History of Tsunami Prevention Policies in Miyagi Prefecture

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Abstract

Tsunami countermeasures have been considered as a result of countermeasure selection aiming at protecting the lives and property of residents as much as possible. We conducted a historical survey of the selection process of tsunami countermeasures implemented in Miyagi Prefecture for past tsunamis mainly based on the newspapers published in the region at the time as sources of information. It shows that for all tsunamis, not all of available measures were investigated in the selection process, but that selections were strongly limited from the smaller set of measures which directly contribute to solve the problems faced by the local government at the time; industrial development issue, for example. The Miyagi Prefectural Government prioritized the swift recovery of fishery industry, protection of public roads as industrial infrastructure, preparation of tsunami-free costal area for industrial development in each tsunami, rather than evaluating an single purpose, such as people's life protection.

Keywords: Tsunami; countermeasures; modern history; entity.

1 Introduction

The Sanriku coastal area is known as a tsunami prone area, and has repeatedly experienced large-scale tsunamis. Since the Meiji Era (1868-1912), the Meiji Sanriku Tsunami (1896), the Showa Sanriku Tsunami (1933), and the Chilean Earthquake Tsunami (1960) had left deadly damages, before the Great East Japan Earthquake and Tsunami (2011).

A historical review of the tsunami countermeasures implemented after each of these tsunamis shows that the content of them has changed with each one. While at the time in Meiji, the implementation of measures and the cost burden were left to the affected areas, after the Chilean tsunami, seawalls and breakwaters were constructed in many areas with National Government subsidies.

These changes are often explained from a technical point of view in previous studies. Or it has been generally accepted that tsunami countermeasures were selected to reduce future damage to the lives and properties of residents as much as possible, within the limits of scientific knowledge, engineering technology and economic constraints of the time.

However, a closer look at the process of selecting each countermeasure reveals that technology and cost are not always the main factor that can explain the choice of them. In these cases, social problems faced by the local government at the time may strongly affect the policy selection process. That has been overlooked so far, and may give a new perspective on the selection of tsunami countermeasures.

Although there have been many studies on tsunami countermeasures in the past, none of them has been able to explain the reasons for the selection other than technical and economic perspectives. The study by Kentaro Okamura [1], in particular, has a common viewpoint with this study, since it compares and analyzes the process of village reorganization in each tsunami in the past, especially the Showa Sanriku Tsunami (1933), and also refers to the background of the reorganization. However, the study only deals with the reorganization of villages and does not cover other tsunami countermeasures. In other previous studies, there is no explanation of the reasons for the selection of tsunami countermeasures other than engineering knowledge, technology, and economic viewpoints.

In this study, we focus on the three tsunamis; Meiji Sanriku (1986), the Showa Sanriku (1933), and the Chilean(1960), and analyze how the countermeasures were selected after each tsunami. We also review the main objectives behind the selection, and reexamine the prioritization of tsunami protection.

2 Materials and methods

The purpose of this study is to clarify how tsunami countermeasures were selected in Miyagi Prefecture after the three tsunamis. For this purpose, it is necessary to grasp over time what kind of discussions were held, but it is not appropriate with the data compiled later.

In order to confirm the policy selection process, we mainly used newspapers published in the area at the time of the tsunami as useful materials. Specifically, the "Ou-u Nichinichi Shimbun" was used for the Meiji Sanriku (1896), and the "Kahoku Shimpo" was used for the Showa Sanriku (1933) and the Chilean earthquake tsunami (1960).

Because disaster stories were widely read, newspapers sent correspondents to the affected areas and published numerous articles on the tsunami on a daily basis. In addition, reporters from local newspapers were familiar with the area and had many acquaintances there. Therefore, the content of the newspaper articles was diverse and informative, and can be analyzed over time.

Furthermore, these newspapers also provide articles, not directly reporting the tsunamis. Such articles sometimes provide information on the historical background of the time and events that occurred in the affected areas and prefectures at the same time, which can be combined to clarify the situation from multiple perspectives.

However, the accuracy of the information cannot be guaranteed with newspaper data alone, we conducts a comprehensive analysis using official documents of the national government and Miyagi Prefecture, as well as other literary sources, in order to collect information that cannot be obtained from newspapers.

3 Results and discussion

At the time of the Meiji Sanriku Tsunami (1896), there was no national or prefectural funding for policies aimed at mitigating future tsunami damage, and implementation was left to the affected communities. Therefore, engineering tsunami countermeasures were technically and financially difficult. Nevertheless, it is known that in Miyagi Prefecture, some of the affected villages moved to higher ground, and that the prefecture dispatched officials to the affected areas and took part in the administrative aspects of the relocation, such as the selection of relocation sites.

