

Greece Sustainable Cities and Regions through Integrated Territorial Investments Technical Facility

Land readjustment policies: Potential for transformative urban policy in the age of climate adaptation

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Abbreviations and Acronyms

LR	Land Readjustment
LVC	Land Value Capture
SUD	Sustainable Urban Development
UN-Habitat	United Nations Human Settlements Programme
UR	Urban Redevelopment

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Executive Summary

Urbanization challenges

Municipalities across the European Union are struggling with rapid urbanization, which brings significant challenges in providing adequate housing, services, infrastructure and public spaces. Uncontrolled and inadequately planned urban growth exacerbates risks such as the marginalization of city residents and low quality of life. In Eastern European context, property speculation often leads to disorganized developments, further intensifying these problems by creating neighborhoods with inadequate amenities and poor connectivity. Inefficient land use and the scarcity of public spaces and technical infrastructure underscore the necessity for effective land management strategies.

Land Use Governance and Policies

The report delves into land use governance, highlighting the critical role of policies in shaping land utilization. Effective land use planning and regulations must strike a balance between private and public interests to ensure sustainable development. The concept of Land Value Capture (LVC) is explored as a mechanism for public authorities to recover and reinvest increases in land value resulting from public actions, such as infrastructure development or changes in land use regulation. However, the effectiveness of LVC varies widely due to historical, institutional, and legal disparities. The need for a robust and adaptable legal framework is emphasized, allowing for the nuanced application of LVC across different contexts.

Land readjustment is a potential LVC tool that supports SUD by enabling planned urban expansion, densification and the redevelopment of previously used land. It can mitigate climate change impacts, aid in post-disaster reconstruction and reduce urban sprawl, fostering more compact and sustainable urban forms. This tool facilitates greenfield development and can be broadly applied in brownfield redevelopment, transforming underutilized spaces into vibrant urban areas. The successful implementation of land reorganization necessitates a robust legal and land system framework, underscoring the importance of precise and context-sensitive methodologies in comparative case analysis.

Comparative Analysis and Best Practices

The report provides a comprehensive comparative analysis of land readjustment policies in different contexts, focusing on Japan as a global best practice and the UN-Habitat's Participatory and Inclusive Land Readjustment (PILAR) approach designed for developing countries. Japan's systematic urban development, efficient land use, and improved infrastructure serve as a model of success. In contrast, the PILAR approach emphasizes community involvement and equitable development, particularly suitable for developing countries with less robust land management systems. This comparative analysis highlights the adaptability and potential of land reorganization in addressing diverse urban challenges and promoting sustainable urban growth.

Land Readjustment in Greece

In Greece, the legal framework and implementation process are critically reviewed, with a detailed case study in Kalamata. Following a significant earthquake in 1986, Kalamata utilized land reorganization effectively for post-disaster reconstruction and urban expansion. The city's

experience underscores land readjustment's potential as a long-term prevention measure to mitigate disaster risks and aid in the recovery and reconstitution of urban land. Kalamata's strategic planning and legal framework were pivotal in enabling effective reconstruction and urban management, transforming the city's landscape and infrastructure. Over four decades, the municipality has developed and acquired land, focusing on urban expansion while utilizing land reorganization to acquire plots for essential social infrastructure.

Conclusion and Recommendations

The report concludes with detailed findings and recommendations for improving and expanding the use of land reorganization in Greece and other European countries. Enhancing the legal and institutional framework for land readjustment is crucial to ensure fair and efficient processes. This involves streamlining administrative procedures, ensuring transparency, and providing adequate training to local authorities on land reorganization implementation. Expanding the scope of land readjustment to address urban core erosion and the challenges of shrinking cities is also essential. This could involve adapting land reorganization practices to facilitate urban renewal in older, densely populated areas and integrating climate adaptation strategies into urban planning.

Learning from global best practices, such as Japan's land reorganization policies, can help refine and adapt the Greek model. Adopting successful elements from Japan's approach, such as flexible zoning laws and robust stakeholder engagement processes, can enhance the effectiveness of land reorganization in Greece. Promoting the creation of pocket parks and the consolidation of open spaces is vital to improve urban microclimates and enhance community well-being. These green spaces can reduce urban heat islands, increase biodiversity, and provide residents with recreational areas, thereby improving the overall quality of life.

Furthermore, the report emphasizes the importance of a comprehensive and adaptive approach to urban planning, considering both local conditions and broader global trends. As cities continue to grow and evolve, adopting innovative land management strategies like land readjustment will be crucial in addressing the multifaceted challenges of urbanization, ensuring that cities remain vibrant, inclusive, and sustainable for future generations.

In conclusion, the report highlights the transformative potential of land reorganization in promoting sustainable urban development. By enhancing legal frameworks, adopting best practices, integrating green spaces, and implementing robust financial mechanisms, Greece and other European countries can effectively address the challenges of urbanization, creating resilient and sustainable urban environments that support the well-being and prosperity of their residents.

Introduction

This report is part of the project titled *“Technical Assistance Facility for Sustainable Urban Development in Greece”* funded by the European Commission’s Directorate-General for Regional and Urban Policy (DG REGIO), aiming to increase the effectiveness of EU funds through qualitative improvements in the planning and implementation of interventions Sustainable Urban Development (SUD). Under the aforementioned project, The World Bank is providing technical assistance to 4 medium sized cities in Greece on the topic of SUD. Capacity building activities are focused on improving the quality of strategies, plans, and projects and accelerating implementation of the Integrated Territorial Investment (ITI) approach. Along with support on improving strategic development and implementation processes, the WB is also providing technical assistance across selected themes, the foremost area of which is integrated neighbourhood (precinct) level planning and implementation.¹

Municipalities across the EU are grappling with ongoing urbanization², facing substantial challenges in providing adequate housing, services, infrastructure, and public spaces. The results of this uncontrolled and inadequately planned urban growth increases the risks of marginalization of many city residents, low quality of life and unsanitary living conditions, impacting in most cases vulnerable groups such as recent migrants, women and children. In the Eastern European context, single residential, new construction fueled by property speculation often leads to disorganized developments that intensify these problems, creating neighbourhoods with inadequate amenities and poor connectivity. One of the primary issues is the inefficient utilization of land, marked by a scarcity of public spaces and areas equipped with the necessary technical infrastructure and services. Understanding and employing various land management strategies, especially those related to negotiated land acquisition, become crucial tools in facilitating SUD.

This introduction sets the stage for a discussion on land use governance, emphasizing the pivotal role of policies in shaping land utilization. Land use planning and regulations, by dictating how land may be used, must strike a balance between private and public interests. Furthermore, the concept of Land Value Capture (LVC) is explored as a mechanism by which public authorities can recoup and reinvest increases in land value resulting from public actions, such as infrastructure development or changes in land use regulation. However, the effectiveness of LVC, highly contingent on the fluctuating land values and macroeconomic trends, varies widely across different contexts due to historical, institutional, and legal disparities.

Land readjustment is a potent LVC tool that supports SUD by enabling planned urban expansion and densification, but also the redevelopment of previously used land. The potential of land readjustment in mitigating climate change impacts, post-disaster reconstruction, reducing land usage, and combating urban sprawl is highlighted, showcasing its capacity to foster more compact and sustainable urban forms. It not only facilitates sustainable greenfield development by organizing undeveloped land for optimal use, but also can be applied more broadly in brownfield redevelopment, transforming previously utilized spaces into revitalized, functional urban areas. The successful implementation of land readjustment, and indeed any land management strategy, necessitates a

¹ Thematic areas of support available to municipalities also include private sector finance mobilization and local business engagement; Climate Smart Service Delivery and innovative financing options for green infrastructure; and enabling city management systems and tools.

² “Europe’s level of urbanisation is expected to increase to approximately 83,7% in 2050.” –The European Commission’s Competence Centre on Foresight

robust legal and land system framework, underscoring the pivotal role of precise and context-sensitive methodologies in comparative case analysis.

The report starts with a brief overview land use, governance, and value capture, explaining why they are important for sustainable urban development. The second section introduces the concept and potential of land readjustment as a tool for urban transformation that can address various challenges such as urban sprawl, climate change, disaster recovery, and social inclusion. The third section presents a comparative analysis of land readjustment policies in different contexts, with a focus on the Japanese case, which is considered a global best practice, and the UN-Habitat's PILAR approach, which is designed for developing countries. Next the attention turns to Greece with a review of the legal framework and implementation process, and then a deep dive into a practical case in Kalamata. This medium-sized city successfully used land replotting for post-disaster reconstruction and urban expansion, with plans to apply the approach to support urban renewal and climate adaptation. The report concludes with key findings and recommendations for improving and expanding the use of land readjustment in Greece and other European countries.

