



CHANGES IN LAND USE AFTER THE GREAT EAST JAPAN EARTHQUAKE AND RELATED ISSUES OF URBAN FORM

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Abstract

Five years have passed since the Great East Japan Earthquake occurred, great progress has been made in rebuilding the affected areas. This kind of recovery from a tsunami is generally accompanied by major changes in land use. This paper aims at providing an overview of reconstruction and land use plans and going over the effects and issues posed by such reconstruction from the perspective of land use planning by categorizing the disaster-stricken regions into following four areas; “non-disaster areas,” “collective relocation areas,” “original location reconstruction areas” and “original relocation areas.”

The “non-disaster areas” hardly sustained any damage from the tsunami and victims are utilizing the Cliff Program and other programs to look for land on their own and rebuild their homes. In cases where there were designated urbanization promotion areas and urbanization restricted areas, as seen mostly in the metropolis and core city areas based on the City Planning Act, development concentrated around the existing urban centers within the urbanization promotion areas, and thus achieved a highly dense utilization and was able to protect the urbanization restricted areas in the suburban zones. However, in the small and mid-sized cities where they had not made such designations, and in suburban areas where they had much looser restrictions, it was found that development was occurring in a sprawling fashion.

In the “collective relocation areas,” in many cases, the municipal governments conducted careful surveys to understand the residents’ intentions and had done their best to match the supply and demand with the number of units available in the relocation residential sites. Thus, for the most part, the residential sites intended for relocation have been filled. However, there are some such relocation residential sites with quite a few vacancies, and with the decline of Japan’s population worsening, the chance of those units ever being occupied is close to zero.

In the locations designated as “original location reconstruction areas,” in both cases where land readjustment projects had built infrastructure and raised the ground level for safety, and those areas where no urban development projects took place and in which immediate reconstruction was allowed, since it is taking too much time, or because of the vivid memories of the disaster, the rebuilding process has not progressed and a very low-density urban form is taking shape. In the case of the “original relocation areas,” as there is hardly any demand for non-residential land use, the now open and remaining lands are hardly being utilized.

The author concluded there has been progress in creating a denser urban form in some areas in “non-disaster areas” in the urbanized area, partly in accordance with plan and partly without plan, and “collective relocation areas,” which can be evaluated as a more sustainable space. In other locations, however, the reality is that a low-density urban form is taking shape before our eyes. He also pointed to a few potential solutions such as the aggregation of land and the importance of creating a district- or local-level land usage management system.

Keywords: land use diversion, the Great East Japan Earthquake, urban form, land use density



1. Introduction

On March 11, 2011, the Great East Japan Earthquake and the accompanying tsunami wreaked havoc and left the region severely damaged. More than half a decade later, great progress has been made in rebuilding the affected cities and towns. At the same time, this process has brought about several issues; one of them is the question of land use.

Recovery from a tsunami is generally accompanied by major changes in land use. That is to say, affected regions try to rebuild their cities and towns in a way that protects them from future disasters. In many cases they realize that levees and other structures are insufficient, and thus end up developing their inland farming areas or hilly lands and forests behind the coast, requiring relocation to such areas.

The resulting environment they wish to create would have the living and residential functions located in places like appropriately sized lots on higher ground to keep the town compact and safe, with the low-lying areas being turned into an industrial zone to create jobs. The goal here is to connect the industrial and residential areas in order to create a sustainable living environment. What, then, does this look like in reality?

This paper will first provide an overview of reconstruction and land use plans. Next, the author will go over the effects and issues posed by such reconstruction from the perspective of land use planning. The affected spaces will be divided into four types that have been created by such plans, and empirical evidence will be presented.

While there is scholarship on the spatial recovery process after Hurricane Katrina in New Orleans [1][2], as well as general discussions of transformations in urban spatial forms in the process of recovery from the Great East Japan Earthquake [3][4], there are few concrete and empirical treatments of such post-disaster changes. The only study on this theme [5] does not focus on the land use change comprehensively as a whole.

2. Reconstruction-Related Land Use Planning, Regulations, and Programs

Land use planning for reconstruction is settled by each local and regional government after a disaster, and their main focus is usually on implementing measures to prevent tsunami damage in the future.

