Land Readjustment for Urban Development and Post-Disaster Reconstruction

Many earthquake-damaged buildings remain abandoned in Talca, Chile.

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The current state of global urban development is unsettling and plagued with man-made and natural disasters. In many developing countries, the government does not have the fiscal and institutional capacity to build affordable housing and basic infrastructure for the growing urban population, resulting in a proliferation of informal settlements and slums. At the same time, natural disasters in some of these distressed regions have destroyed homes, roads, water and sewage systems, and other public facilities, exacerbating the already limited basic services available to the urban poor.

In response to these problems, many international aid agencies such as UN-HABITAT and the World Bank, as well as governments, scholars, and practitioners, are looking for new ideas or repackaging existing ways to rebuild cities. This article discusses a long-established land management tool that has attracted recent attention—land readjustment (LR)—and describes how selected elements of this tool are being adopted to assist post-earthquake reconstruction efforts in Chile.

The LR approach emphasizes the integration of the urban economy, city planning, law, and governance with land management to form a comprehensive urban development or upgrading strategy. It requires an interdisciplinary team of experts with different perspectives to work on a concrete land development project. Although many scholars such as Doebele (1982) and Hong and Needham (2007) have emphasized the importance of this integrated approach, some practitioners perceive it as merely a tool to facilitate land transactions. This narrow view has limited opportunities in some developing countries to resolve urban upgrading and development problems in a more comprehensive way.

The recent resurgence of interest in LR is due to the recognition of the importance of coordinating economic, legal, political, and social institutions in

the design and implementation of urban (re)development plans. Practitioners are also contemplating the possibility of extending LR from management of peri-urbanization and post-disaster reconstruction to slum upgrading, for example in some rapidly urbanizing African cities. The application of this LR approach to countries where the technique has never been used is still at an experimental stage. Potential pilot projects are being designed, but have not been fully implemented, so further research is needed to test the validity of assertions about this approach.

Challenges of Urbanization

In 2010, about 50.7 percent of the world's population (3.5 billion people) lived in urban areas (World Bank 2011). The percentage is expected to increase to 70 percent by 2050, mostly in the periphery of secondary cities in developing countries. According to UN-HABITAT (2011), one-third of the urban population in developing countries (1.2 billion people) lives in slums and, despite substandard living conditions, these populations are increasing, especially in Sub-Saharan Africa and the Asia-Pacific region. Between 2000 and 2010, the number of slum dwellers increased by six million annually (Cities Alliance 2011).

Unfortunately, infrastructure and basic service development in most African countries have not increased at the same rate. Cities where sanitation, roads, water, and other services were already underdeveloped have limited fiscal resources and struggle with accommodating the unprecedented increase in population. Two major problems that hinder urban upgrading are holdouts in land assembly and lack of public funds to finance infrastructure—issues to which we will return.

Natural disasters also have taken a toll on urban populations. According to a United Nations estimate, earthquakes, tsunamis, landslides, floods, and volcano eruptions caused economic damage totaling $109 billion in 2010, three times more than in 2009 (Reuters 2011). Cities in developing countries with poor infrastructure and fiscal health are particularly vulnerable and are facing increasing price tags for both post-disaster reconstruction and adaptation to future calamities. Again, solving the problems associated with land assembly and infrastructure financing are crucial.

Conventional solutions for dealing with land assembly problems, such as compulsory purchase (eminent domain) and market transactions, are onerous. With increasing global demands for democratic governance and the realization of human rights to adequate housing, secure tenure, and protection from forced eviction, the traditional approach of relying on coercive measures that take land from owners or occupants for urban expansion and redevelopment is encountering strong legal opposition and public protests (table 1).

Using the market to facilitate voluntary land transfers is also problematic. Holdouts by individual landowners could thwart the redevelopment project and increase compensation costs for land acquisition. In some African countries where market mechanisms are not yet fully developed, unequal access to information has led to land grabs and speculation by local elites. As a result, the urban poor were either forced out or bought out from their neighborhoods and were relocated to remote areas where access to employment, public transportation, and basic services are limited.