Land use

Land use matters

Land is foundational to Sustainable Urban Development (SUD) as it affects the environment, public health, economic growth, distribution of wealth, and social outcomes. The increasing global population, expanding globalization, and the impacts of climate change have escalated the demand for land, driving urban land prices to unsustainable levels for households. Urbanization has served as a catalyst for economic progress, yet conventional methods of managing urban growth have proven inadequate in addressing the needs of low-income migrants and native city dwellers alike, with the most significant challenges founded in peri-urban areas. Globally, many countries face significant urbanization pressure, while in the EU, urbanization pressure is largely evident in national and regional capital cities. The results of inadequately planned urban growth present challenges for local administrations, which face significant challenges in providing adequate housing, services, infrastructure, and public spaces.

Urbanization pressures within the EU context present a complex set of challenges and dynamics, particularly with regards to greenfield versus brownfield developments, alongside the phenomenon of the hollowing out of urban cores as development shifts to periphery. Greenfield developments involve building on previously undeveloped land, while brownfield developments focus on reusing previously developed urban sites, to revitalize city centers and reduce urban sprawl, despite challenges such as contamination and infrastructure upgrades. At the same time, many European cities are facing the phenomenon of shifting from city centers towards the suburbs or periphery of the economic and social activities, leading to a decline in urban density and the deterioration of central urban areas, with negative consequences for social cohesion, economic vitality, and cultural heritage. This hollowing out of urban cores is particularly relevant in cities with historical centers which failed to keep up with the needs of the modern city, exacerbating issues like traffic congestion, air pollution and the inefficient use of infrastructure and services. Addressing these challenges requires a good understanding of land use, sustainability, economic development, and social cohesion.

One of the main causes is the inefficient use of land: the lack of public spaces and areas equipped with technical infrastructure and adequate services. Determining the ideal size of open spaces in a city, or the optimal per capita ratio of open and green spaces, lacks a definitive answer. Specific standards for open spaces cannot be universally applied because local conditions significantly influence both the qualitative and quantitative needs. Factors such as natural or historical resources within or near the urban area, the city's size, and cultural practices regarding the use of open spaces are crucial considerations. The following table shows the amount of urban green space available per person in various European cities. Thus, knowing and understanding the various ways of land management, especially relating to negotiated land acquisition, become very important tools in facilitating sustainable urban development.

Table 1: European urban green space per capita

Amsterdam	27,00 sqm/ inhabitant
Hanover	20,00
Vienna	20,00

Berlin	13,00
Rome	9,00
Paris	8,54
London	9,00
The Hague	27,00
Warsaw	18,00
Rotterdam	28,00
Zurich	10,00
Bonn	35,00
Bordeaux	2,00
European average	15
Greek Desirable proportion ³	8

Source: Fuller & Gaston, 2009

Land use plays also a significant role in air quality, particularly by introducing green and open spaces balancing urban expansion with environmental sustainability. While simultaneously is affecting the city's attractiveness, it also fosters a sense of belonging and connection among its inhabitants. Given its critical role, policies governing land use often generate debate and are commonly at the center of disputes.

Governance of land use

Land use policies and regulations play a crucial role in shaping how land is utilized, requiring a delicate balance between private and public interests. Individual landowner decisions can significantly affect the broader region, and the complexity of these decisions makes it difficult to create a universal tax system that discourages negative externalities while promoting positive ones. Regulatory decisions must be assessed individually to weigh the private landowner's desire to maximize property potential against the public's interest in beneficial developments.

Land use planning, while often decentralized to local authorities due to its context-specific nature, has far-reaching implications for national and global concerns such as ecosystem stability, social justice, food and energy security, economic growth, housing costs, and climate change mitigation and adaptation. It is integral to achieving several UN Sustainable Development Goals. Coordination between local planning and higher-level strategic plans and policy guidelines is essential, with frameworks and systems varying by country. Some nations impose national regulations, while others

³ Decision 10788/2004 (Government Gazette 285D/5-3-2004) "Approval of urban planning standards and maximum density limits applied in the preparation of the Urban Master Plans and Urban Studies".

grant regional or local governments autonomy. Regardless of the structure, cross-sector and multi-level integration of land use policies is necessary to provide the right incentives.

The need for more flexible land use planning is becoming increasingly apparent, as policymakers must adapt to new challenges, demographic shifts, and economic trends, while also securing funds for essential investments. Local governments often aim to increase land value through public investment and regulatory changes but face budgetary limitations. Traditional fiscal policies do not fully account for the public cost of urban infrastructure versus the private economic benefits, such as increased land prices. It is crucial to ensure that private actors are motivated to follow desirable development patterns through proper incentives.

Land Value Capture

Land Value Capture, or land value recovery, refers to the policies that allow the public authorities to recover and reinvest land value increases that result from public decisions. It consists of three essential steps. First step, value creation refers to the action taken by the public authority on or in the proximity of the privately owned land that results in increased value, such as investments in development of land and infrastructure or a change in the land use regulation. The second step is when the partial value is recovered by the public, followed by the value distribution step, where the recovered land value serves as a source to fund urban infrastructure and public services, needed for local development.

LVC policies distribute both costs and benefits of land development in an equitable way. Without a strong correlation with consistent planning practices and land use regulations, LVC can result in land development that is both inequitable and unsustainable. Highly dependent on changes in land values, the success of LVC can also be influenced by the ups and downs of the macroeconomic trends and the construction industry's cycles.

While LVC is utilized across various countries, its application varies significantly due to diverse historical backgrounds, land market conditions, institutional capabilities, and the constitutional and legal structures in place. This diversity leads to a range of instruments and methodologies for implementing LVC, resulting in varying degrees of success in its application.

Land readjustment

The potential of land readjustment

An instrument of LVC, Land readjustment is a tool for urban regeneration that can support SUD by allowing planned and managed urban extension and densification. It is the process by which a group of neighboring privately owned lands are pooled together and developed as a whole. This often involves changes in zoning or regulations concerning urban parameters, providing the newly developed land with an opportunity to be more valuable. A portion of the land is offered to the municipality for the creation of technical infrastructure, services, and public spaces. As a result of the reorganization, owners receive a smaller area of land back that nonetheless has a higher value due to the improvements and opportunities introduced. Also known as pooling, it can be initiated by public authorities as well as private implementers, through landowner groups or cooperatives, or an outsourcing agent, such as a private developer.

Similar to a public-private partnership, land readjustment can provide benefits for all parties involved. On one hand, the municipality gains through efficient urbanization at a reduced cost, as well as through new revenues generated by the new development, while private landowners also benefit from the improved property values in the neighbourhood.

Land pooling is mostly used for urban expansion, converting from rural to urban land use. Over 80%⁴ of countries use it for this purpose, being still the most common use case today. Urban developments and renewals, farmland consolidation and brownfield regeneration projects are also common applications for land replotting.

One of its main advantages is in creating conditions for denser land development while making provision for important quality of life developments such as green space, alternative mobility corridors, etc. These quality of life benefits can often be directly linked to climate benefits or a new climate focused urban development approach. By consolidating fragmented parcels into larger, more functional plots, cities can grow more vertically and compactly rather than horizontally across vast areas, ensuring also that natural habits and agricultural lands are better preserved. The approach facilitates the creation of more efficient transportation networks, reducing the dependency on personal vehicles and thereby diminishing greenhouse gas emissions. The strategic urban layout enabled by land readjustment also allows for the integration of public transit, cycling and walking paths, promoting a more sustainable and active urban lifestyle. The allocation of green space not only provide recreational spaces for residents, but also play a crucial role in mitigating urban heat island effects, improving air quality, enhancing in the same time the stormwater management, helping to combat climate change.

