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Author: Oloan Sitorus, Sukmo Pinuji, Westi Utami,
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PUBLIC PARTICIPATION AND COMMUNITY DEVELOPMENT ON THE IMPLEMENTATION OF LAND CONSOLIDATION OF POST-DISASTER RECONSTRUCTION MANAGEMENT TOWARD "FUTURE CITY" INITIATIVE: LESSON LEARNING FROM THE GREAT EAST JAPAN EARTHQUAKE OF HIGASHI-MATSUSHIMA CITY, MIYAGI PREFECTURE, JAPAN

Sukmo Pinuji[1]
National Land Institute, The Ministry of Agrarian Affairs and Spatial Planning/National Land Agency, Jl. Tata Bumi Nr. 5 Banyuraden Gamping Sleman Yogyakarta

Abstract

After the great east Japan earthquake occurred in March 2011 and followed by a tsunami, Higashi-Matsushima city suffered from severe damaged. Approximately 73% of the buildings were damaged, and total 3,349 hectares of the agricultural area was inundated. Regarding future tsunami occurred, the government then decided to relocate the city to a higher place, and reconstruct the city by adapting eco-city model called as "future city" of Higashi-Matsushita. The government commits to building the city from the scrap, implementing land consolidation to reconstruct livelihood of the citizens, and to rebuild the city based on the smart city concept. Together with local government, citizens were actively involved during planning and implementation stages. They established self-governing civil power right after the disaster occurred, conducting self-assistance to provide foods, shelters, and identification of missing persons. They also actively involved in city reconstruction program. They then decided to rebuilt and reconstruct Higashi-Matsushima based on community development concept. Public involvement meetings were implemented during the decision of relocation area, the creation of reconstruction plan, and people were actively involved to decide reconstruction planning for "new Higashi-Matsushima" that adapted to the sustainable environment, aging population (which became a big problem for Japan Government) and disaster-prevention. Moreover, reconstruction was also being carried out together with the citizens. They worked during the project as administrative staff and labor, which helped them to earn money to recover their living since most of the citizens lost their job and possessions by the tsunami. The lesson learning from Higashi-Matsushita city, however, provide a good example of the effectiveness of community empowerment to deal with post-disaster reconstruction program.

Keywords: public participation; disaster reconstruction; post-disaster land consolidation; tsunami; community development.

1. Introduction

Located in the northeast of Japan in Miyagi Prefecture, Higashi Matsushima is one of the cities that severely suffered from the great east Japan earthquake on March 2011. The earthquake occurred off the Pacific ocean of Tohoku, with the magnitude of 9.0, the biggest earthquake ever recorded in Japan, and 4th biggest earthquake of the modern world since 1900. The earthquake was followed by a tsunami, and the waves travel along the inland up

[1] Corresponding author. Tel.: +62 274 587239. *E-mail address:* sukmo.pinuji@stpn.ac.id

to 10 km, with the wave height for more than 40 meters. Higashi Matsushima itself was attacked by the tsunami, when 8.6 meters of waves reached the coastal area, destroyed approximately 73% of all housing in the neighbourhood, killed 1.110 people while 24 were missing (3% from total population), and inundated for almost 45% of agricultural area (for total of 1.465 ha of agriculture land were inundated by the sea water). Among of all of the district in Higashi Matsushima, Miyato Island, and Nobiru District, that located near to the coastal area, are two of the districts suffered most damages compare to other, almost 90% of the infrastructures were destroyed (Future-City-Initiative, 2012).

After tsunami attacked, the city government did not function; most of the city officials were killed or suffered, while contact with the outside world was cut off. However, the citizens need to survive and reconstructed their life soon. Together they formed self-governing bodies consisted of citizen survivors, organized community-based recovery system to help the citizens after the tsunami occurred. Moreover, they reconstruct (as a more advanced and go beyond than city-recover) the new Higashi-Matsushima city as a "future city" as a more disaster-prone and eco-model city by maximizing citizen participation and community empowerment. Public involvement was emphasized during the relocation and reconstruction process, and city consolidation was implemented based on public participation (HOPE, 2012). The city then being consolidated into a more adapted to the disaster-prone area and developing a "future city initiative" model for a more sustainable life.