To this point, the Japanese government's Central Disaster Management Council set a certain standard in a report entitled "Report of the Committee for Technical Investigation on Countermeasures for Earthquakes and Tsunamis Based on the Lessons Learned from the "2011 off the Pacific coast of Tohoku Earthquake"" in September 2011[6]. In the report, tsunamis are divided into two categories: level 1, which is "the type of tsunami that occurs relatively frequently"; and level 2, whose "occurrences are very rare, but if they do strike, they are the largest of their class with the most devastating and disastrous effects." For level 1 tsunamis, they recommend "using structures such as breakwaters to prevent tsunamis from entering the inland areas." For level 2 tsunamis, they state that "it is important to set up countermeasures from the perspective of disaster reduction and reduce the damages to the minimum," that the "damages from tsunamis must be reduced as much as possible through hard countermeasures," and "there must be emphasis on soft countermeasures, particularly evacuation." More specifically, they recommend "constructing a secondary embankment inland, utilizing the transportation infrastructure, raising the ground higher, preparing evacuation sites and designated buildings for refugees in case of tsunamis, as well as preparing evacuation paths and stairways. Land use scenarios should take into consideration the flooding risk and construction regulations, and thus combine and implement these appropriately based on local conditions and situations."

Based on these approaches, many local governments have implemented the following land use planning policies and regulations. First, coastal levees will be built to mitigate level 1 tsunamis. Then, a simulation will be conducted of what will happen after the structures are in place when a level 2 tsunami hits. If the expected flood line rises to approximately 2 meters (6' 6") or over, they will designate the area as a disaster hazard zone and as a rule not allow construction of homes and other buildings. The reason the standard is set at 2 meters is because wooden houses have a greater chance of being washed away once the flood level rises above 2 meters. The areas that were designated as disaster hazard zone will then also be designated as resettlement promotion zones for the Collective Relocation for Disaster Prevention Promotion Program (Bosai Shudan Iten Sokushin Jigyo), which means the people who live in such zones will receive government aid to relocate to a residential site on a hill or to some other safe location. At these residential sites (*danchi*), the victims could buy a partitioned lot from the government and build their home anew on their own, or decide to move into a public rental apartment house.

On the other hand, if the expected flood will be under 2 meters, basically the reconstruction of homes will go forward in such areas. However, if the area has ongoing issues with the fundamental urban infrastructure before the disaster, such as the ratio of road area to district being too low or there being no parks, this will become an opportunity to make improvements through land readjustment projects.

However, some local governments have added additional levels to the regulation standards in disaster hazard zones based on the expected level of flooding. For example, in Ofunato City, all areas submerged due to the tsunami were designated as disaster hazard zones. This was not necessarily because the city wanted to emphasize safety, but rather it was done for economic reasons, so the city could utilize the Collective Relocation Program to assist those who were affected by this disaster and wished to move to higher ground. With that said, the construction regulations were divided into four categories based on how badly the area would be inundated with floodwater when the level 1 coastal levees are breached by a level 2 tsunami (Figure 1). While no construction of homes will be allowed where the water would reach over 2 meters in depth, if the expected floodwater inundation depth is on the shallow side, the regulations become a little looser. For example, in the areas where they expect the inundation level to be less than 1 meter, the top portion of the foundation must be 0.5 meters higher than street level. If no flooding is expected, then buildings with no rooms in the basement are permitted, which also means there are practically no regulations.