Land reorganization serves as a powerful mechanism for post-disaster redevelopment⁵, offering a strategic approach to reorganize and repurpose affected areas for recovery and future resilience. As a post-disaster redevelopment tool, it allows communities and authorities to realign property boundaries, consolidate parcels for more effective use, and integrate essential infrastructure improvements. This method facilitates the equitable distribution of land, ensuring that redevelopment efforts not only address immediate reconstruction needs but also enhance the community's ability to withstand future disasters. By enabling a coordinated and adaptive response,

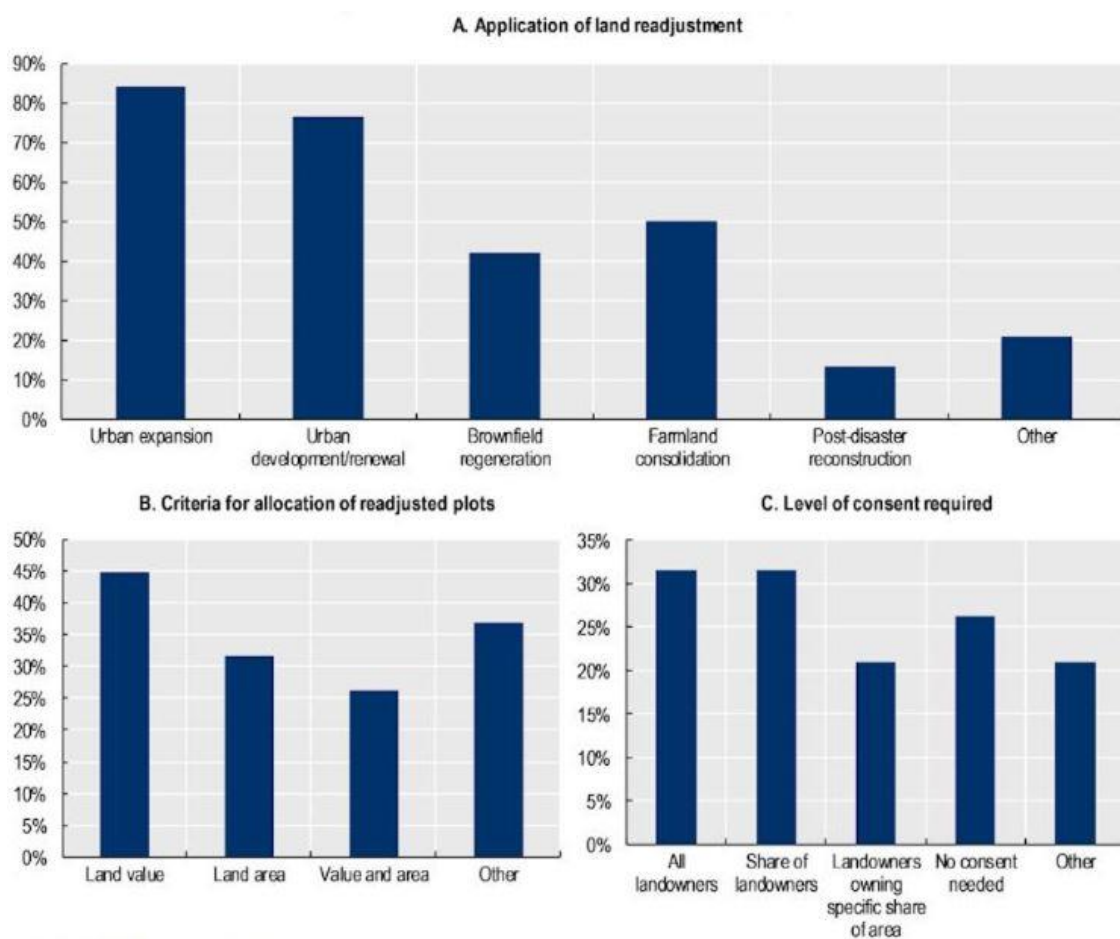
⁴Data from Global Compendium of Land Value Capture Policies, OECD;

⁵Countries like Japan, Italy and India are utilising it as a tool for reconstruction areas affected by natural disasters

it helps in transforming disaster-impacted zones into safer, more sustainable, and resilient spaces, thus playing a critical role in the broader framework of disaster risk reduction and recovery planning.

There is no universally applicable formula, as countries use a variety of approaches to allocate the readjusted plots. These are generally divided based on the original land value, the area of the original plot, and also a combination of criteria based on both value and area. There are also cases where vertical development is preferred as a solution for urban regeneration, where land rights are converted to a share of the joint ownership of the building. Additionally, the level of owner consent varies significantly from country to country. While the majority of countries use a two-thirds quota of the total affected owners, there are countries that use a simple majority (50%+1 in the case of Colombia and Korea). A comprehensive overview of how land readjustment is applied across various contexts, the criteria for the reallocation of readjusted plots and the levels of consent required for such processes is illustrated in the image below.

Figure 1: Implementation of land readjustment



Source: <https://www.oecd-ilibrary.org/sites/13bcc863-en/index.html?itemId=/content/component/13bcc863-en#figure-d1e1611>

As a technical tool, it depends on robust legal and land systems (e.g., cadaster, valuation, land markets), with its successful implementation also hinging on their quality and accuracy. Precisely for this reason, although it is widely used in developed countries such as Japan, Korea, Germany, or Spain, land readjustment can have seen limited success in developing countries.

Methodology for selecting Land Readjustment comparative cases

The methodology for comparing selective land readjustment cases begins with examining Japan, renowned for its exemplary worldwide implementation of land readjustment, showcasing systematic urban development, efficient land use, and improved infrastructure. This approach is complemented by the UN Habitat's land readjustment approach, designed for developing countries, emphasizing participatory and inclusive planning among sustainable growth. Several European countries, each representing distinct legislative systems, exhibit varied approaches to readjust the land. Within this comparative analysis, Greece's legal framework for land replotting is scrutinized, highlighting its approach to urban planning challenges. A notable example within Greece is Kalamata, which emerged as a pilot city leveraging land reorganization tools for post-disaster reconstruction. Through this methodology, the analysis spans from global best practices to local implementations, underscoring the adaptability and potential of land reorganization across various contexts.

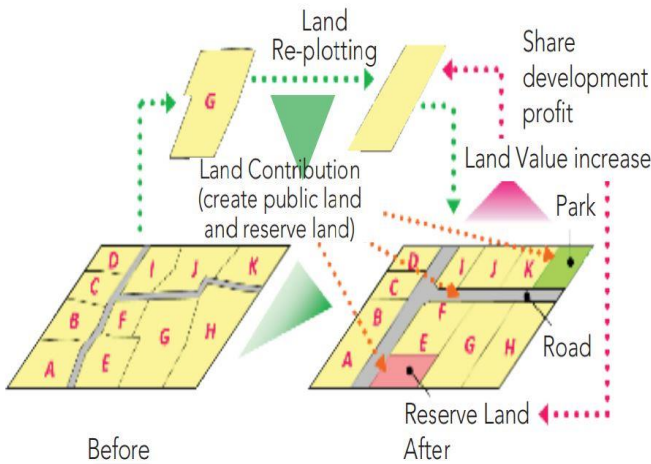
Land readjustment in Japan

Key achievements and other related development tools

As one of the best examples globally, land readjustment in Japan is one of the most widely used urban development methods in the country, being successfully used countrywide over long period of time. The need for land replotting emerged from Japan's rapid urbanization, post-war reconstruction efforts, and the necessity to facilitate infrastructure development and public facility enhancements in a coordinated manner. Aimed at overcoming the challenges posed by fragmented land parcels and limited public land in urban areas, land reorganization has successfully transformed or established urban zones that now span more than 30% of the country's total area. This includes the planning of roads that account for over a quarter of all designated city plans, half of the area allocated for community, neighborhood, or district parks, and more than a third of the country's station plazas.

Taking advantage of the large number of land readjustment projects, the system improved in terms of land replotting techniques, financing and approving process, contributing to a quicker implementation. Starting in the middle of the 20th century from the need to provide a response to socio-economic recovery and increased housing demand, land readjustment was applied predominant in the major metropolitan areas, but, with the financial crisis at the beginning of the 90s, the government shifted its focus to promoting land readjustment for urban renovation in central or transit areas in the cities. Thus, Japan is an example not only in terms of the high number of implemented projects, but also through the diversity of land readjustment typologies. Witnessing a wide range of projects, including urban redevelopment, disaster reconstruction, rural and peri-urban development and integrated development, land replotting techniques in Japan were improved and refined.

Figure 2: Conceptual model of land readjustment

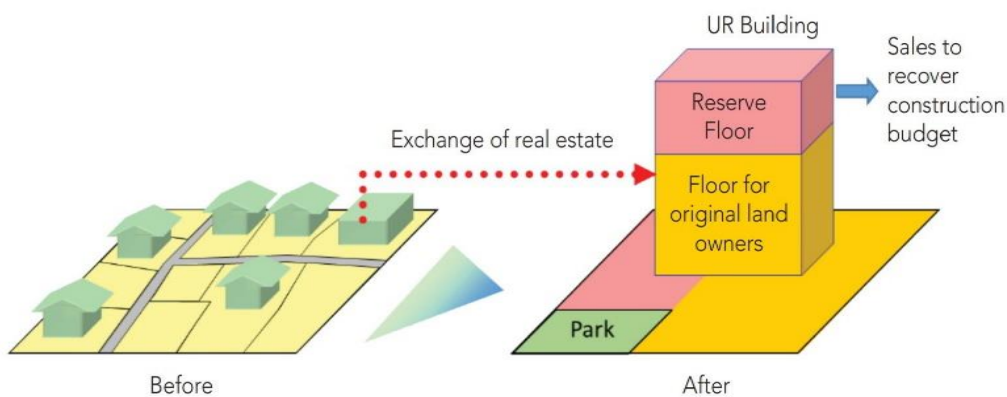


The primary objectives of land readjustment in Japan include the reorganization of land for better utility, development of infrastructure and public facilities, and enhancement of urban environments. The scope of land replotting projects varies, encompassing urban redevelopment, disaster reconstruction, and the creation of new residential and commercial areas. To recover a part of the cost of the projects and to become feasible, the "reserve lands" of the land readjustment Law was established in 1954, through which surplus lands created from private owners after the replotting were sold on the market.

