

Chapter 2

Post-3.11 Reconstruction, an Uneasy Mission

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2.1 Introduction

Six years have elapsed since the Great East Japan Earthquake struck the country's Tohoku region on 11 March 2011. A variety of projects are under way for the reconstruction of the disaster-affected area. The government declared the five-year period from 2011 until the end of March 2016 as the intensive reconstruction period, and is pouring considerable effort into the pillars of its reconstruction efforts, including support for survivors, restoration of public infrastructure, housing reconstruction and community development, reviving industry and livelihoods, revitalizing and reconstructing Fukushima and creation of a “New Tohoku” (http://www.reconstruction.go.jp/english/topics/Progress_to_date/pdf/201608_process_and_prospects.pdf). Over the course of five years, expenditures included 10 trillion yen for housing reconstruction and community development, 4.1 trillion yen for reviving industry and livelihoods, 2.1 trillion yen for health and living support for survivors, and 1.6 trillion for reconstruction and revitalization from the nuclear accident. The rebuilding of houses and reconstruction of towns and communities is being advanced through three approaches: independent reconstruction of housing, group relocation for disaster prevention, and disaster public housing improvement. As of January 2016, 49% of the approximately 30,000 units disaster-resilient public housing were completed, 32% of the approximately 20,400 units of new housing by independent reconstruction were completed, and

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restoration of 2308 schools was for 98% completed. Social infrastructure and seawall reconstruction was for 25% completed, national road reconstruction for 99%, and railway reconstruction for 93%. In industry, 74% of farmland could be planted, fishing port reconstruction was at 73%, and aquaculture facilities were 93% back in operation (Reconstruction Agency 2016).

These statistics show a steady progress in the reconstruction process. However, the delay in industrial and community recovery compared to public infrastructure progress is a concern. Even before the disaster, the region already had issues with a declining population, the aging of society, and the hollowing of industry. Through the reconstruction the government wanted to use Fukushima as a model for the revitalization of Japan. However, there is a large gap between ideal and reality. After five years, 182,000 people were still living in temporary housing. The population of 42 municipalities in the three Tohoku prefectures struck by the disaster had declined by an average of 10%, reaching the projected numbers of population levels for 2030 15 years early. Japan had seen a 140% increase in tourists nationally over five years, while the three prefectures had only reached 70% of their pre-disaster levels.

Also, the Fukushima nuclear accident left some serious challenges for reconstruction. A precondition for reconstruction is the clean-up of the nuclear accident, but there is no end in sight for removal of fuel rods, the final disposal of the reactors, and disposal of contaminated water, etc. A survey under citizens of Minamisoma City in September 2015 found that they still had profound concerns about the future, with 30% responding that they would like to live outside the district, city, and prefecture.

This disaster made people aware of the multiple threats of earthquakes, tsunamis and nuclear accidents. It is not possible to prevent a disaster in the context of the complexity of nature, although with proper approaches, it is possible to limit the extent of damage. Disaster countermeasures require an effort not only into disaster prevention but also disaster reduction. In other words, things should be done in a way that, even if a disaster occurs, recovery can be quickly, and society can recuperate as soon as possible. This is called the “resilience” approach. After the disaster, the government released its “Resilience Japan” concept and in 2012 passed the Basic Act for National Resilience Contributing to Preventing and Mitigating Disasters for Developing Resilience in the Lives of the Citizenry (www.japanese-lawtranslation.go.jp). Based upon the legislation, the national, prefectural, and municipal governments basic plans for resilience have to be formulated. However, the legislation appears to emphasize disaster countermeasures for mega-quakes in the Nankai Trough and East Nankai Trough, and no special consideration has been given to reconstruction of the Tohoku region. For survivors of the Great East Japan Earthquake, their greatest hope is to escape as soon as possible from the post-disaster disruptions and to return to a new normal life. This restoration and recovery is another aspect of resilience.

