Chapter 2

Land Readjustment and Post-Disaster Reconstruction in Japan

Norihiko Yanase

To begin the chapter, it is important to start by defining key terms. "Rehabilitation" (復旧 *fukkyu*) means "the disaster response activity that restores the pre-disaster conditions"[1], and "reconstruction" (復興 *fukko*) means "the activity to revitalize and rebuild the disaster-stricken communities for a better livelihood and living environment than they were before." In other words, reconstruction is the act that aims to overcome vulnerabilities and rebuild disaster-resilient communities to the extent that a repeat of similar damage can be prevented (Hayashi 2010). After a disaster occurs, whether in the East or West, people aim to reconstruct more resilient and stronger disaster-stricken communities, rather than just try to rehabilitate them.

Three major factors necessary for recovery from natural disasters are: (i) "livelihood restoration," which provides basic daily necessities and emergency shelters for those who have lost their families and assets, and are facing difficulties in everyday lives ; (ii) "economic reconstruction," which creates new and/or temporary jobs for those who lost their jobs to help them earn a living; and (iii) "reconstruction of affected areas" which must be conducted in conjunction with the above two activities.

A driving force behind the post-disaster reconstruction is land readjustment. Some of the oldest known examples of the post-disaster reconstruction are Osaka and Edo (currently known as Tokyo), i.e. the big cities affected by wars and great fires in the early 17th century. Records exist that detail urban development through the appointment of a person in charge of reconstruction, the expansion of roads, and the accompanying changes in land ownership. This method was also applied during the reconstruction of Tokyo after the Great Fire in 1872.

In the West, after the Great Fire of London in 1666, the famous architect Sir Christopher

Wren attempted to reconstruct the fire-affected city through land readjustment, but it was a failure, since no consensus for the land readjustment was reached among the residents. However, following the Great Fire of Hamburg in 1842, a law concerning the reconstruction of the fire-affected areas was enacted. The law centered on zone condemnation[2] and had some of the characteristics of land readjustment.

Why is land readjustment, or a method that exchanges and consolidates ownerships to land parcels, useful for reconstruction following disasters? During post-disaster urban development, it is quite reasonable for the authorities to plan, for instance, wide lane roads and/or large parks to serve as fire breaks. However, for the disaster-affected people who have lost most of their assets acquired over many years, the only asset left is land. Therefore, they may offer stronger resistance to the authority's attempt to purchase their land than they otherwise would, and infrastructure development through land purchase could be extremely difficult. This is why land readjustment may be used for post-disaster reconstruction, since consensus is relatively easily reached (though it is never easy).

From Arable Land Readjustment to Land Readjustment

It is well known that land readjustment evolved from arable land readjustment. The former *Arable Land Readjustment Act* enacted in 1899 institutionalized an "enforcement of replotting" system, which involved the transfer of ownership to new parcels in exchange for the former parcels and the land registration is also revised according to this ownership transfer. It could be said that this formed a model for land readjustment based on administrative measures. Nevertheless, there were more institutional reforms before arable land readjustment became a tool for urban development and post-disaster reconstruction.

The objective of arable land readjustment was to improve productivity by consolidating scattered, irregularly shaped fields into areas with regular shapes while simultaneously developing irrigation canals and farm roads. Arable land readjustment was a scheme conducted by landowners of their own accord. Note, however, that those who owned land located within the designated "project area" who objected to the project were forced to comply with the plan for replotting after the required legal formalities had been undertaken (this is called "enforcement of replotting"). If replotting of the project area were not determined by the enforcement of replotting, only one opponent

would be enough to put an end to the project. In other words, replotting without an enforcement order, by administrative measure, would be nothing more than a voluntary exchange of land parcels between parties concerned. Which is to say, if a person who obtained the land by purchase or inheritance refused to accept the replotting plan previously agreed on by the former owner, the project would be back to square one.

Arable land readjustment commenced to modernize agriculture and was used in the industrial revolution era in the early 20th century for housing land development in the suburbs of Tokyo and Osaka where rapid urbanization had occurred (Yanase 2011). Although planning standards in those days were not sufficient to develop housing sites[3], the technical levels of planning were improved to contribute to the development of good residential areas in urban areas of Japan. This happened during the Taisho and early Showa periods (approximately between 1910 and 1930), before the time of motorization started in earnest, while influenced by the concept of garden cities.

