The LR method is applied in several countries around the world. It is known by different names and was originally used for the consolidation of farmlands. We can understand it as a strategy for developing and redefining land unit boundaries with landowner participation. It is currently used as a method for regional development through the implementation and improvement of urban infrastructure without expropriation of the land units. Based on this principle, LR or similar methods, is submitted to the basic ownership conversion models and is broadly applied in developed and underdeveloped nations, which shows that the method has a "general use" character, capable of being applied according to different realities.

In **Germany**, the method is called Baulandumlegung, and similar to Japan, it is an evolution from taking better advantage of farmlands. When it began to be applied in urban development, the trade-off for road expansion was compensated by a fee on land reduction. The Adickes Law, or Territorial Consolidation Law, approved in 1902, established the theoretical fund for the system, which began to be applied mainly in the outskirts of cities. With the recent revision of the urban planning system in the country, by means of the Agrarian Adjustment Law of 1990, it was established that the LR projects that could previously be carried out in a disassociated manner, would begin to be approved by means of a detailed intervention plan called Plan B. The replotting procedure (Umleneungsverfahren) established to implement Plan B, has the basic LR system structure used in Japan, however, there is not an independent law for each LR project. Development costs are absorbed by public authorities through the reduction in private land units and the benefits are absorbed by the private sector through the reevaluation of taxes and prefixed fees.

In **India**, the method is called plot reconstitution and it is applied by means of the Urban Planning Law of Bombay, approved in 1915. Projects have been executed in Bombay areas and others such as Maharashetra, Gurajata and Amedabad, always with the characteristic of reorganizing farm units.

In **Australia**, the method is called land pooling and it is being mainly implemented in Western Australia. In this pool, all land unit ownerships are acquired and then redistributed after project execution. Land pooling was established by the Urban Planning and Development Law of 1928 and improved by the Urban Planning and Development Law of Western Australia (TPA) in 1984, transforming nearly 50 districts since the beginning of its implementation in the 1950s. The procedure establishes two different execution plans: the Resumption Development Plan (RDS) and the Guided Development Plan (GDS). In the RDS, the project is basically implemented by the local government and the landowners participate by offering their property in exchange for financial return, and where the replotting system does not exist. Conversion of the ownership deed is carried out through purchase and sale. In GDS, the project is implemented individually in regions where private landowners possess enormous pieces of land. This plan coordinates execution time and infrastructure costs in a differentiated manner. Ownership conversion occurs through divisions and agglomerations by a single landowner. In the case of land pooling implemented by a private agent, the land is acquired as a pool through the voluntary action of landowners. After the area is developed, the lots are duly distributed or compensation is made in money.

In **Turkey**, the method is called land readjustment, like in Japan, and it was established by Municipal Expropriation Law 2.497 of 1934. It was updated by Amnesty Law 2.981 of 1983 and Reconstruction Law 3.194 of 1985. It was last improved in 2005, with the approval of Municipal Expropriation Law 2.942. This type of project is most used in the country for farm unit reorganization.

In **Korea** (first in South Korea and later in North Korea), the technology and system were imported from Japan and ownership conversion was made through replotting along the lines of the Japanese land readjustment model. The method was introduced in the country through the Urban Planning Law in 1934 and more recently the Residential Development Promotion Law of 1980. Development profits are absorbed by public authorities through mixed subsidies and used for building social interest housing (low-income population).

In **Taiwan**, the method is called land consolidation and it was also imported from Japan about 40 years ago. Projects of this type, indirectly introduced by the Constitution of the Republic and the Agrarian Territory Consolidation Program, are being implemented in many of the country's districts. Development profits are absorbed by public authorities through mixed subsidies and used for the equal division and agrarian reform of farmlands.

In **Spain**, the method is called *reparcelación* and it was introduced by the principle of equal distribution of costs and benefits, by architect Idelfonso Cerda, in 1861. This method, included in a bill as a distribution technique that is the responsibility of all those involved in the project's area, was vetoed that same year. However, it was first used in the "widening" process of Barcelona with the name *regularización y compensación de solares* (lot regularization and compensation) in the city's municipal laws in 1889. The method was later instituted by the Land Law of 1956, recognizing compliance with the principles of cooperation and compensation as an obligatory practice by all landowners; in Spanish urbanism, the land is the main agent in this operation. Every transformed square meter must balance costs with benefits.

In **Indonesia**, the method is called land consolidation, as in Taiwan, and it was instituted by a national land distribution policy in Basic Agrarian Law # 5, of 1960. It was then updated by the Occupation and Housing Law of 1992. The first project began in the 1980s in Denpasar, in the province of Bali, and since its implementation, several others have been carried out (140 areas in 25 States), or they are in the execution process. The main problem faced by the country is the difficulty in providing land for implementing infrastructure: public money restrictions impede compensation by payment using financial resources. Over recent years, a new type of method, called urban land consolidation, has been used, and the development benefits are transferred to the project through a means of financing by commercializing the reserve lands.

In **Canada**, the method is called replotting schemes and it was instituted by the Local Government Law of 1983. The projects are founded on public-private partnerships in which the landowners become the promoting agent and the public authorities stipulate the rules to be obeyed for urban development.

In **Colombia**, the method is called *reajuste de tierras* (land readjustment) and their implementation contrasts with traditional land urbanization seen in the past decades, where responsibility for infrastructure was exclusively up to public authorities. The Urban Reform Law of 1989 and the Territorial Development Law of 1997 instituted the Japanese land readjustment concepts and the Contribution by Improvements concepts, the recovery of the Spanish capital gains appreciation. There is still no regulating decree to establish land readjustment operation rules and the records are very imprecise, especially in farm regions. Due to these problems, and others, such as the illegal occupation of land and social-cultural differences, the method is still in its development stage and its first pilot project is still being formulated.

In **Nepal**, the method is called land readjustment and it is exclusively based on the participation of public authorities in strategic projects for the city, with very few financial resources. Furthermore, the method introduced in 1976 through the Land Acquisition Law and established in 1988 by the Urban Development Law aims to provide basic urban infrastructure in extremely poor areas in the city through landowner contributions. The reserve lands, called "service lands" will be sold to finance the project, and the replotted lots will be returned to the landowners respectively benefited by the improvements.

In **Thailand**, the method previously called land sharing and today called land readjustment was introduced in 1987 after Japanese technicians were sent to apply the new technology in the urban planning projects. In November 1991, Bangkok held the VI International Seminar of Urban Development and Land Readjustment, where the concepts were introduced nationally, thus making the discussion on introducing the method in the country public. In 1992, an evaluation committee was created, and in 1993, the first pilot project (Rama 9 LR) was executed. Several projects have been put in motion ever since. The Land Readjustment BE 2547 Law was approved in 2005.

This chapter will now briefly describe case studies on land readjustment projects in three countries: Colombia, Japan and Nepal.

The project selected from Colombia was the **Simesa** pilot project, which resulted from the method's first implementation efforts in the country. The city of Medellin has a scarcity of land and is unable to enact the desired development. It therefore becomes necessary to reconvert industrial zones since their reuse will constitute lands with great potential for new developments.

The first project chosen from Japan was the **Arimatsu** project. The district is located in a region with great historical importance, and it developed along the old Tokaido road that connects Tokyo to Kyoto. Its characteristics from feudal Japan (narrow streets and houses made of wood) remain intact to this day. The production of a district that adapts to the new demands of urban growth was a prerogative for its transformation, and its adaptation to anti-disaster safety norms was established respecting the country's historical heritage.

Nagakute Nanbu was the second project chosen. Located on the border of the cities of Nagoya and Nagakute, this region is characterized by its rough topography and large amount of native vegetation. In order to preserve this "green heritage", the development plan established that this region would be used for controlled urban expansion along the lines of eco-cities, privileging energy self-sufficiency.