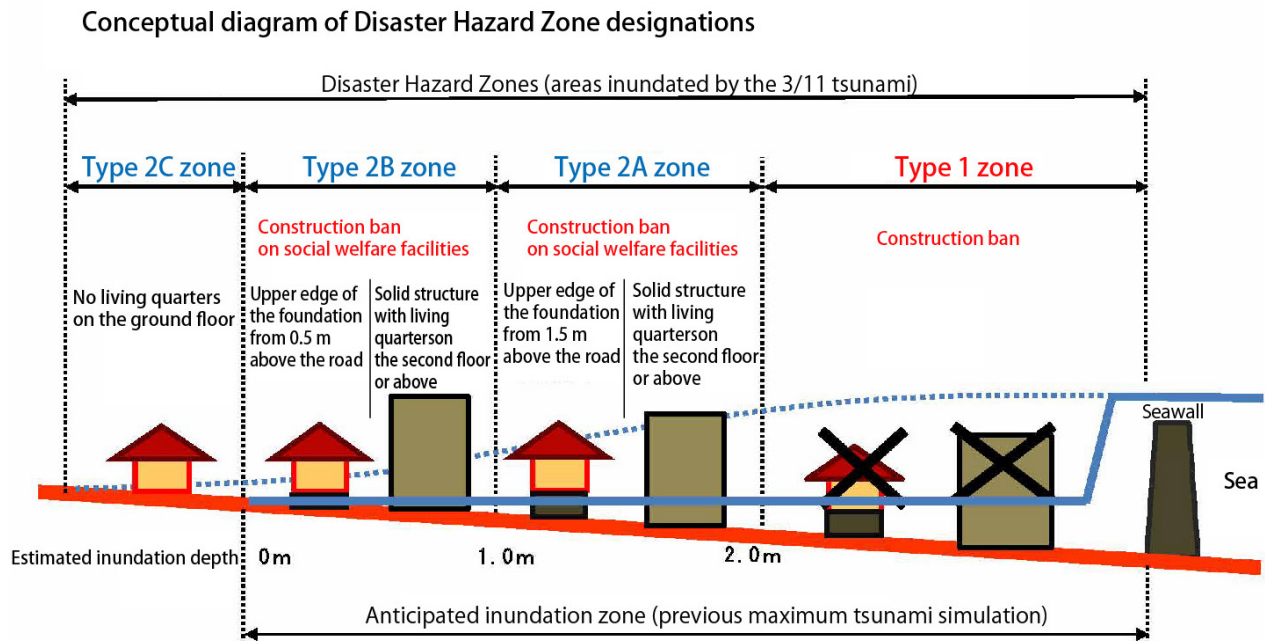


Figure 1: Conceptual diagram of Disaster Hazard Zone designations in the city of Ofunato (source: “summary of building restrictions through designation of disaster hazard zone”, Ofunato city)

Also, in addition to programs and regulations that directly affect the creation of such an environment, there is a system in place to assist disaster victims wishing to rebuild called the “Relocating Program for Hazardous Residential Buildings Adjacent to Cliffs and other Dangerous Areas” (hereafter referred as the Cliff Program). This is a program in which disaster victims who live within the newly designated disaster hazard zone can choose to find their own land and rebuild their homes without the use of the framework of the Collective Relocation Program and still receive approximately the same amount of financial assistance as those under the Relocation Program.

With the points mentioned above as the backdrop, this paper will shed light on how the various programs and systems are shaping each space by categorizing them into four types: “non-disaster area,” “collective relocation area,” “rebuilding on original location area,” and “original relocation area.”

3. Reality of the Changing Landscapes of the Disaster Area

3.1 Non-Disaster Areas (Individual Reconstruction)

First, let us look at how the urban space is changing in the non-disaster areas in relation to individual and independent relocation and reconstruction efforts, including those utilizing the Cliff Program. What heavily shapes the urban space and environment are the land use regulations based on the City Planning Act.

The cities and surrounding areas “that require integrated urban improvement, development, and preservation” (City Planning Act, Article 5) are designated as urban planning zones. In medium to large cities, the urban planning zones are further divided into urbanization promotion areas and urbanization restricted areas. In the urbanization promotion areas urbanization is to be achieved in the coming decade and construction is allowed provided that it is within the designated area and purpose. On the other hand, urbanization restricted areas are basically areas that do not allow development. Additionally, small to medium cities generally do not make this distinction. In such cases, as long as the purpose of the building matches the designated purposes within that specific urban area, then construction is allowed. In such cases, as long as the purpose of the building matches those purposes designated in some areas within the urban planning zones, then construction is allowed. Furthermore, in the suburbs, outside of the designated areas of the urban planning zones, in principle there are no restrictions as to the type of buildings that can be built. Additionally, in the rural villages outside the urban planning zones, there are basically no regulations based on the City Planning Act and people are free to build no matter the location.

In the urbanization promotion areas where infrastructure has been developed, there are efforts to fill the pockets centering on open lots and remaining farmlands in the previously and currently developed areas within the city (Figure 2). In these areas, there is an ongoing issue where there is an abundance of farmland and open lots that could not possibly be urbanized within a decade, and thus this low utilization density has been the subject of concern and debate when it comes to land use. However, the low utilization density has actually helped buffer the sudden surge in housing demand after the disaster. As a result, the density within the urbanization promotion areas has progressed and contributed to shaping efficient urbanization.



Figure 2: Spatial use before (Jun. 2010, left) and after (Apr. 2014, right) the Great East Japan Earthquake in Watanoha district, Ishionmaki city (source: Google earth)

Next, in the urbanization restricted areas, though there is some construction going on in the currently standing communities, in other areas development has been restricted. This is especially the case with collective farmlands, as such areas have been protected from sprawling development under Agricultural Land Act.