Many arable land readjustment projects were conducted in large cities in Japan, such as Tokyo, Osaka (Matsuura 2011), and Nagoya (Sasaki 2011), leading to the development of the current high class residential areas, such as Denen-chofu in Tokyo, Tezukayama in Osaka and Yagoto-chiku in Nagoya. Based on the development of these housing sites, when the former *City Planning Act* was enforced in 1919, a land readjustment scheme started to be regarded as a tool for urban planning. Thus, the *Arable Land Readjustment Act* was applied to a series of operational procedures such as the approval of land readjustment projects, including designs and replotting.

That was a time when urbanization rapidly progressed and people continued to migrate from rural to urban areas, creating some small urban slums. The *Urban Building Law*, or the predecessor of the *Building Standards Act*, was also enforced at the same time as the former *City Planning Act*, thus providing a legal framework to regulate buildings. However, many urban residents were poor and public transport in urban areas was in poor condition, and even though land use restrictions as "use districts" were designated to avoid mixed land uses, i.e. separating industrial areas and residential areas, in reality, it was too difficult to achieve the separation of home and work. As a result, the two most realistic options for urban planning tools at the time were building restrictions through the creation of major road development plans and land readjustment in urban planning project areas. Some planners praised the method, saying, "Land readjustment is the mother of urban planning."

But the *Arable Land Readjustment Act* did not allow land plots with buildings to be included in a project area. Or more precisely, the scheme was not expected to be applied to urban areas. Nevertheless, Article 13 of the former *City Planning Act* stipulated that

in case of emergency, such as post-disaster rehabilitation, land readjustment shall be compulsorily carried out, not by following procedures for arable land readjustment, but in compliance with the order for enforcement of the former *City Planning Act*[4].

Reconstruction Following the Great Kanto Earthquake and Land Readjustment

In 1921, the first land readjustment projects were carried out in Tokyo city based on the former *City Planning Act*, following the Great Fires in Shinjuku and Asakusa, which burned 113 hectares. (Please note that Tokyo city (*shi*) was merged with Tokyo prefecture (*fu*) to form the Metropolis of Tokyo in 1943.)

More than 4,300 hectares of land were burned in Tokyo city and Yokohama city in total by the Great Kanto Earthquake in 1923. The government immediately established the "Reconstruction Board," and decided to implement a reconstruction project using land readjustment. Then, the former *Special City Planning Law*[5] was enacted and, under this law, various frameworks were created to conduct land readjustment in urban areas. The most noticeable one stipulated a contribution of up to 10% of parcels by landowners without compensation, and compensation payment for the losses exceeding the afore-mentioned level. In addition, a "Land Readjustment Committee" and a "Compensation Review Board" were established to build consensus regarding the project. The law also stipulated "replotting planned areas," which provided an institutional framework to keep consistency between landownership and construction works such as building relocation and public facility construction occurring in the project area. This idea of the replotting planning area led to the provisional replotting designation system to be created at a later time.

Efforts were also made to improve the technical aspects of land readjustment. Land assessment methods based on the price of land adjoining a major road (the assessment method by street value) was introduced to assess large areas of land in a short period of time, and to assess each land parcel correction factors developed in Cleveland, Ohio, USA were introduced for the first time in Japan. Thus, the readjustment of approximately 3,500 hectares of land in Tokyo city and Yokohama city was completed in a short period of time by 1930. Consequently, after the Kanto Earthquake, Tokyo city's road density was increased from 11% in the previous year to 25%, which compared favorably to those in London, Paris, and Berlin, or advanced countries' capitals at the time. Fifty-five parks of varying sizes were developed totaling 42 hectares of land in Tokyo,

increasing the ratio of park areas relative to the whole city area to 3.6%. Truly, the imperial capital of Tokyo city was "reconstructed," and, in fact, the land contribution average ratio was 15% for public facilities. The former *Special City Planning Law* was abolished in 1941.

Postwar Reconstruction and Land Readjustment

As of August 1945 when Japan was defeated in the World War II, 215 cities with a total land area of 64,500 hectares had been damaged. Most of the cities – except the historic cities of Kyoto and Nara – were burned down by aerial bombings by the US Army air force. In the following year, 115 cities (63,153 hectares in total) were designated as war-damaged cities. The number of deaths and the severity of damages were unprecedented in Hiroshima and Nagasaki, where atomic bombs were dropped, and in Tokyo, where aerial bombings were repeated due to its relevance as the capital of Japan and the center of its industries. Nevertheless, the government was absolutely determined to reconstruct the land, as seen by the establishment of a "War Damage Rehabilitation Board" in November and the cabinet decision on the "Basic Policy of War-Damaged Area Reconstruction Plans" on December 30. The objective of this basic policy was land readjustment.