Tsutsui was the third project chosen. While Japan designated strategic areas for reconstruction after the Second World War, other areas faced years of urban stagnation and a lack of infrastructure capable of accompanying the great Japanese economic growth. It was necessary to requalify the district, considering that the government had recently built a new subway station and expanded an important highway connecting to downtown Nagoya, which replaced dense occupation by wooden homes with appropriately installed condominiums.

Dambara was the fourth chosen study. This project won international awards and is the result of the Hiroshima Planning Law, which designated 74 ha for building new roads, parks and drainage and sewage infrastructure. This measure adjusted this section to the rest of the city that had been rebuilt after it was destroyed by the atomic bomb. Through an instrument called the Program for the Improvement of Densely Populated Housing Areas (DPHA), the old homes were demolished and the modern ones were built with social equipment.

Nijo was the fifth project chosen. Deactivation of the JR San-in train line cargo terminal made room for expanding the public transportation system from the downtown to the outskirts of Kyoto, and for building a commercial entertainment complex and a post-graduate university next to the station through a partnership with private sector.

Otemachi was the sixth project chosen. This project explores the method's operating capacity and the familiarity the Japanese government has with this technology. The Special Measures for Urban Renewal Law provided support for the intensification of land use in zones designated as important areas for metropolitan development. Fifteen buildings were demolished or adapted and replaced by more modern ones with a higher utilization coefficient and more public areas, readjusting the location for its vocation as an International Business Center.

The seventh project chosen was **Minato Mirai** 21. This may be one of the most ambitious and advanced urban projects in the world. This old industrial zone in the city of Yokohama, designated as an Area for Development of a National Emergency Nature aims to attract all the potential of the private sector and decentralize Tokyo's international and metropolitan functions. By expanding the area into the sea, this project foresees the building of modern urban installations, such as underground service galleries, a potable water reserve and shelters in the event of large disasters.

The chosen project from Nepal was **Naya Bazar**, done after the Gongabu and Saibu pilot projects, and the result of efforts and improvements to implement the method in the country. The project demonstrates the method's capacity to adjust to the most diverse economic and social realities. The environment in the Katmandu metropolitan region has high levels of urban deterioration, poverty, epidemics (hepatitis and dysentery) and a lack of the most diverse basic infrastructures (water and sewage), which challenges any possibility for improving its economy through tourism. The objective of this type of project is mainly to provide minimal living conditions to each lot, reversing the disorderly population growth and the growth of illegal occupations in the form of shantytowns.

'Grande Quadra Simesa' Partial Development Plan - Colombia

Location: City of Medellin, Colombia.
Promoter: Valores Simesa (private initiative).
Project area: 30.60 ha.
Landowners and dwellers: 17 landowners (four large industries keep their building structure and 13 small landowners will readjust three buildings). Among the 13 small buildings, ten are currently being leased, and the remaining buildings and the four industrial ones are occupied by their respective owners.

Conception of the project

Specific objectives: The main objective of the Medellin Master Plan is to "grow inwards" using the underutilized areas within the city, avoiding uncontrolled urban expansion and developing old industrial occupations. This project intends to optimize the installed transportation and public service infrastructure, introducing a new population in this zone with great development potential. Medellin is a city with a scarcity of land so it becomes necessary to recycle land use and occupation, especially in lands occupied by industries with a potential for reutilization and the construction of large developments.

Contribution rate in land (surface): The private lands contributed 40% in area for constituting public spaces.

Urban parameters: The adopted building coverage rate ranges between 40 and 60% and the maximum utilization floor-area ratio is equal to 4.0.

Densities: There is no housing in the study area, however the project foresees the construction of 4 thousand units, creating a density of 130 units/ha, or approximately 520 inhabitants/ha.

Development stages: Five implementation steps were proposed for project development. These steps depend on the capacity of each group of landowners due to the gradual reallocation of those companies that currently occupy the lots and the ability of the real estate market to commercialize the proposed development.

Duration

Starting year: The project was conceived between 2003 and 2005.
Estimated period for implementing the complete project: From 2006 to 2026.

Benefits

For public authorities: The project shall convert approximately 40% of its area into parks and public roads for public authorities (expansion of metropolitan streets and the construction of a cultural center, a sports center and an educational center). And the project will be self-financed, in other words, it will pay its own costs, exonerating public authorities from more expenses.

For landowners and tenants: The landowners participate in cost distribution (around 12%) and shall comply with the contributions for public spaces and urban infrastructure. On the other hand, after the project their properties will appreciate 60% and the buildings around 12%.

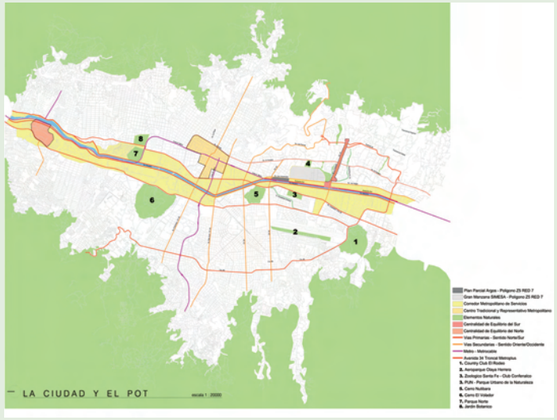
For investors: The investors who acquire the project lots can increase profits around 5 to 10% over total sales.

Costs and subsidy

Total cost is estimated at approximately US$ 450 million.
This project does not have government subsidies, only the private sector contribution and landowner participation.

Other characteristics of the project

The main difficulty encountered was the need to make landowners aware of the project phases and their procedures due to the gradual execution process, preservation of property rights during the transfer of industries and the careful introduction of new uses, avoiding possible conflicts in the future.



Map of location and main projects and actions in the region.
Source: DNP - National Department of Planning of Colombia

Volumetric proposal for "Grande Quadra Simesa".
Source: Juan Carlos Garcia Bocanegra, DNP - National Department of Planning of Colombia

