Transformation of Urban Management in Myanmar - Part II (Flood Management) (ADB TA-8456 Part II)

Due to dynamic social and economic activities in recent years, rapid urban development is expected in Myanmar, creating an urgent need for improving urban functions and strengthening human resources to manage them. To help the country with this development process, ADB decided to proceed with a project to assist the Myanmar government in capacity development for urban management through "TA-8456: Transformation of Urban Management." Since Myanmar suffered heavily from Cyclone Nargis in 2008, it was also important for Myanmar to improve its preparedness and response capacity to reduce disaster risk that may interrupt the future development of their cities. Therefore, in TA-8456, Part I covered the efforts for general urban management such as water supply, sanitation, waste management, and drainage, while Part II covered the efforts in flood management. ICHARM was responsible for the overall technical management in Part II of the project. Other members of Part II included CTI Engineering International Co., Ltd., CTI Engineering Co., Ltd., and PASCO CORPORATION. With ICHARM supervising and guiding the all activities of Part II, the Part II Team implemented flood risk assessment and technical transfer to the government of Myanmar to assist the country in improving the flood risk reduction ability of three selected cities; Yangon, Mandalay, and Mawlamyine (Figure 1). The project began in July 2014 and lasted for two years and five months until November 2016. In Part II, ICHARM established a collaborative framework with the Myanmar government to advance the project in an inclusive way by holding meetings and workshops with relevant agencies. The framework consisted of the Department of Meteorology and Hydrology, Ministry of Transport and Communications as the main counterpart and 13 other government organizations involved in flood risk management including the three cities. The project first conducted field survey, data collection, questionnaire survey (needs assessment) with relevant agencies to understand the local situation before arranging specific activities. The main activities of the project were as follows:

1) Hydro-meteorological analysis related to floods and storm surges,
2) Flood and storm surge risk assessment
3) Capacity development of the Department of Meteorology and Hydrology, and
4) Capacity development of organizations relevant to flood and storm surge risk assessment.

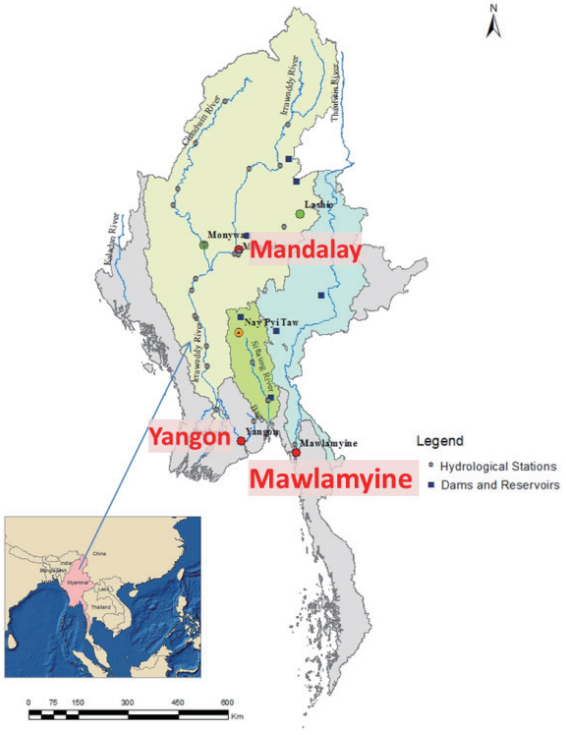

Figure 1 Target cities of TA-8456 Part II in Myanmar

In Activity (1), hydro-meteorological analysis related to flood and storm surges, the Rainfall Runoff Inundation (RRI) model developed by ICHARM was adopted for flood inundation simulation. Myers formula was employed for estimation of distribution of air pressure that was used as the basic information for storm surge simulation. The challenge in building an analysis model in Myanmar was, just like the one in TA-7276, the lack of topographic data and observed rainfall and water level data. Therefore, insufficient data was supplemented with data publicly available on the internet, such as rainfall data around the world, topographic data, and land cover data published by the Japan Aerospace Exploration Agency (JAXA), the National Aeronautics and Space Administration (NASA), and other international agencies.

In Activity (2), flood and storm surge risk assessment, major floods in recent years were simulated using a model developed in hydro-meteorological analysis. Inundation due to a 100-year flood was also simulated to create a flood hazard map (Figure 2). By using a risk indicator capable of showing damage on rice plants according to inundation depth and duration, flood damage to agriculture (rice crops) was also assessed for the past largest flood case and a 100-year flood case. ICHARM held workshops in each target city to exchange opinions regarding the developed flood hazard maps, and the collected opinions were reflected in the subsequent revision of the maps.

