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The Great East Japan Earthquake : lessons on reconstruction from Japan's past earthquakes

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Summary

1. There are various proposals regarding reconstruction after the Great East Japan Earthquake on March 11, 2011. However, it appears that discussions are focused primarily upon the financial resources to fund the recovery, without much heed of post–earthquake reconstruction processes in the past. It is necessary to verify the reconstruction plans and subsequent recovery processes after the Great Hanshin–Awaji Earthquake on January 17, 1995 which wreaked massive damages and the Hokkaido–Nansei–oki Earthquake (offshore of southwestern Hokkaido Island) on July 12, 1993 which possesses similarities with the Great East Japan Earthquake in terms of tsunami damages.
2. The Great Hanshin–Awaji Earthquake
   At the time of the Great Hanshin–Awaji Earthquake, when large urban areas were destroyed, the restoration of infrastructure served to facilitate the reconstruction process. Given the large number of people working in tertiary industries providing services to individuals, the gradual return of residents along with the progress of infrastructure development led to industrial recovery mainly in the tertiary industry. Even so, reconstruction has been an arduous process despite the input of colossal funds in certain areas such as Nagata–ku of Kobe–shi (Kobe City) because of difficulties faced by industries in the area from before the earthquake.
3. The Hokkaido–Nansei–oki Earthquake
   Even before the earthquake, demographic decline was an ongoing issue for Okushiri–cho, the principal area hit by the Hokkaido–Nansei–oki Earthquake. Given its sparse population, Okushiri–cho was able to receive abundant funds for recovery (JPY20 million/resident) and reconstruction of homes (JPY7 million/household). However, Okushiri–cho is still far from a state of “recovery”, with the rate of population decline among the highest in Japan.
4. Population decline and structural socio–economic problems were

pressing issues in the area damaged by the Great East Japan Earthquake. In the case of the Great Hanshin–Awaji Earthquake and the Hokkaido–Nansei–oki Earthquake, reconstruction plans were drafted in a matter of months after the disasters. However, it is clear from subsequent developments that reconstruction of areas possessing structural problems is a difficult process even with the input of massive reconstruction funds when the reconstruction plan is drafted in a hasty manner. Given the demographic decline and structural problems in the area hit by the Great East Japan Earthquake, support toward the livelihood of the residents suffering damages is a matter of great urgency. Nevertheless, careful discussions are necessary for reconstruction. Furthermore, to resolve the long–standing issues held by the disaster–struck region and to focus upon sustainable regional development, it would be necessary to mobilize human, physical and financial resources from outside the disaster–struck area – in particular by seeking a wide range of ideas from private–sector corporations – and to be prepared to transform the disaster – struck area into a new community.

1. Introduction

A stunning array of proposals are being made with respect to Japan's reconstruction in the aftermath of the Great East Japan Earthquake on March 11, 2011. "Let a hundred flowers bloom and a hundred schools of thought contend" would be an apt quotation to describe the situation. However, most of these reconstruction plans are woefully short on specifics. While a large number of experts and organizations call for "disaster–resistant urban development", "compact city" and "environment–friendly urban development", these ideas only capture one aspect of urban development. For example, being disaster–proof is not enough to make a city work. For a city to

truly work, a grand design possessing specifics on the various functions of a city is necessary.

Even so, there are lively discussions on financial resources to fund the reconstruction without such a grand design. Furthermore, there is even a tacit understanding that the total cost for reconstruction should be somewhere in the vicinity of JPY10 trillion to JPY20 trillion. This is based upon the cost for restoration and reconstruction after the Great Hanshin–Awaji Earthquake which totaled JPY16.3 trillion. In terms of the total amount of damages, the Great East Japan Earthquake resulted in the largest amount of damages (JPY16 trillion to JPY25 trillion according to government estimates), followed by the Great Hanshin–Awaji Earthquake (JPY10 trillion according to government estimates).

However, one needs to question whether it is appropriate to model the restoration and reconstruction after the Great East Japan Earthquake on the basis of the Great Hanshin–Awaji Earthquake. A thorough understanding of the differences in characteristics between the areas damaged by the Great East Japan Earthquake and the urban areas hit by the Great Hanshin–Awaji Earthquake is necessary in order to draft a plan on reconstruction. Thus, this paper also looks at the Hokkaido–Nansei–oki Earthquake, given its similarities with the Great East Japan Earthquake in terms of tsunami damages. As the first step, this paper will provide a comparison of the demographic and industrial characteristics of each of the three areas as the premise to the reconstruction after the Great East Japan Earthquake. In the final step, this paper will examine what is best for the reconstruction after the Great East Japan Earthquake by drawing upon the lessons learned from the reconstruction after the Great Hanshin–Awaji Earthquake and the Hokkaido–Nansei–oki Earthquake.

