



Conference paper

## Decision-Making, Policy Choices and Community Rebuilding after the Tohoku Disaster

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**Abstract** The long-term reconstruction following the 2011 tsunami disaster has required extensive deliberation at all levels of government that is now redefining and redrawing the future of the region. Based on semi-structured interviews conducted with municipal government officials and community leaders in the cities of Miyako and Kesenuma in January 2013, this study identifies the ways in which local communities have defined, prioritized and adopted a set of objectives and measures for long-term reconstruction, and how these will likely affect the disaster risk and community rebuilding in the coming years. Particular attention is paid to the debate surrounding tsunami defense measures, including the rebuilding of sea walls, the relocation of communities, and other land-use adjustments, and how multi-layered governance plays out in balancing the need for swift recovery, optimal resource allocation, and future disaster risk reduction. Since the 2011 Great East Japan Earthquake, the national recovery policy has stressed the need to build ‘tsunami-resilient’ communities, envisioning the construction of multi-buffer tsunami defense systems characterized by coastal land-use restrictions based on nationally determined guidelines of relatively frequent to extreme rare tsunamis. While this hands-on approach by the national government has contributed to streamlining the reconstruction processes, limited opportunities for citizen participation have contributed to tensions among stakeholders, calling into question the community ownership of decision-making following a disaster.

**Key words** Great East Japan Earthquake; Reconstruction planning; Land-use restriction; Tsunami defense; Community decision-making,

### 1. INTRODUCTION

Over two years after the triple disaster of an earthquake, a tsunami, and a nuclear power accident on March 11, 2011, the prospect of full recovery is still distant for Tohoku Japan as of 2013. Planning a long-term reconstruction program has called for extensive deliberation at all levels of government that are now redefining and redrawing the future of the region. Through case studies of the cities of Miyako and Kesenuma, this article identifies the ways in which local communities have defined, prioritized and adopted a set of objectives and measures. Particular attention is placed on the debate surrounding tsunami defense measures, including the rebuilding of sea walls, the relocation of communities, and other land-use

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adjustments.

Based on semi-structured interviews conducted among municipal government officials, local community organizations and residents in January 2013, this article answer the following questions: 1) How have localities in Tohoku developed reconstruction plans in general and plans for tsunami defense in particular? 2) What specific ‘hard’ and ‘soft’ measures have been adopted in each locality? 3) What were the top-down/bottom-up elements of the decision-making process? 4) What were the drivers of and obstacles to participatory planning regarding long-term tsunami risk reduction? In general, the reconstruction planning may be described as a top-down process in which national and prefectural governments determine sea-wall heights and municipal governments adjust land use accordingly. Local implementation also involves complex acts of negotiation and coordination where limited efforts are made to include local community in the form of bottom-up planning. Institutional rigidity, lack of manpower, and bureaucratic aversion to the idea of private sector and civil society involvement are identified as major obstacles in participatory planning on long-term reconstruction.

## 2. DISASTER RECONSTRUCTION IN JAPAN

Japan is one of the world’s most disaster-prone countries, and thus among the most well prepared for disaster; yet strikingly few of its long-term reconstruction measures are legally codified. Formal regulations emphasize the importance of prevention and crisis management over reconstruction, as evident in the country’s fundamental law on disaster management, the Disaster Countermeasures Basic Act of 1961. This act comprises 107 articles on disaster management, which charge national, prefectural and local governments with the responsibility for anticipating and responding to natural and man-made disasters. However, only four articles are dedicated to rehabilitation (National Land Agency 1997).

While sufficient to handle frequently occurring disasters such as typhoons and floods, these regulations have proven inadequate in cases of a large-scale disaster, such as the Hanshin-Awaji earthquake of 1995 and the Great East Japan Earthquake in Tohoku in 2011. It has thus become customary to enact supplementary laws to facilitate reconstruction planning and implementation in response to larger-scale disasters (Isozaki 2012). In the immediate aftermath of the Hanshin-Awaji earthquake, for example, the administration of Tomiichi Murayama (1994-1996) implemented 16 special laws to assist the disaster-stricken areas, including financial support for local governments and victims (MLIT 1996). Following the Great East Japan Earthquake, a number of new laws were enacted to provide for a range of recovery and reconstruction operations, including seven laws in the area of victim support, five for the purposes of rehabilitation and *machizukuri*,<sup>2</sup> three addressing business recovery, six for municipal government support, nine addressing nuclear disaster response and recovery, and twelve laws dealing with financial and other aspects of disaster recovery and reconstruction. In addition to these, the national government took the following major legislative measures under the Basic Act on Reconstruction in response to the Great East Japan Earthquake: i) establishing the Reconstruction Agency, creating the special zones for reconstruction and iii) allowing the issuance of reconstruction bonds and other measures to finance reconstruction projects (Reconstruction Agency 2011)

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<sup>2</sup> The term *machizukuri* may literally be translated as ‘town-building.’ It is regarded as an alternative to top-down city-planning. For example, Nishimura (2005) describes *machizukuri* as having a “subtle nuance of soft-oriented bottom-up community planning activities or hand-on community design towards the betterment of the environment. (p.2)”

### *Who's in Charge?*

In the absence of comprehensive legislation to cover post-disaster reconstruction,<sup>3</sup> a complex network of governance has been set up. The national government must coordinate its efforts with those of prefectural and local governments and diverse stakeholders. In general, the national government is required to provide the financial backbone for reconstruction projects, while prefectural and local governments take charge of their implementation. Prefectural governments play a central role in providing livelihood assistance and infrastructural rehabilitation in coastal and agricultural areas and ports, and for some roads and rivers, while local governments provide assistance in the form of compensation and infrastructural rehabilitation for local facilities such as waste-water areas, parks, and some roads and rivers (Isozaki 2012).<sup>4</sup>