The story of Higashi-Matsushima, however, is a good example of survivors of the disaster that willing to start to rebuild and reconstruct their city from the scratch. Citizen participation plays important roles in the success of city recovery and the implementation of disaster-prone land consolidation. Public involvement during the process encourages the sense of belonging and getting involved in determining the city's future for their better life. This paper tried to illustrate public involvement process during the reconstruction of Higashi Matsushima City post the great east Japan earthquake.

2. Material and Methods

2.1. Materials

This paper was written based on literature study research. Some publications related to FutureCity initiative, public involvement for post-disaster reconstruction after the East Japan great earthquake were studied and assessed to learn about the community development process. Some materials were assessed through websites, videos and presentation slide from seminars and meetings. The materials were gathered and studied to find the approach and method implemented by Japan government, or Higashi Matsushima local government in particular, in implementing public participation for relocation and reconstruction process.

2.2. Methods

This paper was written based on literature study research. Some documents related to the implementation of "FutureCity" in Higashi Matsushima and recovery activities post the east Japan great earthquake were studied. The study was focused on the process of citizen involvement during the reconstruction and consolidation. The aim of the research is to understand how public participation was implemented during the post-disaster recovery to implement land consolidation. To achieve this, the research was divided into 2 (two) main questions:

1. How Higashi Matsushima recovered from the disaster and how was the design of "FutureCity" that was implemented?
2. How was public participation implemented for post-disaster recovery in Higashi Matsushima?

3. Results and Discussion

3.1. Results

3.1.1. The recovery process and the implementation of "FutureCity" as part of land consolidation for post-disaster recovery.

After the great east Japan earthquake occurred in 2011, March 11th and followed by a tsunami, Higashi Matsushima was severely damaged. This city was hit by 8.6 m height of tsunami waves. Approximately 3% of the total citizens (1.110 people) died and 24 were missing. Approximately 73% of housing in the surrounded area was damaged, accounting for total 11,077 houses. The number of evacuees was recorded as 15.185 persons, and the city has to affiliate 106 shelters during the evacuation process. All public facilities did not function, electricity was an outage, and contact with other cities was blocked. Furthermore, the city hall also did not function, since most of the city officials were killed or suffered from the disaster. They have no leader to lead them to deal with the crises, while the citizens have to survive with limited conditions. The citizens then have the initiation to form self-governing bodies, with the main role to organize the citizens to organize their life right after the disaster until support from outside came and during the recovery and reconstruction process. There are 8 self-governing bodies within the city, and each body established a community center based on their district. They are Oshio, Ono, Nobiru, Miyato, Omagari, Yamato-Nishi, and Akai Community Center. Each self-governing body has their committee, consist of a president, vice presidents, accountant, secretaries, executive committee, and staffs.

At first, they did self-assistance for the community in the city center. The provided temporary shelters, public kitchen, identified missing person and families, identified

loss and damaged after the tsunami, helped injured a person, and other activities to meet basic needs during the survivals. At this time, infrastructure was lost, communication was cut off, therefore communication between city center impossible to be conducted. The self-governing body focusing their tasks to arrange survival plan until help from outside came.

Then, after they can settle on the basic operational, the centers collaborate each other to perform mutual-assistance within the community. A more comprehensive survival plans were discussed, while they also established plans to reconstruct Higashi Matsushima, including relocation plan, establishing spatial planning for disaster management and built temporary housing for the people.