Source: World Bank Group, *Case Study: Land Readjustment in Japan*

Land Readjustment is implemented in conjunction with other urban development tools. Within this framework, Urban Redevelopment functions as a specific application of LR, converting land rights to a part of building rights. UR is exclusively employed in urban zones identified for high-density use, areas vulnerable to fire risks, or locations requiring enhanced land use efficiency. Therefore, for the construction of developments aimed at high-density usage, LR can be combined with UR. The land rights involved in UR are reorganized into dedicated urban redevelopment parcels within the land reorganization area. These are then transformed into UR building rights, along with a fraction of the collective ownership of the property.

Figure 3: Conceptual model of UR



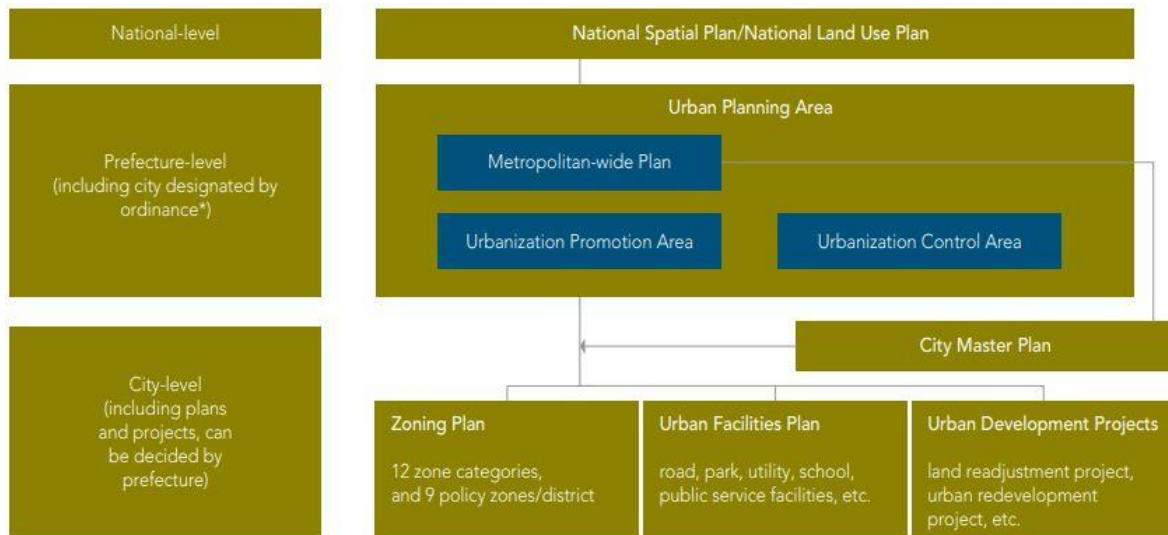
Source: World Bank Group, *Case Study: Land Readjustment in Japan*

Overall legal framework

The legal framework for land readjustment in Japan is established through various laws, including the Land Readjustment Law, Urban Redevelopment Law, Urban Planning Law and other related regulations and guidelines. These laws provide the procedural basis for land reorganization projects, ensuring coordination with urban planning, protection of land rights, and involvement of various stakeholders including landowners, government agencies, and developers. Urban planning, which consists of national, prefecture or city level, is the upper-level plan for land readjustment. The process

must follow the zoning regulations, plans for urban public facilities, and urban development initiatives as outlined in the city's master plan. Although these documents do not present detailed land use plans, they typically outline the overarching vision, development objectives, a conceptual framework for land use, and the development strategies for each sector.

Figure 4: Urban Planning System in Japan



Source: World Bank Group, *Case Study: Land Readjustment in Japan*

Urban facilities in land readjustment projects, such as roads, parks, and plazas, are established through land contributions from the rights holders on the site. For a faster implementation, the process is characterized by flexibility, with the fundamental characteristics (such as size and boundaries) of each facility being determined through discussions at public meetings facilitated by the Urban Planning Advisory Committee. Furthermore, to aid in the implementation process, building activities are limited within the designated area, although transactions involving rights are not restricted.

Characteristics and Typologies of Japanese land readjustment projects

Japan's land readjustment system contributed to better managed urbanisation while integrated various aspects of urban planning and stakeholder engagement. It aims to enhance public facilities and land usability, showcasing flexibility to adapt to changing socio-economic conditions. A distinctive feature of Japanese land readjustment is its ability to coordinate closely with urban planning, ensuring that projects contribute positively to local government policies. Various public and private entities can implement the projects, with a requirement for significant agreement from land right holders to proceed. Financially, land reorganization projects can benefit from central government subsidies, which support the development of public infrastructure and ensure a balance between public investment and private profit. The system also offers tax exemptions and technical support to encourage participation and ensure the smooth execution of projects. Moreover, Japan's land readjustment method emphasizes the protection of land rights, equitable land exchange, and dispute resolution mechanisms, ensuring fairness and efficiency throughout the process.

The flexible use to achieve multiple development objectives involves a series of typologies in Japanese land readjustment projects, which can be viewed in Annex 1 and broadly categorized as follows:

- **New Town Development in Peri-Urban Areas:** Aimed at developing large- and medium-scale residential areas on agricultural and vacant lands. These projects have been particularly prevalent from the 1950s through the 1990s, meeting the massive housing demand of the era. Land readjustment cooperatives often serve as the implementers, utilizing sales of reserve land as a primary financial resource.
- **Post-Disaster Reconstruction:** Utilized for rebuilding urban areas following significant calamities, such as World War II destruction, or several great earthquakes. These projects focus on effective land replotting and supporting the affected population's recovery.
- **City Center and Station Area Redevelopment:** Targets the redevelopment of urban centers and areas surrounding train stations to enhance infrastructure development and land use. Local governments, railway companies, and the Urban Renaissance Agency⁶ commonly implement these projects due to their complexity and financial demands.

⁶ Urban Renaissance Agency (URA), former Japan Housing Corporation (JHC): has an important role in developing, renting and selling social housing

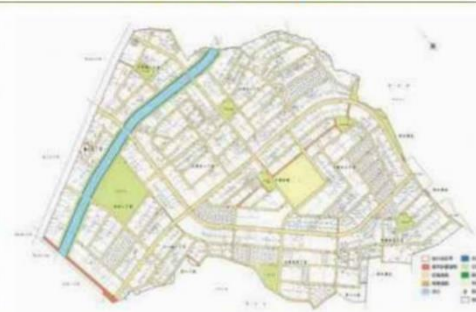
Annex 1: Typologies of Japanese LR Projects

New Town development in Peri-urban Area: Hirate Nanbu LR Project, Nagoya City

Cadastral map before LR project



Land Re-plotting Plan



Post-Earthquake Reconstruction LR Project: Rokkomichi North Station LR Project, Kobe City

After earthquake



Land use plan



Station Area Redevelopment: Akihabara Station area LR Project, Tokyo

Before



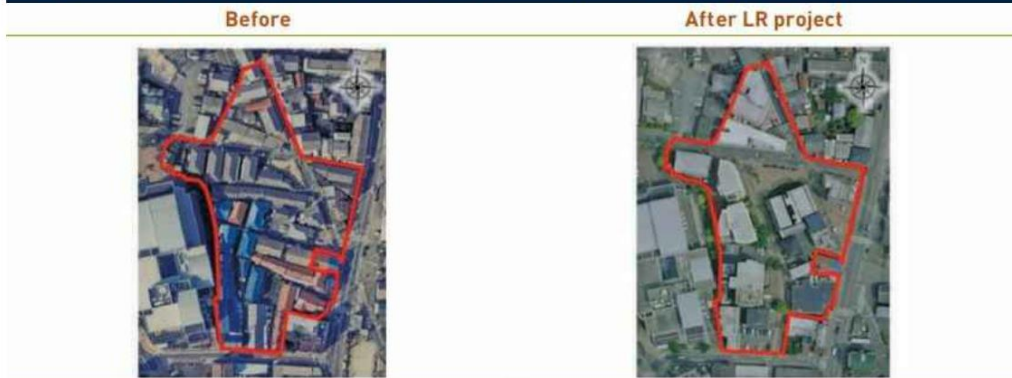
After LR project



- **Improvement of Congested and Wooden Residential Areas:** Aims to enhance safety, disaster prevention, and living conditions in dense residential zones with wooden structures. Objectives include securing evacuation routes, promoting the reconstruction of risky buildings, and supporting collective housing development.
- **Integrated land readjustment with Railway Development:** A specialized category, exemplified by the Tsukuba Express Railway project, which combines prior land acquisition and land replotting

