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## Capital Building for Urban Resilience: the Case of Reconstruction Planning of Kesenuma City, Miyagi Prefecture, Japan

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### Abstract

Urban resilience is being increasingly recognized by scholars as the approach to healthier and more sustainable cities facing various challenges. Among the characteristics of urban resilience, there is a wide consensus that the capability of capital building for local areas is an indispensable attribute. Based upon this understanding, this paper takes the example of Kesenuma City, a small coastal town in Miyagi Prefecture of Japan that was severely damaged by the aftermath of the 2011 Great East Japan Earthquake and Tsunami (EJET), to illustrate how the pursuit of building local capital was incorporated into the agenda of its reconstruction planning. The research relies on the on-site field work together with meetings of local stakeholders and the analysis of various documents and reports. Kesenuma City, facing problems of declining fishery industry, long-time depopulation and severe tsunami damages, has been vigorously exploring for new approaches of diversifying its economy and sustaining its future development, as reflected in the goals of the city's reconstruction plan devised in October of 2011, and other *machi-zukuri* projects. Besides, the evidence of capital building is also discovered in the planning process with high degree of involvement from and cooperation between various stakeholders, including the government, citizens, NGOs and incoming wisdoms, such as universities. In regard of this, this paper scrutinizes the agenda of reconstruction plans together with their functioning mechanisms. It finally concludes with the lessons from this specific case to similar cities with limited resources that face challenges of building local capitals.

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## Introduction

How to make cities healthy is an increasingly heated topic of discussion among concerned scholars from different fields. While there are many offerings that can come from urban scientists and engineers with various discoveries, social science researchers and practitioners such as urban planners and urban policy makers can potentially provide equally important answers. It is almost without doubt that sustainable cities are healthy cities. In fact, sustainability has been a buzzword for decades since its initial introduction. However, its goals for urban planning have often been criticized of being so generic that it sometimes loses its meaning of guiding development courses and agendas. In regard of this, the concept of resilience was introduced and it has quickly surpassed the popularity of sustainability in the urban planning field.

Urban resilience is now being recognized by a growing number of scholars as the approach to healthier and more sustainable cities facing various challenges. According to Ahern (2011), resilience follows a safe-to-fail discourse of sustainability, which means that cities with resilience can survive urban challenges and failures safely because of obtaining certain features, as opposed to the currently much practiced fail-safe mind-set. Among the characteristics of urban resilience, there is a wide consensus that the capability of capital building for local areas is an indispensable attribute. Based upon this understanding, this research will take the example of Kesennuma City, a small coastal town in Miyagi Prefecture of Japan that was severely damaged by the aftermath of the 2011 East Japan Earthquake and Tsunami (herein after EJET) and has been vigorously pushing forward its revival, to illustrate how the pursuit of building local capital can be incorporated into the agenda of reconstruction planning. Analysis is given to this specific case and more generic discussions are made as to how similar small cities facing challenges of disasters and/or economic decline can build capital in order to ensure its future healthy development.

## 2. Research methodology

To start with, the literature review on urban resilience, and one of its most important aspects, capital building, is conducted. In the Japan's urban planning context, the concept and phenomenon of *machi-zukuri* needs special attention, because it provides the basis for multi-sector led and participation focused urban planning philosophy, and is conducive to capital building in this sense. This research relies on the interpretation and analysis of various reconstruction planning documents and reports of the targeted area, and the on-site field work with meetings of local stakeholders. The primary planning document studied is Kesennuma City's recent master reconstruction plan which has guided its development courses during the post-EJET years. The local field trip has been paid in middle March of 2016, five years after the disastrous EJET.

The government official in local planning department and the head of local chamber of commercial were visited and interviewed to understand their roles and duties in the reconstruction process, and the recent reconstruction updates. Besides, random interviews and talks were also made to different citizens and industrial practitioners to learn about their change of life conditions, inputs and visions for the future. Main questions include but are not limited to the following:

1. What are the goals of reconstruction plans and how are these goals related to capital building in the local area?
2. What kind of roles have the government and the private sector played to promote the capital building efforts?
3. What are the feedbacks from the citizens and what are the problems left behind that hinder smooth promotion of capital building in the local area?