Research regarding resilience began in the 1970s (Holling 1973), and today is seen as an essential factor for sustainable society (Zolli and Healy 2012). Resilience has two dimensions: resistance to disaster, and the ability to recover. Both of these are capacities that need to be developed for a country, region, organization, or

system. In other words, first discover vulnerabilities for changes from the external environment, secondly build resistance, and then even if an incident occurs, the ability to absorb the disruption exists and limits the damage. After this adapt to environmental change, and transform to a better situation. When this is applied to disasters and reconstruction, this thinking means preparing well during normal times for the adaptation to disaster risk, absorbing the shock when a disaster occurs, then reconstruct quickly and make an effort to be stronger than before the disaster. This approach of absorbing, adapting, transforming, and thinking about change and transformation is called “resilience thinking” (Walker and Salt 2006).

A disaster is not desirable, but if the former system is damaged by a disaster, the subsequent reconstruction presents opportunities to build and increase resilience. However, restoration and recovery means taking action and they appear as a variety of short-term projects after a disaster. The capacity to recover is the capacity, which is built up from such actions, and it takes time to build this capacity. Finding a balance between the short-term and long-term is a major challenge in recovering from a disaster. Figure 2.1 summarizes these concepts.

In the figure, the vertical axis represents the living conditions (quality of life), the horizontal axis represents time, and the black dot shows the living conditions of survivors. If the disaster is severe, the decline in living conditions is significant. There are various barriers on the path to get out of that situation, and the approach to get there will depend on the vision for reconstruction. From this observation we can extract four key concepts:

- 1. The disaster itself,
- 2. The barriers to reconstruction,

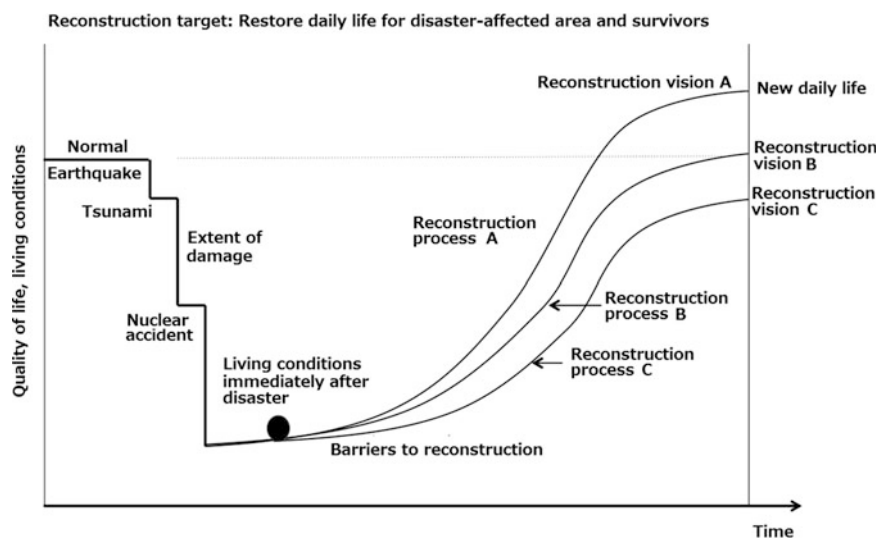


Fig. 2.1 Resilience approach to reconstruction (by author)

3. The reconstruction vision,
4. The reconstruction approach.

If the vision is clear, projects and recovery activities are easier to execute. However, the reality is complex. If the aim is to create better conditions than before the disaster (Reconstruction vision A), things will not go according to expectation unless the approach is commensurate. It is common to hear people say: 'We are making an effort but without results' and 'The idea is good but not permitted by the system'. In other words, reconstruction is not just a simple matter of technology. Japan is a mature society but did not establish clear answers to the following key questions: What is the nature of the disaster, what should be the aims of reconstruction, and what approaches are best?

With the aim of creating the locally-based capacity to recover, this chapter looks at the reconstruction from the perspective of resilience, presents approaches to promote co-creative reconstruction town planning, based on many stakeholders working together, and then considers the outcomes and challenges.

This chapter develops the concept of resilient reconstruction depicted in Fig. 2.1. Section 2.2 covers characteristics of the disaster, Sect. 2.3 covers barriers to reconstruction. This discussion lays a base for the co-creative reconstruction practice in later chapters.

