

Top-down to Bottom-up Approach

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More than 130 years ago, flood control measures in Japan were designed according to factors such as the importance of the area to be protected and natural land characteristics, included the construction of embankments of different heights on the right and left banks or at different locations along the same river so as to protect valuable nearby farms and rice fields and local communities.

The Japanese Government first introduced design flood discharge ($4,730\text{m}^3/\text{s}$) in Shinano River in 1887, enacted the River Law in 1896, and the Sabo Law and the Forest Law in 1897. These laws laid the foundations for modern flood and erosion control in Japan. The original River Law remained the basis for river administration in Japan until it was completely revised in 1964. Professor Emeritus Takahashi Yutaka wrote his PhD dissertation entitled “Theory of Flood” in 1964 saying that the flood discharge should increase because the people keep the flood water outside the river bank and make the river channel straightforward in order to enhance the speed of discharge. Rivers was $4,409\text{ m}^3/\text{s}$ in 1946 and $5,122\text{ m}^3/\text{s}$ in 1964. After the 1964 revision, the basic flood discharge drastically increased and reached $7,841\text{ m}^3/\text{s}$ in 2005. It became impossible to discharge such a large flow without building flood control dams.

Physical scientists’ way of thinking is that the initial trigger of flood disaster should be only heavy rainfall and large discharge. They love to draw hydrograph showing the physical relationship between rainfall and discharge and simply believe that the larger the discharge, the more people and their properties may damage by flood disaster, and reducing hydrological prediction uncertainty may reduce such damage. This way of thinking can be say top-down approach. This approach has been welcomed by the river management administration agency (government) because their river planning work may be easier. Scientists, engineers and governments are thus connected very closely.

In 1990s, Nagara River Estuary Barrage project raised a conflict between people and governments and the River Law was amended or reinforced in 1997 to add a new objective for river administration - namely fluvial environmental conservation. Another important amendment of the River Law in 1997 is a procedure for the river administrator to establish a river improvement plan. The new procedure requires the river administrator to consider opinions from academic experts and persons with experience, as well as residents in the local communities affected by the plan. Moreover, the river administrator must also consider opinions from concerned governors and mayors before a river plan is established. These procedures will enable the river administrator to meet various needs of local residents and citizens about improvement of river management. After the amendment of the River Law a river basin committee, which is composed of many kinds of people such as academic experts, community representatives, non-governmental organizations and government officials, was established to exchange questions and suggestions in order to draft a river improvement plan.

However, most of the river basin committee was not properly functioned and the most famous Yodo River System Basin Committee has been stopped by the government in

January 2007. I feel some disappointment from the people who wish to deliver their opinions to the governments by bottom-up approach. I wonder the scientists and engineers still keep their positions at the government side and have not heard the peoples' voices since the river law amendment in 1997 and the society may disappoint to the scientists and engineers as a result.

The expectations of people to the scientists and engineers, however, are still large. Scientists should stop the top-down approach and start the bottom-up approach if they wish to recover their trusts by the people. The methodology of bottom-up approach is rather simple; visit the real field, hear the peoples' voices and create scientific knowledge and appropriate local technology for the peoples' needs. Raising peoples' awareness is the most important issue for minimizing the number of people lost their life by the flood disaster.