2. The demographic and industrial characteristics of the three disaster–struck areas

By comparing the main areas damaged by the Great East Japan Earthquake, the Great Hanshin–Awaji Earthquake and the Hokkaido–Nansei–oki Earthquake, let us ascertain the issues which must be considered in the recovery process.

(1) Large urban areas with a growing population and areas facing population decline

a. The Great Hanshin–Awaji Earthquake: large urban areas were damaged

The damages stemming from the Great Hanshin–Awaji Earthquake in January 1995 were concentrated in the cities of Kobe–shi, Nishinomiya–shi and Ashiya–shi which are all large urban areas. Prior to the earthquake, the demographic density of these three cities (1990) (2,970 persons/sq. km) was among the highest in Japan. Furthermore, the population of the three cities grew 3.8% during the period from 1985 to 1990 before the earthquake.

Since the epicenter of the Great Hanshin–Awaji Earthquake was close to urban areas (a so–called "epicentral earthquake"), a large part of the damage was comprised of the collapse of buildings and its harm to human lives. It should be noted that the relatively small number of major earthquakes in the Kansai area in recent history had engendered a low level of awareness toward earthquake–resistance among its residents. Hence, the damages were focused upon wooden dwellings, buildings and public transportation infrastructure which were not sufficiently earthquake–resistant. Anecdotal evidence that houses located side by side in the same area faced contrasting destinies – some collapsed while others were unscathed – indicates that the earthquake did not necessarily

damage the entire area of Kobe–shi, Nishinomiya–shi and Ashiya–shi. In fact, the maximum number of evacuees in shelters in the three cities combined totaled approximately 300 thousand, which was only 1% of the total population of the three cities. In other words, only part of a growing metropolis was damaged in the Great Hanshin–Awaji Earthquake.

b. The Hokkaido–Nansei–oki Earthquake: much of Okushiri–cho, a progressively ageing community, suffered damages

The Hokkaido–Nansei–oki Earthquake, which occurred in July 1993, caused massive damage upon the island of Okushiri off the coast of Hokkaido. In "Okushiri–cho" (Okushiri Town), the sole local government of Okushiri Island, the demographic density in 1990 before the disaster was 32 persons/square kilometer. Moreover, during the period from 1985 to 1990, the population of Okushiri–cho fell a sharp 10%. As the foregoing indicates, Okushiri–cho was a region facing rapid depopulation.

Much of the damage to Okushiri–cho was wreaked by tsunami. As the Great East Japan Earthquake has shown, tsunamis are capable of damaging large parts of a community. Okushiri–cho can be divided into the Okushiri–chiku (Okushiri region) in the central part and the Aonae–chiku (Aonae region) in the southern part of the island. The tsunami destroyed most of the Aonae region. The fact that a tsunami destroyed an entire town was a great shock to the people of Japan. The devastation had such an immense psychological impact that it is said that the Hokkaido–Nansei–oki Earthquake served as a watershed with respect to the perception on tsunamis among the people of Japan. The maximum number of evacuees climbed to approximately 2,000, which is more or less 40% of the population at the time (approximately 4,700). In summary, the Hokkaido–Nansei–oki Earthquake damaged much of a rapidly depopulating area.

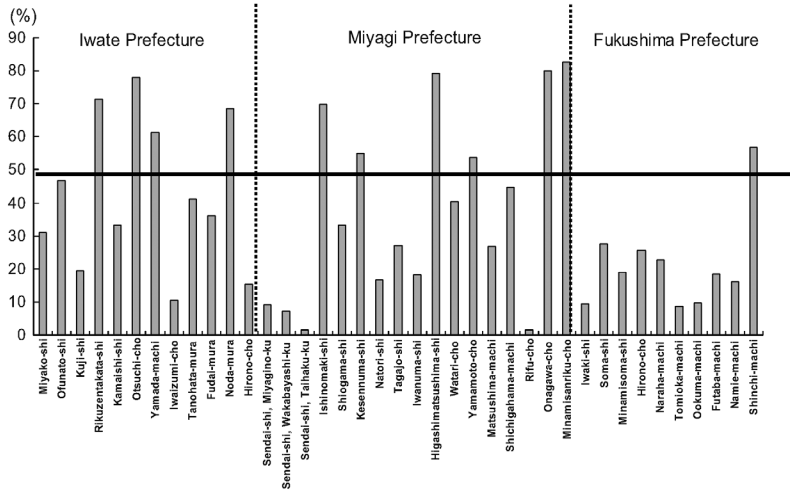
c. The Great East Japan Earthquake: the damage–struck areas possess many similarities with Okushiri–cho

Much of the damage caused by the Great East Japan Earthquake stems from the tsunami. The damage is concentrated mainly in the prefectures of Iwate, Miyagi and Fukushima. The population density of these three prefectures combined is a relatively low 157 persons/square kilometer. Furthermore, prior to the earthquake, the three prefectures had recorded a 2.2% population decline during the period from 2005 to 2010.