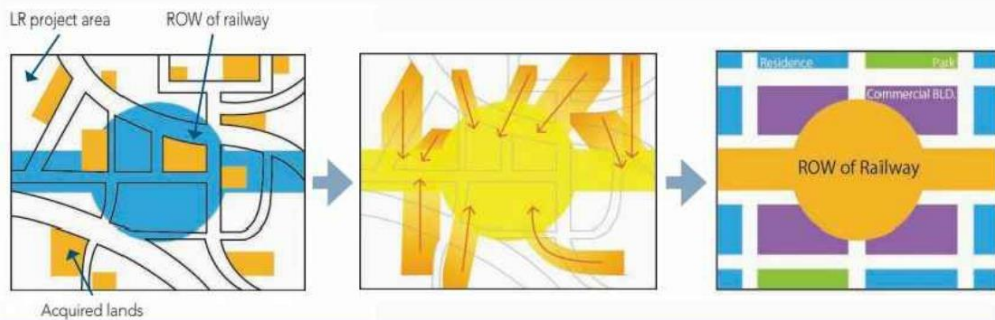
Annex 1: Typologies of Japanese LR Projects

Congested and Wooden Residential Area: Suehiro Minami LR Project, Kadoma City

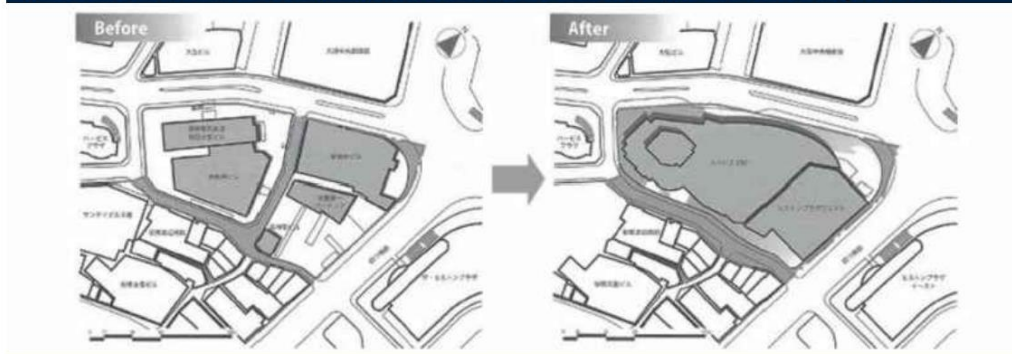


Methodologies of Integrated LR with Railway Development

- Step 1:
- Designate ROW of urban railway
 - Prior-LR land acquisition in LR project area
- Step 2:
- Land replotting of acquired lands into the ROW of railway
- Step 3:
- Railway construction
 - Urban development by LR project



Small-Scale LR for Land Consolidation in Urbanized Areas: Umeda 2-chome LR Project, Osaka



UN-Habitat's Participatory and Inclusive Land Readjustment(PILAR) approach

UN Habitat proposed an approach that addresses many of the challenges conventional land readjustment faces in developing countries, which cannot rely on reliable land systems, called PILAR - Participatory and Inclusive Land Readjustment. This method emphasizes community involvement in the process, particularly the engagement and recognition of vulnerable groups. The local dimension takes a central role, identified through community networks, heritage, culture, and local businesses.

For sustainable and inclusive redevelopment, stakeholder participation is complemented by a partnership between landowners, the local academic community, real estate developers, the private sector, and financial institutions.

PILAR is currently being tested in Colombia, where a UN Habitat team is attempting to apply PILAR principles as a tool for participatory, inclusive, and equitable urban densification in Medellin, even for vulnerable groups. Thus, Medellin serves as a pilot project intended to be an example of sustainable development by improving the planning process, which involves adequate public spaces and infrastructure, as well as mixed-use neighborhoods with appropriate density. Guided by the PILAR model of involvement and planning and motivated by the gains obtained through the increase in shared land values, the municipality is assisted in developing the area at a reasonable cost, while also developing a mechanism to distribute the benefits obtained as equitably as possible for the considered vulnerable categories.

With the potential impact of reducing the effects of informal settlements, equitable sharing of development burdens and benefits, enhancing local dynamics, and building inclusive and sustainable infrastructure, UN Habitat aims to introduce PILAR as a development guide for governments and local authorities in developing countries to better address the current challenges of urbanizing peri-urban areas.

Land Readjustment Policies in Europe

Since the early 20th century, state intervention in the spatial planning of European cities has been actively pursued in an effort to address the issues of urban sprawl and uncontrolled building and housing. This period also saw the enactment of the first urban planning laws in Europe. Such state involvement in spatial matters relates to the practice of planning, linking the creation of plans with legislation and various factors (such as the natural, social, economic, and cultural environment) as dictated by the governments of different countries.

Urban planning varies from country to country, since it is part of the legal apparatus of each country and is implemented through the administrative system, which is certainly different in European countries. Legal instruments usually include guidelines and directives for optimal planning, which are binding, but their role is mostly strategic. European countries (Germany, France, Italy, England, the Netherlands, and Greece) express different legal cultures, belonging to different legal groups with their specificities and vulnerabilities, adopting different mechanisms of feedback and operation.

In all European countries, the central government not only supervises the decisions of regional and local administrations, in general and the implementation of projects, in particular, but local authorities also hold a wide range of responsibilities in formulating and implementing planning policies. The central state and the central administration may have the final say in planning decisions, but in fact they only carry out checks on the legality of the proposed plans, thereby ratifying the decisions of the local authorities. The above-mentioned countries have, to a very large extent and through continuous administrative restructuring, managed to achieve a particular degree of autonomy in local affairs on a number of issues, including those relating to urban development. This autonomy covers many different levels. The organization of local government in Europe is presented in a much more integrated form, compared to Greece. In European cities, the guidelines and directives that have been incorporated into their legislative toolbox are essential guiding mechanisms, giving great flexibility and ease of application to the existing legal instruments for the acquisition of public spaces. Also, municipalities can apply the legal instruments with discretion and self-reliance, always

balancing public and private interests appropriately, in a fairly consensual system, without much controversy and rivalry.

Table 2: Tools of acquiring public spaces in European countries

Countries	Compulsory expropriation	Preference right	Urban Redevelopment	Free trade	Urban Development	Building factor transfer	Synergy	Land contribution	Social building factor
Germany	+	+	+	+	+	-	-	-	-
France	+	+	-	-	-	+	-	-	-
Italy	+	-	-	-	-	-	-	-	-
England	+	-	-	-	-	-	-	-	-
The Netherlands	+	+	+	+	-	-	-	-	-
Greece	+	+	-	+	-	+	-	+	+

Source: Kalliakoudas, 2014

The legal regimes of the examined countries, show evidence of similarities but also differences. There is a diversion on the laws concerning the tools and compensation rights, even if there is some minimal legal transplanted from one country to another⁷. Expropriation, although considered "repugnant" by all European citizens and used as a last resort, is the policy instrument found in all European countries. The right of preference and free trade are among the means of public space acquisition found in most of the countries mentioned. As for the transfer of the building factor⁸, which at least in Greece is appreciated by many technocrats, it is found also in France. For Britain, compulsory purchase is the only tool of exercising land policy, and the combination with the high level of prices makes expropriation a particularly objectionable means of acquiring urban land from communities. For this reason, a special effort is made to ensure that it is not used so frequently.

Greece, Italy, France and the Netherlands are countries that are characterized by partial planning levels (central, regional and local) and have not managed to implement a land policy that would allow them to finance their own the acquisition of the land necessary for the implementation of their urban policy. Moreover, they are characterized by a strict regulatory urban planning tradition and, at the same time, a lack of corresponding experience in strategic spatial planning. The Netherlands (and much more so France), through a fully decentralised administrative system applying informal principles in planning, based on the principle of consensus and the Dutch custom, is considered a model country of a very flexible system of planning public spaces and applying tools for the acquisition of public spaces. In the new revised Spatial Act, which has been in force since 2008, the planning procedures, including the acquisition of public spaces, have been simplified in particular.