To make matters worse, the fiscal outlook for cities in developing countries is bleak, and the opportunities to speed up the construction or repair of housing and basic infrastructure are limited. The 2008 subprime mortgage market meltdown in the United States has had adverse repercussions for municipal finances around the world. The decline in demand for imports in industrialized nations and the tightening of liquidity in the financial markets has slowed global economic growth. As exports to developed countries decrease, income-tax and value-added-tax collections in less developed nations also drop. The reduction in tax revenues exacerbates the already tight local budgets and further undermines the ability of municipalities to repair disaster-damaged infrastructure or build new facilities to accommodate rapid population growth.

Land Readjustment as an Alternative

LR has been practiced in many countries to achieve policy goals ranging from farmland consolidation to inner-city revitalization (Doebele 1982; Hong and Needham 2007). Its basic principle is to organize landowners to act collectively—in cooperation with a municipality and/or private developer—to pool their land in order to accomplish a redevelopment project.

LR is often used to re-parcel land when existing parcel boundaries are in conflict with the current

TABLE 1
Comparison of Land Assembly Approaches

Compulsory Purchase	Land Readjustment
Reliance on coercion or seller's exclusive gains	Reliance on community participation and empowerment
Cash-based transaction that imposes a heavy fiscal burden on local governments	Equity-based transaction that reduces upfront capital requirements for land acquisition
Relocation of the urban poor to remote areas with limited access to jobs and public services	Relocation provided within the same neighborhood with improved tenure security and housing conditions for the urban poor
Redefinition of existing occupants, often through gentrification of the redevelopment area	Preservation of the existing community
Exclusive rights against the existing community	Inclusive obligations to the existing community

land use plan. One important outcome is that a portion of the readjusted land can be retained by the development agency for construction of necessary infrastructure and basic services. If LR is not used, this land would have to be acquired by the local government, which could entail a huge upfront cost.

In return for the owners' or occupants' land contribution to the project, each participant receives, upon completion of the program, a new parcel proportionate in size or value to the original one. The size of the parcel may be smaller, but the value is greater due to land improvements and infrastructure created by the project. In this way, LR generates desirable urban development patterns, increases land values, allocates these increments to the involved parties, and limits displacement.

What is important about the recent interest in LR is its renewed emphasis as a mechanism for building legal and social institutions to govern urban development. The major goal is to combine job creation, land use planning, urban densification, public-private partnerships, and value capture for public infrastructure financing in one comprehensive policy package.

Potential Advantages and Disadvantages

Different elements of this unified goal can be emphasized depending on the context. For instance, in the design of a LR project for urban upgrading in an African city where residents do not have legal property rights, policy makers can legitimatize the occupants' claims to land and allow them to exercise their right to participate in the project. After land is pooled, readjusted, and serviced, the residents will be invited back to the neighborhood to rebuild their homes or receive an apartment unit with legal title. This is a win-win approach because it allows squatters to improve their living conditions and tenure security, and it increases development densities to enable the city to obtain much-needed land for urban expansion.

LR can also help implement citywide land use regulation incrementally. To ensure that individual LR projects add up to a coherent whole, they must be conducted as part of a comprehensive urban planning process. In situations where local governments lack the capacity to execute a large-scale master plan, related LR projects can be implemented in an orderly sequence and at a manageable scale to put into action a coordinated, long-term development strategy.

In addition, LR can engender democratic governance. The core principle of LR is to build consensus and cooperation among the parties involved in land development. These parties include formal landowners, informal landholders, renters, NGOs, national government agencies, city officials, and private developers. The process entails grassroots mobilization by giving the urban poor real bargaining power to approve LR proposals. Agreement from the supermajority of landowners and renters is required before LR can proceed, thus ensuring that the government (or a private organizing agency) will pay special attention to the needs of the underprivileged groups and avoid confrontation caused by the threat of forced eviction at the very beginning of the project.