Approximately 520 thousand people lived in the tsunami–ravaged areas of these three prefectures – roughly equivalent to 10% of the total population of the three prefectures combined. At first sight, this does not seem to be such a large proportion. However, a closer look on a municipality–basis produces a very different picture. **Chart 1** illustrates that many municipalities suffered tsunami damages to large parts of their communities. For example, there are as many as 11 municipalities where more than 50% of their residents lived in tsunami–stuck areas. The highest is Minamisanriku–cho of Miyagi Prefecture where the percentage is over 80%. Moreover, the population in such tsunami–struck areas totals approximately 270 thousand in the 11 municipalities combined. This is roughly half the population living in the tsunami–struck areas of the Iwate, Miyagi and Fukushima prefectures.

Furthermore, a large number of municipalities are placed entirely under voluntary evacuation orders, meaning that the whole area is essentially disaster–stricken for its residents. In summary, the Great East Japan Earthquake caused damages to many of the residents of a sparsely populated and rapidly ageing region. From this perspective, there are numerous similarities between the areas struck by the Great East Japan Earthquake and Okushiri–cho of the Hokkaido–Nansei–oki Earthquake.

Chart 1: Percentage of the population subject to tsunami damages



Source: Ministry of Internal Affairs and Communications, *Higashi-nihon taiheiyogan chiiki no deta oyobi hisai-kanren deta* (East Japan Pacific coast data and damage-related data).

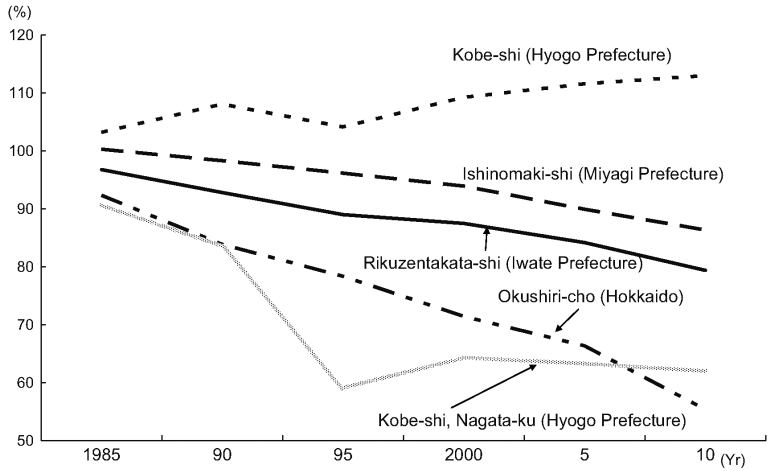
(2) The existence of industries possessing structural problems

More than 70% of the population of the cities of Kobe–shi, Nishinomiya–shi and Ashiya–shi worked in the tertiary industry, mainly in personal services. Thus, it was foreseeable that once infrastructure restoration progressed, residents would gradually return and that the industrial sector would revive, driven mainly by the tertiary industry.

However, areas such as Nagata–ku of Kobe–shi – faced with demographic decline even before the earthquake – were compounded with structural problems such as the rise of competition with overseas manufacturers in its synthetic leather shoes (referred to as “chemical shoes” in Japan) industry and the decline of its main shopping streets as a result of the outflow of consumption to neighboring areas.

In 1990, prior to the Hokkaido–Nansei–oki Earthquake, a large part of Okushiri–cho's labor force worked in the fisheries sector (19%) and construction sector (16%), both possessing problems in terms of growth potential. Of the major disaster–struck areas of the Great East Japan Earthquake, a look at the cities of Rikuzentakata–shi of Iwate Prefecture and Ishinomaki–shi of Miyagi Prefecture shows that their population has been declining since the 1980s (**Chart 2**) and that they have a large percentage of their population working in the primary industry – 16% and 10% respectively. Both of these cities possess characteristics which are close to the rapidly ageing town of Okushiri–cho.