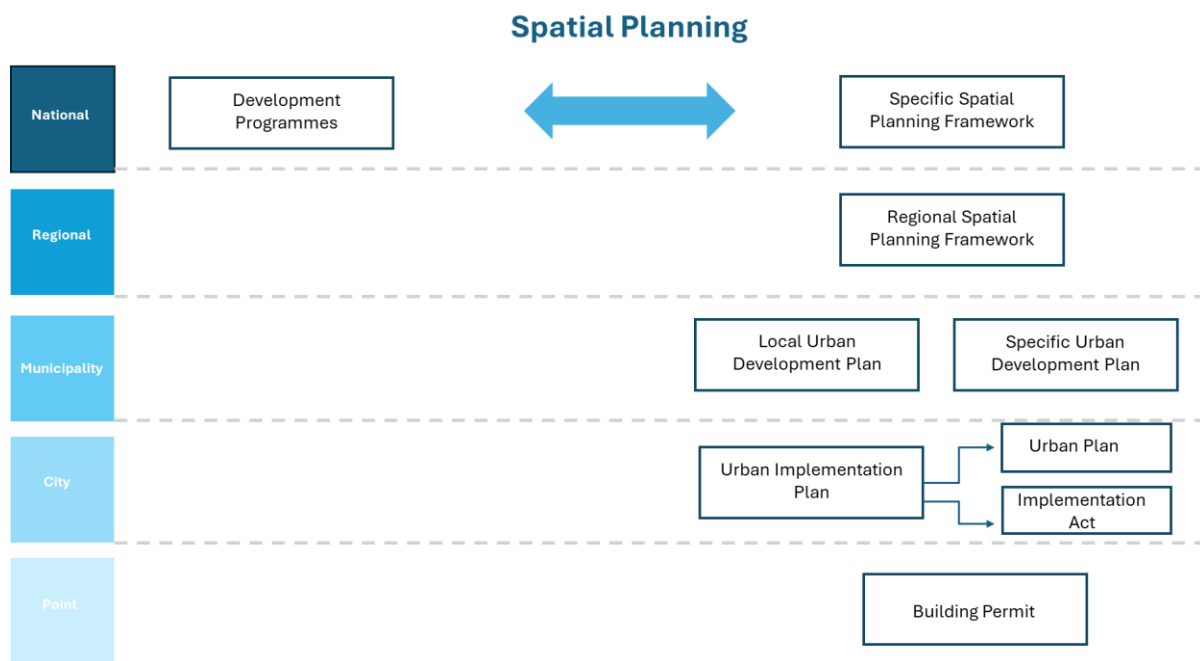
⁷ (Zygouri and Samourkasidou, 2018).

⁸ By this term we mean the possibility provided to beneficiaries of a specific category of properties (e.g. listed buildings) in which the building factor is not depleted to transfer it or part of it to another location of the same property (beneficiary) in the form of an additional B.F.

Germany comes from a fairly decentralised system of administration, but it is coherent because of the principle of reciprocity and the multi-level regulations in the areas of information, participation, coordination and bindingness between the administrative planning levels. It has managed, through a codified system of legal rules consisting of adequate legal instruments for the acquisition of common areas, to have more effective institutions. Of the instruments for exercising land policy, both expropriation and the right of preference are used rarely (to a minimum), although the administration intends to simplify the procedures for their use.

In contrast, Greece's administrative planning system, influenced by the French model, legally embraced the German civil code. This adoption has led to a governance system with a centralized administrative structure. Greece's tendency to adopt rules and standards results, on the one hand, in the formal adequacy of urban planning tools for the acquisition of common areas, which do not guarantee practical and effective implementation, and on the other hand, the formalistic model of public intervention leads to rigidity in planning and easy acquisition of common areas. In addition, objective difficulties such as small property size and its overprotection by the Constitution, put barriers to the smooth implementation of public space acquisition tools and caused years of costly and time-consuming litigation. Its legal instruments, although similar to those of Germany and the Netherlands, could not be implemented to the extent and with the adequacy with which they are presented within the existing institutional framework.

Figure 5: Urban Planning System in Greece



Source: Author's elaboration

Greece urban land policy: Compulsory land contribution

This section delves into Greece's implementation of the compulsory land contribution as a pivotal tool for urban land acquisition. Defined as the state's most secure and cost-effective strategy to fulfill the demands for public and communal spaces⁹, compulsory land contribution mandates that all properties within the designated urban plan areas, or where such plans are extended, must cede a portion of their land¹⁰. This cession is essential for the establishment of common areas as outlined by the Urban Design. This approach not only facilitates the creation of public spaces but also stands in close relation to land readjustment methods, offering an innovative solution for urban development and planning.

History

Article 24, paragraph 3, of the 1975 Constitution marked a pivotal shift in Greece's approach to urban planning. This provision established a new framework for the state's regulatory authority over the country's spatial organization, including the planning and development of cities to enhance their functionality and to guarantee optimal living conditions. The above provision provides for a contribution in land as well as financially as an obligation for owners who are included in a city plan, which is maintained in the revisions of the Constitution made in 1986, 2001 and 2008. The compulsory contribution of land was first introduced by Law 947/1979, article 17, which provided for equal percentage participation of all properties in the creation of common areas. This percentage was set at 40 % in areas of regulatory building conditions and 30 % in Active Urban Planning Zones or Urban Redevelopment Zones. The land levy is available only for the creation of common areas, while for the acquisition of land for public utility functions, expropriation remains the basic institution. These first modernizing provisions met with universal opposition from property owners (mobilizations, press protests, etc.), while the opposition political parties at the time considered them unpopular because they were particularly damaging to small property, and as a result they were not implemented. Thus, in the two years until the 1981 elections, even the executive Presidential Decrees provided for by the law on the extensions of urban plans were not promoted¹¹.

Owners of real estate located in a residential area, as classified by its inclusion in an urban development plan, are obligated to provide a portion of their property at no cost¹². This is done to ensure the necessary areas for public spaces and areas of common use as outlined in the urban development plan. The Urban Planning Implementation Study is conducted in all cases where property owners contribute land for common areas and financial resources for infrastructure construction in urban plan extensions. Both private individuals and public sector entities are required to participate in this mandatory contribution of land and money for their private real estate, without distinction¹³.

⁹ (Aravantinos, 1997).

¹⁰ Calculated on a staggered basis, depending on the total area of the properties on 10/3/1982

¹¹ (Kalliakoudas, 2014).

¹² According to the provisions of Article 8 of Law 1337/1983, along with the supplementation of Law 2508/1997, based on the regulation of Article 24, paragraph 3 of the Constitution of 1975/2001.

¹³ Provided by Law 947/1979, in accordance with the constitutional requirement of Article 24, paragraph 3 of the Constitution.

Law no. 1337/1983 and the Planning Reconstruction Mission (EPA) that accompanied it, were one of the first systematic efforts for the reorganization of the urban planning system in Greece. However, the implementation of Law no. 1337/1983 did not fully justify the expectations for a short, flexible, and comprehensive procedure for public space acquisition. The provision of urban land through inclusion in the city plan requires long procedures. The drafting of the Implementation Act requires a lot of evidentiary records (contracts, certificates, pre-1983 ownership, etc.), is highly complex and leads to its perpetuation, even after its ratification, with constant corrective acts. The mechanism of self-compensation as well as the land contribution had not been able to fully meet the needs of modern cities for public spaces, especially in areas where the high fragmentation of property ownership has put the initial planning of studies out of scope. When properties occupy a large area, they contribute significantly to a positive land balance and reduce the area to be compensated.

The 1983 legislation revolutionized the greek urban development, by introducing the land readjustment process. Historically, based on planning legislation from 1923, the responsibility for imputation and financing land acquisitions for urban development fell on the developers themselves. This requirement persisted until the introduction of law 1337/1983. Prior to this law, cities bore the financial burden of land acquisition. However, the 1983 legislation marked a turning point, as it enabled the use of the land readjustment tool for the first time. This innovative approach facilitated the acquisition of 20,000 stremmas¹⁴ of land, which were then allocated for public and social infrastructure projects, including the development of streets, squares, playgrounds, and kindergartens.

Law 4315/2014

The next revision to note is that of Law no 4315/2014, which continued the reforms and introduced a tiered land contribution system that varies based on land size and total area. This is in contrast with Law no 1337/1983's according to which, the corresponding rate was applied not to a separate property but to the sum of the owner's land holdings included in the boundaries of the area to be included. The new legislation framework aims to address property fragmentation but facing implementation challenges despite its environmental alignment. Although is an unequal treatment of land property, it is considered a fair measure, because property segmentation, that was a common practice, has emerged as major issue for the integrated spatial planning of an area, covered over time by the previous legal framework. The law also favors larger estates by exempting areas over 10,000 m² from surcharges, thus protecting significant property holdings while attempting to foster a cohesive land policy when conditions permit. When there is a positive land balance, then new plots may be created, and the Municipality could establish an integrated land policy.