Finally, LR can facilitate land value capture for financing local infrastructure and social services.

In readjusting the land boundaries, land space is created by increasing development densities. This land space can then be sold in the market to raise funds to defray a portion of the infrastructure costs. This technique creates a clear connection between the development benefits received by landholders and the price that they need to pay to make the program financially viable.

Despite these potential advantages of LR over conventional land assembly methods, it is hardly quick or uncomplicated. LR is particularly difficult to implement in developing countries where public participation is not integrated into urban planning or where there is limited capacity to maintain ownership records and resolve competing land claims. When property owners do not recognize their obligation to pay for basic infrastructure and services, requests to give up a portion of their land to cover the project costs will be strongly resisted.

Another concern is that LR reduces plot sizes, causing problems in many informal settlements where people often rely on extra space to earn rental income or conduct agricultural and business activities. In some cases, urban legislation is often too rigid for facilitating LR. Furthermore, different stakeholders may value real assets in diverse ways, making consensus building difficult. Some see possible improvements in living conditions, neighborhood amenities, social networks, and cohesiveness of community as the predominant factors. Others may make their decision based solely on monetary gains.

The integrated LR approach is designed to target all of these issues by focusing on institutional design and development. It emphasizes learning from past LR experiences to illustrate the importance of local context and enhancing this tool to accommodate a wide range of variables and situations. In addition, future adoption of the technique will search for a good fit rather than a single best practice. Most fundamentally, the design of LR projects must be based on multiple perspectives ranging from political economy and anthropological approaches to legal investigation.

Designing Land Readjustment in Chile

On February 27, 2010, a massive earthquake and tsunami destroyed a large part of Central Chile. Three regions—O'Higgins, Maule, and Bio-Bio—comprising 5 major cities and 45 small towns were seriously damaged; more than 80,000 homes were destroyed, and about 108,000 units were severely damaged (figure 1).

In response to this unprecedented disaster, the Chilean government expanded its National Reconstruction Plan to include new mandates and more flexible policies to speed up its post-earthquake reconstruction efforts. This plan offers four types of assistance in the form of vouchers to affected families: (1) US$24,144 for rebuilding a new home on existing land; (2) US$19,083 for buying a new home in another neighborhood; (3) US$3,761 for repairing houses that were partially destroyed; and (4) a special bonus of US$4,200 if the destroyed house is located in a heritage zone (Ministry of Housing and Urban Development 2011).

Despite this financial assistance from the government, affected property owners are facing two major problems. First, because the reconstruction program gives priority to low-income households, the money provided by the state to middle-income

FIGURE 1
The 2010 Earthquake Region in Central Chile

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Basic model homes are part of the national voucher program for low-income families displaced by the earthquake.

families is insufficient for them to rebuild homes of the same size and quality or in the same neighborhood. Property owners without insurance coverage who want to build a similar house must sell their land and move to another neighborhood where the land price is lower. Those who live in tsunami-damaged areas now considered unsafe for redevelopment must resettle further inland, yet that may limit their access to jobs and public services.

Second, selling their land to finance reconstruction may not be a viable option for all affected residents. Some landowners refuse to sell to private developers who offer a low price because the property is so badly damaged. Others who are unable to sell their land may not have sufficient financial resources to rebuild. This persistence of unlivable houses and vacant lots covered with debris further dampens the private incentive to reinvest in the neighborhood.

To assist the post-earthquake reconstruction effort, the Lincoln Institute of Land Policy and the ProUrbana Program in the Public Policy Center at the Catholic University of Chile (the team) put forward a joint proposal to the Chilean government to experiment with LR.

The Pilot Project: Las Heras, Talca

The team decided to conduct its first pilot in the Las Heras neighborhood in Talca for four reasons.