In September 1946, the *Special City Planning Law* was again stipulated and promulgated (and later abolished in April 1956). The law was generally based on the former *Special City Planning Law*. However, compared to the previous one, the new law placed more focus on land readjustment implemented by prefectural governments and municipalities based on the central government's order in existing urban areas. Regarding the designation of planned replots, the law stipulated the extent and period of the rights to use or benefit from land in the period between its designation and the enforcement of replotting. Thus, more considerations were given to the protection of land rights during the project implementation, compared to the provisions of the previous law. In addition, detailed revisions were made to the law to include the provisions for the non-allocation of replotted land upon the consent of the right holder, the size optimization of excessively small housing land, and installment payments for equity. In addition, the responsibilities and member selection process concerning the "Land Readjustment Committee" and "Compensation Review Board" were stipulated in the enforcement orders and regulations, creating a legal framework similar to the current *Land Readjustment Law*.

While the old law had stipulated a contribution of up to 10% of a land parcel by the owner without compensation, the ratio increased to 15% under the new law. For the contribution of land exceeding 15%, compensation for the loss of the land would be granted. Forcing landowners to freely give 5% more land than under the previous law, was perhaps the result of the recognition of the effects of urban facilities in past land readjustment projects. However, the current Constitution enacted in 1946 strongly protects the rights of the people, and a question arose that the contribution of up to 15% of land without compensation failed to satisfy the constitutional requirements.

This was because certain features in the land readjustment areas might prevent the land prices from increasing to a level that would offset the 15% contribution. As a result, a revision was made by a Diet Resolution in 1949 to include a provision stipulating that "the implementing agency shall be bound to pay the amount of money equivalent to the decrease in the total land value of the project area through the land readjustment project to those who own the original plot or rights as compensation for the decreased value," which led to Article 109 of the current *Land Readjustment Law*.

The "Basic Policy of War-Damaged Area Reconstruction Plans" set high standards for public facility development in place. The policies required the width of a major road to be 50 meters or more in large cities and 36 meters in small and medium-sized cities. They required the development of wide lane roads that varied in width from 50 to 100 meters and public squares, and also required green spaces and open spaces to account for more than 10% of the city area. Consequently, symbolic roads and tree-lined roads in major cities were developed in postwar reconstruction projects.

The following are the topographic maps of Hiroshima city and Nagoya city while the postwar reconstruction projects were underway.

The map of Hiroshima city represents five years after the dropping of the atomic bomb (see Figure 2.1). The map shows that housing reconstruction progressed to a certain degree. The major street running through the center of the map (shown in white) is Heiwa Odori Avenue (Imao 2011).

In Nagoya city (see Figure 2.2), Hisaya Odori Avenue, which runs south from the Naka Tax Office (shown as a white line that runs east to west in the map), was developed as a street with a width of 100 meters during the postwar reconstruction project, in the vacant land where buildings had been compulsorily removed to create a fire break[6] to mitigate damages from the aerial bombings during the war (Nishiyama 2000).

▼ Figure 2.1. Hiroshima city (1950)