Of course, these duties are hardly set in stone, as post-disaster phases are characterized by an acute shortage of human and other resources. Debris clearance and disposal, for example, are typically held to be the responsibility of local governments. However, the copious amounts of rubble created by the recent disaster overwhelmed local capacity. In response, the national government enacted special laws acknowledging responsibility for coordinating debris disposal in affected areas and handling radioactive debris above 8,000 Bq/kg (Ministry of the Environment 2011). Furthermore, the national government has taken a more hands-on approach to the recent reconstruction planning. In addition to providing financial support, it has worked with municipal governments to carry out damage assessment and identify appropriate redevelopment measures for affected communities.

Although the national government has implemented a set of special laws and projects to facilitate recovery and reconstruction, these efforts only partially resolve the issues of overlapping mandates and institutional inflexibility observed at the local level. The exemption of post-disaster projects from certain ordinary regulatory requirements has a significant effect on the speed of their implementation and administrative workload at a local level. As a result, communication and coordination are crucial, both within each level of government and between different levels. Formal and informal channels are available, but systematic barriers remain. The following section of this paper briefly discusses the national response to the Great East Japan Earthquake, and provides two case studies of local reconstruction planning.

### **3. RECOVERY AND RECONSTRUCTION EFFORTS FOLLOWING THE GREAT EAST JAPAN EARTHQUAKE**

The Great East Japan Earthquake prompted the largest response and recovery project in Japan's recent

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<sup>3</sup> This is increasingly recognized as a critical institutional 'gap' in Japan's disaster-management apparatus. In response, a group of academics and legal experts, including the Japan Society for Disaster Recovery and Revitalization, has proposed its own draft for a basic law on disaster reconstruction, protecting the human rights of the affected population and specifying that the reconstruction should aim to restore both tangible and intangible assets lost due to a disaster (Japan Society for Disaster Recovery and Revitalization 2010).

<sup>4</sup> The notion of 'self-reliance' remains a central—and controversial—consideration in the matter of institutional support for recovery and reconstruction as the national government is often perceived as the insurer of last resort in the case of a catastrophic natural disaster. This principle encourages victims to carry out their own reconstruction in cases of damage to private businesses and housing, along with other forms of livelihood rehabilitation. In general, public assistance is restricted to the provision of immediate material assistance and the rehabilitation of public infrastructure. Assisting the reconstruction of private property is commonly avoided. However, the strict implementation of the self-reliance principle has proven inadequate in the face of large-scale disasters. Responding to citizens' call for wider post-disaster assistance, the government has in recent decades enacted several laws providing for livelihood assistance, including the 1998 Act on Support or Livelihood Recovery of Disaster Victims (Nakagawa 2011).

history. Responding to what many described as the country's most severe crisis—in which nearly 20,000 people perished and the nation's critical infrastructure, including the Fukushima Daiichi nuclear power plant, ports and harbors, were severely impaired (Reconstruction Agency 2012)—the government immediately established Japan's first national headquarters for emergency disaster control headed by the former Prime Minister Naoto Kan. A total of 107,000 maritime, ground and air personnel, 541 aircraft and 59 ships were dispatched, along with the US Operation Tomodachi with more than 20,000 ground, air and marine service members—together comprising the largest-ever disaster-response operation in Japan (Sasamoto 2011). Furthermore, Sasamoto reported that search and rescue teams from more than 20 countries around the world rushed to the region in search of surviving victims. In terms of recovery and reconstruction, the major national responses included generous financial assistance to, and regulatory exemption of, the affected areas.<sup>5</sup>

### ***Integrating Disaster Risk Reduction into Long-Term Planning***

Despite decades of advancement in tsunami prediction and warning systems, Japan's structural defenses were largely ineffective in the case of the 2011 Great Tohoku Earthquake, which highlighted the inadequacy of an engineering-focused approach to disaster management. Consequently, recovery and reconstruction prompted a major rethink of Japan's tsunami defense systems, characterized by a shift away from sole reliance on infrastructural measures.<sup>6</sup>

Central to the new defense systems is a portfolio of structural and policy measures addressing both frequent and rare tsunamis. The recently implemented Act concerning the Development of Tsunami-resistant Communities stipulates that prefectural governors, in consultation with the national government, estimate the heights of two kinds of tsunami, namely L1 (relatively frequent > 100+ yr) tsunamis and L2 (one in hundreds or 1000 yr) tsunamis (MLIT 2011). Based on the simulated heights of expected tsunamis, national and prefectural governments have determined appropriate sea-wall heights for individual coastal zones (24 zones in Iwate, 22 zones in Miyagi and 14 zones in Fukushima). Meanwhile, municipal governments are authorized to plan accordingly and to introduce necessary land-use restrictions. As Table 1 illustrates, the difference between existing and new planned heights is generally greater in Miyagi than in other prefectures, reflecting the historical patterns of tsunami occurrence in the region.