Presumably, this is due to the fact that there are certain restrictions based on the diversion of agricultural land and even the aforementioned City Planning Act.

In the suburban areas in the small to mid-sized cities where there are no restrictions on land usage, or those outside the urban planning zones, because of the loose regulatory standards regarding what buildings can be built, sprawling development was an ongoing reality before the disaster struck. That trend continued even after the disaster, and this is creating a widespread, low-density urban form, which has led to the problems of mixed urbanized and agricultural land, inefficient infrastructure, and deterioration of the landscape.

3.2 Collective Relocation Area

(1) Collective Relocation at the Macro Level

Collective relocation at the macro level means the integration and consolidation of one district into another, as represented by the term “consolidation of settlements.” Maintaining a settlement that has only a few homes at the edge of its network costs a lot, especially providing social services, maintaining and managing infrastructure, and so on. Therefore, in the case of remote small-scale settlements, it has been considered best to take the opportunity provided by this natural disaster to consolidate these settlements into key settlements to reduce costs while improving their sustainability. This type of consolidation is not just simply aggregating settlements, but also expanding their scale so it becomes much easier to maintain social services, to the benefit of the consolidated settlements.

Most of the settlements that were consolidated into existing towns were from rural plains and relatively new residential areas. Specific examples are the six settlements on the coast of Iwanuma City that were relocated to Tamaura-nishi district, and Sendai City’s Arahama district that was relocated to Arai district (Figure 3).

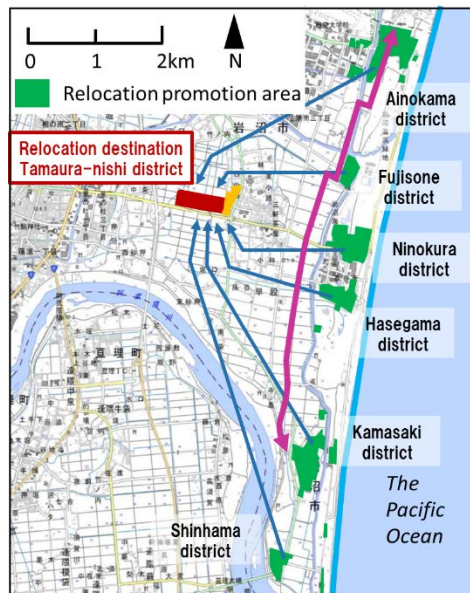


Figure 3: Relocation promotion area and consolidated relocation destination of Iwanuma city (source: author)

On the other hand, the coastal fishing villages have not seen a progression towards such consolidations. Rather, in most cases, even though it may be just a few homes, each home in the vicinity of the fishing ports was individually relocated to higher ground. One of the typical examples of this type is Ogatsu district in Ishinomaki city (Figure 4).