Nonetheless, Higashi Matsushima considers that they cannot stand by themselves alone. They need support from central government and other parts. On the other hand, March 2011 tsunami has changed Japan's policy on smart city and energy. The earthquake has made Fukushima became famous on all over the world since the disaster destroyed Fukushima Daichii Nuclear Power Plan that located in Fukushima city. March 2011 catastrophe also increases awareness of Japan Government to design and to establish a city that adapted to the disaster while forming a sustainable future city for the citizens. Therefore, public-assistance was set up: central government, local body, and city council collaborated with private companies from different scale, financial institutions, academic organization, Non-Governmental Organization and citizens to formulate new Higashi Matsushima city. They also form Higashi Matsushima Organization for Progress and Economy Education, Energy (HOPE), that has been inaugurated in October 2012, jointly by the Municipality, Social Welfare Council and Chamber of Commerce, whose its main roles were to collaborate with industry, academia, government and the citizens to work together on the implementation of FutureCity initiative. They organized meetings to design plans for city recovery by using Public Involvement method. They start with identifying some of the issues related to the recovery, that are:

1. Environmental recovery-reconstruction. Since most of the area was destroyed by the tsunami that damaged both private and public facilities, it is important for the city to recover the livelihood for a living. Due to the disaster-prone area, it is also important to design livelihood adaptable to the future catastrophe. The activities including debris removals, rebuilt buildings for housing and public facilities and other infrastructures such as roads, bridges and so on
2. Civil livelihood recovery-reconstruction. Most of the citizens lost their house, their belongings, and their living. Many facilities were swept away by the tsunami, and lots of people lost their jobs and occupations. Nonetheless, they should earn for living. The citizens then design livelihood recovery program,

with the idea that they should able to provide jobs for the victims, so during the reconstruction process, they can earn money for living expenses. One of the job creations during the reconstruction is tsunami waste collection and rubbles division. Rubbles from disaster were divided into 14 categories, and final treatment was divided into 19 rubbles that were categorized manually and has been done by the citizens worked for waste separation. They were paid to

3. The recovery program should be eco-friendly during the implementation and for the future design of Higashi Matsushima. The citizens agree to strictly minimize waste disposal during the reconstruction process, and the debris was recycled. There were 1.098 million tons of debris, accounted for 110 times of general waste generated annually in Higashi Matsushima), and total recycling rate of the disaster waste was 99.22%, including 2.160.800 tons of tsunami deposits that were entirely recycled. It was a hard work to short the waste based on categories since it has to be done manually. On the other hand, this waste separation gives opportunities to the citizens to get the job. Moreover, the citizens also agreed to redesign Higashi Matsushima as a "FutureCity", that more adapted to disaster mitigation and implement the concept of sustainability based on Sustainable Development Goals criteria. Land consolidation was designed to achieve sustainability.
4. Reconstruct and revive industrial sectors to encourage economic activities. Right after the disaster, Higashi Matsushima lost their economic activities, since all infrastructures were damaged. Moreover, for more than 50% of agriculture area was inundated and the commercial area was being swept by the flood. The city lost their economic function while economic activities play important roles for the living. Therefore, reconstruction program should be able to promote local events and small business for the citizens, while reconstructing the city.

The basic plan for the implementation of FutureCity in Higashi Matsushima came from the idea to reconstruction initiatives that 'go beyond recovery'. In Japanese term, recovery called as "fukkyu" – the act of returning something damaged to its former state, to the original situation, while reconstruction, or "fukko", described as the action of making something damaged better than before. The people realized that they were living in a disaster-prone area, with lots of earthquakes and tsunamis occurred since ancient time. They realize that they cannot change anything about the state condition of their nature, but instead, they can design their environment to be more adaptable for the disasters. Therefore, they set up some relocation action plan, consist of several activities including (Future-City-Initiative, 2012) :