In addition to the construction of various buffer systems, including man-made structures and controlled forests, areas adjacent to the coast are to be labeled 'Red' and 'Yellow' based on their expected inundation depths in the event of a L2 tsunami. Areas with an expected inundation height of 2 m or above are designated as Red zones, with residential reconstruction prohibited within their boundaries. While commercial and industrial activities are still permitted in these zones, municipal governments must buy

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<sup>5</sup> Within a year of the disaster, the Japanese government had approved three supplementary budgets totaling 18.24 trillion yen, ushered in a cabinet-level agency dedicated to reconstruction, and adopted a host of policies including special zones for reconstruction subject to deregulation policies and other economic stimuli (Government of Japan 2011). Although the figures are highly debatable (Harada 2012), official estimates indicate economic damages of around 16.9 trillion yen, including a loss of 10.4 trillion yen incurred by damage to buildings, a 1.3-trillion-yen loss to lifeline utilities, and 2.2 trillion yen lost as a result of damage to roads, airports, and other infrastructure (Government of Japan 2011). The government's initial estimates of the costs of recovery from these losses were 19 trillion yen over the first five years of reconstruction, and a total of 23 trillion yen over 10 years. Following the recent change of leadership in Japan's national politics, Prime Minister Shinzo Abe has put forward an additional proposal to expand governmental assistance.

<sup>6</sup> As discussed in relation to the case study. It is also worth noting that this new national focus has had some unintended consequences at local levels in which the use of additional structural measures (i.e. new sea wall construction) has been introduced.

out all residential land in order to prevent future use and to provide financial support for residents' relocation. Areas with an expected inundation height between 1 m and 2 m are classified as Yellow zones, in which reinforced or raised residential buildings are permitted. In many areas, raised roads will serve as the second line of defense against tsunamis, separating Red from Yellow zones. Natural barriers such as controlled forests will be reinforced by the use of mounded land, encouraging deeper root growth with a greater potential to withstand the force of tsunami waves. The remaining areas are considered to be safe, and land use is hence unrestricted (Cyranoski 2012).

**Table 1. Planned Sea-Wall Heights in Selected Coastal Zones**

	Planned Heights Prior to 2011	New Planned Heights	2011 Tsunami Height
<b>Iwate Pref.</b>			
- Taro	10.0 m – 13.7 m	14.7 m	16.3 m
- Miyako	8.0 m – 8.5 m	10.4 m	11.6 m
- Omoe	10.0 m	14.1 m	21.8 m
<b>Miyagi Pref.</b>			
- Kesennuma	2.8 m – 4.5 m	7.2 m	14.6 m
- Oshima East	1.8 m – 4.5 m	11.8 m	12.1 m
- Motoyoshi	2.5 m – 5.5 m	9.8 m	18.8 m
<b>Fukushima Pref.</b>			
- Okuma	6.2 m	7.2 m	n.a.
- Tomioka	6.2 m	8.7 m	n.a.

Source: MLIT (2012)

To support local reconstruction, the national government offers a grant scheme composed of 40 core projects such as land readjustment, road reconstruction, and agricultural and fishery rehabilitation. Further, local governments may implement related projects under an 'associated project' scheme. To facilitate the process of gaining permission for such projects, the national government has developed a framework known as the 'special zone for reconstruction', whereby municipal governments may seek across-the-board approval and/or exemptions for i) reconstruction promotion plans, ii) land-restructuring plans, and i) the planning or funding of reconstruction projects. 245 districts in 24 municipalities have been approved for a collective household-relocation project, while 58 districts in 20 municipalities have been authorized to carry out a land-readjustment project as of October 2012 (Reconstruction Agency 2012).<sup>7</sup>

On the whole, the reconstruction of tsunami defense systems may be described as a top-down process in which national and prefectural governments determine sea-wall heights and municipal governments adjust land use accordingly. Within this structure, the national government offers a list of possible projects to municipal governments, and financial support is extended on the condition that the latter follow guidelines provided by the former. In practical terms, however, implementation at the local level involves more complex acts of negotiation and coordination: local governments may make their requests through formal channels such as the local branches of the Reconstruction Agency, or by more informal means such as personal contact with prefectural and national government agencies. In addition, bottom-up *machizukuri* planning involving local residents allows for an exchange of ideas among various stakeholders. The following section provides case studies of two municipalities—the city of Miyako in the Iwate Prefecture, and the city of Kesennuma in the Miyagi Prefecture—drawn from interviews and desktop reviews of reconstruction planning documents to illustrate the process of reconstruction-phase decision-making at the local level.

<sup>7</sup> For the first and second rounds of project grants offered in March and May of 2011, 29% was used in public housing development and 28% for collective reallocation (MLIT 2012).

#### 4. CASE STUDIES

##### Miyako City, Iwate Prefecture

Miyako is a major coastal city in Iwate Prefecture. Following the nationally promoted decentralization campaign known as the ‘Great Heisei Consolidation’ (‘Heisei no Daigappei’), the city merged with Taro Township and the village of Nizato in 2005, and with the village of Kawai in 2010. The city now encompasses an area of 1,259.89 km<sup>2</sup>, with a total population of 60,124. Its major industries are agriculture and fishing. The fishing ports of Miyako Bay rank sixteenth in the nation, with an annual landing of 35,265 tons (Sakaiminato 2013).