【別添1】土地利用構想図(4/8)雄勝地区

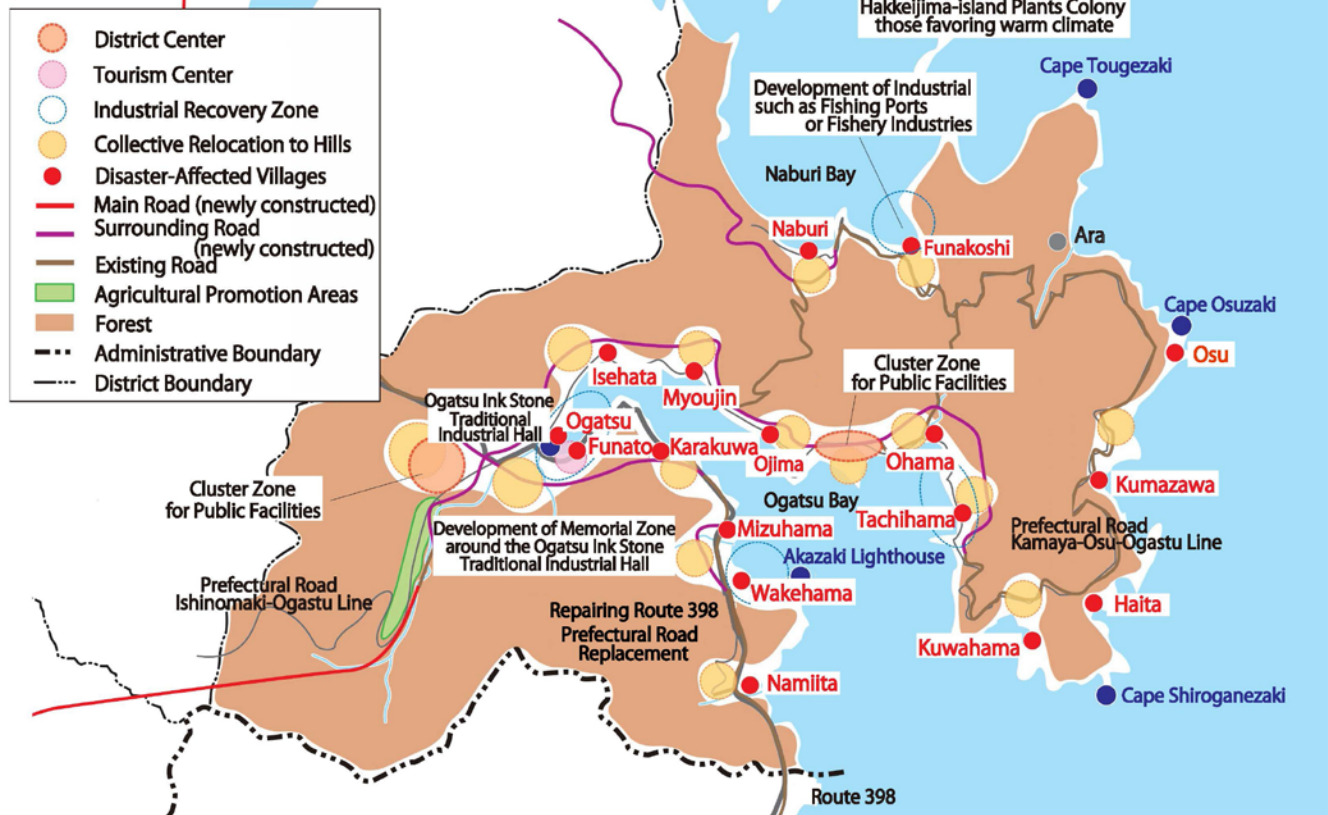


Figure 4: Land use concept of Ogatsu district in Ishinomaki City

(source: Recovery Development Plan of Ishinomaki City)

However, when we evaluate this situation, it does not necessary seem that the former was a success and the latter a failure. Such matters cannot be seen in simple terms, but rather, it is necessary to consider why consolidation is being conducted in the first place. It may be true that through consolidation it is possible to reduce the cost of maintaining and managing infrastructure, as well as the costs of various social services. However, when it comes to these small-scale settlements, each household is generally engaged in fishing, and that provides the foundation of their economic lives, and at the regional level, they contribute to the vitality of the industrial activities. Also, these individuals have had community based lives where they have naturally checked on one another's wellbeing through their regular neighborly interactions. However, when these people are relocated to key settlements and metropolitan areas, the industrial activities will wither away and individual economic lives and the community's mutual assistance all weaken, which means that they become dependent on the public safety net, leading to various additional costs.

Therefore, in order to evaluate the merits of such relocations, it is necessary to take into consideration multiple factors and evaluate and judge the situation based on the aggregate effect.

On the other hand, what should not be forgotten is that a large-scale population migration also occurred due to individuals trying to rebuild their lives on their own and households merging or splitting. It can also be seen that people are tending to move from small-scale settlements, like Minami-sanriku town or Onagawa town to key settlements and core cities, like Ishinomaki city or Ofunato city, and even on to metropolises like Sendia city or Natori city (Figure 5). This means that the populations of small-scale settlements are experiencing a marked decline, and rather than succeeding in "planned consolidation," what we are seeing is an "unplanned deterioration."

With such a deterioration, this type of settlement is expected to become harder to maintain. How we are to respond to this situation remains to be seen.