Under the terms of Law 4315/2014, several modifications to existing legislation have been introduced. These changes encompass various aspects, including the handling of property (land areas) in the process of preparing the Implementation Act, the methodology for calculating land contributions, the approach for calculating and settling financial contributions, and the procedures for modifying approved urban plans following the cessation of urban expropriation or commitment. Having the objective to reduce the reliance on the expropriation, which indirectly imposes costs on all taxpayers, it introduces the formalization of a self-evaluation mechanism within the planning process, specifically concerning the sufficiency of public spaces, revised scales and more advantageous

¹⁴ A stremma is a unit of area measurement used primarily in Greece. It is equivalent to 1000 square meters;

conditions for land contributions. The most decisive factor for a positive land balance is the large area of the land and/or the large area of existing public spaces¹⁵.

The modifications introduced by the Law 4315/2014 are the following:

- In order to proceed a transfer of ownership of a property that owes a financial contribution, in accordance with a ratified Implementation Act, at least 30% of the total liabilities attributable to the transferred property must have been paid.
- Article 8 of Law 1337/1983, currently effective following the amendments by Law 4315/2014, stipulates a revised scale for land contributions as follows:

Table 3: Scaling of land contribution under Law 1337/1983

No	Total area	From	To	Rate	Scaling of contribution	Total
a	250	0	250	10%	25	25
b	500	250	500	20%	50	75
c	1000	500	1000	30%	150	225
d	2000	1000	2000	40%	400	625
e	10000	2000	10000	50%	4000	4625
f		>10000		60%		

Table 3: Scaling of land contribution under Law 4315/2014

No	Total area	From	To	Rate	Scaling of contribution	Total
a	500	0	500	10%	50	50
b	1000	500	1000	20%	100	150
c	2000	1000	2000	30%	300	450
d	10000	2000	10000	40%	3200	3650
e		>10000		50%		

Source: Author's elaboration

- **To calculate the land contribution, the property is defined as a parcel of land in the sense of a continuous area of land, which constitutes an independent and unitary property, owned by one or more owners by shares**, in contrast to the provisions of Law 1337/1983, where the corresponding coefficient was applied not to an independent property but to the sum of the owner's land holdings included in the boundaries of the urban unit to be included.
- **The implementing acts are harmonized with the data from the National Land Register to prevent any discrepancies.**
- **It increases the requirement for public space in urban planning, exempting large properties, raising questions about its calculation and impact on land availability.** This change introduces self-assessment in urban planning to ensure minimum public spaces are met, marking a legal first.

¹⁵ (Panagiotopoulos, 2021).

- **The procedure for the payment of monetary contributions allows flexibility for owners, who are not required to settle the full amount in a single payment.** The financial service of the Municipality certifies the contribution amount as public revenue, offering the possibility to distribute the total over 108 installments across 9 years. Failure to pay results in the enforcement of fines and surcharges. Additionally, the affected plot cannot be transacted, and no building permits will be issued until the outstanding debt is cleared. Should the plot change hands before the contribution is fully paid, the new owner assumes the remaining payment obligations, with any contributions made by the previous owner being duly recognized.
- **Affected landowners have the right to lodge legal objections if they disagree with certain aspects of the land management process.** They can file an appeal, which is first reviewed by the municipal council. If an owner's request is unsatisfied at the municipal level, they may then escalate the appeal to a higher authority, as specified by presidential decree, which could be the Region or the decentralized administration, based on the established planning framework. Should an appeal to revise the land contribution be denied, the municipality is required to provide a detailed explanation, justifying why the proposed amendment by the owners cannot be accommodated.
- **Greece's current spatial planning reform introduces a cohesive framework emphasizing street plan implementation and corresponding acts.** This approach marks a significant enhancement over previous practices, characterized by gaps and discontinuities between planning and execution. The reformed system allows for simultaneous development, enabling urban planning authorities to save time. Furthermore, it facilitates a more systematic consideration of space needs, including public and communal areas, ensuring designs comply with planning standards and requirements more effectively.

The Kalamata Case

Background



Kalamata, the second most populous city on the Peloponnese peninsula, serves as a good example of the effective use of land readjustment tool in Greece over time and on a large scale. In 1986, Kalamata experienced a significant earthquake disaster, after which the city embarked on a comprehensive reconstruction effort, collaborating closely with national, regional, and local entities. The magnitude 5.9 earthquake on September 13, 1986 caused significant damage and resulted in at least 20 deaths. Of the more than 9000 buildings in the city at the time, 20% sustained severe damage and had

to be demolished, a further 16% of buildings were considered heavily damaged and another 36% with moderate damage.

Figure 8: Damage to buildings in Kalamata 1986 earthquake



Source: <https://greekreporter.com/2022/09/13/greece-kalamata-1986-earthquake/>

This was a pivotal moment in the development of Kalamata which prompted a shift towards integrated urban planning. Leveraging the General Urban Plan of 1984, the city embarked on a reconstruction strategy that was a significant departure from the previous reliance on the 1904 street plan and its subsequent revisions, which lacked comprehensive land use plans. This transition represented a new era in Kalamata's urban planning, one that was more holistic and forward-thinking. The western expansion required existing plot owners to contribute up to 50 percent of their land, an unprecedented move that initially faced public opposition.

Notable features

The use of the land readjustment tool was essential in the development and reconstruction of the city following the 1986 earthquake. Approved in 1984, the Urban Plan, alongside the 1983 land compulsory law, provided Kalamata's municipality with powerful tools for post-disaster recovery. With a clear vision for reconstruction, the city leveraged these instruments to request relief funds from the EU and the Greek state for specific projects like new roads, public spaces, residential areas, and schools. This strategic planning and legal framework were pivotal in enabling Kalamata's survival, effective reconstruction, and prosperity, transforming the city's landscape and infrastructure post-disaster.reconstruction happen.

Over four decades, Kalamata's municipality developed and acquired land surpassing 2,000 stremmas, focusing on the urban plan's west and east expansion. Utilizing the land readjustment tool

enabled the acquisition of plots for vital social infrastructure—such as schools, public squares, parks, and thoroughfares—at a minimal cost to the city's budget, showcasing efficient urban management and strategic use of resources for community enhancement.

Figure 9: Aerial view of Kalamata's western expansion



Source: <https://www.greekscapes.gr/index.php/2010-01-21-16-47-%202029/landscapescat/70/131-kalamata.html>

Kalamata can be seen as a model for post-disaster rehabilitation in Greece and Southern Europe.

This is underscored by its significant demographic growth post-earthquake, with a population increase of over 20% in fifteen years, from roughly 50,000 in 1986 to 61,373 in 2001¹⁶. This growth occurred despite facing deindustrialization challenges since the early '80s, demonstrating the city's resilience and developmental dynamism.

Over time, public sentiment towards Kalamata's urban expansion plan transitioned from opposition to acceptance. Initially, in the western district, the novel requirement for landowners to contribute land met with organized resistance, a first for the city. Yet, as the positive impacts of development emerged, erstwhile opponents began to see the value in their contributions, leading to a shift in perspective and increased community support for the project¹⁷.

Although Kalamata primarily utilized Land Readjustment as a tool for post-disaster recovery and expansion in the city's western part, it's now being applied to develop other urban areas as well.

Recently, the municipality announced its plans to use it for the development of an area known as Kipoupli, located in the eastern part of the city. This move signifies a broader application of land

¹⁶ The population growth trend continued, reaching approximately 72,000 in 2021;

¹⁷ Information obtained from the interview with Panagiota Kourakli- Director of Development planning and European Issues, Municipality of Kalamata;

readjustment in greek context, showcasing its utility in enhancing and expanding urban landscapes beyond just post-disaster scenarios.

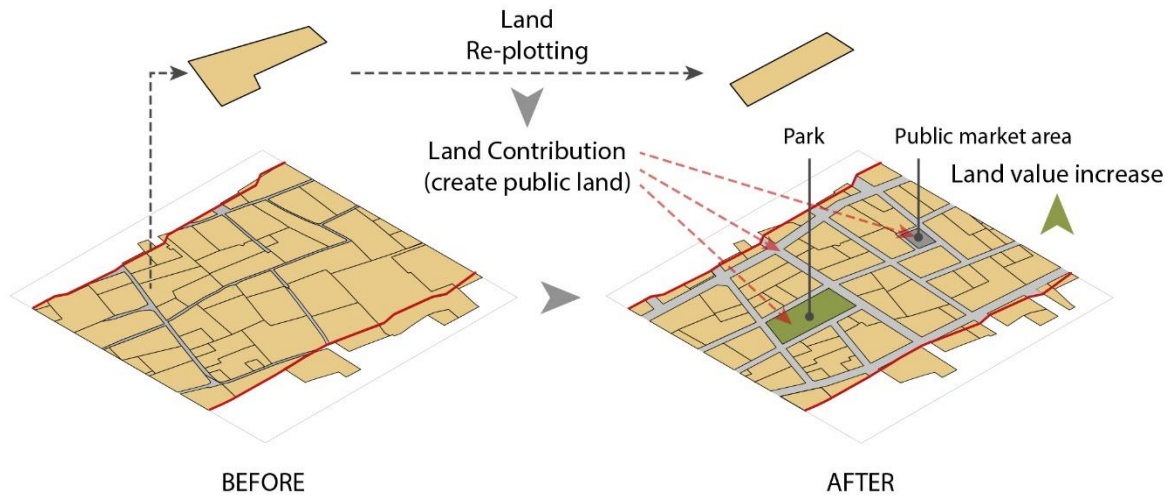
Figure 10: Kipoupoli area, Kalamata



Source: Author's elaboration

The Land Readjustment project in Kipoupli aims primarily at enhancing public facilities and land usability. Its comprehensive strategy includes replotting lands to reorganize and reshape parcels, contributing land to create public spaces, and developing public facilities, thereby improving plot proportions and access to services. This approach is expected to lead to an increase in land value, showcasing the benefits of land replotting in urban development. The replotting process and its outcomes are visually depicted below, illustrating the transformation and optimization of urban spaces.