Aerial Image. Source: Google Earth

Arimatsu Land Readjustment Project - Japan

Location: City of Nagoya, State of Aichi, Japan.
Promoter: Nagoya Urban Planning Agency, Department of Urban Planning.
Project area: 6.9 ha (69,890.46 m²).
Landowners and tenants: 173 landowners and three tenants.
Conception of the project
Specific objectives: : the project intends to adjust the district's old characteristics and its constructions to new urban infrastructures, maintaining the charm and historical ambiance of feudal Japan from the occupation of the Traditional Street of Tokaido (historical road that connected Tokyo and Kyoto along the Tekoshi River). The district's houses were all destroyed in a great fire in 1784 and rebuilt using a very peculiar fireproof method which gives the location unique characteristics. Finally, besides the conservation of the historical site, the following urban installations will be built: Arimatsu-Line Street, National Road # 1 and Arimatsu Park.
Contribution rate in land (surface):): the private lands contributed 18.93% in area for constituting public spaces.
Densities: 76.5 inhab/ha before project execution.
Implementation plan (from 1989 to 2010):
1989 Feb.: Nagoya approves its urban plan, including the Arimatsu LR project.
1990 Dec.: The Arimatsu LR Project is approved.
1991 Oct.: The Arimatsu project evaluation commission is established.
1992 Dec.: LR project is exposed to landowners, tenants and stakeholders.
1993 Nov.: Modification of the LR project.
1995 Oct.: Temporary replotting is announced.
1996 Oct.: Reallocation of population from area 1 and beginning of project works.
1997 Oct.: Reallocation of population from area 2 and beginning of road system works for area 1.
1998 Oct.: Reallocation of population from area 3 and beginning of road system works for area 2.
1999 Oct.: Reallocation of population from area 4 and beginning of road system works for area 3.
2000 Oct.: Reallocation of population from area 5 and road system interconnection works for areas 2, 3 and 4.
2001 Oct.: Reallocation of remaining population from area 5 and road system interconnection works for areas 2, 3 and 4.
2002 Mar.: Modification of the LR project.
2002 Mar.: Reallocation of population from area 6 and beginning of road system works for area 5.
2003 Mar.: Approval of Urban Development Plan.
2003 Mar.: Reallocation of population from area 6 and road system interconnection works for areas 2, 3, 4 and 5.
2004 Mar.: Road system interconnection works for areas 2, 4 and 6.
2005 Mar.: Reallocation of population from area 6 and modification of LR project.
2006 Mar.: Reallocation of remaining population from area 6 and road system works for area 6.
2007 Mar.: Road system works for area 6.
2008 Mar.: Road system interconnection works for areas 5 and 6.
2009 Mar.: Construction of Arimatsu Park.
Duration
Starting year: The project was conceived between 1990 and 1995.
Estimated period for implementing the complete project: From 1995 to 2010.
Benefits
For public authorities: Disaster prevention (earthquakes, landslides and fires) by replacing very narrow roads, building a new road system proposed by the Urban Development Plan and conservation of the historical site adapting its road system to city demands.
For landowners and tenants: Improvement in property use and prevention of large accidents in case of earthquakes and landslides. Lots appreciated around 101.13%.
For investors: There is no external private investment.
Costs and subsidy
Total cost is estimated at around US$ 85.4 million. A total of US$ 43.5 million in municipal subsidies was used. There was landowner participation.

Aerial Image. Source: Google Earth

Conceptual design of Arimatsu in 1990, before project implementation. Source: Nagoya Urban Planning and Development Agency, Japan

Conceptual design of Arimatsu in 2006, after project implementation. Source: Nagoya Urban Planning and Development Agency, Japan

Panoramic view of Arimatsu in 2006.
Source: Nagoya Urban Planning and Development Agency, Japan

Nagakute Nanbu Land Readjustment Project - Japan

Location: City of Nagakute, State of Aichi, Japan.
Promoter: Association for the Promotion of Land Readjustment of Southern Nagakute.
Project area: 98.2 ha (981,988 m²).
Landowners: 398 landowners (during approval period). At present, there are already 416 landowners.

Conception of the project

Specific objectives: The Nagakute Nanbu project aims for the city's urban expansion following all the precepts of a safe and ecologically active city. The blocks were designed using a method called "eco-residential block" where all garbage is recycled. There is a high percentage of green area per inhabitant and project area accessibility was developed to attend to children and the elderly, as well as all handicapped people.

Land use proposal before and after the project:
Private lots: 864,187 m² (88%) before and 567,001 m² (57.8%) after.
Public areas: 30,790 m² (4%) before and 311,511 m² (31.7%) after.

Contribution rate in land (surface): Private lands contributed with 28.91% in area for establishing public spaces and 10.98% for reserve lands, for a total of 39.89%.

Densities: There is a proposal to build 1890 housing units for a projected population of 5.1 thousand inhabitants. We will therefore have an approximate density of 51.93 inhab./ha.

Implementation plan: The project implementation stages involve building and articulating four structural roads (16 to 20 m in width, total length of 3366 m); construction of a local road system (6 to 12 m in width, total length of 16,929 m); construction of exclusive lanes for pedestrians (4 to 8 m in width, total length of 2,189 m) and the construction of six small parks, for a total green area of 30,000 m². The project also stipulates the construction of the following public installations: elementary school, kindergarten and a cemetery.

Duration

Starting year: The project was approved in 1997.

Estimated period for implementing the complete project: From 1997 to 2007, unfinished.

Benefits

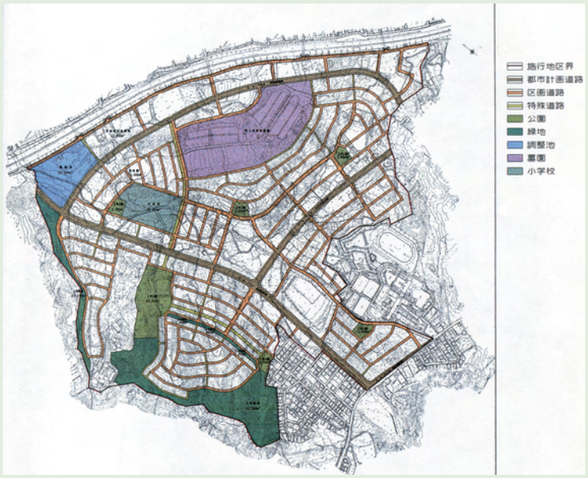
For public authorities: Development of the southern section of Nagakute through occupation control according to eco-city concepts (ecologically correct city).

For landowners and tenants: : Improvement in property use and land appreciation of around 40% (after the project the land value jumped to US$ 1,145/m²).

For investors: There is no private investment.

Costs and subsidy

Total cost is estimated at around US$ 179 million. There were federal subsidies of US$ 50.3 million and municipal subsidies of US$ 6.6 million. Reserve lands totaling 103,475 m² were established for commercialization, and they brought in US$ 120.4 million. Donations totaled US$ 7.7 thousand.



Nagakute Nanbu Land Readjustment Project. Source: City of Nagakute, State of Aichi, Japan

Aerial image of Nagakute Nanbu in 1999. Source: Nagoya Urban Planning and Development Agency, Japan

Aerial image of Nagakute Nanbu in 2005. Source: Google Earth

Tsutsui Land Readjustment Project - Japan

Location: City of Nagoya, State of Aichi, Japan.
Promoter: Nagoya Urban Planning Agency, Department of Urban Planning.
Project area: 15. 71 ha.
Landowners and dwellers: 839 landowners and 567 tenants.

Conception of the project

Specific objectives: The region of Tsutsui is a mixed use zone located east of Nagoya, 4 km from the JR Nagoya central station. They are outlying areas dating back to the Edo period (feudal Japan) and were destroyed by bombs during the Second World War. With the implementation of LR as a measure to recover the cities, many regions were excluded for having little strategic value and therefore they have an outdated urban structure today – houses made of wood and narrow streets – great fire risks in the event of earthquakes. With the construction of Sakura-Dori Avenue and the execution of the Sakura-Dori subway line, the region was designated as a priority for urban recovery and development. Tsutsui is characterized by small lots, most measuring about 65 m2 or smaller, and few are empty. The project proposes greater block density with the demolition of 213 old residences and the construction of 43 new condominiums. It also proposes the construction and expansion of three main roads (Sakura-Dori, Tedaimachi and Shadomachi), the construction of a local road system (from 8 to 4 m in width) and the construction of two parks (totaling 2,700 m²).

Land use proposal before and after the project:

Private lots: 135,574 m² (86.30%) before and 118,878 m² (75.67%) after.
Road system: 21,480 m² (13.67%) before and 35,523 m² (22.61%) after.
Parks and green areas: 0% before and 2,700 m² (1.72%) after.

Contribution rate in land (surface): the private lands contributed 12.35% in area for constituting public spaces.

Densities: In 1986, the year the project was approved, the population was 2402 inhabitants and the density approximately 150 inhab./ha. The proposal contemplates future occupation with 2.7 thousand inhabitants and an approximate density of 170 inhab/ha.

Stages of Development (until 2001):

1981 Jan.: Study and survey of information about the intervention area.
1981 Jun.: Assembly for explanations to the local community and specific cases.
1986 Mar.: The Tsutsui Land Readjustment Project is approved.
1986 Nov.: Project execution plan is defined.
1987 Jul.: The Tsutsui Land Readjustment Council is established.
1989 Jan.: The Tsutsui Plan for Environmental Improvement of the Residential Zone is approved.
1989 Sept.: Modification of the LR project.
1989 Dec.: Temporary repositioning area is specified.
1993 Aug.: Modification of the LR project.
2000 Sept.: Modification of the LR project.
2001 Mar.: Modification of the LR project.