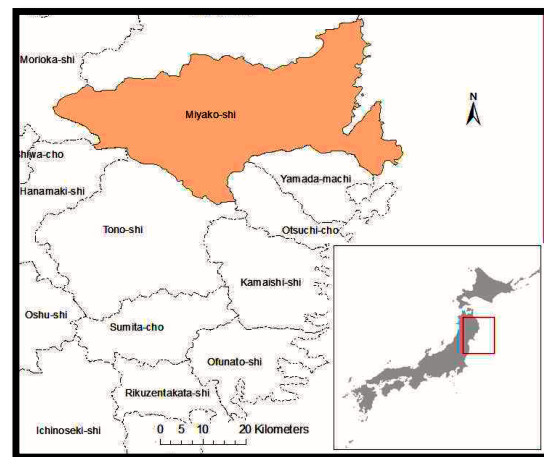
Tsunami preparedness is integral to this coastal community, where stories of loss and resilience are passed down from generation to generation (Onishi 2011). The Taro district was once home to one of the country’s most extensive sea walls—10.5 m in height and 2,433 m in length—before a 16.3-m wave engulfed the township. The city of Miyako has been hit by a series of tsunamis, including the Meiji-sanriku tsunami of 1896, the Showa-sanriku tsunami of 1934, the Chilean tsunami of 1960, and the 2011 tsunami.

The 2011 tsunami resulted in severe damage to local livelihoods and infrastructure. Extending over an area as large as 998.32 ha, it washed away or inundated a total of approximately 6,900 houses in the city, causing 525 deaths and 33 injuries (Table 2). Critical lifelines such as electricity, water and transportation networks, along with the region’s communications infrastructure, were also damaged, with as many as 16,000 incidents of power outage, and 25 sections of city roads suspended. Within months, however, much of this infrastructure had recovered: all power outage ceased by April 30, 2011; water outage by April 15; national road suspension by March 19; and prefectural road suspension by March 23. Of 25 suspended sections of city road, 13 were re-opened by March 30, 2012. Although as many as 8,889 people had evacuated to designated evacuation centers, these centers had been closed by August 10, 2011. 62 areas in the city, mostly community parks and public school playgrounds, are now designated as temporary housing land. As of March 30, 2012, these temporary houses accommodated 1,724 households, with a total of 3,923 residents (Miyako City 2012). Also, an estimated 715,000 tons of debris were created by tsunami (of which only 4.2 % had been properly disposed of by March 30, 2012).

**Table 2. Tsunami Damage in Miyako City.**

<b>Population Affected</b>	Number of Deaths: 525 (Missing: 25) Number of Evacuees: 8,889
<b>Housing Damage</b>	Total Collapse: 3,669 Partial Collapse: 1006 Partial Damage 176
<b>Tsunami Height</b>	Maximum wave: above 8.5 m Run-up heights: 37.9 m (Taro District) 40 m (Omoeaneyoshi District)
<b>Inundated Area</b>	10 km <sup>2</sup>
<b>Land subsidence</b>	-0.33 m to -0.5 m

Source: Miyako city (2012)



**Figure 1. Map of Miyako City**

### ***Reconstruction Planning***

Broadly speaking, reconstruction planning in the city of Miyako comprises two parallel processes: i) basic reconstruction planning, and ii) detailed *machizukuri* planning. The basic planning followed the national reconstruction planning manual published by the cabinet office in 2010, which focused on: i) residence and livelihood recovery, ii) industrial and economic reconstruction, and iii) building a safer city (Cabinet office 2010). Due to the limited manpower of the planning division, the basic plan was carried out by groups of five individuals in consultation with a 22-member expert committee composed of local business leaders, academics and community representatives. To prevent hasty and disorganized reconstruction, the city asked for a voluntary suspension of new housing construction in May 2011. The expert committee met five times between July and October to advise on the overall framework for reconstruction, and public consultation took place in 14 locations in June and July. In total, 1,516 residents participated in these meetings, and questionnaires were sent to 6,644 households. Combining their input with expert opinion, the basic plan was completed and published on October 31, 2011. Miyako was one of the many municipalities to have received support directly from the national government for damage assessment and urban redesigning evaluation. The city received support from the Ministry of Land, Infrastructure and Transportation, which by June 2011 had assisted local officials in appraising the damage and subsequently in identifying potential strategies for urban redevelopment and *machizuriki* planning. Support was also provided by externally hired consultants.

In parallel, Miyako adopted two approaches to detailed *machizukuri* planning: i) a consultation-committee approach headed by community leaders including local organizations, first-responder associations and parent-and-teacher associations; and ii) a direct-discussion approach, wherein municipal government officers and consultants exchanged ideas directly with a smaller number of household heads. The city adopted the consultation-committee approach in a total of 10 districts, each with more than 100 affected households, and employed the direct-discussion approach in the remaining 23 districts, in which fewer than 40 households had been affected per district. From October 2011 to January 2012, the city implemented four consultation-committee meetings, and a number of individual discussions with the above-mentioned groups were held between December 2011 and January 2012. As part of the latter approach, additional questionnaires were sent out in February/March 2012, followed by five group consultations in mid-March 2012. On March 30, 2012, Miyako released its *machizukuri* plans for all affected districts, and the construction moratorium was lifted for areas categorized as safe based on their expected inundation levels.

The coastline along Miyako Bay is divided into three sections—Taro, Miyako Bay, and Omoe—which were assigned sea-wall heights of 14.7 m, 10.4 m and 14.6 m respectively. These heights were derived from the wave levels estimated for each of the various districts. Five of the total 33 districts in this region were expected to face inundation levels of 1 m or below, and were thus permitted to rebuild in their original residential (Table 3) areas. For the remaining 28 districts, the city planned a host of relocation and reconstruction projects. In the fiscal year 2011, Miyako had received reconstruction grants and others worth JPY 32 billion, which were more than their ordinary annual budget of around JPY 29 billion (Board of Audit of Japan 2012). Due to a shortage of human resources—particularly of individuals able to design and implement fishery-related projects—the majority of the budget was rolled over to the fiscal year 2012.