## 3. Resilience, capital building and *machi-zukuri*: a literature review

The concept of resilience was first adopted by Holling (1973) in the field of system ecology. It concerns the adaptability of a system reflected after the occurrence of disturbance. The theories of resilience develop through three stages: the engineering perspective, which views resilience as the mere ability of recovery to the previous state after shock; the ecological perspectives, which considers resilience as the amount of disturbance the system can absorb before the change of state; and mostly recently the evolutionary perspective, which deems resilience as the

ability of continuous adjustment to the changing backgrounds. Although the application of resilience to the study of urban environment started much earlier, it was not until late 1990s that resilient thinking was adopted to inform and guide planning activities (Tasan-Kok, Stead and Lu, 2012). Urban planners adopted the idea of resilience, mainly the third perspective, in the process of planning for post-disaster reconstruction on one hand and crisis management, such as climate change, on the other hand. In this paper, the first category will be discussed through a case study.

The theory of resilience is not useful to planning unless its detailed meanings can be explored. Resilience certainly has many attributes, of which scholars have been discussed much about. There are a few common attributes which are shared by scholars. For example, robustness (or strength, persistence) is a frequently mentioned keyword. So are words like efficiency, diversity, redundancy, connectivity, adaptability and transformability. Capital building is also among these keywords. According to Flora, Flora and Fey (2003), capital is defined as any resource capable of producing other resources, and there are altogether seven forms of it, including cultural, human, social, political (above are human factors), and natural, financial, and built (above are material factors) capitals. Mayunga (2007) has proposed a capital-based community resilience approach to facilitate analysis, which include financial, social, human, natural and economic forms of capital.

Social capital, as is defined by Tasan-Kok, Stead and Lu (2012), refers to the quality and quantity of a society's social interactions that are shaped by institutions, relationships, and societal norms. The process of social capital building can not only lead to collaborative actions resulting in better economic performance and the creation of civic infrastructure, but also support formal and informal processes of decision making and public involvement (Warner, 2001; Tasan-Kok, Stead and Lu, 2012). As to Putnam (1993), social capital refers the features of social organization, such as networks, norms and trust, which facilitate coordination and cooperation for mutual benefit. It enhances the benefits of investment in physical and human capital. Human capital, on the other hand, is often defined as those attributes of individuals that contribute to their ability to earn a living, strengthen community, and otherwise contribute to community organization, to their families and to self-improvement. Narrowly defined, education and training are the most important forms of human capital (Flora, Flora and Fey, 2003). In this study, built capital (material factor), social capital and human capital (human factors) are focused.

*Machi-zukuri*, or Japanese styled community planning, is a word made up with the word *machi*, which literally means cities and towns, and the word *zukuri*, which literally means the process of hand-made creation. The term has gained popularity during the citizen environmental movement in 1960s and 1970s, and further development in the post-Hanshin earthquake reconstruction process (Kusakabe, 2013). In addition to Japan's statutory urban planning system (*toshi-keikaku*) which was institutionalized in 1919 by the City Planning Act, *machi-zukuri* has supplemented the planning of physical and social environment through a bottom-up grassroots approach. It is a process that exerts much social and human capital. This supplementation is important in the Japanese culture because it has a connotation of residents planning their own environment with traditional urban form that reflects their own values and lifestyles, contrasting with a modern interventionist approach that formal urban planning system *toshi-keikaku* inserts (Hein, 2001).