Figure 2.2. The northeastern part of Nagoya city (1953) ▲

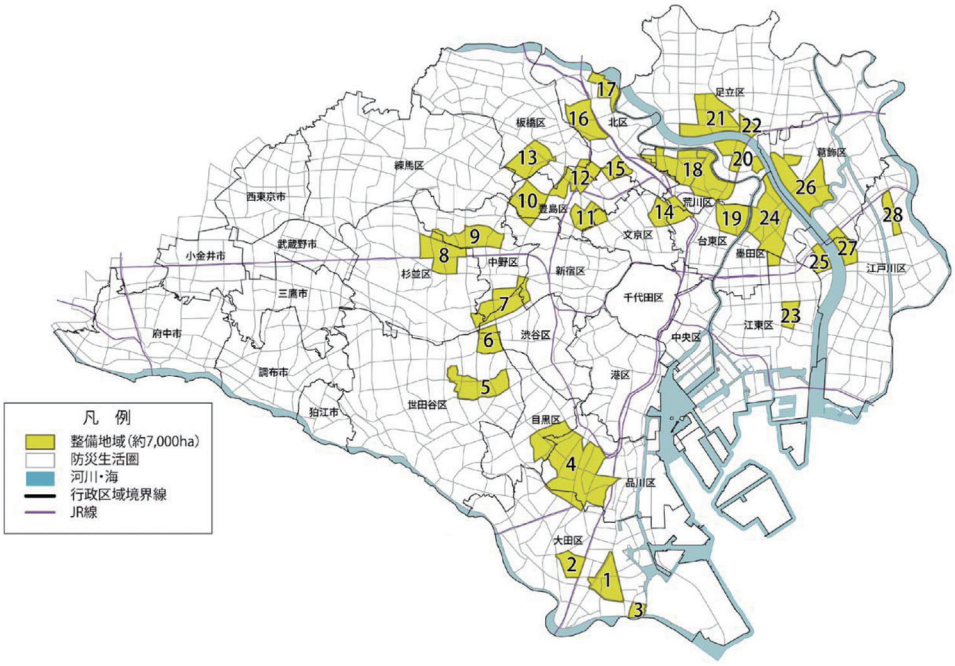
However, the postwar reconstruction projects did not progress smoothly. Extreme inflation occurred in the chaotic aftermath of the war, adversely impacting the central and local governments' financial health. Along with monetary tightening as instructed by the so-called financial advisory group from the US in 1949[7], revisions were made to the postwar reconstruction projects. In particular, the land readjustment area planned for Tokyo, the largest war-damaged city in Japan, was revised several times and reduced to 4,958 hectares, or one quarter of its original plan of 20,130 hectares. Eventually, the project was completed for 1,274 hectares, which only accounted for 6.3% of the total planned project area, and the location was limited to the areas in front of the Yamanote railway line stations. Since the projects in provincial cities progressed ahead of those in Tokyo, the downsizing of the projects was avoided. On the other hand, the capital of Japan, Tokyo, was subject to a drastic downsizing. Table 2.1 presents a list of the postwar reconstruction plans in major cities and the outcomes. It shows poor project results in Tokyo.

Table 2.1. Comparison of Postwar Reconstruction in Major Cities

City Names	Planned Area (hectares)	Final Project Implemented Area (hectares)	Ratio of Actual Land Readjustment Area to Previous Planned Area (%)
Nagoya	4,407	3,452	78.3
Kobe	2,284	2,344	102.6
Yokohama	2,066	853	41.3
Osaka	6,097	2,195	36.0
23 Special Wards (former Tokyo city) (*)	20,130	1,274	6.3

(*) The data of the 23 Special Wards is modified on the author's responsibility. (Source: Nishiyama 2000).

As a result of this downsizing of postwar reconstruction projects in Tokyo, numerous small wooden houses still remain in the densely populated areas within the Yamanote railway line loop and along the outside of it, making these areas very vulnerable to disasters (see Figure 2.3).



▲ Figure 2.3. Densely populated wooden building district in Tokyo Metropolitan

The yellow areas represent the densely populated wooden building district.

Post-Disaster Reconstruction and Land Readjustment in the Latter Half of the 20th Century

While people were making efforts in post-disaster reconstruction, natural disasters hit several districts in Japan. The Fukui Earthquake that occurred in 1948 caused terrible damage, killing about 3,900 people and completely destroying about 36,000 houses. In the following year, land readjustment for 128 hectares in the Morita area commenced during the post-disaster reconstruction efforts. In addition, in 1949, Iwanai town, Hokkaido, was hit by the Toyamaru Typhoon, and due to the strong winds, 80% of the

houses in the area were burned down. Post-fire land readjustment was carried out for 137 hectares. In 1952, a fire started in Tottori city and was fanned by a strong southerly wind caused by a föhn phenomenon, affecting almost half of the citizens (20,451 affected people; 5,288 damaged houses; and 160 hectares of damaged area). However, post-disaster land readjustment for 177 hectares of the area was initiated.

While these disasters and subsequent reconstruction projects continued, in May 1954, many years' earnest wish of people concerned in land readjustment was fulfilled. The *Land Readjustment Law* was enforced as an independent law regulating project implementation methods. The 1954 law was established as a coherent land readjustment framework. The new framework evolved over a long period of time from the older ones developed to meet the needs of the times and societies provided under the former *Arable Land Readjustment Act*, the former *City Planning Act*, and the former *Special City Planning Law*. During the legislation process, considerations were paid to allow for reality-based project implementation, reflecting opinions by various people doing the actual work on the law.