### ***Bottom-up or top-down?***

In Miyako, one of the difficulties with the combination of top-down/bottom-up approaches is that the municipal government is caught between two roles, and must therefore operate with a high degree of policy-related and fiscal uncertainty. As a ‘public’ entity, the municipal government is responsible for

communicating policies and plans; yet as a ‘local’ entity , it often lacks the authority to make its own decisions. As a result, while Miyako’s planners were responding to a residents’ inquiry regarding a possible public-land acquisition scheme, they had no idea as to the details of the schedule and whether or not they would receive sufficient funding. Furthermore, although residents greatly desire swift reconstruction, the municipal government was unable to move forward with a detailed reconstruction plan until the national/prefectural governments had completed their tsunami simulations and published sea-wall height requirements for Miyako’s coastline. This type of combined planning, therefore, greatly increases the need for coordination, which can itself prove difficult due to the general shortage of manpower and lack of authority at the local level.

**Table 3. Planned Land-Use Restrictions in Miyako City**

Category	Criteria	Restriction
1. <b>Restricted</b>	Expected inundation of above 2 m in the event of a L2 tsunami.	No residential building construction allowed.
2. <b>Restricted</b>	Expected inundation of 1 m to 2 m in the event of a L2 tsunami.	Residential construction is allowed for structurally sound buildings in which the ground floor is not used as the place of residence and/or the foundations are more than 1.5 m above street level.
3. <b>Restricted</b>	Expected inundation of less than 1 m in the event of a L2 tsunami, but adjacent to category 1 or category 2 region.	Residential construction is allowed for buildings in which the foundations are more than 0.5 m above street level.
4. <b>Unrestricted</b>	Expected inundation of less than 1 m in the event of a L2 tsunami.	No restriction.

Source: Miyako city(2012)

Another problem observed is that the top-down nature of general planning and funding provision makes it difficult to take residents’ wishes into account. The mere presence of a *machikuri* committee may give residents false hope that their preferences will be reflected in the planning process. During the first two consultation meetings in Kuwagasaki District, for example, the facilitators asked residents to describe their ‘dream community’ with reference to existing problems and possible solutions. The residents’ suggestions included both costly measures such as the relocation of residences to higher ground, and less costly ones such as installing street lamps on dark and steep roads for safety. By the third consultation meeting, however, almost all of their ‘dreams’ had been rejected simply because the city ‘did not have enough funding.’<sup>8</sup> Consequently, in the eyes of local residents, the current *machizukuri* measures depend on governmental decisions, rather than reflecting the desires of their own community.

Other notable challenges include the fact that residents’ opinions are far from uniform; rather, they are highly diverse and in constant flux. For instance, some of the residents who had initially rejected the idea of moving back to lower ground gradually changed their minds as they began to see that residence on higher ground might be more inconvenient in the longer term. There are also differences in opinion between local residents: in general, older members of a community prefer to return to their original places

<sup>8</sup> Interview with the leaders of the local neighborhood council in Miyako in January 2013.

of residence, while younger residents prefer to move upland for the safety of their children. Therefore, it is important that residents be given sufficient opportunities to discuss their ideas in order to reach a general consensus on behalf of the community. However, this is difficult due to the time pressure involved in reconstruction decision-making.

In addition to the challenges associated with establishing a consensus, it is also important to note that real bottom-up discussions on reconstruction may begin months prior to the formal establishment of a consultation committee. In Kuwagasaki District, for example, local district heads, priests, and city officials began of their own volition to gather once a week at the local shrine just three months after the disaster to discuss their concerns and plans for reconstructing their community. The city's designation of these leaders as consultation-committee members came much later, in around October 2011. Unfortunately, however, many of their collective proposals were dismissed due to budgetary constraints.

At the time of the interview in January 2013, most of the planned land-use readjustments had been completed, and construction had already begun in one district. Within a few years, it is expected that the construction moratorium will be lifted, and public housing provided. Until then, many residents must continue to live in temporary houses. As elderly residents in particular face difficulties in obtaining loans for private housing, the municipal government must provide public housing suitable for their needs in the coming years. For this purpose, community organizations such as the Miyako's Social Welfare Council regularly meet with representatives of the municipal government to discuss the special needs of vulnerable populations.

## **Kesennuma**

Located in the north of Miyagi Prefecture, the city of Kesennuma is one of the region's major ports, with a population of 74,247 (Kesennuma 2012). The city merged with Karakuwa Township in 2006 and Motoyoshi in 2009. Like Miyako, Kesennuma has been hit by repeated tsunamis, including the Meiji-sanriku tsunami of 1896, the Showa-sanriku tsunami of 1934, the Chilean tsunami of 1960, and the 2011 tsunami.

The 2011 tsunami and subsequent fire caused large-scale damage to the city of Kesennuma, damaging or inundating as many as 25,996 households, which comprise some 40.7 % of all of the city's inhabitants. The area of inundation extended over 18.65 km<sup>2</sup>, or 5.6 % of the city's land. While the precise cause of the subsequent disaster remains unknown, it seems that the presence of oil tanks along the bay led to a massive fire engulfing the city center and the neighboring island of Oshima in the immediate aftermath of the tsunami. Thirteen separate cases of fire were recorded within a few days of the tsunami, with one fire in Shishiori District covering as much as 101,973 m<sup>2</sup>, and another extending to the nearby island and raging over a 103,199 m<sup>2</sup> area (Kesennuma and Motoyoshi 2012a). Major efforts were made to contain the fires. In accordance with a pre-disaster agreement, 61 members of the Tokyo Metropolitan Fire Department arrived in the morning of March 12, and as many as 484 additional members had joined them by March 13, 2011. Other fire-fighting units across Japan also arrived in the days following the first waves of the tsunami (Kesennuma and Motoyoshi 2012a). As a whole, the earthquake, tsunami and subsequent fire resulted in 1,026 deaths, and 130 missing persons. As of December 2012, 3,227 households (7,700 people) had been relocated to temporary houses, while 1398 households (4,105 people) were living in equivalent rented temporary properties (Table 4).<sup>9</sup>