In Activity (3), capacity development of the Department of Meteorology and Hydrology, ICHARM compiled the recommendations for future actions, such as the expansion of meteorological and hydrological observation systems and the utilization of satellite information, based on the current activities and roles of the department in the national development plan. ICHARM also conducted a series of training programs on the RRI model and the storm surge model from an introductory level to an advanced level for young engineers in the Department of Meteorology and Hydrology. The advanced-level

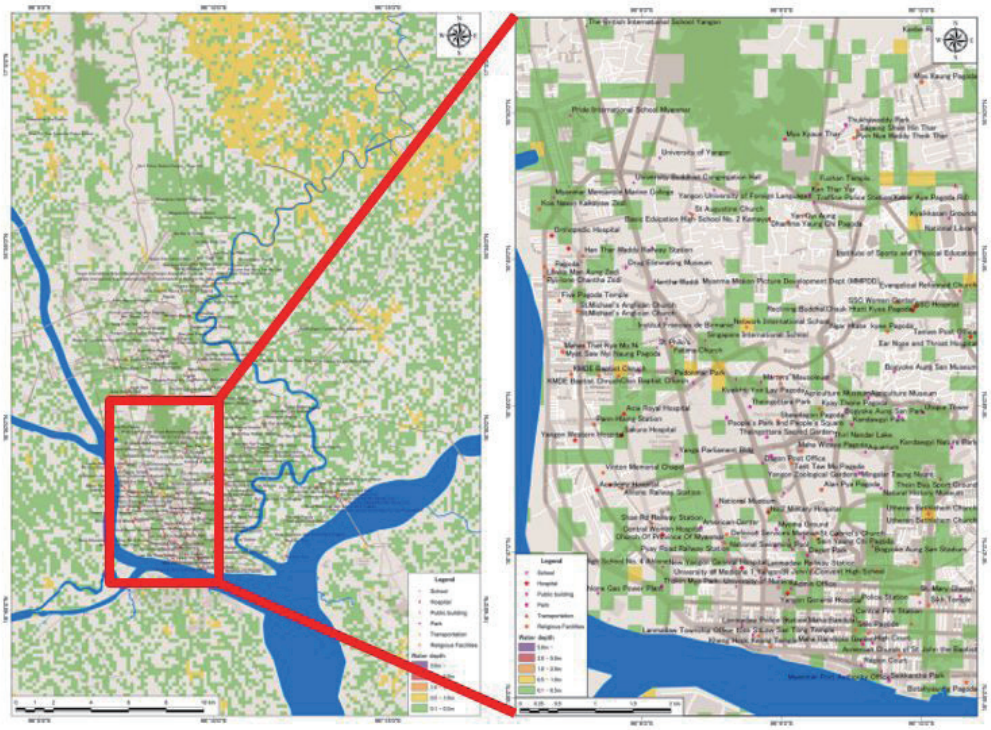

Figure 2 Flood hazard map of Yangon, Myanmar, for a 100-year flood (green: 0.1-0.5 m, yellow: 0.5-1.0 m)

training was specifically provided for selected candidates of DMH, who were expected to become trainers on the RRI Model and the storm surge model in the future (Photo 2). As a result, 10 candidates were trained as trainers, who independently planned and conducted capacity development training on the RRI Model for other members of DMH and related organizations in July 2016. Upon request from the Irrigation and Water Utilization Management Department, Ministry of Agriculture, Livestock and Irrigation (IWUMD), the representatives of IWUMD also participated in all training programs on the RRI Model and the storm surge model. ICHARM also organized a training program on flood risk assessment for DMH and IWUMD officers.

In Activity (4), capacity development of the organizations relevant to flood and storm surge risk management, ICHARM conducted workshops for central and regional organizations engaged in flood and storm surge risk management other than the Department of Meteorology and Hydrology. In those workshops, we introduced the effective use of flood hazard maps for better emergency response by relevant organizations and more appropriate land use planning. We also explained the method to estimate flood-induced agricultural damage using risk indicators. With this method, the effect of disaster prevention investment can be quantitatively evaluated as reduced damage; thus, the importance of stable investment in disaster prevention can be clearly understood by the general public.

In flood response, basic information was created to understand the situation by collecting and analyzing hydro-meteorological information and evaluating disaster risk caused by a flood. In this project, ICHARM provided technical assistance to improve the capacity of the Department of Meteorology and Hydrology, the three major cities, and other relevant organizations to properly produce, correctly understand, and effectively use such information. This project was primarily targeted for Myanmar, but we hope it will be a good example for similar projects in other Asian countries as it addresses many issues commonly existing throughout the region.

Photo 1 Meeting with DMH staff

Photo 2 RRI Model training