Chart 2: Demographic trends of major disaster–struck areas



Notes: 1. The population in 1980 is benchmarked at 100. Data on present administrative divisions is retraced to the past.

Sources: Ministry of Internal Affairs and Communications, *Population Census* (every 5 years), *Preliminary Counts of the 2010 Population Census of Japan.*

3. Characteristics of reconstruction plans of disaster–struck areas in the past

Next, let us look at the reconstruction plans and subsequent recovery processes after the Great Hanshin–Awaji Earthquake and Hokkaido–Nansei–oki Earthquake.

(1) The Great Hanshin–Awaji Earthquake: problems in the development of infrastructure and industrial promotion

The "*Toshi–saisei–senryaku–sakutei–kaigi*" (conference on urban renewal strategy) – comprised of experts and mayors of disaster–struck municipalities, was established in a mere two weeks after the Great Hanshin–Awaji Earthquake in January 1995. By the end of March, the conference had drawn up a draft strategic reconstruction plan, which served as the basis of the Hyogo Prefecture's "*Hanshin–Awaji–shinsai–fukko–keikaku*" (the Hanshin–Awaji earthquake reconstruction plan) in July. The plan was drawn up, most likely, in time for the FY1996 national budget.

The costs for restoration and reconstruction after the Great Hanshin–Awaji Earthquake was JPY16.3 trillion. Hyogo Prefecture, the main disaster–struck area, had a population of 5.41 million prior to the earthquake (1990). Simple arithmetic, the division of the reconstruction and restoration costs by the population, results in a sum of JPY3 million/person. Among the principal use of the funds were items such as the follows (all sums are approximations): JPY9.83 trillion for urban development and urban infrastructure development, JPY2.95 trillion for industrial reconstruction (for the purpose of nurturing local industries and the creation of new industries such as the medical and healthcare industries), and JPY2.85 trillion for health, medical care, welfare and public housing development.

Despite the historical sum of donations exceeding JPY180 billion, the amount received by each disaster victim was a very small sum

due to the large number of victims. Subject to income limitations, a sum around JPY100 thousand to JPY300 thousand was paid per disaster–struck household to cover housing–related costs. In view of such a small direct payment to victims, the Hyogo Prefecture established a JPY900 billion reconstruction fund from which interest–free loans – not payments – were provided to disaster victims to cover part of their livelihood and housing costs.

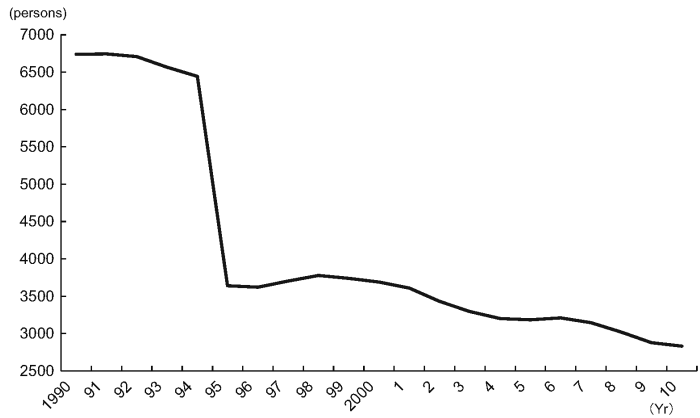
The actual state of damages at the time of the Great Hanshin–Awaji Earthquake was quite different from the image of destruction conveyed by media reports. In fact, a large number of residential buildings were largely unscathed, much of the city was spared of destruction, and a considerable portion of its residents and companies were wealthy. Given these characteristics, many of the disaster–struck areas recovered along with the restoration of infrastructure such as public transportation and water/sewerage systems. On the other hand, some of the public works for reconstruction – so–called *hakomono* (concrete construction of structures such as bridges) development and industrial development have had dubious effect.

In particular, the redevelopment project of the fire–ravaged Nagata–ku – which gathered widespread media attention – was deemed as a symbol of reconstruction. The project turned out to be the largest of its kind at the time with the injection of a massive amount of reconstruction funds. The project cost for the station–front high rise tower and shopping area totaled JPY271 billion. The fact that this is equivalent to the cost of development of the Roppongi Hills project in Tokyo (including land purchasing costs) may provide a sense of perspective. Even though the Nagata–ku project is still ongoing, the existence of vacant spaces gives the impression of the lack of popularity. Half of the commercial lots remain unsold or unrented (note 1). At present, approximately 30 blocks of the 40 blocks planned have been completed. Despite the tepid popularity of the area, there are no plans to make changes to the construction of the remaining blocks.