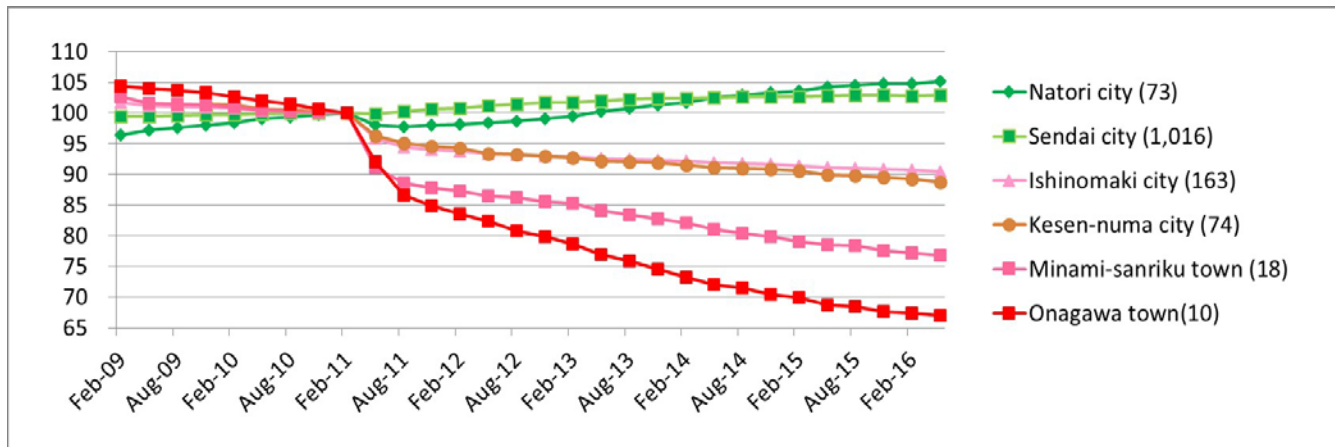


Figure 5: Population dynamics on the municipal level (in parentheses: population in thousand in Feb. 2011)
 (Data are expressed as relative values, taking the number in Feb.2011 as 100.)
 (source: author, based on basic residents register of each municipalities)

(2) Collective Relocation at the Micro Level

In order for a relocation project to be approved by the Minister for Reconstruction, there must be a demand. To provide numerical evidence for such a demand, residents’ intentions are ascertained through surveys.

However, residents’ intentions have changed drastically over time. In particular, there were quite a few who originally desired to move to higher ground, but then the reality of the financial burden and the difficulty of obtaining a bank loan hit them and they consequently gave up on the idea. Then there were those who wished to rebuild on their own, but, due to the needs and demands of reconstruction, and the fact that the cost of reconstruction had skyrocketed due to increases in material and labor costs, they decided to wait to rebuild. Furthermore, there were those who looked at the convenience and speed in which reconstruction would occur in other municipalities and thus chose to move to other areas altogether.

Even under such circumstances, many of the residential sites that were prepared for the relocation project have a more than 90% occupancy rate. This can be attributed to the fact that as time passed, even though the regulatory conditions changed, the administration kept an accurate pulse on the changing needs of the residents and responded with flexibility in the planned number of dwelling places. In particular, while there are so many reconstruction projects going on, the administration not only utilized a simple, rough survey to get an overview, but they also conducted individual, face-to-face interviews to grasp the intentions of the residents and get an accurate count to determine the number of partitions they would need. They kept adjusting their designs up to the last possible moment in order to determine how many units they would need, trying to address the constant changes.

Yet, it is not easy to determine beforehand what kind of demand there will be over time. Additionally, responding to changes in demand that reduce the number of units needed in a residential site once the draft of the design has been started is not easy and can lead to delays in the execution of the project.

Therefore, there are some cases where the planned residential sites became too large for the people’s needs and therefore there were open lots after completion. For example, in the town of Watari, they had allocated 200 residences in the housing complex in the residential sites built under the Collective Relocation for Disaster Prevention Project based on the interviews with residents; but, they still have 20 openings [7]. Likewise, in the city of Ishinomaki, though they were in the process of accepting a second round of applications, the applications submitted put some of the relocation residential sites at less than 50% capacity.



Furthermore, it must be noted that a high ratio of the relocating households have only elderly residents. That means the relocation residential sites will experience an acceleration of aging residents and with that will have many more vacant lots and homes. On the other hand, based on the current trends, there are hardly any areas for new demand to be created. That is to say, once a residence or lot becomes vacant, for the most part, it would be vacant permanently with no potential future use.