The main characteristics of the law include: the introduction of the replotting plan framework; the systematization of reserve land which had previously dealt with the interpretation of the laws; the treatment of leaseholders in the same way as landowners regardless of whether they own unregistered or registered lands as democratization progressed; the establishment of the term of office, and re-election and removal of directors of the land readjustment association and members of the land readjustment council; the right of the implementing agency to directly conduct the transfer and removal of buildings; the introduction of buildings for replotting; and the designation of provisional replotting when it is necessary for construction works.

Japan, which saw a period of rapid economic growth and became a member of advanced countries, implemented infrastructure development projects, including river projects, which resulted in increased disaster preparedness. Nevertheless, the fact that the country is prone to natural disasters remains unchanged. Japan is hit by typhoons every year and also hit frequently by heavy rain, flooding and earthquakes. On January 29, 1976, a great fire occurred in Sakata city, a medium-sized provincial city situated on the coast of the Sea of Japan. The fire burned down about 1,800 houses and about 3,300 persons were affected. In the middle of the night of January 30, after the fire was put out, a decision was made on policies for conducting the "Post-Fire Reconstruction Land Readjustment Project" aiming for disaster-resilient urban development, and more specifically for the reconstruction and modernization of shopping streets, and the creation of residential environment in the fire-hit area (Nishiyama 2000). Subsequently,

the projects made significant progress and in 1979, a reconstruction ceremony was conducted. The experiences in Sakata city were also successfully applied to the reconstruction following the Great Hanshin-Awaji Earthquake in 1995.

The Great Hanshin-Awaji Earthquake as a Turning Point for Post-Disaster Reconstruction Projects

On January 15, 1995, the Great Hanshin-Awaji Earthquake (also known as the Southern Hyogo Prefecture Earthquake) with a magnitude of 7.3 occurred. The earthquake occurred directly beneath Kobe, causing damages to the Kinki area (Hyogo Prefecture in particular, and Osaka and Kyoto). The urban area of Kobe, one of the major cities in Japan, suffered significant damages. The earthquake left 6,437 people dead or missing, and 43,792 injured. A total of 460,000 households suffered damage; 104,906 houses were completely destroyed and 144,274 houses were partially destroyed. Fire following the earthquake completely destroyed 7,036 houses, partially damaged 7,574 houses, and affected 8,969 households. In addition, the earthquake and the subsequent fire caused significant damage to the infrastructure: 7,245 roads, 330 bridges, and 774 rivers were damaged and 347 landslides took place. The total amount of damage was estimated to be about JP¥ 10 trillion (Fire Defense Agency 2006).

Kobe city, the most severely damaged city, conducted post-disaster reconstruction projects, including public housing development for the sufferers and land readjustment in 13 areas (2 areas of which were implemented by land readjustment associations). In addition, as a post-disaster reconstruction project, land readjustment was conducted in Hokudan town, Awaji-shima island as well. Being designated by ordinance as a major city, Kobe city made use of land readjustment for urban development and had enough experience for that. Nevertheless, there were not enough engineers to urgently conduct large-scale post-disaster reconstruction projects. It is worth noting that the Housing and Urban Development Corporation (currently the Urban Renaissance Agency) working in new town developments through land readjustment and construction of flats and apartments, provided tremendous support to help reconstruct the city in a short period of time.

The government responded swiftly to these reconstruction movements. On February

26, a little more than a month after the earthquake, the *Act on Special Measures Concerning Disaster-Stricken Urban District Reconstruction* was enacted. This act enabled a special framework for land readjustment. For example, a joint-construction public apartment site can be designated in the project area in which land owners can get their replotted land and participate in the joint construction of the apartment if they want (articles 11 and 12). In addition, Article 15 of the act, on "the provision of houses, etc. in place of equity," provided a framework to offer a flat in an apartment instead of replotted land to the disaster-affected people who lost their houses and were left with the land as their only asset. Legally, when the replotted land is not offered, equity is paid. The new framework helped the disaster-affected people to restore their livelihood by providing them with houses built by an implementation agency in place of money. It is expected that the framework will enable the disaster-affected people to move out of a temporary house into their own house relatively soon after a disaster without financial burdens (Research Group on Urban Planning Act 2011).