Duration

Starting year: The project was approved in 1986.
Estimated period for implementing the complete project: From 1986 to 2008, unfinished.

Benefits

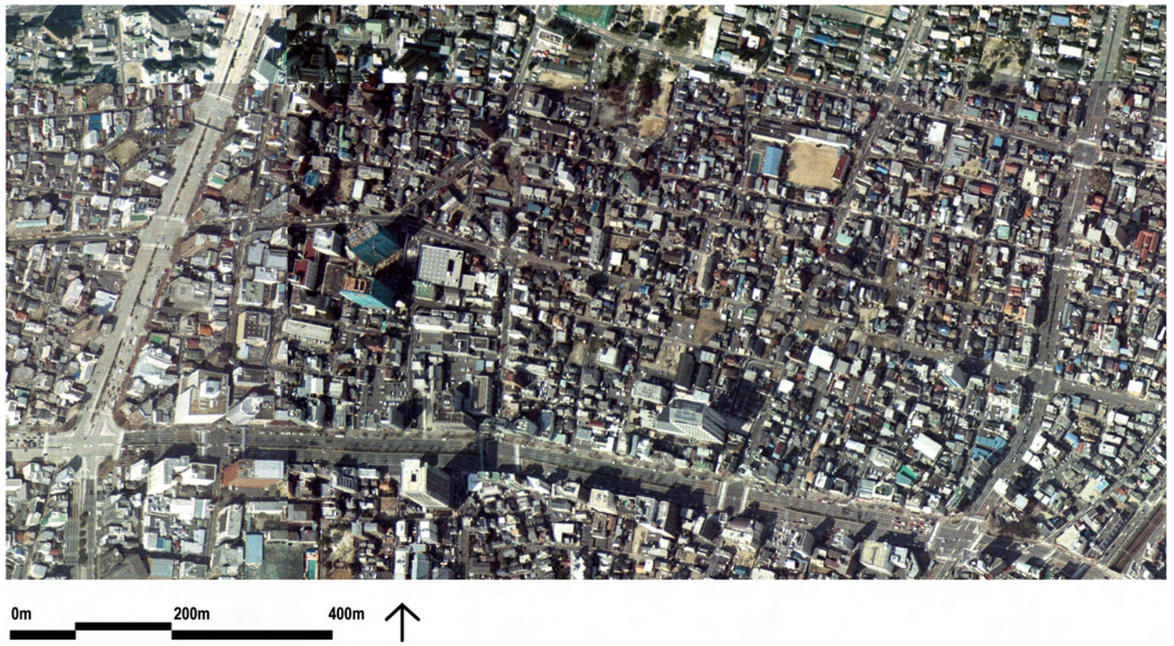
For public authorities: Disaster prevention (earthquakes and fires) thanks to the replacement of old homes and the expansion of very narrow roads; construction of a new road system proposed by the Urban Development Plan.
For landowners and tenants: Improvement in property use and prevention of large accidents in case of earthquakes. Land appraisal estimated land appreciation of around 20.15%.

Costs and subsidy

Total cost is estimated at around US$ 124 million. There was a municipal subsidy of US$ 55 million.

Tsutsui Land Readjustment Project.
Source: Nagoya Urban Planning and Development Agency, Japan

Process to replace old buildings and increasing block density.
Source: Nagoya Urban Planning and Development Agency, Japan



Aerial image of Tsutsui in 2005. Source: Google Earth 2007

Dambara Land Readjustment Project - Japan

Location: District of Dambara, City of Hiroshima, State of Hiroshima, Japan.

Promoter: Hiroshima Municipal Urban Planning and Development Agency.

Project area: 48 ha.

Landowners and dwellers: 1710 landowners and 442 tenants (before project execution in March 1973).

Conception of the project

Context: The atomic bomb dropped on Hiroshima on August 6, 1945 devastated the city center, however the district of Dambara became known around the world as the only area in Hiroshima protected from the explosion thanks to Mount Hijiyama. Immediately after the explosion, the district became a refuge for many citizens. Consequently, in a short period of time, it began to prosper as a commercial and residential area, becoming the most densely populated area of the city. However, the growth of the district did not compare to the areas that were rebuilt after the war and the lack of urban infrastructure worsened the scenario: the streets were narrow, the public drainage and sewage system was inadequate and there was a high concentration of wooden housing.

According to the district's land survey, the proportion of public lands was relatively low, only 10.2% of the total, and the proportion used for the road system was only 6.3%. There were a large number of streets only 2 to 3 m in width and these were the only ones available for accessing existing buildings. Green areas and parks were nonexistent and there was a shortage of leisure and living space (Hijiyama Park, to the west, was the only one in the region). There was no sewage treatment system in the district and the water and gas pipes were precarious. Most of the district was occupied by domiciles and many of these, nearly 30%, were in narrow lots with areas under 100 m2. Besides that, the domiciles were built very near to each other and 77% were made of wood, which contributed to the increased risk of large fires.

The area's development plan is comprised of the construction of new roads, parks and drainage and sewage infrastructure. Through an instrument called the Program for the Improvement of Densely Populated Housing Areas (DPHA), the old houses were demolished and the modern ones were built with equipment for the community and a playground.

Specific objectives: The new road system project for the Dambara district planned the following roads (with their respective widths): Nakahiro-Ujina Avenue (36 m), connecting the entire district from north to south; Hijiyama-Shinonome Avenue (25 m), which crosses the central part of the district from east to west; Hijiyama-Kaniya Street (27 m), which serves the north of the district; and Shinmachi-Kamishinonome (12 m), Suehiro-Hinode (10 m), Shinmachi-Nakamachi (8 m), Deshio-Kasumi (11 m), Ohata (8 m), Higashiura-Minami-Dambara (8 m) and Minami-Dambara (8 m) Streets. Streets of a local range, measuring from 4 to 10 m in width, connecting the abovementioned main streets, were also considered in the project.

Specific characteristics: The project also contemplates the construction of five new parks, ranging in size from 1,000 to 2,500 m2. The proportion of available area for the road system and green areas increased to 30.3% and 3% respectively, when compared to the levels prior to the project, which were 6.3% and 0.5%, respectively. The project area saw a decrease in the proportion of residential use, from 90 to 65%, and 27% of the lot area was converted for construction of public infrastructure. However, as a means to compensate landowners for the reduction in their lots, resulting from contributions, small parcels of the affected lots were sold back to the landowners. If the lot size after acquisition would be compared to the initial size, then real reduction in lot area for public use was only 15% on average.

The district had a high concentration, 31%, of lots smaller than 100 m^2. An agreement between landowners and tenants led to a redrawing of the project and it was carried out in a manner where these small lots were not used for constructing public improvements, so they could thus keep their original areas (non-contribution policy). For lots larger than 100 m2 the project was carried out so that, although the areas for said lots (including the rented ones) would be used for the construction of public works, they would not have areas under 100 m2 (controlled contribution policy).

Contribution rate in land (surface): the private lands contributed 14.99% in area for constituting public spaces and urban equipment.

Implementation plan: Program for the Improvement of Densely Populated Housing Areas (DPHA) The objective of this plan is to demolish old domiciles and build new and modern ones with equipment for the community and playground.

Implementation Stages (between 1967 and 2006):

1967 Oct.: Beginning of studies and surveys of the area for project development.

1969 May: The Dambara LR project is published and the agreement process begins among landowners and tenants.

1969 Jun.: Beginning of the meetings to explain the project to neighborhood associations and commercial zone representatives.