#### **4. Kesenuma's reconstruction planning experience: a case study**

##### **4.1 An overview of Kesenuma City**

Kesenuma City is a small coastal town in the northeastern part of Japan's Miyagi Prefecture (Fig. 1). The city was blessed by abundant fishery resources, and is the one of largest fishing ports in Japan, and has a strong economy reliance on fishery and related processing industries. It was severely damaged by the aftermath of the EJET. According to the figures, 1,359 people died or were missing and 15,815 homes were damaged, and more than 9,500 households were affected because of EJET.<sup>†</sup>

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<sup>†</sup> <http://www.city.kesenuma.lg.jp/www/contents/1300452011135/>

Even before (and after) the EJET, other long-term problems that have been troubling Kesennuma City are the depopulation and aging population structure. This is a common existing phenomenon for nearby middle and small sized cities in the Tohoku region of Japan, as people move to prefecture seats, Sendai the Tohoku regional center or more developed regions, for better amenities and more working opportunities. Statistically, the city had a total population of 92,246 in 1980, which started to decline steadily in the past three decades and a half. By the March of 2014, its population reached 67,268, 72.9% of its population in 1980. At the same time, Kesennuma City has seen a huge lost in its working age population, going down from 61,700 in 1980 to 37,327 in 2014. Its aging population percentage has risen from 9.2% in 1980 all the way to 34.2% in 2014, and its youth population percentage has declined from 23.9% in 1980 to 10.3% (Fig. 2).

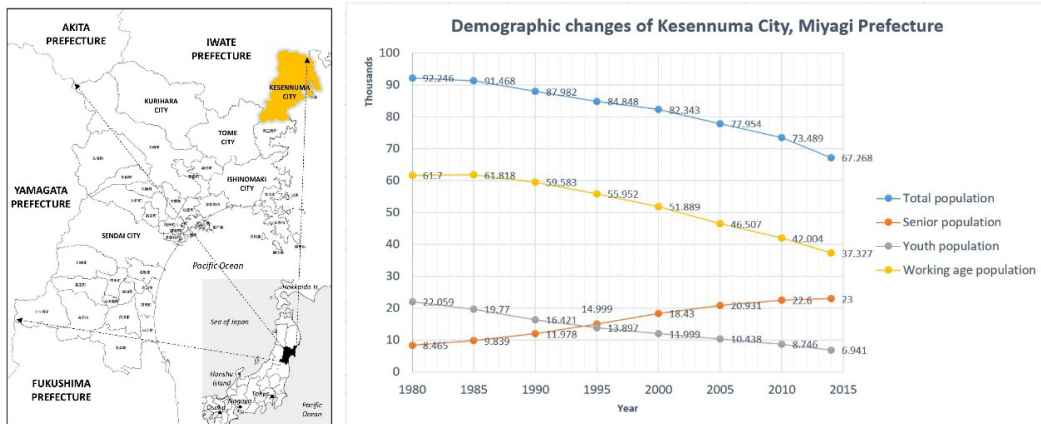


Figure 1 (upper left). The location of Kesennuma City  
Source: drawn by author with original source retrieved from T-worldatlas

Figure 2 (upper right). Population changes of Kesennuma City, Miyagi Prefecture between 1980 and 2014 March  
Source: National Census conducted by the Statistics Bureau of Ministry of Internal Affairs, Japan

In sum, Kesennuma City is a typical example of the *kaso* regions of Japan, where are featured by continuously declining population, losing working labors, shrinking youth population, and rising aging population. To ensure and sustain future development is a tough problem for local government and citizens. This situation was made worse through the damages from the tremendous EJET, which ruined its seafront area, and caused great scale of casualties.

## 4.2 Kesennuma City's master reconstruction plan

### 4.2.1 The background settings of reconstruction planning in national and prefectural levels

The reconstruction planning efforts started one month after the occurrence of EJET when Japan's Prime Minister established the national Reconstruction Design Council, which had 16 members and an assisting 19-member study group. On June 25<sup>th</sup>, 2011, the Council released the national recovery vision. On the prefectural level, Miyagi Prefecture recommended the reconstruction planning concept proposal to twelve cities the prefecture governs. It is under this circumstance that Kesennuma City, like any other cities in the prefecture, prepared its master reconstruction plan. Absorbing the feedbacks from cities, the prefecture's reconstruction plan was adopted on October 19<sup>th</sup> of 2011 (Iuchi, Johnson and Olshansky, 2013).