## ***Reconstruction Planning***

Reconstruction planning in Kesennuma differs from the equivalent process in Miyako, as the former

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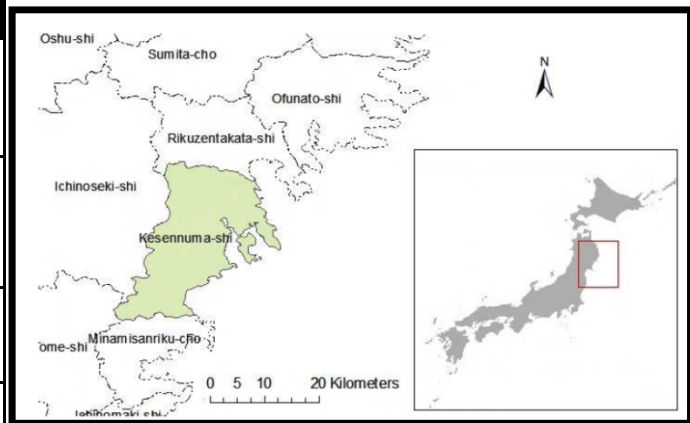
<sup>9</sup> Given the shortage of temporary housing facilities, rented properties (e.g. apartments) are also used as temporary houses, with rent directly subsidized by the government on behalf of the disaster victims.

city has not set up formal consultation groups for detailed machizukuri planning. Kesennuma’s process consists of two approaches: i) an expert reconstruction committee composed of 13 members, including professors, and ii) a citizens’ reconstruction committee comprising 11 members, including local business and community leaders. The expert committee advises on formal planning and implementation, while the citizens’ committee may discuss wider aspects of the city’s reconstruction without reference to institutional and budgetary restrictions. Public opinion is evaluated through questionnaires, public commentary and other formal meetings. Since Kesennuma published a general development plan just one month prior to the disaster, in February 2011, its disaster reconstruction plan has closely followed the February guidelines, and was developed by a permanent staff of 7, together with additional external staff members.

**Table 4.** Tsunami Damage in Kesennuma City.

Source: Kesennuma city (2012 a);  
Kesennuma and Motoyoshi (2012 b)

<b>Population Affected</b>	Number of Deaths: 1040 (Missing: 243) Evacuees: 20,086
<b>Housing Damage</b>	Total Collapse: 16,454 Partial Collapse: 2,308 Partial Damage: 5,31
<b>Tsunami Height</b>	Kesennuma: 3.75m to 20.99m
<b>Inundated Area</b>	18.65 km <sup>2</sup>
<b>Land subsidence</b>	-0.65 m to -0.74 m