Nagata–ku of Kobe is also known for its synthetic leather shoes

("chemical shoes") industry. Prior to the earthquake in 1990, the percentage of workers in the manufacturing sector was the highest (27%) among the wards (*ku*) of city of Kobe (Kobe–shi). Thus, various forms of support were provided on the basis of the belief that the revival of the local chemical shoes industry was indispensable for the reconstruction of Nagata–ku. In particular, the construction of "collective factories" (note 2) which house a number of factories in a single structure was one of Nagata–ku's characteristics. Generous assistance was provided in the development process styled upon residential housing; starting first with "temporary factories" stepping up to "reconstruction support factories". Even so, the state of the chemical shoes industry is still far from recovery, since it is losing ground in its competition with developing countries (**Chart 3**).

Chart 3: Trends in number of workers in the "chemical shoes" industry



Notes: Corporate enterprises which are members of the Japan Chemical Shoes Industrial Association (data as of the end of December every year). Many of the members are located in Nagata-ku.
Source: Japan Chemical Shoes Industrial Association.

As shown above, the disaster–struck areas in the Great Hanshin–Awaji Earthquake were mostly urban areas. Even though restoration led to recovery, the input of massive funds into so–called *hakomono* developments (infrastructure investment involving concrete

construction of structures such as bridges) have failed to produce their desired effect in regions such as Nagata–ku which were facing problems such as the lackluster growth of its principal local industry and the loss of vitality of its shopping districts due to the outflow of consumption to neighboring areas. Although the population of Nagata–ku initially grew slightly after the earthquake, it has taken a downturn again, failing to achieve a V–shaped recovery as in other parts of Kobe–shi. Moreover, Nagata–ku's population as of 2010 is 70% of what it was in 1980, hovering at a level close to the ageing town of Okushiri–cho (**Chart 2**).

In hastily planned *hakomono* infrastructure projects, there is seldom enough prior discussion on its "soft" aspects such as its usage. Industrial development must not be based upon short–term perspectives. Admittedly, resentment runs deep among residents who were unable to partake in the planning process. In contrast to the need for quick action toward infrastructure restoration in the case of earthquake disasters in urban areas, this approach does not apply to the preparation of reconstruction plans which determine the future of the region. The reconstruction plan should have been drafted by spending a certain amount of time, holding discussions on various ideas from all perspectives on the future of the region through the participation of various interested parties.

(2) The Hokkaido–Nansei–oki Earthquake: reluctance to face the region's problems and dependence upon massive public funds

The drafting process of the reconstruction plan for Okushiri–cho reveals that the "*Hokkaido–Nansei–oki–Jishin Saigai–fukko–taisaku Iinkai*" (Committee for disaster reconstruction for the Hokkaido–Nansei–oki Earthquake) was established within the Hokkaido government in July – only a month after the earthquake. The Hokkaido government presented Okushiri–cho with a draft reconstruction plan in September, followed by a final reconstruction plan in December, which was approved by Okushiri–cho.

In the Hokkaido–Nansei–oki Earthquake, the restoration and reconstruction funds totaled approximately JPY86 billion, which was several dozen times the annual budget (JPY4 billion to JPY5 billion) of Okushiri–cho (the sole municipality of the island of Okushiri). Since Okushiri–cho's population at the time was approximately 4,700, this means that a huge sum of JPY20 million/person was injected as restoration and reconstruction funds. The funds were used mainly for the maintenance of coastal levees (JPY35 billion) and "*bokaikyo*" (structures elevating coastal areas for the purpose of providing temporary refuge from tsunamis) (JPY2.6 billion), public works project to rebuild fishing villages ("*Gyogyo shuraku kankyo seibi jigyo*") (JPY2.4 billion), public works project to convert tsunami–hit residential zones into parks and residential land development on high lands (JPY0.7 billion), and the construction of the "*Okushiri–to tsunami–kan*" to serve as monument for the disaster (JPY1.1 billion).