### 4.2.2 Kesennuma City's master reconstruction plan

Kesennuma City's master reconstruction plan was initiated by the Planning Department of Kesennuma City out of the joint venture of local public and private sectors (Fig. 3). The plan was formally approved and promulgated in October 2011. The theme of the plan is "to live together with the sea" (*umi-to-ikiru*), which reflects the strong will of local people to live harmoniously with the sea. Under this theme, five fundamental principles have been determined. The principles are to be embodied through six goals. Under these goals, seven planning facets are focused, including infrastructure, emergency institutions, industry and employment, environment conservation and

improvement, welfare, education and cultural facilities, and community building. Informed by these seven categories of pillars, the next level lists 31 detailed directions of endeavor. Some major components of the reconstruction plans include the following, which has greatly enhance the built capital of Kesennuma City.

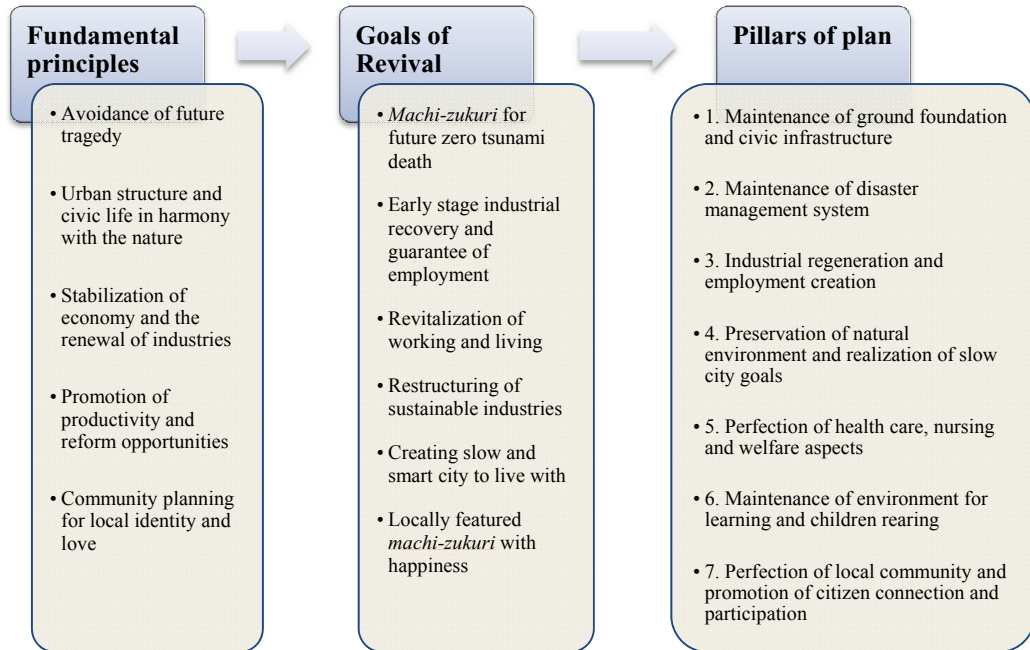


Figure 3. The outline of Kesennuma's master reconstruction planning

Source: Planning Department of Kesennuma City (2011)

- 1) Rezoning the areas which were destroyed by the EJET. The new plan recommends a zoning pattern which features fishery and processing industries in the seaside lowland areas, and residential and commercial functions in the inland areas with relatively higher elevation. Green belts and parks are introduced between the above-mentioned two types of land uses as the buffer areas.
- 2) Raising the ground level. Because the city has been hit by great water inundation during the EJET, the new plan recommends rising the elevation of ground up to 3 to 5.5 meters above the standard sea level for the inland residential and commercial areas. For seaside lowland, the plan also recommends rising the elevation to 1.8 meters above the sea level (Fig. 4).
- 3) Restoring and reconstructing seashore levees. To avoid the tragedy of future tsunami inundation, according to the recommendations from the prefectural level plans, Kesennuma City has been pushing forward the construction of higher levees along the seaside.
- 4) Constructing temporary and resettlement housing and facilities. Immediately after the EJET, Kesennuma City started to build emergency prefabricated homes for disaster affected households. A total of 3,504 units were built in 93 locations. By January 18<sup>th</sup> of 2012, the occupancy rate reached a peak of 95.9% with 3,155 families equaling 8,288 people living in the facilities. By the end of February of 2016, the occupancy rate was 63.3% with 2,071 families equaling 4,763 people. This figure is added with 1,584 people living in the post-disaster public-funded rental accommodation and 517 people living outside Kesennuma in nearby cities. In total, by the end of February of 2016, 2,937 families equaling 6,864 people still lived in temporary housing. To facilitate local small business that were destroyed in the EJET, revitalization temporary stall villages were set (Fig. 5). At the same time, permanent housing is steadily under construction, with 910 units of relocation, and 2,133 units of

