Concluding Report
"Roadmap toward Effective Flood Hazard Mapping in Vietnam"

Pham Hong Nga
Division of Environment and Watershed Management
Department of Hydrology and Environment
Hanoi Water Resource University
Address: 175 Tay Son Str. – Dong Da Dist. – Hanoi – Vietnam
Email: phamhongnga@hn.vnn.vn
p_hongnga@yahoo.com

1. Course evaluation (personal)

As attending the training course on "Flood Hazard Map", 3-week curriculum has provided me broad knowledge and perspective about the need and appliance of flood hazard map in flood prone area like East and South East Asia.

Among the lectures included in the curriculum, the lecture on "Procedure for Flood Hazard Mapping", "Development of the Dynamic Flood Hazard Map" and the last lecture on "Flood Hazard Mapping in Developing Countries" interested me most.

2. What to do for effective flood disaster mitigation in Vietnam?

In Vietnam, along with drought and forest fire, flood is considered as the most serious disaster occurred throughout the country.

Beside hilly topography and monsoon torrential rain, another reason that water disasters are so serious is that most of the population engages in agricultural activities, mainly wet-rice cultivation and thus, they lives in the river deltas susceptible to flooding. By the other words, both the main Red river delta in the north and Mekong delta in the south and also the narrow coastal strip along the central part of the country are prone to flooding from monsoon rains and typhoon storms. Further, the remaining three-quarter of the country is mountainous and suffers from flash flooding. Over 70% of the population of Vietnam eventually is at risk of water disasters.

In Vietnam, the flood characteristics vary considerably from the north to the south summarized in Table 1.

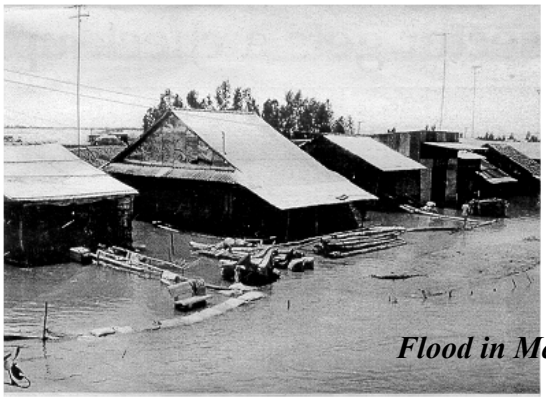
Table 1. Main characteristics of flood occurrence throughout Vietnam

	Northern rivers	Central rivers	Southern (Mekong delta) rivers
Time of occurrence	June - August	Sep - November	October - December
Frequency	Almost every year	About several years	Almost every years
Flood control measures	Large reservoirs and dike system	Medium and small reservoirs, No dike or low embankment	No reservoir, No dike
Issue of concern	Inundation/Overflow Dike/dam breaking	Overflow, Dam and embankment breaking	Overflow
Countermea-sures	Community preparedness and awareness Institutional framework development Integrated river basin management / Land use planning Hydro-meteorological monitoring Flood forecast and forecast information transmission Emergency relief		
	Dam/reservoir regulation Dike maintenance Relocation ???	Dam and retarding pond, Dredging	Elevated house/ floating house Water gate, Canal dredging

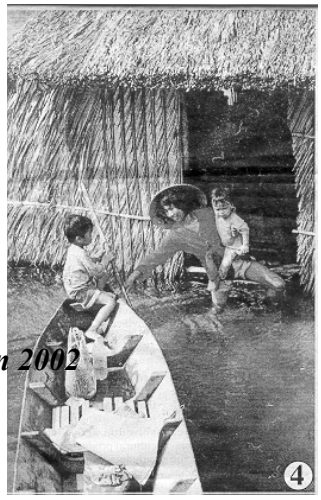
In the northern part, flood often occurs rather suddenly with extremely high peak. To prevent flood, all the rivers are bounded with the huge dike system on both sides. However, due to large population and consequently, high demand of area for cultivation and housing, it is often the case that the flood plain is used up as crop fields during dry season and used for housing, of course, for whole their life. Apparently, those people have to confront with flood and inundation every year. It is very risky to live there but those people with quite low income do not have any other choice. Therefore, information about flood occurrence is of great importance to help them evacuate to higher location timely. On the other hand, people living inside the dam are often relaxed as they trust the dam. So, national government and local authority must raise their awareness on preparedness on any flood disaster that could occur anytime due to dike or dam breaking. The Government also must maintain and strengthen the safety of dike system.