1970 Apr.: LR project is presented to the local population (the public department received 5222 criticisms and suggestions).

1971 Jan.: The LR project is revised and once again submitted for approval (after its definition, 170 meetings were held over a 2 year period).

1972 Apr.: LR project is presented to the local population (the public department received 3932 criticisms and suggestions).

1973 Mar.: The LR project is approved and its definition is officially published.

1978 Mar.: Beginning of works and preparation for execution of residential zones (area 1).

1979 Dec.: Beginning of works and preparation for execution of residential zones (area 2).

1982 Jun.: Beginning of infrastructure and road system works in areas 1 and 2.

1982 Nov.: Temporary replotting process is officially announced.

1983 Mar.: Modification of the LR project (from 74 ha the project now has 74.2 ha).

1983 Oct.: First area for temporary repositioning is specified. Building transfer works begin.

1987 Mar.: Revision of the application of the LR method.

1987 Oct.: Publication and designation of all areas for temporary repositioning are concluded.

1987 Dec.: Matizukuri resident association commission is formed.

1989 Mar.: Revision of the residual area and definition of the urban project for the Dambara commercial zone.

1990 Oct.: Receives the BSHF Award (British Social Housing Foundation Award).

1994 Nov.: Modification of the LR project (from 74.2 ha the project now has 74,5 ha).

1995 Mar.: Transfer of all buildings is concluded.

1997 Mar.: Program for the Improvement of Densely Populated Housing Areas (DPHA) is concluded.

1998 Mar.: Skywalk Hijiyama access is concluded.

1998 Oct.: Replotting project of residual areas is presented to the local population (the public department received 2561 criticisms and suggestions).

2004 Mar.: City Hall defines measures to solve the reimbursement problem of small residential areas due to property depreciation.

2005 Jan.: Agreement signed with small area landowners.

2005 Jul.: Revision of replotting project is presented (the public department received 5705 criticisms and suggestions).

2005 Nov.: The LR Council answers all criticisms and suggestions concerning the revision of the replotting project.

2006 Jan.: New replotting project for residual areas is approved.

2006 Mar.: Temporary replotting process of residual areas is officially announced.

Duration

Starting year: The project was conceived between 1967 and 1973.

Estimated period for implementing the complete project: From 1973 to 2006.

Benefits

For public authorities: Execution of the Program for the Improvement of Densely Populated Housing Areas (DPHA).

For landowners and tenants: Improvement in property use and prevention of large accidents in case of earthquakes and landslides.

For investors: There is no private investment.

Costs and subsidy

Total cost is estimated at around US$ 512.4 million.

Federal subsidies corresponding to US$ 170 million and municipal subsidies of US$ 134 million were used.

Other characteristics of the project

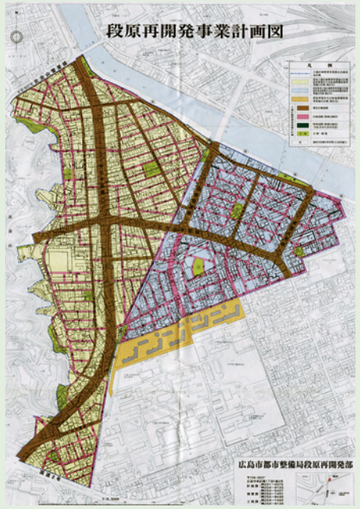
Owners of lots under 100 m2 did not need to donate part of their property, but had to offer financial compensation. Some areas became residual during the replotting process and had reallocation problems in the project.

Panoramic view of Dambara in 2004.
Source: Hiroshima Urban Planning and Development Agency, Japan

Panoramic image of Dambara in 1980.
Source: Hiroshima Urban Planning and Development Agency, Japan

Panoramic view of Dambara in 2005.
Source: Felipe Francisco de Souza

Aerial image of Dambara in 2004. Source: Google Earth 2007



Dambara Land Readjustment Project. Source: Hiroshima Urban Planning and Development Agency, Japan

Nijo Station Land Readjustment Project - Japan

Location: District of Nijo, City of Kyoto, State of Kyoto, Japan.
Promoter: Kyoto Urban Planning Agency.
Project area: 13.2 ha.
Landowners and dwellers: 146 landowners and six tenants.

Conception of the project

Specific objectives: The objective of the project is to reconfigure urban space that was once disarticulated and occupied by a deactivated maneuvering yard that served as a barrier to connecting downtown Kyoto and the western section of the city. This area is strategically located with regard to city unification. Public transportation was made possible by building the Nijo station, and the road system through the construction of Oike Avenue.

Land use proposal before and after the project:

Private lots: 120,936 m² (91.6%) before and 85,566 m² (64.9%) after.
Road system: 7,527 m² (5.7%) before and 33,373 m² (25.3%) after.
Public areas: 0% before and 9,001 m² (6.8%) after.
Parks: 1,255 m² (1.0%) before and 4,001 m² (3.0%) after.
Rivers: 2,223 m² (1.7%) before and (0%) after.

Contribution rate in land (surface): The private lands contributed with 29.25% (19.45%, minus the depreciation value) in area for constituting public spaces and urban equipment.

Densities

Resident population before project execution: 366 inhabitants, for a density of 28 inhab/ha.
Projected population after project execution: 829 inhabitants, for a density of 97 inhab/ha.

Implementation plan: Strategic Project for the Adjustment of Disorderly Districts in Community Areas. This plan was designated in 1989 with the objective of development regional centers with the construction of new urban infrastructure. The interventions for implementing the project involve the construction of the Nijo Station, the Oike Avenue road connection (connecting the downtown to the west of the city), a local road system, exclusive lanes for pedestrians connecting the Nijo station to the Tozai and JR Nijo subway stations, parking lots and public squares. An attached complex with cinemas, stores and entertainment rooms was inaugurated as part of the development involving the construction of the station in the public-private partnership. A university for post-graduate in law was also built.

Duration

Starting year: 1988.
Estimated period for implementing the complete project: From 1990 to 2008.

Benefits

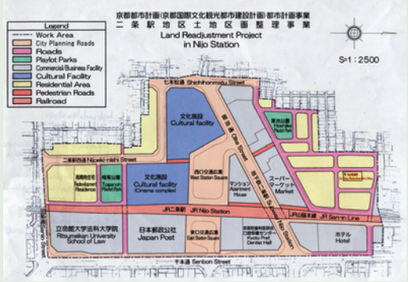
For public authorities: Execution of the Strategic Project for the Adjustment of Disorderly Districts in Community Areas and construction of one of the JR San-in Line stations.
For landowners and tenants: Greater intra-district accessibility and improved connections of the region with the rest of the city.
For investors: Public-private partnership during execution of the Nijo station: investment with great return potential (great circulation of users due to the station).

Costs and subsidy

Total cost is estimated at around US$ 170.8 million.
Federal, state and municipal subsidies were used, as well as private contributions and landowner participation.

Other characteristics of the project

There was an adjustment in the contributions rate due to the depreciation of land worth during project implementation. The implementation agency had to guarantee a minimum square meter price for the land and reduce the contribution rate for the depreciation not to reach very high values. Property values thus remained balanced.



Aerial image of Nijo in 2005. Source: Google Earth 2007.

Nijo Station Land Readjustment Project. Source: Kyoto Urban Planning Agency, Japan

Panoramic view of Nijo Station in 2005. Source: Kyoto Urban Planning Agency, Japan

Otemachi Land Redevelopment Project - Japan

Location: District of Otemachi, City of Chiyoda, Tokyo Metropolitan Region, Japan.
Promoter: Urban Renaissance Agency (URA).
Project area: 13 ha.
Landowners: 23 companies.

