood Hazard Map objectives, to prevent loss of people's lives and helps smooth refugee from home to evacuation shelter as well as to notifying the residents of potential flood damage and enhancing their awareness of the importance of flood disaster preparedness could be achieved.

B - The Allocation of Roll in Making Flood Hazard Maps in Cambodia

1-Organization should hold the main responsibility for making a fundamental map such as anticipate inundation area map.

No	Line Agency	Role
1	Ministry of Water Resources and Meteorology	-Planning, coordinating and supervising relief -Operations during flood. Support the flood disaster preparedness activities among the committee members. - Providing flood forecasting and warning service to the public. - Main organizations for planning, prepare and disseminate Flood Hazard Map. -Providing weather forecast information to flood forecasting and warning activities
2	Ministry of Finance	-Prepare budgets for five yearly developments.
3	Ministry of Environment	-Support and provide development allocation for flood mitigation projects at the federal level.
4	Ministry of Land	-Providing the digital topographic map, DEM of the drainage basin
5	Provincial Government	-Support and provide development allocation for flood mitigation projects at the state level. - Dissemination of Flood Hazard Map - Provide information on evacuation routes in their region.

2-Organization should hold the main responsibility for making and disseminating flood hazard maps.

No	Line Agency	Role
1	Ministry of Water Resources and Meteorology	-Making Flood Hazard Map. -Dissemination of Flood Hazard Map
2	Ministry of Finance	-Prepare budgets
3	Ministry of Environment	-Support
4	Ministry of Land	-Providing the digital topographic map, DEM of the drainage basin
5	Provincial Government	- Dissemination of Flood Hazard Map
6	National Committee for Disaster Management.	- Dissemination of Flood Hazard Map
7	Cambodia Red Cross	- Dissemination of Flood Hazard Map

C– The “ Action Plan” of Making Flood Hazard Maps in Cambodia :

1- Tonle Torch River Basin are the target area for flood hazard maps

- Tonle Toch River Basin is a tributary of Mekong river. It pass 2 provinces (Kompong Cham & Prey Veng province). Prey Veng province has been effected seriously by Mekong flood through this river. Prey Veng was suffered seriously and longest prone inundation (Peam Ro and Ba Phnom district). Prey Veng is covers an area 4,883 quire km and it was divided two main regions. Flood plain which flooded every year from the Mekong River. This region has many Streams, tributaries, lakes and Reservoirs for irrigation in dry season and supplementary crops.

-Central-plain which cover by rain-rice fields. They have not more water resource. They have depended on the rainfall. This region has a small-scale irrigation systems and some places have used ground water for irrigating. Prey Veng province was divided 12 districts, 116 Communes and 1,138 Villages. Totally populations are about 1,025,331persons .Among of those, female are about 541,572 persons equal 52.8 % and mans are about 483,759 persons equal 47.2 %. Totally families are 208,727 and density of people about 210 pers/km2.

-Prey Veng has 2 main rivers & 2 streams(Kompong Trabek & Stung Slot): In the covers area about 488,300 ha, it was divided: land for rice field about 310,000 ha,(among those, rain rice is about 238,000 ha; dry rice is about 60,000 ha), land for crops is about 12,000 ha; forest land is about 19,461 ha; land use is about 45,518 ha and other lands about 107,286 ha.



3- Propose “Action Plan” within the next five year :

Project Name: Flood Hazard Mapping (FHM)

Summary of general action plan within 5 years ahead as follow: 2011

Target Area: Tonle Touch River Basin, Prey Veng Province Date: 28 Nov 05

No	Year	Action Plan
1	2007	<ol style="list-style-type: none">1- Deliver a presentation of FHM to my department2- Formed the committee members of FHM3- Gain and enhance my knowledge in anticipated inundation area mapping, Topographic Map and GIS (Flood Runoff Analysis)4- Check the viability and update topographic map at Department of Survey Mapping and Data collecting5- Having some meeting and understanding of FHM between the related organizations6- Get an opinion and idea from the local residents’ perspective of FHM
2	2008	<ol style="list-style-type: none">1- Promote the idea of FHM to the local government.2- Educating people and enhancing their awareness due to flood disaster preparedness3- Start planning and doing some ground works of FHM for rural area. Target area
3	2009	<ol style="list-style-type: none">1- Carry out survey to study effectiveness –DHRW2- Model construction (consists Topographic Modeling, Flood Modeling and Flood Stimulation).
4	2010	<ol style="list-style-type: none">1- Model construction (consists Topographic Modeling, Flood Modeling and Flood Stimulation)(cont ...)
5	2011	<ol style="list-style-type: none">1- To disseminate the completed FHM to the target group (State Resident)2- Educating people and enhancing their awareness due to flood disaster preparedness3- Carry out survey to study effectiveness Tonle Torch River Basin4- To conduct survey via questionnaire to the target groups with the view to improve the usefulness of the FHM

Notice: FHM : Flood Hazard Map, NCDM : National Committee for Disaster Management, DHRW : Department of Hydrology and River Works MOWRAM : Ministry of Water Resource and Meteorology

4- Problems In Making Flood Hazard Map In Cambodia

- Insufficient data e.g. updated topographical map
- Data reliability – rainfall, water level and discharge
- Flood modeling and flood stimulation
- Social and economic impact such as sales and price of land and properties will be affected by showing the forecasted inundation depth in the FHM.
- Suggestions for making this training course more meaningful

D- Conclusion

The capacity to deal with flood reduction still limited in terms of using the flood reduction technology, knowledge, experience, fund and resources for the activities of flood. The selection of pilot site for mapping is difficult due to inadequate of related data and information. Consideration, support and willingness of Japanese Government Agencies especially Japan