

Perspectives of Providing and Managing Public Infrastructure for the Next Generation

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1. Introduction

A country with a rugged geography, Japan now faces problems including population decline, a rapidly falling birthrate, aging of society, and limited natural resources. In order for Japan to build and maintain good quality public infrastructure under such conditions and to ensure safety and convenience for the next generation, it is important to conduct research from two perspectives: research on national land management considering broad issues, including disasters, for the entire nation, which is the foundation of people's lives, and research on construction management and all aspects of production systems in order to maintain the infrastructure stock properly and ensure high-quality public works projects from the narrow perspective of efficiently implementing specific methods. This article discusses these two perspectives based on surveys being undertaken by the Research Center for Land and Construction Management.

2. Perspective from national land management

Japan is facing unprecedented changes, with frequent massive natural disasters in addition to social weakness caused by the declining population, aging of society, economic stagnation, and other factors. In view of the devastating loss of life and property caused by the Great East Japan Earthquake, we must now revise various established disaster countermeasures in order to reduce damage and provide multi-layered protection. Accordingly, we are now revising national land plans in preparation for the Tokai, Tonankai, and Nankai Earthquakes which are likely to occur in the future. In a public opinion survey in October 2011 concerning people's lives, 45% of respondents reported that since the earthquake disaster, they had become strongly conscious of "preparing for disasters," revealing strong public awareness of disaster protection¹⁾. Regarding administrative systems, it is necessary to build social systems that function well not only during normal times, but also when disaster strikes. In addition, finding ways to maintain regional societies and local bonds in order to manage the national land is a challenge which cannot be ignored. Its increasing importance was confirmed by the same public opinion survey, in which 40% of respondents replied: "I value bonds with my family

and relatives" and "I value bonds with my region". Therefore, studies are needed on creating national land which integrates safety, the environment, and vigor based on natural and regional environmental conditions and present policies in individual regions. It is important to prevent weakening of this awareness of disaster prevention. Therefore, perhaps disaster prevention awareness needs to be internalized in social systems, for example, by regularly diagnosing the disaster prevention capabilities of social systems. This study will require a broad range of data that accurately represents a region's disaster prevention capability.

3. Perspective from building construction management

To create national land which integrates safety, the environment, and vigor, it will be necessary to efficiently provide good quality public infrastructure that conforms to regional characteristics. Another urgent challenge is to prepare for the maintenance and renewal of existing public infrastructure stock as it deteriorates. In construction management, it will be necessary to optimize and prioritize public procurement systems to efficiently build good quality infrastructure and to maintain the existing stock.

As public procurement systems for prioritized, efficient provision of good quality public infrastructure under the Law for Ensuring the Quality of Public Works (2005), a variety of initiatives, such as the comprehensive bidding evaluation method, integrated design and execution procurement method, and construction management (CM) method, were introduced to improve the quality of public works. But to create a bidding and contract system which encourages participating bidders to improve their technological capabilities by analyzing problems in projects managed by the Ministry of Land, Infrastructure, Transport and Tourism, and revisions deemed necessary as a result²⁾, these systems must be steadily upgraded.

The growth strategy of the Ministry of Land, Infrastructure, Transport and Tourism enacted in May 2010 aims to expand Japan's superior construction and transport industries, and its infrastructure related industries into overseas markets, and to build a solid presence in the world market. It is therefore necessary to incorporate and promote international ordering and

contracting methods in public works projects in Japan. It is also necessary to study the good points of ordering and contracting rules which have been gradually upgraded around the world, including public infrastructure provision methods using public-private sector links such as PFI/PPP, etc., to make Japan's building production systems even better. It is important to respond to changes in quality assurance methods at the execution stage resulting from technological reforms, and to improve execution management technologies by, for example, full-scale introduction of computer control, monitoring and surveying of public works, revision of standards and techniques to appropriately and efficiently evaluate results, and reliably obtaining high quality products in individual works. Procedures to appropriately reflect the achievements of companies in contract selection processes must also be developed.

4. Perspectives from both sides

To prevent harm to the public economy by fatal damage and reduce life cycle costs by prolonging the service lives of public infrastructure while sustaining harmony with the natural environment amid severe natural conditions such as earthquakes, tsunami, storm surges, volcanic disasters, floods, sediment disasters, and heavy snowfall in Japan, it is essential to carry out systematic maintenance based on inspections and deterioration predictions based on the characteristics of individual facilities. We must not only provide good quality stock for construction management, but also maintain that high quality. The comprehensive development project, "Development of Inspection and Monitoring Technologies for Preventive Maintenance of Public Infrastructure", which was conducted for three years beginning in 2010 by the Ministry of Land, Infrastructure, Transport and Tourism, is being implemented jointly with relevant research divisions³⁾. A similar concept of stock management is important for national land management. In the future, it will become increasingly necessary to consider the management of public infrastructure by appropriately responding to changing circumstances while combining the natural and social environments of individual regions, based on management of public infrastructure throughout the country.

5. Conclusions

This article introduced the aims of research from a variety of angles regarding national land management and construction management. These challenges are closely related, and it is necessary to conduct comprehensive research while ensuring that one solution does not create new problems. We will bear this in mind when conducting further research.

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