Conception of the project

Specific objectives: The Otemachi LR project has peculiar characteristics that stem from the Special Measures for Urban Renewal Law. In order to take better advantage of Tokyo's blocks in the downtown region, the 15 buildings that are more than 30 years old will be replaced by others with a higher utilization coefficient (higher floor-area ratio) and the new installations will be better adapted for use as an international business center. The first phase of the project will use government property to gather three existing functions into a single building. The second phase of the project will use the land from the three buildings (previously reallocated) to build a new one, in order to group three existing functions together. During project development, two roads will be widened and a large exclusive lane for pedestrians will be built.

Land use proposal before and after the project:
Constructed lots: 11.7 ha before and 10.6 ha after.
Public areas: 1.4 ha before and 2.4 ha after.
Reserve lands: 0 ha before and 0.2 ha after.

Contribution rate in land (surface): Private lands contributed with 8.40% in area for establishing public spaces and 1.30% for reserve lands, for a total of 9.70%.

Urban parameters: Floor-area ratio between 9.0 and 13.0 before project execution and between 12.0 and 15.9 after project execution.

Implementation plan: Special Measures for Urban Renewal Law.

Stages of Development (until 2005):
2002 Jun.: Approval of the Special Measures for Urban Renewal Law.
2002 Jul.: The areas surrounding the Tokyo and Yurakucho Stations are designated as Emergency Development Areas.
2002 Oct.: The governor of the Tokyo metropolitan region presents to the Minister of Finance the proposal to dispose the old government building for the Otemachi LR project.
2003 Jan.: Adoption of the strategy to create new urban centers using government-owned lots and buildings.
2004 Mar.: The Otemachi Project Promotion Council requests the participation of the Urban Renaissance Agency (URA) to carry out the LR project.
2005 Mar.: The Urban Renaissance Agency (URA) acquires the government's old building and begins the repositioning process.

Duration

Starting year: The project was conceived between 2002 and 2006.

Estimated period for implementing the complete project: From 2006 to 2016, unfinished.

Benefits

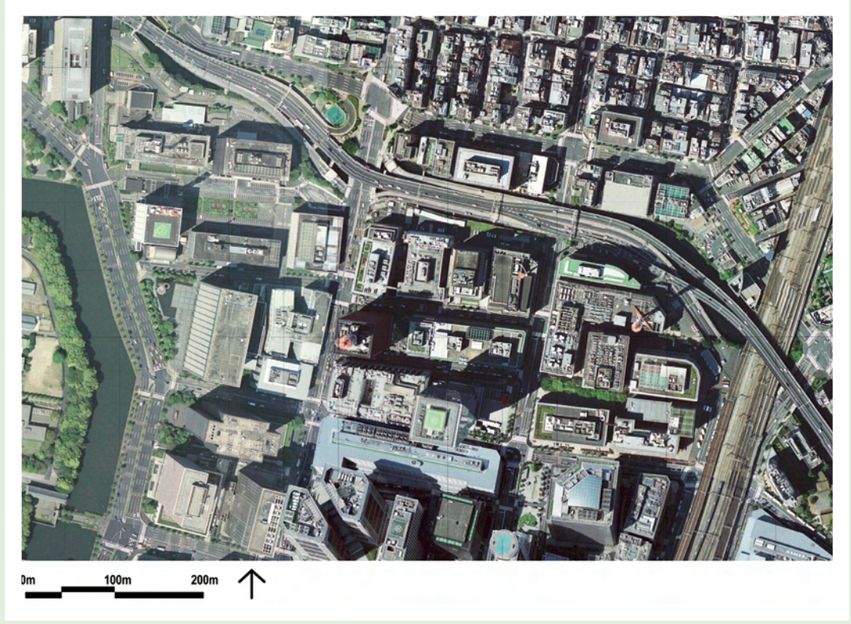
For public authorities: Construction of a new international business center, which improves downtown Tokyo functions and the development of its roads (road system and exclusive pedestrian lanes) without government financing.

For landowners and tenants: Reconstruction of old buildings, creating new developments without stopping preexisting activities; fair distribution of costs and project benefits among all companies associated with the project. Land appraisal estimated land appreciation of around 3%.

For investors: Large number of business offices for expanding company installations and the possibility of new developments.

Costs and subsidy

Total cost is estimated at around US$ 307 million. No federal, state or municipal subsidies were used. The project received approximately US$ 165 million in private financing. An area measuring 0.14 ha (1,435 m²) in reserve lands was also created to be sold as a form of contribution to project financing.



Panoramic view of Otemachi in 2005.
Source: Urban Renaissance Agency, Japan

Aerial image of Otemachi in 2005.
Source: Google Earth 2007

Minato Mirai 21 Central District Land Readjustment Project - Japan

Location: City of Yokohama, State of Kanagawa, Japan.

Promoter: Yokohama Minato Mirai 21 Corporation. Composition: Yokohama Urban Development Agency, Government of the State of Kanagawa, Urban Renaissance Agency and local cooperatives.

Project area: 186 ha, divided as follows: 87 ha for buildings, 42 ha for roads and railroads, 46 ha for parks and green areas and 11 ha for port infrastructure.

Landowners and population involved (density): In 1999, the date the project was expanded to 101.6 ha, there were 24 landowners and one tenant. Current density is estimated in 1020 inhab/ha, considering the floating population.

Conception of the project

Specific objectives:

1. Self-sufficient Yokohama: Before the project, downtown Yokohama was divided into two areas, Kannai and Yokohama station. The intervention therefore foresaw the integration of the two, concentrating companies, shopping malls and cultural buildings.

2. New role for the port region: With the construction of tree-filled parks and spaces, such as the Rinko Park and the Nippon-Maru Memorial, the urban space can now hold international conferences and new administrative services.

3. Decentralization: The project was designated to receive new function as part of the strategy to decentralize commercial, governmental and international functions, which are mainly concentrated in Tokyo. This will promote balanced metropolitan development.

Main installed infrastructure networks:

1. System for underground circulation: Underground circulation throughout the main road system, including equipment traffic and the installation of urban utilities, such as water and electric power networks.

2. Central heating and cooling system: The construction of a centralized system for the production, control and processing of air is more efficient, less pollutant and safer.

3. Anti-earthquake shelter: The cargo sector in the port zone was remodeled so that in case of disasters, it can serve as a shelter for area inhabitants and a deposit for supplies.

4. Emergency underground water tanks: In the event of a disaster, 500 thousand people will be supplied with four high capacity water tanks, for three days.

5. Transportation system: Construction of the Shin-Takashima and Minatomirai stations, which connect the region to other important points, including Tokyo's main station and Haneda Airport. Furthermore, the area can be accessed by bus lines, roads, highways and by ship.

6. Exclusive lanes for pedestrians: Three main routes were established within the project in order to create a safe and efficient network for pedestrians. These lanes are equipped with several features, including a rolling sidewalk that connects Nippon-Maru Memorial Park to the Yokohama Landmark Tower.

Contribution rate in land (surface): Private lands contributed with 29.20% in area for establishing public spaces and 7.30% for reserve lands, for a total of 36.50%.

Urban parameters: building coverage rate of 80% and a floor-area ratio ranging between 4, 6 and 8. The building height limits ranges between 60 m in height at the waterfront to 300 m.

Implementation plan: Minato Mirai 21 Basic Urban Development Agreement. This plan aims to share the basic values between the landowners and the stakeholders in order to develop and create an urban environment to attract new investments. The agreement, signed by all in 1988, defined self-financing lines, determining the following concepts as urban development goals:

a. Renewal of the environment (water system and green areas).

b. Skylines and visual control (scales, their relationship with exclusive pedestrian lanes and their respective streetscape).

c. Activity floor use control

d. Control of urban landscaping (colors and open-air advertising).