government-run rental housing. The construction is to be completed in 2017 according to the plan (Planning Department of Kesennuma City, 2016).

- 5) Cultivating new industries. Kesennuma City has devoted great efforts into the restructuring of its local economy. For example, a research society focusing on aquatic resource utilization was established to promote the functional usage of the abundant fishery resource. Under this program, cosmetic products and seasonings are made from shark collagens and sea squirt extracts respectively. Furthermore, to attract the investment from the outside interested business, the city has provided favourable conditions, helped connecting ties with local business and distributed information email magazines (Planning Department of Kesennuma City, 2016).



Figure 4 (upper left). The ground level rising work under construction in Sakanamachi, Kesennuma

Figure 5 (upper right). Kesennuma revitalization temporary stall village, Yokocho

Source: photos taken by the primary author.

### 4.3 Slow City Kesennuma Plan

Beside the official master reconstruction plan, there are other plans which were jointly made by the cooperation between private and public sectors. Among these plans was the Slow City Kesennuma Plan, which was cooperatively promoted by the 1) the City Office, 2) Kesennuma Tourism Cooperation, 3) Kesennuma Chamber of Commerce and Industry, 4) Slow Food Kesennuma, a non-profit organization, and 5) other concerned regional and cooperative organizations. The Slow City Movement (*cittaslow*) started in Italy in 1999, which focuses on the appreciation of local identities and natural lifestyles. In 2003, echoing the local economic decline due to the severe depopulation and the national trend for healthy foods and lifestyles, Slow Food Kesennuma made the first declaration in Japan featuring food-centered community building. After the founding of the new Kesennuma City following the Great Heisei Municipal Amalgamation, the new declaration was again promulgated. In April of 2013, Kesennuma became the first official slow city in Japan, after passing more than 50 items of strict criteria for recognition, including natural environment, infrastructure, urban planning, local specialties, friendliness spirits, community building, and citizen awareness (Planning Department of Kesennuma City, 2013).

### 4.4 Social and human building in Kesennuma's reconstruction planning and *machi-zukuri*

The Kesennuma's reconstruction plans not only focus on the physical revitalization (built capital), but also emphasize building the local community bondages and cohesion, and training people for more resourceful future, which in turn help enhance local resilience.

#### 4.4.1 Evidences of social capital building in planning

Through his observations of the inspiring rebuild stories from citizens in the Lower Ninth Ward and Versailles communities of New Orleans after Hurricane Katrina, Campanella (2006) argues that urban resilience is largely a function of resilient and resourceful citizens, and highlights the importance of rehabilitating social fabric and communal networks. Aldrich (2010) also contends on the re-orientation of disaster preparedness and recovery programs from physical infrastructure to social infrastructure, which can be deepened both through local initiatives and interventions from foreign agencies. In this regard, social capital really matters in the reconstruction planning.

One important aspect of building social capital is to involve citizens and private sectors into the planning process of reconstruction plans through a variety of inputs. Kesennuma City has actively pushing for that goal. For example, to better absorb the inputs from local residents into the master reconstruction plan, a special citizen's committee consisting of 11 members was formed in June of 2011. The committee held 16 meetings until the mission was completed in February of 2012. In another case of levee construction, initially a cookie-cutter safe height was recommended. However, a variety of appeals arose on the feasibility of reaching this height considering different concerns including safety, landscape, and convenience for fishery production. In regard of this, the civil engineering department of Kesennuma City commissioned a task force to investigate the situation and negotiate with related stakeholders on a case-by-case basis. By the end of October of 2015, a total of 80 out of 87 levee locations has been reached agreement on, with adjustments made on heights, design, greening and other details (Imakawa, 2016).