2.2 Characteristics of the Great East Japan Earthquake

Some people say the reconstruction after the disaster was delayed, but perhaps the reconstruction plan was made with too much reference to the Great Hanshin Earthquake, also known as the Kobe Earthquake, which occurred January 17, 1995. In the face of the unprecedented disaster and unanticipated conditions of the Great East Japan Earthquake, some say the Japanese experience was ineffective. In the context of reconstruction and community planning, it is important to understand the character of the disaster. It is also important to recognise that the disaster conditions were different in Iwate, Miyagi and Fukushima prefectures, and that therefore, one single approach to reconstruction may not be the best.

2.2.1 Multiple Disasters from Earthquake, Tsunami and Nuclear Accident

The Great Hanshin Earthquake was an urban earthquake in a densely-populated region. An earthquake damages houses, buildings and structures, and there will be victims if they collapse. In the event of an earthquake, the local social infrastructure need to be rebuilt and lifestyles must be restored. The earthquake and tsunami of the Great East Japan Earthquake were of a size that occurs only once in a thousand

years. Survivors of the tsunami needed to choose between moving away or returning to live in the original low-lying area. After the disaster, many of them wanted to move to higher ground to avoid any future tsunami. The government and researchers encouraged a reconstruction model, which separates employment and settlements, with employment being located in low-lying areas and housing on higher land. However, it is a long process, which takes time to find resettlement sites, develop plans, prepare the urban infrastructure, and construct housing. The Sanriku coast has only a finite amount of flat land, so finding resettlement sites is not an easy task. Also, to make flat land and low-lying areas safer, the ground level of the town must be raised. For the land to settle, it takes also time. Meanwhile, areas affected by the nuclear accident face another level of difficulty. The policies differ for a radius of 10, 20, and 30 km. In places where government functions have moved away, there are still no prospects for restoring them. Decontamination work is also not making progress, so it is still difficult to make any projections.

If the challenge was only to deal with earthquakes, considerable experience exists to build seismically robust designs for buildings and structures. However, as in this case of multiple disasters, normal assumptions may not be reliable. What is true safety, and what is practicality? It is attractive to live near the coast, but tsunamis are a major risk. Higher land is safer, but there may be not enough work. A town can be better protected if the seawall level is raised, but some people feel uncomfortable when they cannot view the sea. People thought nuclear power was a clean and convenient energy source, but it turned out not to be so. This disaster resulted in profound anxiety with residents, and it will take time and effort to alleviate that anxiety.

2.2.2 Damage to a Region with a Declining Population, an Aging Society, and a Weak Industrial Base

The six prefectures in the Tohoku region account for 17.7% of Japan's land area and 7.1% of the population, but it counts for only 6.0% of the gross domestic product, or GDP (METI 2011). In terms of industry, the Sanriku coastal region has fishery product processing and shipbuilding (fishing boats), but not enough manufacturing, knowledge, and service industries that attract young people. The residents here generally were living a self-sufficient life near the sea by cultivating oysters, scallops, ascidians (sea squirts) and *wakame* seaweed, while on land they grew rice. But this changed with industrialisation and urbanisation. After the period of rapid economic growth in the twentieth century, the population in the Sanriku region was steadily declining. Many towns were dealing a low birth rate and an aging population, and facing tough fiscal challenges. The disaster was a catastrophic shock, lifting fishing boats and dropping them inland, inundating fishing ports, and smashing seawalls. Much of the infrastructure has been rebuilt, including roads and fishing ports, but workers are not returning. Young people are less

interested in fishing and farming. There are concerns that infrastructure, which was restored with big efforts may end up to be used very little. Reconstruction must not only mean restoring facilities, but a sustained socio-economic capacity should also be installed.