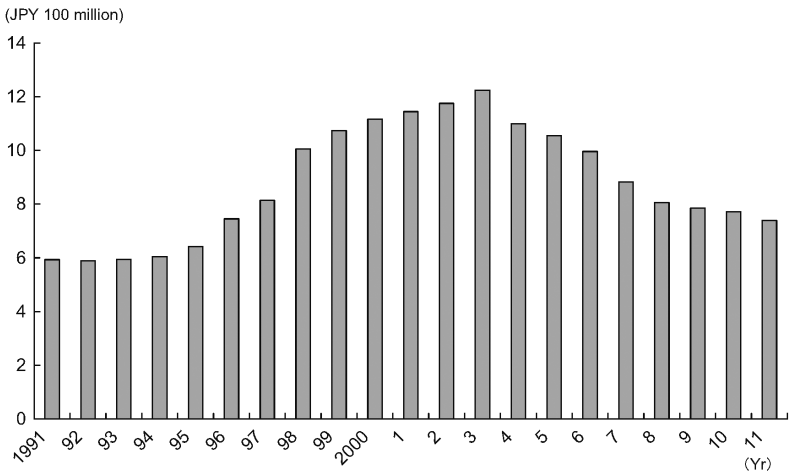
Furthermore, the Hokkaido–Nansei–oki Earthquake is characterized by the huge amount of monetary donations totaling approximately JPY19 billion. This was used to provide JPY7 million per household as part of residential purchase costs. The benefits provided toward the disaster victims of Okushiri–cho were considerably larger than the victims of the Great Hanshin–Awaji Earthquake who only received a small sum of payments and loans.

Even so, the population of Okushiri–cho is continuing to decline despite such generous reconstruction funds. During the period from 2005 to 2010, the rate of demographic decline of Okushiri–cho was among the worst in Japan at –17%. Despite public works projects such as the aforementioned "*bokaikyo*" (structures elevating coastal areas for the purpose of providing temporary refuge from tsunamis) and the "*Gyogyo shuraku kankyo seibi jigyo*" (public works project to rebuild fishing villages to revive the fisheries industry) which were deemed the key to reconstruction, the number of workers in the fisheries industry almost halved from 418 in 1990 prior to the earthquake and tsunami disaster to 196 in 2005.

The massive public spending on infrastructure development is leading to huge municipal debt servicing costs as well as costs for

management, maintenance and repair for Okushiri–cho, thus serving as substantial burdens upon its remaining residents. For example, Okushiri–cho's municipal debt servicing costs have grown sharply from the mid–1990s along with the full–fledged repayment of debt (**Chart 4**). Over the years, Okushiri–cho's municipal debt servicing costs have been several times its local taxes which are the equivalent of a local government's "earnings". Even so, the amount of local government bonds issued and outstanding has increased from approximately JPY4 billion prior to the earthquake in FY1992 to approximately JPY6 billion in FY2009. Furthermore, the "full–fledged" payments of maintenance and repair costs will only start from now. The deterioration of fiscal conditions amid the sharp demographic decline is leading Okushiri–cho into dire straits.

Chart 4: Trends in Okushiri–cho's municipal debt servicing costs



Source: Okushiri-cho, "*Okushiri-cho ni okeru zaisei no suiihyo*" 2009 (Fiscal trends in Okushiri-cho).

This stems most likely from Okushiri–cho's absence in the drafting process of its reconstruction plan, leaving its compilation in the hands of the Hokkaido government. Given the paucity of industries with growth potential and a declining population even before the earthquake, Okushiri–cho possessed a structural problem

of the exodus of its youth population. Furthermore, the hasty formulation of a reconstruction plan without the participation of the parties involved provides little hope for the effective use of the massive restoration and reconstruction funds.

In its "*Okushiri–cho gyozaisei kaikaku jikko puran*" (Okushiri–cho administrative and fiscal reform implementation plan) drawn up in 2006, Okushiri–cho admitted quite frankly as follows that it had erred in its administrative and fiscal management. "Amid the nationwide deterioration of local government finances, the town government (of Okushiri–cho) is facing a serious financial crisis on the brink of fiscal collapse (categorized as a "*junyo zaisei saiken dantai*" (note 3)) due to the decline of tax revenues resulting from the prolonged stagnation of the economy and the issuance of massive local government bonds in response to the central government's economic stimulus measures. The condition stems from the lack of awareness on the need for administrative streamlining in fiscal management after the collapse of Japan's bubble economy, the failure to curb ballooning public debt due to the acceptance of a wide range of needs among residents, and the issuance of massive local government bonds due to public works related to the Hokkaido–Nansei–oki Earthquake of 1993." (Note 3 by MHRI) The foregoing provides a glimpse of Okushiri–cho's acceptance of a reconstruction scheme using massive public funds following in the steps of loose local fiscal management during the bubble era.

4. Lessons on reconstruction from past earthquake disasters

The four points below may be cited as lessons from the reconstruction after the Great Hanshin–Awaji Earthquake and the Hokkaido–Nansei–oki Earthquake.