1. Collective relocation and rebuilding life.

The basic plan of Higashi Matsushima's reconstruction was released by the local government on December 2011, 9 months after the disaster. The primary issue of the reconstruction is Disaster Risk Reduction (DRR) for a future tsunami. The city decided to implement Group Relocation Projects at several affected areas that potentially endangered by the future coming of the tsunami. For example, previously, Nobiru District had 800 houses and 2.300 residents before March 2011. During the tsunami, almost all houses were destroyed and over 500 people were killed. Nobiru District located at the coastal area with most of its area was exposed to the ocean. March 2011 experience then made the local government to reconsolidate and relocate the area into higher place. Previous Nobiru then has been set up into the non-residential area and has been designated as a commercial and industrial area to reduce the potential life lost for the next tsunami. For this purpose, large-scale relocation project had been implemented. The collective relocation was designated in 7 relocation sites in 5 districts complexes, accommodated for 1.288 households. The relocation places were designated in Yamoto Nishi (127 plots), Ushiami (74 plots), Murohama (22 plots), Tsukihama (22 plots) and Ohama (15 plots).

2. Urban planning to secure perpetual life

   For the purpose to reduce the impacts of the future tsunami, Higashi Matsushima implements the adjustment of urban planning to be more adaptive with disaster mitigation. Households located in potential tsunami-affected areas have been relocated to a higher place, while the current area was designated for commercial and industrial sites. This arrangement, however, hard to be implemented. They have to relocate people from their daily life to a new place with a new neighborhood. However, the designation of relocation site should be implemented by tackling 3 (three) keywords: (1) safe sites for collective relocation (2) Near JR station that provides for perpetual safety in 100 years, and (3) Can accommodate the entire community and respect the bonds between local people.

3. The design of FutureCity initiatives.

   People of Higashi Matsushima were badly suffered from the March 2011 disaster, they lost family, friend, neighbor, and most of the living. However, they agree to create better living with the disaster as the starting point, by creating a city that brings the concept of "human-centered" while creating new values to resolve the challenges of the environment and aging.

Reconstruction of Higashi Matsushima, however, encounter several problems regarding the social environmental condition in Japan. First, land consolidation for FutureCity initiative needs to relocate citizens collectively. To move neighborhood to another place collectively was challenging since the government has to find a suitable place in term of environment condition and area. Second, they also have to deal with aging population, as a common problem in Japan. Higashi Matsushima, like other cities in Japan, only have limited productive age, and most of the population are aged people. By the time of disaster, Higashi Matsushima lost more than 3% of its population. During the recovery process, the population keeps decreased, many citizens migrated to another city. Therefore, reconstruction process has a limitation on the number of human resources affecting many sectors of the project. Third, the characteristic of Higashi Matsushima as a disaster-prone area. The future city should be able to predict and mitigate future disasters to reduce the number of loss. Therefore, disaster-prone management should have been affiliated in the design of sustainability goal.

The policy of Japan government has been emphasized on the public involvement on a public work project. Therefore, in the reconstruction process and the design of FutureCity of Higashi Matsushima, public involvement was conducted to achieve common goals between stakeholders to achieve a "human-centered city".

3.1.2. Public participation for post-disaster recovery in Higashi Matsushima

The process of citizen's involvement during land consolidation after 2011 east Japan great earthquake in Higashi Matsushima is a good example of public participation in designing, implementing and monitoring public work project. During the process, no one was left behind. Public hearing and meeting to exchange opinions were implemented several times, to achieve mutual agreement within the citizens, government, and other involved stakeholders. The process of public participation, however, it is time-consuming and needs more effort, is important to achieve "human-centered city", a place where everybody wants to live there and everyone has vitality in the community. These two aspects are the key role of community development to foster the sense of belonging and the feel responsibilities since they were being involved in the decision making. The following Figure 1 shows the structure and content of reconstruction plan implemented in Higashi Matsushima, including how they affiliate public opinion and how they implement public involvement. The figure shows that on phase 1, public involvement was implemented to gather ideas on how to make a city that is resistant to disaster, promote industries that able to create work opportunities, as well as to create sustainable development.

