Participative planning of a community revival plan after the Great East Japan earthquake tsunami disaster
A case study of a frequently stricken area in the Iwate prefecture

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ABSTRACT
In this report, we described the creation and implementation of a village revival plan, along with its results, after the Great Tohoku Earthquake and Tsunami. Special features of the planning process are (1) professional support through methods of participative design; (2) the three terms of planning, handling urgent requests, implementing spatial planning, and assembling lessons for the future; and (3) initiating community organization.

Village description and background
Ryori village, in Ofunato city, is a typical coastal fishers’ village with a saw-tooth coastline in the southern part of the Iwate prefecture, which is composed of 11 small hamlets. The village has suffered from tsunamis several times in the past; 1350 people died during the Meiji Sanriku Tsunami (1896), and 178 people were killed by the Showa Sanriku Tsunami (1933). After 1933, the village decided to develop a new residential area upland, and the people decided to move there as well. In the 2011 disaster, 26 people from a population of 2700 died or were missing, and 183 houses and seven fishing ports were destroyed.

The number of casualties caused by tsunamis has decreased over the latest three tsunamis, from 1350 deaths to 178 to 26, because of an accumulation of spatial revival projects, rules, habits, and ways of thinking. Since 2011, local community leaders from each hamlet have been

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trying to develop new projects, rules, habits, and ways of thinking for future disasters that are even better than those of the past. They founded the Ryori Revival Council (RCC) in July of 2011 with 50 members and started to discuss their community revival plan. Our report describes how they have built the planning process over these three years and how planners (authors) support the council. The planning process is divided into three terms: (1) Term of urgent requests, (2) Term of spatial planning and (3) Term of lessons for the future.

Term of urgent requests

After the disaster, the local government of Ofunato created a revival policy on April 20, 2011, and set forth the structure of a revival plan on July 8, 2011. The RRC began discussing and examining urgent requests at approximately the same time in July. A series of meetings was held throughout July and August, and a proposal that gathered together 76 urgent requests was presented to the mayor of Ofunato in September. Then, the RRC continuously held meetings, conducted questionnaire research, and engaged in negotiations with the local government. They revised their 76 urgent requests down to 13, and a second proposal was presented in March 2012.

The reconstruction of a nursery school and a fire substation were decided, based on the proposal, and two emigration projects, as well as disaster recovery public housing, were planned. The RRC took on the responsibility of selecting the sites for each project, negotiating with landowners, building consensus among the survivors for the emigration projects, and negotiating with the local government.

Although the RRC devoted much time to examining the requests, these requests were discussed without professional support and without a long-term vision for the future. Therefore, the RRC requested the authors to support the preparation of a community spatial plan called the "community revival plan."

Term of spatial planning

After the second proposal, the authors began supporting the RRC in creating a 10-year community spatial plan, beginning in April 2012. The RRC organized six small working groups (Fig. 2) that held a series of meetings (once every two weeks) to discuss the plan. The authors supported these meetings through participative design, which included visual materials such as topographical models, large maps (known in Japan as “Gulliver maps”), and a montage of pictures. The plan includes the following spatial aspects: (i) land use zoning of lowlands, (ii) a road network for evacuation, (iii) woods to guard the village from tsunamis, and (iv) the height and design of the sea wall (Fig. 3).

Following is a detailed explanation of each list item:

(i) Land use zoning of lowlands
The lowlands are divided into two zones: an intensive revival zone and a self-revival zone. Land use by landowners in the self-revival zone can continue as usual, whereas lands in the intensive revival zone are intended for fisheries and woods that will guard the village from tsunamis. Before the tsunami, the lowlands had many houses and huts for fisheries, which have all disappeared. The local government is considering new land use regulations that will prohibit the building of houses. Therefore, homeowners have decided to move to the highlands through an
emigration project, and the sites of those houses will be turned into fishing utilities.

(ii) Road network for evacuation
A new road plan for evacuation was instituted. Some existing roads will be raised, and new roads will be constructed to connect all the hamlets to each other as well as to a place of refuge if and when a tsunami strikes the village.

(iii) Woods to guard the village from tsunamis
Trees will be planted to create a wooded area at the boundary of the self-revival zone and the intensive revival zone. The woods are expected both to weaken the power of a tsunami and to protect the residential area by catching outflows of property and humans by backwash. Community members demonstrated strong approval for this approach.

(iv) Height and design of the sea wall
The RRC agreed in 2011 on 14.1 m as the height of the sea wall. However, when the local government presented its detailed plan in late 2012, the RRC reconsidered the height. Certain aspects of the detailed plan were considered to be faulty, such as considerations of sunshine, transportation, and design. After several meetings with residents and the local government, the
RRC agreed on a height of 11.6 m and proposed an exterior design for the sea wall. The spatial plan was completed in May 2013 and was proposed to the mayor of Ofunato. The city government is now preparing to implement projects according to the proposals.

**Term of lessons for the future**

After completing the spatial plan, the authors supported the examination of lessons for the future. Because this village has periodically been inundated by tsunamis, all residents believe that another tsunami will occur in 30–50 years. Therefore, the community requires not only a spatial plan to protect their village in the near future but also rules, habits, and ways of thinking to save their lives and to revive their community in the distant future. Since March 2013, the authors have been researching histories, economical systems, ecological systems, and experiences of villages from the Great Tohoku Earthquake Tsunami, and have started discussions with residents about lessons for the future, including the following aspects: (1) survival, (2) shelter, (3) fishery, (4) spatial change, (5) occupation, and (6) disaster prevention.

The research addresses each hamlet in turn, and the research regarding the hamlet of Koishihama was finished in December 2013, resulting in the publication of a small brochure titled “Lessons from Koishihama.” The hamlet's history and the lessons learned from the disaster were summarized in 20 pages using simple language in order to hand down lessons among the fishing communities for the next 80 years.

The residents of Koishihama also wanted to imprint the lessons on the physical space; therefore, 11 wooden monuments recording the Great Tohoku Earthquake Tsunami flood line were erected by the residents themselves in March 2013. Wooden monuments located outside will decay within 10 to 20 years; therefore, residents decided to re-erect the monuments every decade. Future generations will commemorate the lessons of the Great Tohoku Earthquake Tsunami by re-erecting the monuments with their own hands.

**Conclusions**

In this report, we have described how a village has created and implemented a revival plan, resulting from the Great Tohoku Earthquake Tsunami and its results. Special features of the planning process are (1) professional support through methods of participative design, (2) the three steps of planning, handling urgent requests, implementing spatial planning, and assembling lessons for the future, and (3) leadership of community organization. We hope that these experiences will be helpful to community-based revival plans all over the world.

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