On the other hand, a survey of newspaper articles on the discussions leading up to the decision to relocate to higher ground reveals that a plan for mass relocation to other areas was discussed immediately after the tsunami. At the time, national policy recommended that people move to Hokkaido and Taiwan, and it was not uncommon for communities that were severely damaged by the disaster to move together as a group. This background was probably the reason for the proposal.

The reason why people chose to live on higher ground in spite of such circumstances was that the governor of Miyagi Prefecture had a policy of maintaining villages, no matter how badly damaged they were, and prevented people from moving out of their homes. Furthermore, the governor had also instructed that no change of occupation would be allowed. These facts clearly indicate that Miyagi Prefecture placed importance on the maintenance of local industries, particularly fisheries, which is one of the major industries, and that assistance measures were taken to prevent migration to other areas, subsidize the continuation of families, and otherwise maintain the community.

After the Showa Sanriku Tsunami (1933), the national government took the lead in conducting on-site surveys by researchers and experts, and various disaster prevention measures such as seawalls, breakwaters, and tide embankments were discussed, in addition to relocation to higher ground, according to previous studies.

By this time, the government was subsidizing not only the cost of disaster recovery, but also the cost of preventative measures. It is known that many disaster-stricken areas were relocated to higher ground as a result of these subsidies. In these days, measures to improve farming, mountain and fishing villages were underway as a relief for those villages that were economically exhausted due to the Showa Depression and bad harvests. It was confirmed that, the relocation to higher ground was planned as an application of this measure, and as a result, the government budgeted for the relocation. At the time, the national government considered the economic rehabilitation of the region to be an urgent issue, and was therefore receptive to the project.

On the other hand, it was found that Miyagi Prefecture planned to construct breakwaters and coastal levees other than relocation to higher ground, but most of these measures were not budgeted by the national government, and in the end, only a small portion of them were implemented. Our close look of these prefectural plans of coastal levees revealed that the planned locations did not correspond to the scale of damage to settlements or human lives. Rather, they were planned mainly where prefectural roads existed as industrial infrastructure or where new roads were to be constructed. This indicates that Miyagi Prefecture gave priority to the contribution to the economic and industrial development in selecting tsunami countermeasures.

After the Chilean tsunami (1960), it is known that tsunami countermeasures mainly consisted of structures such as seawalls. On the other hand, there were various discussions on tsunami countermeasures during this period, especially among scholars in Miyagi and Iwate prefectures. In particular, since the Chilean tsunami was a “distant tsunami”, which occur far away, it was pointed out that it was necessary to take into account past near-shore tsunamis such as the Meiji Sanriku and Showa Sanriku tsunamis. And Miyagi Prefecture has established a tsunami countermeasures study group led by researchers.

However, Miyagi Prefecture focused on structure-based tsunami countermeasures at an early stage and planned structure-centered tsunami countermeasures, without waiting for the discussion of the study group.

At that time, "Tohoku Development Promotion Law" were enacted, and the promotion of the Tohoku region was at a turning point. Furthermore, industrialization was being promoted by the national government, and new industrial sites were being requested due to the shortage of existing sites. Tohoku, which had been a backward region since the Meiji Era, was also trying to keep up with industrialization. Miyagi Prefecture was also promoting industrialization by building suitable factory sites and developing new economic plans. In this context, the tsunami countermeasures that would lead to the securing of industrial sites in the waterfront area were selected as a priority.

4 Conclusions

By looking at the process of how tsunami countermeasures were selected in Miyagi Prefecture since the Meiji Era, we have clarified the thinking behind these choices.

The results show that, although the purpose of protecting people's lives and property is a prerequisite, the measures were selected to directly contribute to solving the problems faced by the local government, rather than selected based on technological improvement or economic factors, as considered so far. The prefecture, in particular, has always prioritized the maintenance and promotion of industry.

Even in the immediate aftermath of a disaster, the national, prefectural, and local governments tended to give priority to solving different problems that they had faced just before the disaster, rather than working together to solve the common problem of improving their ability to cope with the tsunami that is expected to hit in the future. There were pressing issues, then it was difficult to take tsunami countermeasures for a single purpose.

This history of tsunami countermeasure selection can be seen as an inspiration for the reconstruction efforts that are expected to be initiated by the local residents in the future.

Reference

[1] Kentaro Okamura, “Sanriku-tsunami” to shuraku saihen(The "Sanriku Tsunami" and the Reorganization of Villages), 2017.