The private sectors which have strong community ties can also play a leading role in the process of planning. For instance, in Slow City Kesennuma Plan, Kesennuma Chamber of Commerce and Industry not only provided financial resources and wisdom inputs to support the community building efforts, and assisting the work of the city's planning department, but also proactively promoted local products and tourism to the national and international market through public relations endeavours. The Chamber has proved to be a strong bondage between the public and citizen sectors. The active public-private co-governance features the reconstruction planning of Kesennuma City, making it a unique and vigorous case in the region (Sugawara, 2016).

#### 4.4.2 Evidences of human capital building in planning

Human capital building is mainly achieved through a variety of human-centered *machi-zukuri* projects. One example is the Future Management School (*keiei-mirai-juku*). The school trains small local business owners and runners with invited tutors from banking, management and NPO sectors. Starting from 2013, four sessions have been conducted with a total of 67 participants. The fifth session of the program will be carried out in 2016 from April to October. Another typical example is the organization of local practitioners for field trip observations to Europe and New Zealand in order to study the experience of aquaculture and fishery industries, as well as tourism development.

The human capital training programs do not only involve business owners and practitioners, but also the general citizens. The *machi-zukuri* seminar Kesennuma School (*kesen-numa-juku*) for instance, trains and inspires local younger generations including teenagers, twenties and thirties, with the sharing by local industry and community leaders, under the concept of "learning from the local" (*chiiki-kara-manabu*). By the end of 2015, this bi-monthly event has held 14 sessions with 356 participants. Against the background of depopulation, this program has helped young people to understand and appreciate the local stories and identities. Kesennuma School is further followed by the newly introduced Numa University (*numa-daigaku*), an open workshop program for local younger generations to nurture and practice their own plans with regional vitalization goals. In addition, the city is also planning for a specific training program for local senior people named Active Community University (*akutibu-komyuniti-daigaku*) through a cooperative mission with Tohoku Gakuin University, a local concerning college.

### 5. Summary and conclusion

In terms of reconstruction planning, Kesennuma City has provided us with a good example to discuss with. It is commonly accepted that larger cities, such as regional and national centers like Sendai and Tokyo in Japan's case, generally have higher levels of resilience because the cities have more resources that can be mobilized after the impact of disasters. These resources not only mean more talented people, but also better financial support and stronger political will. Equipped with these, those cities have strong abilities to absorb the impact of disturbance and even gain further development afterwards. However, in smaller cities, it is not usually the case. They may have some problem or another before the disaster, which can be magnified by the disturbance, resulting in vicious cycles. Kesennuma City, obviously, belongs to the latter category, but is a fortune exception. The reasons can be explored in the process and content of reconstruction planning, which can serve as the general takeaways for cities alike.

Firstly, the city has fully exercised its advantages and promoted unique development approaches. The city leaders, longing for changes that reach beyond the situation before the EJET, have a clear picture of the current situation of

the city, with its advantages and drawbacks, and a master of the current trend of society. Secondly, the city has demonstrated a strong local public-private relationship in developing its plans. Citizen consultation and involvement is featured in the planning process. Particularly, the Chamber of Commerce and Industry has played a connecting part between the government sector and citizens. Thirdly, the continuous investment in human capital, such as field trips and training programs, has helped broaden the horizon for local business and general public and inspired ideas for opportunities. Fourthly, the city is open to wisdom and staff assistance from the outside society. For instance, Waseda University alone has a deep engagement into Kesennuma's reconstruction process, including the voluntary activities and the academic support for the slow city plan.

In sum, the features of capital building, including built capital, social capital and human capital, are quite evident and inspiring in the reconstruction planning and *machi-zukuri* process of Kesennuma City, Miyagi Prefecture. The city has been actively striving to gain its future development opportunities against an adverse situation of post-disaster damages and depopulation challenges, providing valuable lessons for similar cities. Although the process is tough, there can be more reasons to expect.

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