2.2.3 Disaster in a Time of Uncertain Economic Future

The disaster occurred after the global financial crisis of 2008, when the global economy was still unstable. The disaster interrupted supply chains, and many experts believed it would have a negative impact on the global economy. Meanwhile, some had the view that special demand driven by reconstruction would accelerate the economic recovery. The disaster resulted in enormous losses, as much as 16–22 trillion yen, but it was also seen as an opportunity, with the concentration of a considerable amount of money from financial government assistance, private sector casualty insurance, public donations, and so on. The past few years have even been referred to as a reconstruction bubble in the disaster-affected area. There is no clear social consensus, however, on where and how these enormous sums of reconstruction funds should be spent. Some have expressed the view that economic efficiency should be improved, by using reconstruction as an opportunity to select, concentrate, and place both industry and the labour force in large cities and industrial clusters. If this approach is chosen, it would mean abandoning fishing villages and small settlements. Certainly, concentration can boost efficiency. But when it comes to human beings, efficiency is not the only desirable factor to consider. Modernisation is based on the economic system. But the adverse effects of the earthquake disaster revealed weaknesses. Concentration depends on heavy and large-scale social infrastructure, and production, transport, and consumption creates enormous emissions of gases, wastewater, and waste, with negative impacts on the local and global environment and deleterious effects on sustainability of society as a whole. But sustainability of society does not mean prosperity for just one area of concentration or abundance for just one segment of the population. Also, due to its steep terrains, the Sanriku coast is perhaps not suited to be a society that prioritises efficiency. In this region, reconstruction using the conventional model that prioritises efficiency might not be the most sustainable one.

2.2.4 Natural Disaster or Man-Made Disaster?

This disaster was an earthquake that struck as an overwhelming external force, which triggered a tsunami, and resulted in the loss of a tremendous amount of life and property. This made it impossible to operate nuclear power plants, which could be considered a delicate system for modern society, resulting in enormous economic losses and social disruption. The earthquake and tsunami were unavoidable

natural disasters, but the nuclear accident was not inevitable. Investigative reports and mass media portrayed this accident as human error and concluded that this was a human-caused disaster (Asahi Shimbun 2014).

A disaster is a natural and societal incident, and results in physical and human losses. We know that nature can be violent, and that humans can make mistakes. The potential to be exposed to an undesirable incident is known as risk. But even if that risk is known, it does not mean that one can immediately take evasive action. We make decisions in the midst of constraints on time, finances, strength, and capacity. Governments implement projects based on policy, and corporations conduct business based on finance. It is not possible to completely eliminate all risks in one sweep. It is not possible to prevent a disaster from occurring tomorrow. However, it is possible to imagine a variety of scenarios occurring in day-to-day life and to limit losses. That is the significance of resilience thinking. Disaster reduction requires consideration of disaster causes and effects, and integrated consideration of impacts on human activities and the behaviour of people in disasters. Losses that occur when these things are neglected could be all referred to as man-made or human-caused disaster. Seen from this perspective, this earthquake disaster was not only the nuclear accident, but it also included many elements of human-caused disasters in many dimensions. They are too numerous to mention, but some of these are: the building of primary and middle schools on low-lying land, the lack of evacuation roads, the failure of communications and notification systems to function during a crisis, and people should not have been living on low-lying land. Modern society is built upon fragile foundations like this, and this is at the root of human-caused disasters (Beck 1992). Reconstruction must re-launch itself from reflection about those things, and establish a resilient future oriented vision.

2.3 Reconstruction Challenges

2.3.1 *Confused Visions for Reconstruction*

Soon after the disaster, the national and local governments started to formulate reconstruction plans. At the end of 2011, the affected prefectures released their respective reconstruction plans. All of them portrayed a bright future with targets for livelihood restoration, industrial reconstruction, safety and security and livability. After five years have passed, some stakeholders asked if the original plans were appropriate, and asked if they should be reconsidered (NHK 2015). The basic trend before the disaster was a declining population, but will the reconstruction process be capable of halting that trend? As suggested by Fig. 2.1, what should be the direction of reconstruction, and how far along the path can we call it reconstruction? The establishment of this vision is not easy. The resulting population and GDP might be lower than before the disaster. However, resilience is not just a matter of quantity, but can also be viewed as something that should also be

measured in terms of human happiness and level of living conditions. The Reconstruction Agency regularly issues a report on reconstruction status and challenges, Iwate Prefecture uses a reconstruction INDEX, and Miyagi Prefecture issues reconstruction reports. However, they are still nothing more than lists of individual indicators, and have not reached the point of indicating the overall direction to be headed. We still tend to measure economic activity in terms of GDP. A steady-state economy is a sustainable economy that does not have GDP growth targets (Daly 1974; Yan and Tajima 2013). In contrast to “smart growth” there is also the idea of “smart retreat” (Science Council of Japan 2011). However, steady-state economics has never been tested for a declining population.