This activity including conducting public hearing and meeting to create reconstruction plan, involving over 2000 citizens to exchange opinions, including farmers, fishermen, students including some sensitive communities like women and elderly. The process to gather people and formulate design from many ideas was challenging, since they came from different background and interests. Often, some groups did not willing to attend the meeting because of some reasons, and the committee should encourage them and provide a meeting place that comfortable for them to speak their ideas and getting involved in the process. For this purpose, they also established reconstruction facilitators which main responsibility was to provide assistance for the citizens during public involvement process. The assistance was implemented for the purpose of:

1. Facilitate local government and the community about planning and implementation of the reconstruction plan. They have to summarize the opinion from the resident, listening to their opinion from a wide range of background, encouraged the citizens to actively participated during the meeting and to support sharing information from the local government among the residents.
2. Accumulate lessons learned and cases through participation in the reconstruction process.
3. Derive the essence from the accumulation to formulate the future overseas assistance program.

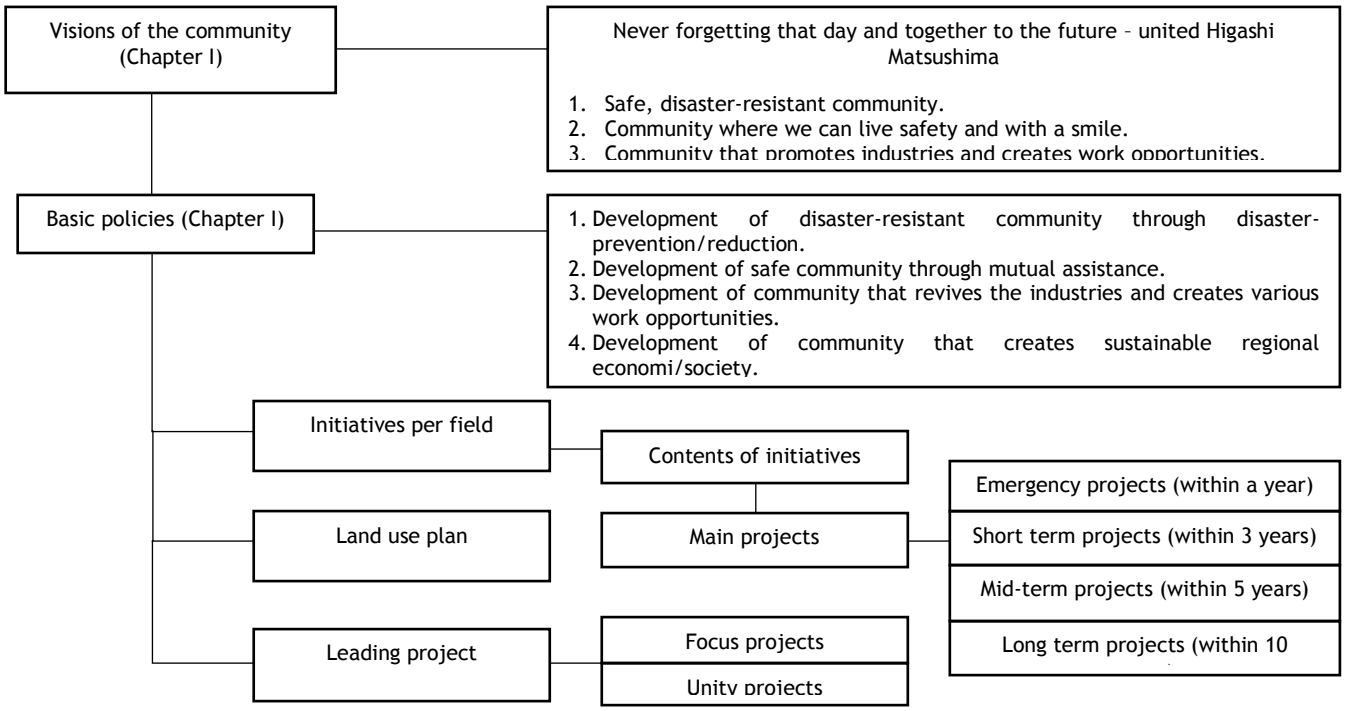

Figure 1 Structure and content of reconstruction plan, with the implementation of public participation as part of decision making process (adapted from (Future-City-Initiative, 2012).