(3) Rebuilding on the Original Location

A. Original Location Reconstruction and Readjustment Project Area

Areas designated level 1 were devastated by the tsunami, but with the building of a second line of levees and/or through raising the land they will be protected from a level 2 tsunami. In such cases, by conducting land readjustment projects at the original sites, and by developing the urban infrastructure and improving the living environment, the cities wish to encourage the disaster victims to stay in the area. In fact, while the price of land remains relatively stable, since roads, parks, and other public utilities and infrastructures are to be built, the area will become a depreciation compensation district, in which public agency has to purchase more land than the amount of increment value of whole building sites. In many cases, since a lot of public housing will be built for disaster relief, the appropriate land will be acquired by public agencies, which will create an intentional secondary effect of potentially having the victims' wishes to sell their land come true as well.

However, the greatest issue is that these projects take a considerable amount of time. Now, five years since the disaster, most areas are still under construction and in most places it will take several more years for all rebuilding projects to be completed. This passage of time—along with the fear instilled by the disaster—has led to an increase in people wishing to leave the area. In such cases, they tend to hold on to the land they had, but, since they have already rebuilt in another location, the land will have a greater chance of going unused. As many as 43% of those under the disaster areas' land readjustment projects wish to sell their land or move out of the area, with about 50% wishing to continue to live in the area or hold on to their land [8]. In this way, while a significant amount of public money has been poured into these land readjustment projects, the land that has been developed is not being effectively put to use, and as a result, a low-density urban landscape is starting to form.

B. Original Location with Permission for Immediate Reconstruction

What if the areas did not need to go through readjustment programs and instead approved immediate reconstruction on the original sites? Would such an area manage to avoid creating urban areas with such low density? The answer is no.

“White background zones” are zones that experienced flood-related damages in the last tsunami, but with the construction of coastal levees are now safe (that is to say, in case of a level 2 tsunami simulations indicate that their level of inundation would be under 2 meters). They also already have a certain amount of urban infrastructure in place, and no particular projects, including superficial ones, are planned.

Such places allow for individuals to independently start the rebuilding process, and for the homes that had floodwater right under or above their floor, and in areas where the tsunami's speed was relatively slow and caused relatively minor damage, repairs and rebuilding took place rather quickly. There are also areas that experienced severe and destructive damage from the last tsunami, but a simulation showed that through the construction of coastal levees they are now safe, even against a level 2 tsunami, and thus immediate reconstruction efforts were greenlit.

Moreover, while the area may be designated as a disaster hazard zone, since the regulations regarding construction do not entirely prohibit all homes from being constructed, there are cases where permission to rebuild was granted as long as the foundation level (or the ground floor level) was raised, or as long as there was no basement. In such cases, the residents were allowed to receive aid within the framework of the Collective Relocation for Disaster Prevention Promotion Program if they desired to relocate while working on selling their land and moving away. At the same time, if they decided to rebuild in the same location, they were free to remodel or rebuild their home. In other words, each landowner had options, and they could decide whichever way they wished to go. The other side of the coin here is that when it comes to land use, there are areas where the owners

tore down their home and sold the lot back to the local government, which left the lot bare and vacant, right alongside homes that were rebuilt (Figure 6). At this point, we can expect that all who wish to rebuild on their own have already done so, and we cannot expect to have too many new homes rebuilt in the area. Instead, there is a much higher chance that such situations are going to be permanently fixed in place. It can be said that the desire to grant the victims' wishes as much as possible while creating land use regulations and a framework for reconstruction projects has caused this aftermath.



Figure 6: An example of super low-densely used urban area in Higashi-matsushima city (Source: author photo)

C. Original Relocation Area

When it comes to relocation projects, not all land that was designated part of the Resettlement Promotion Zone became available for the local government to purchase. These districts were also designated as disaster hazard zones, and usage became restricted, but what was banned were primarily residences, and thus business, industrial, and agricultural lands were not considered up for sale under these programs. Moreover, if the land had been passed down through generations, even in cases where it was used for a residence, the landowners would not sell, or could not sell due to matters of inheritance. There are even cases where it was no longer clear who owned the land legally, leaving the municipal governments unable to find the other party to negotiate. In any case, this meant that there were lands scattered across the districts that the local governments could not purchase. Some of the lands housed buildings for businesses and industries, but the result was nothing more than super low-density land use (Figure 7).

Originally, this type of residential relocation did not take place, as they had a better use for the original area. Residential relocation from such places has everything to do with disaster prevention, and how to utilize what was left behind is an afterthought—which makes it even harder. This is especially true when it comes to small-scale settlements; there is hardly any demand for effective use of the land. How to maintain the newly acquired public land and/or utilize such land remains an open issue.