For management, the agreement establishes an autonomous administration system for recycling and disaster prevention, with the Minato Mirai 21 council acting as secretary.

Stages of development (between 1983 and 2005):

1983 Feb.: Yokohama approves its urban plan, including the LR method.

1983 Mar.: Mitsubishi finalizes the process of reallocating its large industries outside the Minato Mirai port region.

1983 Nov.: The Ministry of Construction authorizes the 35.1 ha LR project.

1983 Nov.: The Yokohama Minato Mirai 21 project is approved.

1984 Jul.: The Yokohama Minato Minai 21 Corporation is established.

1985 Apr.: The Nippon-Maru Memorial Park is partially inaugurated.

1987 Mar.: The land recovery process in the downtown district is concluded.

1987 Jun.: The plan to alter the area of the LR project (expansion to 64.3 ha) is authorized. 1988 Apr.: Beginning of temporary replotting for the Minato Mirai 21 downtown district.

1988 Jul.: Conclusion and signing of the Minato Mirai 21 Basic Urban Development Agreement.

1989 Jan.: Modification of the LR project (expansion to 74.3 ha).

1993 Mar.: Registration of investors in the Minato Mirai 21 project is established.

1989 Mar.: Inauguration of the central heating and cooling system for the Yokohama Maritime Museum, and the part of Rinko Park.

1989 May: Yokohama Minatomirai Railroad Company is established. Inauguration of the Yokohama Art Museum

1990 Nov.: A consortium of 23 companies is chosen, through a public bid, to develop block 24 and its proposal and business plan.

1991 Apr.: The oil pipeline and pollutant emission and control system begins its activities.

1991 Jul.: Inauguration of Yokohama Pacific (international convention complex started in 1989).

1992 Jul.: Inauguration of bridges and ramps that access Minato Mirai 21.

1992 Nov.: Start of phase 1 of the Minatomirai subway line.

1993 Jun.: Minato Mirai 21 Recycling Council is established.

1993 Jul.: Inauguration of the Yokohama Landmark Tower.

1993 Nov.: Minato Mirai 21 celebrates its foundation's tenth anniversary.

1994 Apr.: Inauguration of Kokusai Boulevard and bridge.

1994 May: Holding of the first conference to evaluate Minato Mirai 21 project promotion measures.

1995 Feb.: Start of phase 2 of the Minatomirai subway line.

1995 Apr.: Inauguration of the Yokohama Marine anti-disaster complex and modification of the LR project (extension for execution to 2003).

1997 Apr. to Sept.: Inauguration of several projects: Yokohama Central Post Office Agency, Queen Square Yokohama block, Nisseki Yokohama Building, Minato Mirai Boulevard, Hotel Pan Pacific of Yokohama and Queen Mall Bridge.

1999 Mar.: Modification of the LR project (extended for execution until 2010 and expansion to 101.6 ha).

1999 Sept.: Inauguration of Unga Park and Aka-Renga Park.

2000 Mar.: Inauguration of the Tobe police stations (job began in 1998).

2002 May: 2002 World Cup in Yokohama.

2003 Feb.: Inauguration of the Minatomirai Line.

2004: Several companies are selected to develop specific blocks (Nissan Motor Co., FujiSoft, Sega Corp., Daiwa House Industry Co. and Pacific Management Corp).

2005 Feb.: Construction of residential condominiums south of block 50.

Duration

Starting year: 1983

Estimated period for implementing the complete project: By 2010 (revision every five years).

Benefits

For public authorities: Execution of the Special Measurements for Urban Renewal Law in 2002, generation of nearly 56 thousand new jobs in the area, creation of 1140 companies and offices, collection of nearly ¥ 10.7 million per year in taxes. 47 million tourists have already visited the region.

For landowners and tenants: Better use of urban land thanks to implementation of the plan guaranteed by the Minato Mirai 21 Basic Urban Development Agreement. Real estate appreciation was estimated at around 60%.

For investors: The city of Yokohama offers an enormous menu of incentives, such as special tax exemptions (property taxes and

urban planning taxes cut in half for five years) and subsidies to attract local and international investments (maximum of ¥ 5 billion per company in a pre-established area).

Costs and subsidy

Total cost is estimated at around US$ 1.457 billion. About US$ 83 thousand have been recovered every year since 2002 through tax collections.

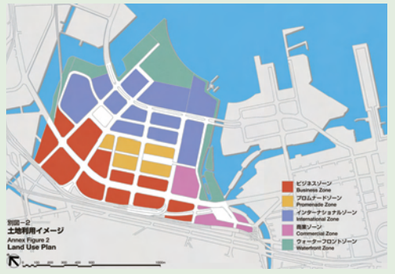
Federal, state and municipal subsidies were used, as well as private contributions and landowner participation.

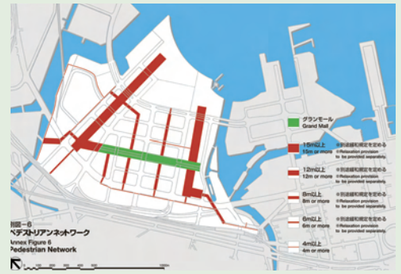
Compensations or contributions obtained

Until the present moment, nearly US$ 7 million have been collected in financial compensations and nearly 7 ha of reserve lands have been made available for commercialization.

Other characteristics of the project

Project implementation foresaw the adoption of the land recovery process (using 40% of the territory, that is, 73.9 ha) and the LR process was applied to the remaining 60% (112.1 ha). There are generally conflicts or misunderstandings among landowners in LR projects due to the required contributions and the replotting process. In this case, there were no conflicts because besides the fact that all landowners and stakeholders had signed the Minato Mirai 21 Basic Urban Development Agreement, the Special Measures for Urban Renewal Law went into effect in 2002, designating Yokohama as an Area for Development of a National Emergency Character.





Aerial image of Minato Mirai 21 in 1983. Source: Yokohama Minato Mirai 21 Corporation, Japan

Land use of Minato Mirai 21. Source: Yokohama Minato Mirai 21 Corporation, Japan

Exclusive pedestrian lane network for Minato Mirai 21. Source: Yokohama Minato Mirai 21 Corporation, Japan

Aerial image of Minato Mirai 21 in 2005. Source: Google Earth 2007

Naya Bazar Land Readjustment Project - Nepal

Location: Katmandu Valley, area of Naya Bazar (districts 16 and 17), Nepal.
Promoter: Metropolitan Government of Katmandu through the Katmandu City Hall.
Project area: 42 ha (district 16: 25 ha and district 17: 17 ha).
Landowners and population involved (density):
393 landowners (1091 lots – 95 % rural) and 326 tenants. Prior to the project, population density was 115 inhab/ha. A current density of 220 inhab/ha is estimated.

Conception of the project

Specific objectives: This project's main objective is to offer each lot's access to urban infrastructure and to the main road system in the Naya Bazar region. This was recently expanded according to the Guided Land Development Plan (GDL) without benefiting the next lots inserted in the urban grid.
Specific characteristics of the project: A goal was established to recover half of the project's costs, that is, 50%. This recovery occurs through the selling of "service lands" (reserve lands for health, commerce and education services). The other half is financed through federal government resources. The reserve lands total 16,800 m2 in area. The minimum size for each lot is 79.8 m2 after the replotting process. The landowner who has a lot smaller than this meterage will contribute with an amount in money estimated by real estate market data and regulated by the LR project management committee rather than contributing with part of his/her land.
Land use proposal before and after the project:
Private lots: 97% before and 70.5% after.
Road system: 1.6% before and 21.5% after.
Public areas: 1.4% before and 4% after.
Reserve lands: 0% before and 4% after.
Contribution rate in land (surface): Private lands contributed with 23.20% in area for establishing public spaces and 4.10% for reserve lands, for a total of 27.30%.
Urban parameters: Building coverage rate of 50% and floor-area ratio equal to 1 (296,100 m2 of private land for construction).
Real estate appreciation: Value of land before the project: US$ 50/m2, value of land after the project: from US$ 60 to US$ 90/m²; appreciation of around 80%.