In summary, public involvement in Higashi Matsushima was successfully implemented based on several reasons, which are:

1. Strong bond within the community to recover from the disaster and the willingness to reconstruct a new, better life. This bond, however, was already formed before the 2011 tsunami occurred. Social value within communities to have the same goal to achieve better future was important for public involvement process. By the disaster, the bond between them became stronger, since they feel that they share the same grieve and hope of better life.
2. Trust and respect between community, city council and the government. It is not easy to achieve common goal and understanding between different stakeholders to achieve agreement on the design and implementation of land consolidation through FutureCity.
3. The role of facilitators plays an important role to bridge communication between stakeholders. Sometimes, the stakeholders came up with the same idea but were communicated in different 'language' because they came with a different background. Sometimes, they also came up with the totally different idea and interests, and often most of them were conflicting each other. In this case, the role of facilitators is important, since they have to communicate ideas from different perspectives and draw the conclusion based on the agreement. The role of the facilitators including conducting research on how to encourage people to attend the meeting such as what kind of meeting that they will attend, when and where the meeting should be held, and how to encourage certain community to be able to deliver their ideas (such as is there any gender and age discretion, is there any sensitive community that should be represented, and other factors).
4. Commitment and determination of the government and city council to implement FutureCity and create a better living for everyone. The concept study of the FutureCity initiative first emerges on February 2011, initiated by Building Research Institute, Japan (Regional-Revitalization-Bureau, 2014). On December 2011, 11 cities in Japan were selected as model cities, 6 of them were disaster-affected cities of the East Japan great earthquake. The implementation of FutureCity demand high cost of money and resources (both human and natural). Without high commitment and full determination from the key actor to implement public involvement for land consolidation and reconstruction, FutureCity will not be realized. The determination and commitment came in form of funding assistance, policy and regulation, and also capable and sufficient human resources. Main stages of the creation of Higashi Matsushima are (1) preparation of the city's vision for regional energy policies, that has been implemented in 2012. After Fukushima's disaster, Japan government promote a new local power generation able to supply safe and stable energy by

introducing renewable energy, such as solar power, (2) Measures to promote renewable energy, by reinstate the energy-related subsidies and executing support schemes for installing renewable energy, and (3) creating a smart, disaster-resilient eco-town project through special sanction on supply (MOE model project 2014) (Regional-Revitalization-Bureau, 2014).

3.2. Conclusion

Public involvement is important to be implemented in public work. The advantages of public involvement are to create mutual understanding between stakeholders, including local government, central government, community, private sectors and other affected stakeholders. The bond between stakeholders is important to achieve a common goal, which plays the key role in the success of public work program. Nonetheless, public involvement needs more effort to be implemented, including time, money and human resources. The commitment of the government is the key role of the success of the implementation. Nonetheless, post-disaster reconstruction needs a fast, efficient project to as soon as possible recover people's life as it state condition. Therefore, an efficient public involvement process is important, and the presence of facilitators is crucial during the process, that can be different from one place to another. The understanding of social capital at the local level will effectively contribute to the success of public involvement. Nevertheless, public involvement is worth to be implemented if we commit to design a future-sustainable city to fulfill the need of present generation without neglecting the right and need of future generation. The example of public involvement in Higashi Matsushima was successfully implemented because they have social value as they are familiar with the process of community involvement for public decision-making. If this method will be implemented in a different region with the different social background, the understanding of the behavior of the community should be assessed and studied more to achieve the goal.

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