Furthermore, the "land purchase" framework as stipulated in Article 8 of the act is integral to the restrictions on the construction of buildings and other activities in the disaster-affected area where a reconstruction project is being promoted, and is based on Article 56 of the *City Planning Act* on the purchase of land in the scheduled project site. This may have effects similar to those of Article 7-6 of the *Urban Renewal Act* that protects the freedom and rights of land owners who do not agree with a planned project to sell their parcels in the scheduled project site and to move out of the project site. Between the institutionalization of land readjustment in 1954 and 1995, land readjustment projects in connection with post-disaster reconstruction were conducted in 178 areas, and covered 7,660 hectares of the land in Japan (Osawa and Kishii 2005).

The Reconstruction Project for the Great East Japan Earthquake

On March 11, 2011, a big earthquake at the Pacific Coast of Japan hit the eastern part of the country. Damages from the 9.0 magnitude earthquake and subsequent tsunami, which is said to be the kind that hits once every 1,000 years, were far more devastating than those by the Great Hanshin-Awaji Earthquake. According to the National Policy Agency, official records confirmed that the earthquake and the tsunami left 18,456 people dead or missing and 400,438 houses/buildings either completely or partially destroyed as of August 8, 2014. The number of evacuees totaled more than 400,000

immediately after the disaster, and 247,233 people as of July 10, 2014. Note, however, that these figures include evacuees from around the damaged Fukushima Daiichi Nuclear Plant due to the fear of radiation contamination. The direct damage of the earthquake is estimated to be around JP¥ 16 to 25 trillion (Cabinet Office 2011). According to the estimation by the World Bank, this was the worst economic damage from a natural disaster in the world's history. It really was an unprecedented disaster.

The damage was done across the eastern part of Japan. In particular, the coasts of Iwate, Miyagi, and Fukushima were severely damaged by the tsunami. The cities and towns damaged by the earthquake and tsunami were all small and medium-sized municipalities with small populations, except for Sendai city. There was a town where the mayor and many of his staff members were killed by tsunami. There were not many municipalities that could design a post-disaster reconstruction plan and conduct a reconstruction project themselves. After the earthquake and the tsunami, the Ministry of Land, Infrastructure, Transport and Tourism conducted a "Survey on Reconstruction Methods for the Tsunami-Affected Areas" and dispatched experts and consultants specializing in urban planning to 62 municipalities to investigate the extent and severity of damages and help the affected municipalities to prepare reconstruction plans that would suit the situations in their respective cities/towns (except for the areas directly affected by the Fukushima Nuclear Power Plant) (MLIT 2012). Based on this survey, making use of experience of the unprecedented tsunami damage, a plan that included measures to improve disaster prevention functions was prepared. Several post-disaster reconstruction projects concerning urban planning are being conducted, including large-scale site preparations to move the communities from lower ground close to the sea to higher ground[8], and most of these projects are centered on land readjustment. According to the Reconstruction Agency of Japan, as of the end of June 2017, 50 areas of all the projects which completed urban planning formalities started construction works, out of which 17 projects were completed. Rehabilitation of individual infrastructures, including coastlines, sewers, roads, railways, etc. is progressing relatively smoothly. On the other hand, difficulties remain for the urban reconstruction projects.

In areas where many landowners lost their lives, confirmation on land rights in connection with reconstruction projects was difficult. In addition, the majority of small and medium-sized municipalities do not have enough engineers to start a project in the first place. Initially, many public servants were dispatched from local governments all around Japan to the affected municipalities to provide help with administrative works and reconstruction projects. Nevertheless, a land readjustment project – even a relatively short one – usually takes several years to complete. It is difficult for these dispatched staff members to support the works, including public facility planning,

construction orders, construction management and explanation to landowners, over a long period of time.

Therefore, the Urban Renaissance Agency, which employs many professional engineers, signed contract agreements with 22 affected municipalities for reconstruction using the construction management method. Approximately 400 engineers and staff members dispatched from the Urban Renaissance Agency are now supporting the projects. The construction management method is a method in which Urban Renaissance Agency signs a kind of turnkey contract for a land readjustment project with the affected municipalities, and manages the whole project by overseeing the completion of reconstruction activities by planning consultants and construction companies hired by the agency (Urban Renaissance Agency 2014). In the tsunami-affected areas, the majority of the buildings were swept away and many places look like wastelands. Based on its experience in new town developments, Urban Renaissance Agency employs a method that is not often used for the existing urban areas. The method employed is to lease all land necessary for construction works from the owners concerned at an early stage instead of using provisional replotting to implement the project, and tries to complete the project at the earliest possible time (according to interviews conducted in March 2014 at the Urban Renaissance Agency's local offices).