First, Las Heras was ripe for redevelopment even before the earthquake. It is a middle-class neighborhood with large old houses and a beautiful main square. Good social networks exist among its residents, organized by the church and local NGOs, although its development had stagnated for many years due to economic restructuring of the Chilean economy. The central government was offering Las Heras assistance in developing affordable housing through the national voucher program, and these housing subsidies later became an important potential funding source for the proposed LR project.

Second, the Public Policy Center has another program called *Puentes* (Bridges) that conducts collaborative research projects with local municipalities, including a preexisting work agreement with Talca, which facilitated prompt support and cooperation from city officials.

Third, Talca has a master plan that allowed the team to design a series of related LR projects to be implemented step-by-step, so it could fulfill the city's long-term development plan. Preliminary land ownership and demographic information, land use data, and property damage assessments in different neighborhoods are also available.

Fourth, the local government and private developers in Talca were interested in increasing urban densities. Densification provided the much-needed profit incentive for the private sector to redevelop damaged sites, and it could help the local government achieve its objective of increasing and upgrading the housing supply.

Buy-In from All Involved Parties

Following the integrated LR approach, the team recognized the importance of gaining support from the central government. It organized a seminar in Santiago in May 2010 to present the concept of LR and exchange views with top officials from the Ministry of Housing and Urban Development (MHUD). After several rounds of follow-up discussions, the director of the National Program of Housing Reconstruction agreed to purchase reserved land generated from the proposed LR project, thus providing a guarantee for one of the funding sources, and agreed to go to Talca with the team to encourage property owners to participate.

To obtain critical local government involvement, the team travelled to Talca in September

2010 to present the LR ideas to city officials. The team also met with selected property landowners to determine if they might be interested in contributing all or part of their land as capital to finance the reconstruction of their homes and neighborhood. In another visit, some team members also met with school and community leaders, emphasizing the need for broad community support for the project's success.

The team next began to gather detailed data about the area by conducting a survey of residents in eight blocks comprising 217 lots near the main plaza of Las Heras (figure 2). Team members completed 135 questionnaires over the telephone and then interviewed selected residents. The survey results indicated that 77 percent of the respondents trusted their neighbors, and the majority of them (65 percent) wanted to stay in the neighborhood and were willing to work with their neighbors to rebuild the community. Only 12 percent of respondents planned to sell their property and relocate to another area. This information revealed that organizing property owners for LR was feasible.

Project Design

Because the majority of residents in Las Heras are unfamiliar with the concept of LR, the strategy started with a small pilot project to demonstrate the applicability of this method. The team chose a block near the plaza and proposed three scenarios for combining 8 to 12 sites for LR. The number of lots included in the proposed project would depend on the levels of difficulty involved in negotiating with affected property owners. To facilitate the participation process, the team prepared visual images of what the neighborhood environment might look like after the project (figure 3).

The team also conducted detailed financial and legal feasibility studies for the project. A tentative plan for financing the pilot included a careful calculation of the amount of land that each owner would need to contribute based on the availability of government subsidies, estimated building costs, compensation for temporary relocation, and a projected land price at the completion date of the project. The financial study also revealed that constructing housing units at an estimated future price of US$46,000 per unit would allow the project to be self-financing and provide the developer with a 10 percent profit margin—under the assumption that MHUD would purchase the reserved land to build affordable housing for low- and low-to-middle-income households after LR. It was also estimated that 24 percent of the housing units within the block would be affordable for low-income households. This would help the MHUD

FIGURE 2
The Survey Area Around the Plaza in Las Heras, Talca, Chile

Source: © Julio Poblete, DUPLA/Diseño Urbano y Planificación, Providencia, Chile

FIGURE 3
Proposed Architectural Design for New Housing in Talca, Chile

Source: © Julio Poblete, DUPLA/Diseño Urbano y Planificación, Providencia, Chile

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Vacant lots full of debris from traditional-style buildings damaged in the earthquake can be found in the same neighborhood as newer townhouses, which provide a model for new construction in Talca.

attain its policy goal of social integration through the provision of subsidized housing.