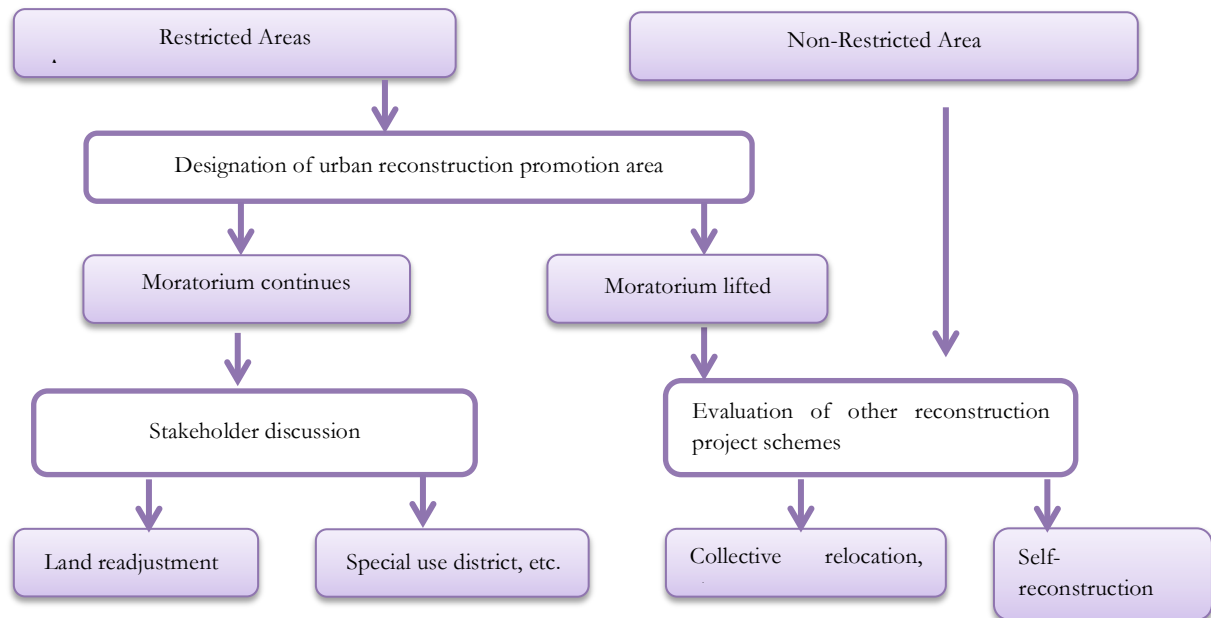


**Figure 2.** Map of Kesennuma City

Kesennuma was included in Miyagi prefecture’s moratorium on housing construction promulgated on April 8, 2011 (Furukawa 2011). The city performed a detailed evaluation of the city’s restricted areas to determine which qualified as ‘urban reconstruction promotion areas’. With regard to the non-restricted areas, the city is currently identifying possible projects to combat widespread land subsidence and carry out other forms of infrastructural rehabilitation (Figure 3). As of December 2012, 36 of 38 planned relocation projects, involving some 1,070 households, had received ministerial approval (with expected completion as soon as fall 2013), and the city plans to provide 2,000 additional public residences in 19 districts. In areas falling outside the scope of the existing national subsidy scheme, the municipal government plans to provide additional support for private-housing reconstruction (Kesennuma 2012 a). In the fiscal year 2011, Kesennuma had received reconstruction grants and others worth JPY 33 billion, which were more than their ordinary annual budget of around JPY 29 billion (Board of Audit of Japan 2012).

As Kesennuma’s case illustrates, one commonly encountered problem is that the list of implementable projects provided by the national government is insufficient to deal with the large-scale damage caused by tsunamis. This is because the list of projects has remained largely unchanged since the Kobe earthquake of 1995. Consequently, the city has been left with patches of private land that do not qualify for any grants under the current scheme, impeding the swift implementation of coastal reconstruction. To solve this issue, the city is currently negotiating with the national government for inclusion of these private

areas in the scheme. However, the national government generally upholds the principle that public spending should not be used to finance private assets, whose reconstruction should instead be privately financed. Municipal officials have often expected the local branch of the Reconstruction Agency set up at the prefectural capital to function as a supervisory and coordinating body capable of channeling these local needs, yet it has thus far proven incapable of meeting these requirements for communication.<sup>10</sup>



**Figure 3: General Land-use Planning Scheme of Kesennuma City (Kesennuma city 2012 b)**

Other issues encountered during land readjustment and relocation include the existence of unregistered land owners and buried cultural properties in potential relocation areas. Cadastral information is available for 89 % of Kesennuma’s land areas, and land may require proper registration before being purchased by the municipal government. In the case of inherited land, for example, the municipal government must first identify all of the descendants entitled to the particular portion of land at stake, and make a formal agreement with each of them before the land may be developed. Furthermore, Kesennuma faces problems associated with buried cultural properties: of 38 areas planned for relocation, 9 areas have been found to contain buried cultural properties, and 6 require detailed examination. The duration of the excavation process depends on the size of the site involved, such that excavation may take as little as one month or as long as two years (Kahoku Shinpo 2012). In general, these processes require the same amount of administrative procedure under all circumstances, which is an additional burden during times of post-disaster reconstruction.

***How high is too high?***

Kesennuma has a complex set of shorelines, and its coastal areas are divided into eight zones (Miyagi Prefecture 2013). Unlike Miyako, which had high sea walls prior to the 2011 tsunami, much of the

<sup>10</sup> For example, one municipal government official interviewed hoped that the local branch of the Reconstruction Agency would provide information regarding the kinds of exceptions for which other municipalities have applied and been granted. This information would have helped the municipal government to prepare a project proposal and implement the project, but no effective channels were found to be in place for smooth and swift information sharing.

Kesennuma coastline has no sea wall at all, or else much smaller structures. As a result, public acceptance of sea-wall construction remains one of the most contested issues in this region. While both the prefecture and the city promote sea-wall reconstruction, a group of residents has independently established discussion forums in which citizens may learn about regulatory requirements as well as the engineering, economic and social dimensions of sea-wall construction. One such group, *Bouchotei wo Benkyosurukai* (a study group on the sea wall), invited legal, planning and engineering experts to hold a series of public lectures on the topic, and collectively submitted petitions to the prefecture and city governments requesting proper public consultation and environmental assessment prior to sea-wall construction.<sup>11</sup>

One of the challenges faced by Kesennuma is that residents involved in these participatory processes have diverse opinions on tsunami sea-wall construction. For example, land owners whose land will be purchased by the government advocate sea-wall construction, while those engaged in aquacultural activity oppose such measures due to the potential adverse impact on the environment. Since only two districts of Kesennuma provide a formal forum for negotiation, many residents remain skeptical about the planning process, questioning the notion of a residents' 'consensus' as defined by the city government.<sup>12</sup>

In general, the residents interviewed described Kesennuma's public-hearing sessions as vehicles for the one-way provision of information as opposed to two-way discussion. Although staff from other municipalities were recruited to describe the details of the plan, along with hired consultants, their explanations were often insufficient to answer residents' questions and meet their requests for scientific and evidence-based evaluation of alternative reconstruction scenarios. Some residents also expressed concerns that the records of these public sessions were not made available in any form but that of the final output prepared by the external consultants. Increasingly frustrated by the perceived non-transparency of this arrangement, some residents began of their own volition to video-record sessions as a way of ensuring open documentation.

Public consultation is particularly difficult given the number of constraints at the local level. As municipal governments face perpetual staff shortages, large-scale public consultation sessions further strain their limited resources. At the same time, residents themselves have limited time to spend participating in these sessions. Speed is another issue, since local planning must follow the fiscal calendar, and national grants are extended only for a limited period of time. With regard to these pressures, one resident described the consultation process, and the time and money involved, as resembling 'hostage negotiation'. However, some residents are keen to participate actively in the reconstruction process. Local business leaders have been vociferous over the past year and a half about their willingness to help the municipal government with designing and planning reconstruction projects. These leaders feel that while government planners are generally skilled in land-use planning, most lack know-how in terms of designing cost-effective buildings that cater to the particular needs of users. In short, members of the private sector feel that they can complement the city's reconstruction planning in such areas as user experience. However, the city has thus far remained reluctant to collaborate with local businesses in this regard.