Figure 11: Conceptual model of land readjustment in Kipoupoli area, Kalamata



Source: Author's elaboration

The implementation of Land replotting in Kipoupoli area, especially in creating a variety of public spaces like parks, playgrounds, and public market areas, significantly contributes to city's effort to climate change adaptation. By forming a vital part of the green infrastructure, these spaces not only offer recreational opportunities for residents but also enhance air quality and play a critical role in mitigating the urban heat island effect. Such initiatives are instrumental in combating climate change, showcasing how urban planning and environmental sustainability can be effectively integrated.

Figure 12: Zoomed-in example of land readjustment in Kipoupoli area of Kalamata



Source: Municipality of Kalamata

In the case of Kalamata, Land Readjustment involving land and monetary contributions from owners, it proved to be a very useful tool for post-disaster reconstruction and for redeveloping urban land for public uses in newly urbanized areas, such as greenfields. Yet, this tool is restricted to areas newly incorporated into the urban plan, not applying to zones already covered by previous plans. For parcel reconfiguration in these established areas, municipalities must acquire land from owners.

Financial constraints and reduced urban expansion needs have notably slowed the adoption of land reorganization and urban growth in recent years. Greek cities face challenges due to insufficient funding for planning studies and interventions, limiting their ability to execute necessary urban planning tasks. Historically, funding for these studies was scarce, with minimal financial support provided on one occasion by the Green Fund. This lack of investment has hindered the implementation of planned urban development projects.

Land readjustment projects in similar Greek cities

Although Kalamata was among the first Greek cities to implement this, to date many Greek cities have applied the land replotting process. An indicative picture of three dynamic Greek cities, apart from Kalamata, is presented in relation to the mechanism of land contribution for the creation of public spaces in areas to be urbanized, from 1990 until today.

In Larisa, about 15 Implementation Acts were compiled to extend the urban plan across nearly 6,500 acres within the Municipality. To streamline the process and expedite completion, the Urban Planning Department divided these acts, resulting in a larger number but with narrower scope. Currently, only two acts in the Averoff district are pending, facing delays due to significant ownership issues and transcription difficulties at the Land Registry¹⁸. In Patras, a total of 10 Implementation Acts were prepared for areas designated for city plan extension, with 9 of them successfully ratified, achieving a 90% ratification rate, while in Heraklion, 11 Implementation Acts aimed at extending the city plan were created and subsequently achieved a 100% ratification rate.

Acquiring public spaces in Greek cities over time faces multiple challenges, including the division of private urban land into numerous small properties that hinder cohesive development and coordinated planning. The scarcity of large public lands in city centers limits the scope for extensive public works and affects land policy goals. Furthermore, the fragmentation and dispersion of public open spaces across the city complicates efforts for large-scale, impactful land policy interventions. Overlapping responsibilities among stakeholders and budgetary constraints exacerbate the difficulties in executing significant projects and interventions.

These factors are typical characteristics of medium-sized Greek cities, serving as constraints in land policy and influencing the physical layout of urban areas. However, the effectiveness of established practices should not be overlooked: punctual, gradual, and mild interventions may be able, in the long run, to improve the image of the Greek city. However, they are not capable of delivering a rapid, radical, and comprehensive upgrading of the image and quality of Greek cities, which is required for their competitiveness within the rapidly evolving single European urban system¹⁹. Integrated urban design, which will provide quality of life and development opportunities in the city, as well as opportunities to improve the living conditions of citizens, is perhaps easy to plan but ,ultimately, difficult to implement.

¹⁸ Kalliakoudas, 2014;

¹⁹ Gospodini, 2019;

Conclusions

The extant urban Land Readjustment tools in Greece offer a potential solution to address challenges posed by climate change, yet they require enhancements to ensure fairness and efficiency throughout if the process is to gain additional scope. The Greek institutional framework was mainly based on Law 1337/1983 when there was a strong push for urban expansion and reconstruction in the country. As a result, the available tools mainly refer to reshaping of lands and the acquisition of public spaces in undeveloped areas. The current model of the compact city, however, has completely different characteristics focusing, among other things, on climate adaptation and resilience of cities.

In practice, this means that in shrinking cities, the instrument will have to be adapted to speeds up the process and apply more flexibly to changing environmental and socioeconomic situations. The efficient use of urban space in city centers or high-density areas can be obtained by converting land right to building rights, stimulating development by enabling landowners to capitalize on the potential of their property while facilitating urban renewal and the creation of more livable and sustainable communities. The adaptation of urban renewal tools such as land readjustment to the issues of ageing building stock and deprived areas in cities is a growing challenge that can be in part addressed by a reformed land replotting mechanism. Drawing from the wider scope and application such as from the Japanese land readjustment policy can offer a direction for regulatory adaptations necessary to widen the scope and enhance the impact of the existing tools.

The case of Kalamata indicates the potential of a reformed land replotting tool to function as long term prevention measure to mitigate disaster risks and aid recovery and reconstitution of urban land after disaster events. The municipal authority of Kalamata benefitted from the existence of a newly revised General Urban Plan in their efforts to rebuild the vital social and environmental infrastructure of the city following the catastrophic earthquakes of 1986. Land pooling and redistribution was used in the development of the eastern neighbourhood which catalyzed the development of new and affordable private housing and was designed according to modern street plan with adequate social and educational infrastructures, and included recreational spaces that improve access to essential services and foster social inclusion. Furthermore, land replotting tools can form part of a strategy to enable reconstruction of urban neighbourhoods following disaster events based on build back better principles. Redesigned urban neighbourhoods will benefit from superior standards of public services, social infrastructure, evacuation routes and better welfare and quality of life indicators, thus contributing to long term urban resilience.

The implementation of the reserve lands concept in Greece's land readjustment process could also offer several benefits, particularly in increasing the feasibility of the projects. Currently, in the process, parcels of land are reserved for public interest uses such as parks, infrastructure projects, and urban market spaces. However, this strategy can also encompass participation of private sector in land reorganization by exchanging designated central land parcels to be redeveloped into public use and open, social or spaces according to policy specifications and requirements of urban plans for revitalisation and resilience, while offering compensatory parcels in exchange. The proceeds from these exchanges could generate essential funds required for municipalities to finance the entire investment. This approach could offer a lever to address the funding shortages experienced by Greek municipalities in performing urban development projects.

A specific tool that could be applied and transferred by convention by all cities is the consolidation of open spaces between buildings, particularly in densely populated areas with a lack of green spaces, in conjunction with the transfer of the building factor. Pocket parks are also a good example, promoting the planning and integration of public spaces in neighborhoods or in densely populated

city centers, with the ultimate goal of improving the microclimate. These small, strategically placed green spaces provide residents with accessible areas for recreation and relaxation, enhancing community well-being, reducing urban heat islands, and fostering biodiversity within the urban fabric.

Land Readjustment can also represent a strategic solution for revitalizing derelict or abandoned buildings and bringing the former historical centers back to life by allowing for the reorganization and optimal use of urban land. Through it, municipalities can reallocate these spaces for public use or redevelopment, integrating them into broader urban renewal projects. This process not only rehabilitates unused structures but also enhances the overall urban landscape, contributing to community improvement and economic development. Land readjustment's flexible framework facilitates the transformation of neglected areas into vibrant, functional spaces, addressing both urban decay and the need for sustainable development.

Modern cities are dynamic ecosystems, with many exposed elements, which transform, grow and adjust to new challenges and circumstances. In this context, land readjustment is a key strategy for improving urban resilience. Through the policies described in this document, Greece has made a major progress in creating an effective land replotting mechanism, that works well for post-disaster reconstruction and greenfield development. This approach could also be a model for other European countries. However, it's crucial for Greece to broaden its operational scope to tackle the erosion of urban cores and the problem of shrinking cities, exploring ways to enhance its application and impact.