

# Research Trends and Results

## Studying the Process for Reconstruction Planning for Tsunami-Stricken Cities Following the Great East Japan Earthquake

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### 1. Foreword

Five years after the Great East Japan Earthquake (“the Earthquake”), we started to see the emergence of reconstructed urban areas in some of the cities devastated by the tsunami (seismic sea wave) triggered by the Earthquake. Following the Earthquake and the tsunami, with huge affected areas, there have been many issues that need to be addressed, such as the necessity of selecting areas for reconstruction of communities, development of new preventive measures against tsunamis, development of plans for the utilization of land in coastal regions devastated by the tsunami, and provision of accommodation for tsunami victims, among other things. These and other issues have been intricately intertwined with one another, thereby making the current reconstruction project unprecedentedly large-scale and complex in the history of post-disaster reconstruction programs. We have investigated the process for the development of the reconstruction plan based on case studies.

### 2. Process for Studying and Development of Reconstruction Plan

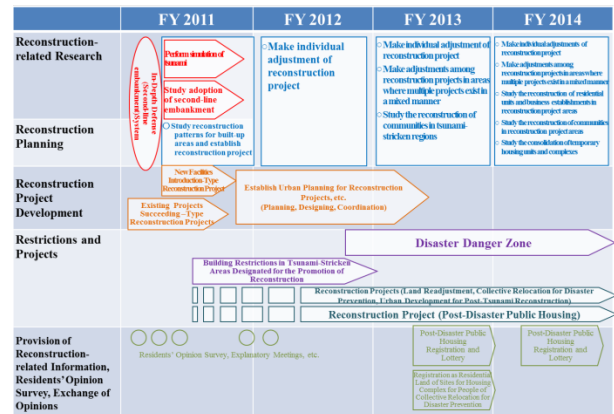
An outline of the process for the studying and development of a reconstruction plan for a certain tsunami-stricken city that took four years to complete immediately following the Earthquake and the tsunami is shown on the chart at the bottom right. A common process for the study and development of a reconstruction plan is as follows:

- (1) Development of the Plan for Construction and Improvement of Sea Embankments: A prefectural government to study and determine the installation of sea embankments (seawalls) with the basic objective of defending against Level 1 (L1) tsunamis.
- (2) Adoption of Method for Achieving In-Depth Defense<sup>1</sup>: Study methods for achieving in-depth defense of urban built-up areas and the specific location and configuration of such in-depth defense facilities by simulating level 2 (L2) tsunamis and the current tsunami event.
- (3) Securing of sites for relocation housing: Study the location (upland, inland) and size of sites for relocation of residential built-up areas that cannot be fully protected with in-depth defense systems.
- (4) Development of Reconstruction Plan for Tsunami-stricken Built-up Areas: Study the specific project method<sup>2</sup> for the reconstruction of tsunami-stricken built-up areas and the development of plans and procedures for related infrastructure development and land utilization, through discussions and coordination with residents, landowners, and leaseholders.
- (5) Development of Post-Disaster Public Housing: Study plans for development, construction, and landscaping of post-disaster public housing and public buildings in tsunami-stricken built-up areas that are to be reconstructed.

### 3. Characteristics of Process for Studying and Development of Reconstruction Plan

Of the above reconstruction planning process from (1) to (5), planning and coordination stages of (1) through (3) are a new

addition to the post-quake reconstruction planning process in the case of the Great Hanshin-Awaji Earthquake. Although an outcome from each of stages (1) through (4) should be a precondition for planning at each of the succeeding stages in an effort to draw a conclusion earlier, studies in the later stages of the process began earlier based on then available information while planning was still in progress at the preceding stages, and there was hardly any room to go through the feedback stage.



**Chart. Process for Studying and Development of Reconstruction Plan for Case Study City**

In addition, the development of in-depth defense systems and securing of sites for relocation housing were studied and planned on a priority basis. As a result, the studying and development of the concept of an appropriate urban structure and the population frame, which should typically be performed at first when developing an urban master plan, was pushed back to later.

### 4. Conclusion

We will summarize and publish our study results in the form of NILIM documents in the near future.

<sup>(1)</sup> The method for achieving an *in-depth defense*, which is designed to protect the life and property of people by employing multiple protection measures, is explained as follows: (a) construct sea embankments (seawalls) as the first-line embankment, (b) in order to defend against tsunamis that go over these embankments, install the second-line embankment by constructing raised roads or elevating the ground, among other things, and relocate residential houses in areas that cannot be protected with these measures to developed lands in upland or inland regions, and designate such areas as disaster danger zones and convert lands in the areas to non-residential use, and (c) in addition, further bolster a tsunami detection, warning and evacuation system and further enhance evacuation facilities.

<sup>(2)</sup> Such project methods as a land readjustment project, a project for promoting collective relocation for disaster prevention, and an urban development project for post-tsunami reconstruction are mainly applied and employed in urban areas.