Implementation plan: Construction of the road system proposed in the Guided Land Development Plan (GDL) for the project area, applying the real estate pooling and the LR to provide basic infrastructure and housing.
Development stages:
1. Interaction between the community and the project's manager committee.
2. Presentation of analytical studies and field survey.
3. Proposal for the replotting project.
4. Project approval by the district association.
5. Planning of the road system.
6. Planning for project execution.
7. Project execution (engineering works, transfer and creation of public areas).
8. Preparation of new cadastral map.
9. Commercialization of reserve lands, here called "service lots".
10. Temporary distribution of property deeds.
11. Cadastral map to real estate registry office.
12. Permanent distribution of property deeds

Duration

Starting year: The project was conceived between 1995 and 2000.
Estimated period for implementing the complete project:
From 2000 to 2005, unfinished.

Benefits

For public authorities: Execution of the Guided Land Development Plan for the project area.
For landowners and tenants: Makes it easier for the low-income population to acquire urban lots (individual lots).
For investors: There is no external private investment.

Costs and subsidy

Total cost is estimated at approximately US$ 1 million.
The project had the collaboration of the Asian Development Bank and the Nepal Development Bank.

Other characteristics of the project: problems and conflicts

a. There was a need for a new replotting process in order to create lots with a minimum permitted size. This occurred because the speculative real estate market was acquiring the lands that even after the replotting process still had sufficient dimensions for new replotting, for land appreciation purposes.
b. LR's proposal is to achieve better urban land use through a fair process in mutual agreement with the inhabitants. In the project area, women and children are part of the population that spend most of their time at the location, and therefore, would have to have priority in opinions. In this project, their opinions were disregarded.
c. The high illiteracy rate made it difficult to understand the documents that refer to the project. For this reason, many people were confused and distrusted the public agents involved in the project.
d. The "service lots" have yet to be sold due to delays and a lack of resources, and therefore, the project has not been concluded.

Aerial image of Naya Bazar in 2005. Source: Google Earth 2007

Naya Bazar Land Readjustment Project. Source: Tribeni Pradhan, Urban Development Department, Kathmandu Metropolitan City, Nepal

Synthesis of case studies

The projects presented demonstrate that the LR instrument makes it possible to transform very diversified urban areas: from consolidated areas resulting from old urbanization (Arimatsu, Dambara, Nijo and Tsutsui) to areas that result from recent and disorderly urban expansion (Naya Bazar and Simesa), and even strategic areas for enabling comprehensive plans of industrial decentralization and the decentralization of commercial and service centers to generate employments (Nagakute Nanbu, Otemachi and Yokohama). This diversification results in very different urban, economic and social results depending on the location of the agents involved in the territory, landowner participation and the process and duration of urban project development.

1. The scales of the projects shown vary from 6.9 to 186 ha, depending on the dimensions and the number of lots and lands involved.

2. The project and implementation period varies from ten years (Arimatsu and Nagakute) to 39 year (Dambara), as per the complexities that result from the number of landowners, conflicts of interest, scale of intervention, need for temporary rearranging families and nature of the works and projects to be implemented.

3. The program that results from the projects shown encompasses the consolidation of high density commercial centers (Otemachi) to predominantly average density residential areas (Naya Bazar), with different typologies in each case.

4. Some projects promote complex and sophisticated infrastructure, as in the case of Minato Mirai 21, in Japan, which foresees an underground circulation system, a central heating and cooling system, anti-earthquake shelters and underground emergency water tanks. Other projects foresee more simplified infrastructure, such as the implementation of roads and parks, in the Naya Bazar project in Nepal.

5. . In some projects, there is heavy federal and municipal subsidy and no private investment (Arimatsu, Nagakute Nanbu and Dambara). Others are promoted exclusively through private resources (Otemachi and Simesa).

6. . The contribution rate in surface (area) also varies from one project to the next. In the case of Otemachi, in Japan, the contribution of private lands for creating public spaces and reserve lands was 9.7%; in the case of Simesa, in Colombia, the contribution rate was 40%. The contribution is not necessarily related to project subsidy and financing, but to its implementation strategy and the resulting urban shape. This can be ascertained by the fact that in the case of Otemachi, in Japan, as well as Simesa, in Colombia, financing came exclusively from private sources. However, both projects have the lowest and the highest contribution rate, respectively.

The above-described characteristics permit ascertaining that the LR concepts can be explored in an isolated manner. In other words, land transformation can occur independent from project self-financing, according to each project's objective, the available instruments, the institutional capacity of the public agents when promoting developments together with private initiative and the legal context of each city and country. In this sense, it is necessary to differentiate the LR concepts from the urban management techniques and the related integrated planning system. In the case of Japan, the project management technique was improved, revised, updated and refined over the years, making it possible to carry out complex, large scale projects, while the basic LR concepts (replotting, contribution, preservation of property deeds, etc.) remained the same. In other countries, such as Colombia, the so-called improvement appreciation and the resulting (partial) financing of urban development can occur through the participation of "plus-valia" appreciation, in an independent manner from LR projects. This is in turn applied to making partial plans possible, among other purposes.

International Experiences on Land Readjustment or associated techniques

Country	Legal origins / Related regulation	Period / Year(s)	Term or technique applied
Japan	Introduced through the Agricultural Land Consolidation Act and then through the Land Readjustment Federal Law.	1899 and 1954	Land Readjustment / Kukaku Seiri
Germany	Lex Adickes - Land Consolidation Act (LCA); also referenced in Baugesetzbuch (BauGB) and Law on Adjustment of Agriculture (LAA).	LCA 1902 BauGB 1986 LAA 1990	Baulandumlegung
India	Bombay Town Planning Act.	1915	Plot Reconstitution
Australia (Western)	Western Australian Town Planning and Development Act (TPA).	Framework from 1928, current TPA of 1984	Land Pooling
Turkey	Municipal Expropriation Law 2497, Building Amnesty Law 2981, Reconstruction Law 3194 current Municipal Expropriation Law 2942.	1934 1983, 1985 2005	Land Readjustment
South Korea	Introduced through the City Planning Act and recently through the Residential Land Development Promotion Act	1934 and 1980	Land Readjustment
Taiwan	Indirectly in the Republic's Constitution and Agrarian Land Consolidation Program	1949 and 1958	Land Consolidation
Spain	Land Use Law	1956	Reparcelación
Indonesia	Basic Agrarian Law N.º 5, Spatial Use Management Law, Law on Housing and Settlement	1960 and 1992	Land Consolidation
North Korea	Five Lines of Nature Remodeling, Nature Remaking Policy and the Agricultural Law	1976 then late 90's	Land Realignment
Nepal	Land Acquisition Act, Town Development Act	1976 and 1988	Land Plotting
Canada (some provinces)	Local Government Act	1983 and later updates	Replotting Schemes
Colombia	Urban Reform Law, Territorial Development Law	1989 and 1997	Reajuste de Terrenos
Thailand	Land Readjustment Act BE 2547	2005	experience with Land Sharing before Land Readjustment
United States, Sweden, Malasia, Philippines	Introduction and Implementation under Consideration (law and projects)	Introduction and Implementation under Consideration (law and projects)	Introduction and Implementation under Consideration (law and projects)

Source: Ministry of Land, Infrastructure and Transport - MLIT from Japan. Updated by Felipe Francisco de Souza in 2007.