Japan International Cooperation Agency (JICA)

Project Study on the Effective Countermeasures against Earthquake and Tsunami Disasters

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Special Committee of JSCE held 1st Reporting Meeting on Future Concept on Tsunami Countermeasures

Japan Society of Civil Engineers (JSCE) held a meeting on May 10, 2011 and announced a preliminary idea and comments for tsunami reconstruction and countermeasures in future. This bulletin summarizes the idea in English for your reference. The original document in Japanese is available at: http://committees.jsce.or.jp/2011quake/node/79.

1. Introduction

JSCE formed a special committee for the Great East Japan Earthquake and tsunami with thematic sub-committee and is discussing the issues on effective reconstruction from the disaster.

Tsunami sub-committee for the special committee headed by Prof. Imamura of Tohoku University, is working on three issues of 1) understanding the characteristic of the tsunami, 2) reconstruction and design strategy for tsunami countermeasures, and 3) issues taking into account for reconstruction through integrated countermeasure such as city planning and management, structure and non-structure measures.

On the day of May 10, the tsunami sub-committee held a meeting to report an interim results of the discussion.

2. Characteristic of the tsunami

According to the analysis of the tsunami survey done by researchers groups, the tsunami scale is considered to be the same as the tsunami that occurred in 869 (Jogan Tsunami) or more, and the frequency of these large-scale tsunamis would be once in 500 to 1000 years.

3. Strategy for designing and reconstructing coastal Protection facilities

"To protect all human lives – no human damages by tsunami disaster" is set as the fundamental principle for planning countermeasures of tsunami disasters, and the two kinds of tsunami levels should be proposed to be set for planning purpose.

Level 1 tsunami: Tsunami scale of this level would be as large as the one which will occur once in several decades to several century.
For this level of tsunami, human lives and properties should be protected mainly by coastal protection facilities, and the estimated tsunami height and energy of this scale should be used for the designing of the facilities.

Level 2 tsunami: Level 2 tsunami is an extreme tsunami event and may have much higher tsunami wave and stronger tsunami power, and it would exceed the tsunami protection function of structural measures.
To save human lives from this extreme event, all possible measures shouldbe applied.

(Note: Level 1 and Level 2 are tentatively used.)

It is noted that evacuation is always required as it is difficult to predict the necessity of evacuation by current technologies. It is also noted that overtopping of tsunami,, deformation of ground and other factors affect to the facilities in extreme events should be taken into account for designing of facilities.

Furthermore, stepwise rehabilitation and reconstruction should be considered for preparing the next typhoon season as the function of existing facilities has been loweed by

the subsidence of the fault and tsunami.

4. Issues taking into account for reconstruction

Tsunami Disaster Management Plan

Tsunami disaster management plan should be re-prepared during the reconstruction process to address the Level 2 tsunami with the first priority of protection of human lives, and it should cover all possible measures of structural and non-structural measures which include the revision of evacuation plan and information dissemination system as well as urban planning with land use control.

However, there are technical limitations for estimating the height of Level 2 tsunami precisely. Therefore the height should be set with the research result of historical tsunami records and numerical simulations with the latest information and technology and it should be reviewed as needed.

Necessity of Local Experts

It is important that the tsunami management plan should be prepared in line with the regional characteristics especially in preparation of hazard maps and evacuation plan. In this regards, fostering of local-based experts who support to prepare the plans are required.

Understanding of Actual Situation

To understand actual situation of tsunami event, and provide accurate information for evacuation, enhancement of the observation network with break-proof equipment should be required.

Maintaining of Awareness and Continuous Activities

From the past experience, it is difficult to maintain awareness on disasters. For example, many of peoples shifted to high land returned to low land area near the sea after several decades of disasters. Such lessons learned should be studied and incorporated in the tsunami disaster management plans that consist of structural and non-structural measures.

Implementation scheme of the plan that will be effective more than 100 years is also considered to create tsunami resilient society.

The proposal reported in May 10 was the 1st proposal from the sub-committee and discussion is still going on. JICA Study Team will follow the discussion and report the progress and results of the discussion ether our website or this bulletin when new things arise.