Figure 7: Actual situation of resettlement promotion zone in Kamaishi city (Source: author photo)

4. Discussion

As mentioned above, the disaster stricken areas are going through major changes in the reconstruction process, and their spaces and sceneries are changing. First, with individual relocations, where there are regulations based on the City Planning Act, they are managing to create a compact and tight, high-density urban form (and that also means that the nearby collective farmlands are being preserved). On the other hand, in areas where the regulations are loose, sprawling development is evident. When it comes to collective relocation to higher ground or inland areas, for the most part, they have been able to create relocation residential sites that meet the demand, though some areas are left with vacant lots. In areas where original locations are used for reconstruction, whether they have a readjustment project or not, the reconstruction rate is extremely low, resulting in minimal land use, creating a low-density urban area. Additionally, when it comes to the original relocation area that people were urged to vacate, as housing related usage is prohibited, it has hardly seen any use so far.

In this way, some areas have managed to create a compact and highly dense space, or in other words, a more sustainable space. In most areas, however, they have only managed to create spaces with low-density usage, resulting in lower sustainability.

So then, what kind of response could we consider in situations like this? When it comes to the original relocation areas with a lot of vacant lots where most of the land is owned by the local government, it becomes necessary to consider “aggregation.” That is to say, the scattered privately owned land should be aggregated and then separated from the public land, which will allow for large-scale land use. If there is the potential for industrial usage of such land, land readjustment projects could be implemented to aggregate the land and build an industrial complex, for example.

On the other hand, there are many areas with scattered small lots. In cases where some land is used for residential purposes, or cases where micro sprawl is seen in the land use, to go through a readjustment program and aggregate or consolidate the land use is not quite cost effective. Therefore, in such situations, an agile, case-by-case approach would be best.

What will be called for in such a situation is a district-level land use management system. Similar to how previous districts built their towns, not only should there be a function for evaluating how the land should be used within a district, if the owner is not around, and in cases where the land is not well maintained, the district should have the right to manage it, or even transfer usage rights for that land. If such a system is to be created, it will also be necessary to change the legal structure, with ownership, management, and usage concepts all being reconsidered.

In either case, whether there will be an attempt at aggregation or considered micro usage, it is important to explore a usage system that will generate some benefit; however, this also means there will be maintenance costs



and thus potentially a negative effect. Therefore, in some cases, there should also be a choice to not utilize the land at all, and there should be an aggressive movement towards designating some land to be left alone and returned to nature.

5. Conclusion

In this study, the author looked at the aftermath of the Great East Japan Earthquake and designated the disaster-stricken regions as “non-disaster areas,” “collective relocation areas,” “original location reconstruction areas,” or “original relocation areas.” Based on these designations, each location type was examined to see what types of spaces and environments were being created and what issues exist.

The “non-disaster areas” hardly sustained any damage from the tsunami and victims are utilizing the Cliff Program and other programs to look for land on their own and rebuild their homes. In cases where there were designated urbanization promotion areas and urbanization restricted areas, as seen mostly in the metropolis and core city areas based on the City Planning Act, development concentrated around the existing urban centers within the urbanization promotion areas, and thus achieved a highly dense utilization and was able to protect the urbanization restricted areas in the suburban zones. However, in the small and mid-sized cities where they had not made such designations, and in suburban areas where they had much looser restrictions, it was found that development was occurring in a sprawling fashion.

In the “collective relocation areas,” in many cases, the municipal governments conducted careful surveys to understand the residents’ intentions and had done their best to match the supply and demand with the number of units available in the relocation residential sites. Thus, for the most part, the residential sites intended for relocation have been filled. However, there are some such relocation residential sites with quite a few vacancies, and with the decline of Japan’s population worsening, the chance of those units ever being occupied is close to zero.

In the locations designated as “original location reconstruction areas,” in both cases where land readjustment projects had built infrastructure and raised the ground level for safety, and those areas where no urban development projects took place and in which immediate reconstruction was allowed, since it is taking too much time, or because of the vivid memories of the disaster, the rebuilding process has not progressed and a very low-density urban form is taking shape. In the case of the “original relocation areas,” as there is hardly any demand for non-residential land use, the now open and remaining lands are hardly being utilized.

In this way, while in some areas there has been progress in creating a denser urban form, in many locations the reality is that a low-density urban form is taking shape before our eyes. In order to resolve this issue, the author has pointed to a few potential solutions such as the aggregation of land and the importance of creating a district- or local-level land usage management system.

6. Acknowledgement

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