In its *Annual Report on the Japanese Economy and Public Finance 2012*, the year after the disaster, Japan’s Cabinet Office discussed the disaster and how the economic system should be (Cabinet Office 2012). It raised the idea of ‘the quality of development’ and asserted that households, corporations and society need to be more aware of ‘tail risks’ that have serious impacts but low probability of occurring, such as earthquakes and global financial crises, and that it is necessary to have resilient lifestyle foundations, corporate management, and a global economy. However, other than proposing the use of renewable energy, it made very few specific recommendations for broad and diverse reconstruction of disaster-affected areas. Nevertheless, it did ask questions that were not asked at the time of the Kobe Earthquake. Should reconstruction give a priority to efficiency in terms of the traditional economic system? Or should reconstruction emphasise the sustainability and quality of society and increase its resilience. Ultimately, resilience means responding with the capacity to spare, and that it is in itself incompatible with efficiency.

The 2011 disaster reminded people of the community and human connections and bonds in the Tohoku region. In the restoration as well, there is a tone of thinking about raising the level of happiness in terms of the local community (a given collection of people) rather than the individual (Tohoku Regional Advancement Centre 2012). However, an elevation of the level of happiness is something that is fostered over time. It cannot be synchronized with reconstruction targets that must be achieved in a short period of time. The question of how to close this gap is a major issue.

2.3.2 Decline of the Community

When it comes to risk, humans tend to have a strong interest in their surrounding area and what they can directly see. People will pay attention to family health insurance and employment insurance, but it is less common for people to take action proactively regarding the risks and future for the town as a whole. After the 2011 disaster, helping hands arrived from around the country, and connections spread out, and ‘Resilience Japan’ moved the world. But that was during a brief disaster utopia period (Solnit 2010). As the situation settled down, people became

more distant from the activities, and communication declined. There was not necessarily a big opportunity for an inclusive discussion about the preferable direction of reconstruction. Also, discussions on “soft” (non-physical) dimensions, cultural, medium and long-term issues do not easily find their way to the government’s “menu” of topics to address.

The Tohoku region was originally made up of hamlets and towns in an environment characterized by a ria coast, a coastline with multiple parallel inlets separated by prominent ridges extending inland, and with a high level of local self-sufficiency. A number of hamlets were combined to become towns, which the fishermen, craftsmen, and farmers shared. The individual hamlets had their own fire brigades, flood brigades, youth associations, chambers of commerce, housewives’ groups, and so on, and communities were lively with activity. After Japan’s post-war period of rapid economic growth, young people left, the local area shifted from primary industries to manufacturing and service industries, and organizations like this with local ties to the region dissolved.

Municipal governments affected by the disaster in Fukushima have been fragmented in a multi-layered way due to the tsunami and nuclear accident. The damage differed depending on the area. The conditions for reconstruction could differ on opposite sides of a road, for example in terms of tsunami flooding risk zone versus a housing restricted zone. So it was difficult for people could speak with one voice. In other places the issues were delayed in nuclear decontamination work, damage to brand reputation, or a decline in employment. Elsewhere, there could be concerns about future employment and health. It was not rare to see families be torn apart, for example, with the elderly members remaining, children being sent away to school, and parents going elsewhere to work (Zhang et al. 2014).

In this context, questions are being asked about what it means to emphasise the local community, and what will become of the community due to reconstruction.

2.3.3 Project-Based Reconstruction

Immediately after the disaster, the talks about the reconstruction raised expectations, as evidenced by slogans, such as ‘Reconstruction is a re-launch from zero’ and ‘The future of Japan will start in Tohoku’. The year after the disaster, the government launched the Reconstruction Agency, in an effort to avoid the adverse effects of a vertical-splintered bureaucracy. However, the reality was that the budgets were formulated by the traditional government structure, with ministry jurisdictions. For example, for house reconstruction it was the Ministry of Land, Infrastructure, Transport and Tourism in charge, for decontamination the Ministry of the Environment, and for care of survivors, the Ministry of Health, Labour and Welfare. Even though reconstruction and community planning requires an integrated approach, the budgets were still isolated, on a project-by-project basis. As a result, gaps appear between projects (Akanuma 2014).