(1) Haste is not always beneficial in drafting reconstruction plans

Demographic trends would provide one measure to gauge the success or failure of the reconstruction following the two earthquakes in the past. In contrast to the V–shaped demographic recovery of Nishinomiya–shi and Ashiya–shi, Okushiri–cho suffers from depopulation as indicated by its record high rate of population decline during the period from 2005 to 2010 (**Chart 2**). That said, note that in the disaster–struck areas of the Great Hanshin–Awaji Earthquake, the population is continuing to decline in Nagata–ku. Given these demographic trends, it is clear that reconstruction is not an easy task in regions possessing structural issues such as a large number of workers engaged in industries lacking growth potential.

The reconstruction plans for the two past earthquakes were both drafted in an extremely short period of time to meet the time schedule of the national budget. If such short–term reconstruction plans are capable of revitalization, why were they not utilized in past urban reconstruction? It would be a mistake to believe that reconstruction is possible through the injection of massive funds while overlooking the difficulties in past urban revitalization processes.

The Great East Japan Earthquake occurred in March, two months later in the calendar than the Great Hanshin–Awaji Earthquake which occurred in January. In spite of the timing, the government is trying to draft the reconstruction plan before the summer as in the case of the Great Hanshin–Awaji Earthquake. The odds are high that such a reconstruction plan will fail to succeed.

(2) Tread carefully on regional reconstruction through infrastructure (*hakomono*) and industrial development

Given the large number of workers in industries lacking growth potential, the town of Okushiri–cho, which was hit by the Hokkaido–Nansei–oki Earthquake, had faced difficult structural problems such

as the outflow of its population from before the earthquake. Considering its hastily–drafted reconstruction plan without the proactive participation of related parties under such circumstances, it comes as no surprise that the input of massive restoration and reconstruction funds has had little effect. Of the areas hit by the Great Hanshin–Awaji Earthquake, reconstruction has had little success in Nagata–ku of Kobe–shi (Kobe City) despite the input of massive reconstruction funds, because of the lack of competitiveness of its local industries and central commercial districts.

It is clear not only from post–disaster recovery projects such as the Nagata–ku redevelopment project but also from regional revitalization in general that *hakomono* infrastructure development using massive fiscal spending is not particularly effective for difficult issues such as the revitalization of city centers and declining industries. For example, virtually none of the large facilities built in city centers across Japan for the revitalization of "shuttered" shopping streets (shopping districts which are mostly closed, and thus "shuttered") have succeeded. Furthermore, given the costly maintenance and repair accompanying these facilities, the costs will serve as a heavy burden particularly in areas with an ageing population.

(3) Future growth potential and utilization of the private sector are keys to industrial development

In the case of large earthquakes in the past, restoration and reconstruction plans were drafted in a haste to secure national budget outlays in response to calls for speedy restoration and reconstruction in tandem with support toward disaster–struck victims. However, just as in the case of Okushiri–cho, many of the areas struck by the Great East Japan Earthquake were subject to structural problems from before the earthquake, such as a declining population stemming from a large number of workers in the primary industry lacking growth potential. Sadly, restoration and reconstruction would not be easy in these areas even with the input

of massive funds. The effective utilization of the huge amount of public funds would be difficult, hampering its use for support toward disaster victims.

In particular, the restoration and maintenance of ailing industries back to their state prior to the earthquake would be difficult even with various support measures including public funds. Such ailing industries should be supported in view of their future potential considering the trends among corporate and other entrepreneurs which will actually bear the task of revitalization. If there are young and willing entrepreneurs and persons, it would be necessary to spend public funds and the time necessary to nurture the industries. For example, it would be worthwhile to establish internships to related industries for such young and willing persons even if they are different from jobs they had held before the earthquake. The new experience could provide various insights for such young people in their original jobs. Furthermore, generally speaking, "outside" opinions are valued in regional revitalization. This is because regions may be revitalized by receiving a wide range of support from outside. Disaster–struck areas should be prepared to transform themselves into entirely new regions through the injection of human, physical and financial resources from outside including a wide range of ideas from corporate enterprises.

(4) In disaster–struck regions, "livelihood support" should be differentiated from "restoration and reconstruction"

Considering that much of the area hit by the Great East Japan Earthquake is in a state of decline, "a realistic approach to regional management" would be a better option than reconstruction "in one great leap" by the use of massive public funds. It might prove prudent to avoid additional infrastructure developments such as the construction of expressways and regional industrial vitalization through *hakomono* projects depending upon government support. It would be necessary for the disaster–struck areas to come face to face with its problems and to hold careful discussions on its future by

obtaining ideas from private corporations without dwelling on past practices. Even if public funds are to be provided for support of the livelihood of the victims in disaster–struck areas and external organizations supporting awareness campaigns toward residents, the "realistic" approach would lead to a far more effective reconstruction plan than one that is put together in a hasty manner. Moreover, if reconstruction is deemed difficult in the disaster–struck area, it would be necessary to keep in mind that the area's demographic decline will continue. In such case, the option of urban planning from the perspective of a "balanced contraction", namely to keep restoration to a minimum and pare down the public sector should be added to the list of possible reconstruction plans.