At the time of interview in January 2013, the city had yet to agree on a detailed land-use plan with local residents. While the government hopes for an overall agreement by the end of the 2012 fiscal year, many administrative hurdles remain. Local residents are planning to organize additional meetings to express their concerns and particularly to request proper public consultation and environmental-impact

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<sup>11</sup> The website of a study group can be found at: <http://seawall.info/>.

<sup>12</sup> Kesennuma's Naiwan and Motoyoshi Districts are the two areas in which the city government has set up consultation groups composed of local citizens, experts, etc. In other areas, non-profit organizations and university groups have been helping to facilitate local discussion in more informal settings, and to convey public opinion to the municipal government.

assessment. The prefectural government, in charge of the general process of sea-wall construction and management, maintains that the planned heights are an imperative, and that tsunami defenses must be built to protect human lives and properties.

## 5. DISCUSSION AND CONCLUSION

Interviews with local officials and stakeholders in both cities have revealed some of the common characteristics of post-disaster decision-making. Municipal governments and local communities face the ongoing problems of institutional flexibility, lack of manpower, and barriers to public-private collaboration and public consultation. Some of the observations made on reconstruction planning and implementation in both cities are given below.

First, both municipalities faced difficulties due to their multi-layered governmental structure, which requires the municipal government to operate within a set of institutional and resource-based constraints. When detailed planning has been carried out at the municipal level in both Miyako and Kesenuma, the city planners have closely followed the guidelines provided by the national and prefectural governments. The relationships between national, prefectural and municipal governments are both complementary and constraining. For example, the national government's decision to take a more hands-on approach to damage assessment has helped local governments to plan reconstruction projects. However, some of the national-level guidelines jar with the on-the-ground reality, creating confusion and delaying project implementation. In addition, while municipal governments must coordinate their efforts with those of higher levels of government, they must also be sensitive to residents' concerns, and this dual obligation further complicates the decision-making process. Within this combined structure of bottom-up and top-down decision-making, observation thus far suggests that neither of the cities has done particularly well at involving citizens in the decision-making process.

Second, lack of manpower and time pressure were frequently identified to delay the implementation of reconstruction projects in both cities. The lack of skilled labor was cited as the primary reason for their inability to carry out many of the proposed projects, despite the availability of funding. In both cities, the basic reconstruction plans had to be drafted by a mere handful of individuals, and completed within six months of the disaster. Public engagement was limited to a few questionnaires and public commentary sessions. Furthermore, even though both cities hired a large number of external consultants, convoluted regulatory processes also hindered swift project implementation. To address these limitations, it may prove useful to mobilize community resources, including private sector know-how, and to take on board citizens' input. However, municipal governments have generally remained resistant to the idea of community engagement, as in the case of Kesenuma.

Third, regardless of the presence of a formal *machizukuri* system, it has been difficult to incorporate citizens' voices into the decision-making process in both cities. Civil participation in the form of *machizukuri* planning is a new development; and because the disaster-hit areas had little or no prior experience of the system, it has proven difficult to ensure a productive exchange of ideas. In addition to the general lack of effective participation, institutional barriers and time constraints also hinder public participation: it is difficult to incorporate local needs, for example, when project funding is determined in a top-down manner. Also, the lack of experienced facilitators meant that public meetings were rarely used productively: they were either a mere vehicle for information delivery, or else promised citizens too much too early. In both cases, they failed to serve as an informed forum for discussion. It is important to note that both Miyako and Kesenuma benefit from tightly knit communities, whose members have acted of their own volition to help each other and educate themselves as to the reconstruction process. They are thus the intangible 'asset' that makes these communities resilient, and formal institutions should be made more flexible in order to incorporate this productive local input.

In the years to come, the Tohoku region will face tough challenges due to its aging and declining population. While locals hope that the range of incentives offered to the region will serve to stimulate its economy, further aging and population decline are inevitable, according to existing demographic trends. It is thus a matter of debate as to whether or not excessive national subsidies should be extended to these affected communities (Ubaura 2014). After all, recovery and reconstruction may be measured in a number of matrices: reflecting the general cultural preference for bigger over smaller, for example, there is a tendency to prioritize massive infrastructural reconstruction and more symbolic projects in the case of large-scale disasters. However, on close examination of the livability and sustainability of these rural communities in Tohoku, it is clear that bigger may not necessarily be better, and that social capital and other intangible qualities that make communities resilient deserve more attention. If Tohoku is to serve as a model for future reconstruction in Japan and beyond, its leaders must pay closer attention to these intangible assets and use them productively to ensure the successful and sustainable recovery of afflicted communities.

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### **Appendix 1: A list of interviews conducted for this study**

January 18<sup>th</sup> 2013

- An interview with local planners and disaster management officers at Miyako-City.

January 20<sup>th</sup> 2013

- An interview with community volunteer leaders at the Japan National Council of Social Welfare, Miyako-City branch.
- An interview with neighborhood association leaders at the Kuwagasaki district, Miyako-City.

January 21<sup>st</sup> 2013

- An interview with leaders of an local community organization “Bochotei wo Benkyo Suru Kai.”
- An interview with first responders, Kesenuma City.

January 22<sup>nd</sup> 2013

- An interview with local planners at Kesenuma City.