Being different from rivers in the north, the rivers in the central and southern part have no dike system or just low embankment.

In central region, the flood also occurs quite suddenly and seriously due to steep topography but with lower frequency compared to those in the north. However, if flood occurs, the damage in terms of property loss and human casualties is enormous because of lack of preparedness and effective countermeasures. In Mekong Delta with densely river and canal network, the flood is occurred every year and characterized by widespread, uncontrolled and prolonged inundation.



Flood in Mekong Delta in 2002



Huong river in ancient Hue city (Central part)

Therefore, to mitigate flood damage effectively, firstly, it is necessary for Government to raise the awareness of local communities about the flood occurrence in terms of time and extent. As soon as they understand about the flood situation, they can rearrange their lifestyle and economic activities to adapt it. Then, the impact of flood can be reduced. Secondly, the flood must be regulated, controlled and protected by combination of physical and non-physical countermeasures implemented by the Government. So far, many kinds of structures have been built for flood control and regulation nation wide, such as dam, reservoir, dike, sluice, pumping station, etc. Vietnam Government, however, still must spend more effort on development of comprehensive river basin management plan as well as powerful flood forecast and flood warning system.

3. Individual Actions in the Future

After going back to the country, I will discuss with the colleague in the university about the advance and necessity of flood hazard map in the flood prone area. Also, possibly, in

the coming year, we will add a session on so-called Introduction on flood hazard mapping in the curriculum of teaching subject "Integrated River Basin Management". Later, in the longer term, we will propose the Ministry about the development of flood hazard mapping projects in the pilot areas, especially in the central provinces.

I will strongly recommend my colleague in the university or in the ministry to join the training course on Flood Hazard Mapping because, firstly, it is a good chance for her/him to learn sophisticated tool used in flood control and prevention and also, to experience about advanced and beautiful Japan. Secondly, to development map on flood, it requires skillful staff or team, rather than few individuals.

4. Suggestions for more effective flood management in Japan?

To date, being the most advanced country in the world, Japan has applied numerous state-of-the-art technology and knowledge in flood management gaining great success in flood control and prevention. Nevertheless, after studying brochure on "Flood Control in Japan" and especially, after visiting several offices involving in river management, I would like to propose some recommendations as follows:

- Regarding to the content of integrated river basin management, developing flood hazard map for the whole basin or a certain (downstream) vulnerable region, rather than for just an individual prefecture, should be taken into consideration. Moreover, the format of flood hazard map should be standardized, in term of size, colour and legend.
- In order to harmonize the tough task of coping with the flood and also the task of environment and natural habitat conservation, apart from powerful physical measures, non-physical measures should be effective and important as well, especially land use planning. For example, some physical measures, such as diversion canal construction or dredging can result in long term changes in morphology, natural aquatic habitat and consequential environmental degradation as a whole.

5. Suggestions for a more meaningful training course?

The training course has provided us quite broad knowledge on matter of flood hazard mapping. Generally, the entire course curriculum is divided into three parts: (1) Lecture sessions; (2) Practical exercise on hydrology and Group work on Town watching and (3) 2-day field trip, additional lectures on flood hazard map around the world and concluding report preparation. I am very interested in 1st and 3rd parts. However, the exercises included in 2nd part seem not really useful and relevant. The arrangement of town

watching survey should be improved as well. For example, due to limited time, each group or two groups are assigned to investigate in details, let's say, 3 checkpoints, but not whole 6 checkpoints. Then, the participants would share the findings during presentation session.