While terms like ‘creative reconstruction’ were used bandied about, each of the projects tended to follow conventional approaches and not take innovative steps. House reconstruction simply followed the standard government approach of public-managed disaster reconstruction, and only the minimum standards of disaster prevention design could be applied. The fishing port projects were nothing more than ‘restoration’ of damaged facilities, and coastal projects tended to be nothing but building ‘seawalls’. Ideas that should have been considered, such as ‘livelihood restoration’, ‘industrial recovery’, and ‘environmental harmony’, did not apply. With these kinds of project-based budgets and project structure in municipal governments, the attention goes toward seeking how to acquire the budget and work proceeds in the usual way, without a complete picture of the future. For example, every town has a reconstruction plan, but in every one of them, the roads, facilities, and houses are planned simply in abstract terms. In many cases, when objectively reviewed later, people question whether that approach was good enough. If someone were to raise questions about how reconstruction could reflect a town’s identity, the resources of the land, or incorporate peoples’ wishes, it was rare to be seriously considered. Instead, the municipal governments, which should speak for the local people, were under the jurisdiction or authority of the national government or the prefecture, so they did not want to take responsibility. Unlike the model that propelled Japan into a developed country in post-war reforms, a model of creative reconstruction to put Japan on the path of sustainable development has not yet been found (Mikuriya 2016).

2.3.4 Roles of Government, Private Sector and Citizens

The disaster damaged natural and societal systems, so restoration has to be done based on new environmental conditions. For restoration and reconstruction after the disaster, different things are needed depending on the phase. To respond to this situation, new information and methods are needed. When people are asked what changed in Tohoku with the disaster, many will say that it was the flow of people and information. After the disaster, civic participation was active in every town. Non-profit organisations and university students flowed into the region, and experienced the disaster together with the people, spoke about hopes for reconstruction and prepared plans. The government, as well, paid attention not only to hardware, the physical construction, but also to software. About 20% of the reconstruction funds for ‘New Tohoku’ were allocated to non-physical projects. The majority of those funds were allocated to reconstruction projects done by citizens and NPO (Non-Profit Organisation) stakeholders. The projects covered a broad ranges of areas, such as renewable energy, care for people living in temporary housing and tourism promotion. In response, many small and medium-sized organisations started, including NPO’s and general incorporated associations, a type of government designation for registered organisations. Immediately after the

disaster, private sector corporations were also highly visible and companies around the country showed their desire to participate in reconstruction projects.

However, it should be noted that the expectations of corporations, NPO's and universities differ from each other, so it is not so simple for all to come together in a unified way for a creative reconstruction. After the disaster, a wave of helpers and participants rushed into the area and in some cases the locals were overwhelmed. The external NPO's, universities and corporations did not adequately grasp the local needs, and had a tendency to impose their own ideas. In that situation, in Iwate Prefecture, Iwate University played a central role and the government created a liaison offices and contact points. In Kesennuma City (Miyagi Prefecture) as well and universities played an active role. Forty universities got involved, created a network and supported the reconstruction. NPO's and general associations also played a role in providing intermediary support. However, as activities shifted toward reconstruction, the needs became more diverse, making it more difficult for high quality assistance to be provided by people serving as volunteers. At this stage of reconstruction, it is important to have frameworks in place that can coordinate internal and external collaboration.

2.4 Conclusions

The Great East Japan Earthquake of 2011 was a multiple disaster that occurred in the midst of a complex domestic and international situation. For reconstruction it is necessary to provide urgent assistance so that survivors can quickly free themselves from the conditions of the disaster, and also to balance those needs with a future plan that considers sustainability. As approaches for that, we often see government-directed citizen-participation models, but in the race against time, reconstruction often does not advance the way people may have expected. Meanwhile, with the reconstruction of the 2011 disaster, many experts went into the local area and cooperating on reconstruction with diverse stakeholders, including universities, governments, citizens, and companies. In such a context, the government, citizens, and experts, thought together about the future, without distinction or hierarchy, and from that situation the potential was initiated for plans and design. This chapter refers to that approach as 'co-creative reconstruction and community planning'. In this chapter the authors describe their experiences of having participated in such processes in Minamisoma City and Kesennuma City, and explain the details of these approaches.

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