The last question is how to provide support for the livelihood of disaster victims. To answer this question, it would be necessary to classify the areas struck by the Great East Japan Earthquake according to the state and degree of destruction. Areas with a mild degree of destruction – for example where the destruction is limited in terms of geographic area – should be restored so as to facilitate the livelihood support of the disaster victims. In the initial phase, quick steps should be taken to restore infrastructure, secure housing for disaster victims and reconstruct business establishments of disaster–struck enterprises. As for the question of whether or not large sums of public funds should be used to restore industries in which victims have lost jobs, it would be necessary to ascertain the future potential of each industrial sector. In the event its future potential is deemed questionable, one option would be to provide payments to disaster victims for livelihood assistance from public funds instead of restoring the industry.

Next, in areas with a higher risk of inundation due to land subsidence caused by the earthquake, both restoration and reconstruction would be difficult in the current state. For the time being, it would be necessary to provide temporary levees by, for example, stacking sandbags. However, huge public works projects to build massive levees or structures to lift the ground level of sunken areas by several meters should not be implemented in haste in areas

with a shrinking population. The future of the community should be considered carefully, including the relocation of residents to higher land, or if such land is not available, to high–rise buildings instead of single–family homes. While infrastructure development and industrial revitalization require careful deliberation, livelihood assistance toward victims should be provided promptly while deliberations are in progress. In particular, in view of the difficulty to construct temporary housing in many of the areas suffering serious land subsidence, a more appropriate option would be to provide public payments to assist the victims' relocation and livelihood in other areas.

Even in areas suffering devastating damage from the tsunami in a large area of the community, various possibilities for reconstruction would still exist if some parts of the land have not been affected much by land subsidence. However, in view of the current state that restoration has barely touched off in such areas and many of the victims have started to lead separate lives in different parts of the country, it would probably be difficult to restore the area back to its state before the earthquake. The future of the community should be examined carefully, including questions such as whether its original residents will return and continue to live in the area. In the meantime, the government should provide prompt livelihood support toward the disaster victims through public fund payments. Furthermore, since it is precisely in these areas that ideas of private–sector corporations would prove most effective, a wide range of options should be examined, including bold deregulatory measures which were previously unthinkable. In the event a large number of residents wish to relocate to other areas, it would be necessary to provide support for their livelihood in new areas through the provision funds by the purchase of their property, and to establish clear and thorough public records setting forth the property rights toward land in the area. In disaster–struck areas such as these, a plausible option would be to select and concentrate on the reconstruction of certain areas possessing potential rather than restoring the entire area.


(Photographs of Ishinomaki–shi of Miyagi Prefecture after the earthquake taken in late May 2011 by the author.
Left: Areas affected seriously by land subsidence continue to be flooded daily, making restoration a difficult task.
Right: Given the scarcity of flat land suitable for residential development in Ishinomaki–shi, it appears difficult to relocate many of the disaster victims to higher grounds.)


(Photographs of the port of Yuriage (Yuriage–ko) in Natori–shi of Miyagi Prefecture after the earthquake taken in late May 2011 by the author.
Left: Yuriage–ko was a popular tourist destination well–known for its morning bazaar. The neighboring areas were also popular as a scenic residential area for single–family homes. The entire area suffered devastating damage as a result of the recent earthquake.
Right: The port of Yuriage (Yuriage–ko) in Natori–shi of Miyagi Prefecture is one of the ports which suffered colossal damage. Many

of the ports in the disaster–struck areas suffered considerable damage. Few boats and vessels remain and facilities have been subject to heavy damage. Considering the huge costs for construction, it would not be realistic to reconstruct all the ports.)

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Notes:

1 The Kobe Shimbun, January 9, 2011. http://www.kobe–np.co.jp/news/shakai/0003725867.shtml

2 Although eligibility is not limited to manufacturers of "chemical shoes", many of the companies housed are those in the chemical shoes industry.

3 "*Junyo zaisei saiken dantai*" are local governments designated by the Ministry of Internal Affairs and Communications which are on the brink of fiscal collapse with the amount of deficit exceeding a certain level. Also referred to as a "*zaisei saiken dantai*".

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