Closing. Japan's land readjustment is characterized by the use of a certain level of legal force, i.e. "enforcement of replotting" as an administrative measure within a framework for urban planning in conducting a project. Land readjustment associations composed mainly of landowners are given authority to take this administrative measure to provide landowners with replots which are different from the former parcels of the owners in terms of location, shape and size even if the owners do not agree to their replots provided. This authority is based on the requirement of the consent of at least two thirds of the landowners to the articles of association and the project plan (and, simultaneously, the land areas owned by them are required to exceed two thirds of the total landowners' area). On the other hand, unlike the land readjustment by association, in order to develop infrastructure in urban areas, local authorities and public institutions are granted implementation authority. They implement projects through enforcement of replotting with an agreement from committees consisting of landowners' representatives. The latter method is used for land readjustment for post-disaster reconstruction and, as explained, the legal framework and operations have been established and improved throughout nearly 100 years of experience. In the reconstruction projects following the 2011 disaster, land readjustment will contribute to realizing safer and more comfortable urban environment for communities than ever before.

Endnotes

[1] In Japan, disaster rehabilitation projects are defined as those needed due to a disaster, and to recover the disaster-affected facilities to their original states (including the construction of a facility to recover the former utilities of the disaster-affected facilities in a case where it is impossible to recover the disaster-affected facilities to their original states) (article 2, *National Government Defrayment Act for Reconstruction of Disaster-Stricken Public Facilities* of 1951). In addition, Article 3 of the mentioned act states, "In projects needed due to a disaster, where it is extremely difficult or inappropriate to recover the disaster-affected facilities to their original states, the projects that aim to build substitute facilities are regarded as 'disaster rehabilitation projects' in the application of this law." And the disaster rehabilitation principle is "to recover its original state."

[2] Zone condemnation was an expropriation method used for opening roads, through which larger areas than the actual planned road were expropriated; following the development of the area, the excessive land was sold at the increased land price and the profits were used to recover the development costs. This is a method successfully used by Georges-Eugène Haussmann, the prefect of the Seine Department, for devel- oping Paris in the second half of the 19th century. In Japan, the method was adapted in Articles 16 to 21 of the former *City Planning Act*, and there are six examples of the method being put into practice. This is also called "excess condemnation."

[3] Initially, the roads were 2.4 meters wide and the roads on which carriages ran were about 3.6 meters wide. A size of a block was 109 meters x 182 meters, which came from a standard size of farmland. Note that Tatsutaro Sasahara, who promoted housing site development by arable land readjustment in the suburbs of Nagoya during the Taisho period (1912-1926), guided innovative development projects, as exemplified by the development of 14.4 meters wide roads, an extraordinary width for the standards in those days.

[4] Land readjustment not based on the *Arable Land Readjustment Act* included projects to which the following articles were applied: Article 13 "disaster rehabilitation," Article 15 "integration of building sites," Article 17 "integration of buildings for the security or sanitation purposes," and Article 20 "projects that need judgments by the Expropriation Committee."

[5] The "former" is added to distinguish the law from the *Special City Planning Law* enacted at a later time for conducting postwar reconstruction projects. It was enacted in 1923 and abolished in 1941.

[6] Removal of existing houses was required to set a firebreak. Since the Japanese houses in those days were made of wood and were very vulnerable to fire, the houses and buildings that were likely to catch and spread fire were forcibly removed. A total of 610,000 houses were destroyed across the country (Nishiyama 2000).

[7] Mr. J. M. Dodge, financial advisor for the Supreme Commander of the Allied Powers, proposed the tight monetary policy in December 1948. The postwar reconstruction plan was reduced in budget and size by half of its initial plan.

[8] The "Project for Promoting Group Relocation for Disaster Mitigation" was planned for 333 areas, the legal process was completed for all the areas, and construction has started in 292 areas, or 88% of the planned areas as of March 2014 (MLIT 2014). The project is relatively small in scale: a relocation site is purchased for the respective disas- ter-affected communities and the site development is conducted for each community.

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