The Real Estate Co-ownership Law in Chile requires all participating owners of the LR project to sign a legal document specifying their rights and liabilities. For example, any sale of land held by the designated organizing agency would require the consensus of all participating owners. A legal contract signed by the agency and each participating owner would specify explicitly the number of housing units that the owner would receive at the end of the project and the date of the delivery. The contract would also guarantee compliance by requiring the agency to pay compensation to owners in case of failure to transfer properties in a timely manner and of acceptable quality. The agency also needs to submit the proposed plan to the city. The Municipal Works Department would review the project, approve the building plan, and authorize the transfer of land. The approved plan would then be recorded by the registrar.

Although the research conducted by the team shows that LR is feasible in Las Heras, progress in convincing landowners to participate has been slow due to five key challenges.

First, most property owners are unfamiliar with LR, and there is no existing example in Chile to show how the idea could work. The lack of precedents makes community organizing difficult.

Second, city officials have not provided sufficient support in organizing community meetings or interacting with property owners directly about the proposed project.

Third, many affected property owners who received assistance from their extended families or friends have already relocated to other areas. These owners are in no hurry to rebuild their homes and are delaying the transfer of their land until they receive a higher offer from a private developer or the government. In Chile, there is no LR law that can force these owners to transfer their real assets.

Fourth, not all buildings in the neighborhood were destroyed by the earthquake, and the owners of the unaffected homes are not willing to give up their existing plots for a neighborhood-wide redevelopment.

Fifth, although the survey shows that many owners are willing to work on rebuilding with their neighbors, solving local problems through collective action is not a social norm in Chile. Some property owners have a strong sense of entitlement to receive public resettlement assistance, which contradicts the idea of community self-help.

Interim Assessment

Although the LR approach in Las Heras is still a work-in-progress and it is too soon to predict if the team will be able to overcome local challenges, the project has already generated several observable impacts on Chile's post-earthquake reconstruction policy (Public Policy Center 2011).

First, LR gives property owners in Las Heras an additional option for reconstructing their homes. Before the proposal, they had to either sell their properties to a private developer and move to another area or take the government's subsidies and rebuild a house of smaller size and lower quality. LR provides residents with the opportunity to remain in the neighborhood and to attain the highest possible living standard by using their land as capital for home reconstruction.

Second, LR opens a new channel for the central government to work with local communities on reconstruction projects. The main reasons that the LR proposal for Las Heras could go forward are MHUD's willingness to buy land, provide assistance in encouraging landowners to participate in LR, and give participating landowners the first priority to receive government housing vouchers to finance reconstruction.

Third, the introduction of LR has influenced the government's overall post-earthquake reconstruction strategy. Through this holistic approach, public officials are designing a comprehensive reconstruction plan to rebuild the entire neighborhood coherently, rather than giving subsidies to individual homeowners to rebuild their houses separately. The MHUD has also invited the team to assist its reconstruction effort in the earthquake-damaged city of Constitución, indicating that the government has taken LR seriously as a viable option for other projects.

Fourth, all discussions among the central and local governments, landowners, NGOs, developers, scholars, and urban designers about LR have engendered an environment of mutual learning and understanding, which in turn is reshaping the governance structure for post-earthquake reconstruction. The involved parties have begun to realize that neither a top-down nor a bottom-up approach is sufficient to generate satisfactory solutions. Cooperation among all interested parties is paramount. The LR experiment has fostered a social discourse that helps all segments of society learn how to solve their problems collectively.

Conclusion

Like all policy experiments, the current proposals to test the integrated LR approach for urban upgrading and post-disaster reconstruction in countries where the idea is new will face uncertainties and challenges. Yet, given the mixed outcomes of conventional land assembly methods in many (re)development situations, LR could offer another option for policy makers, practitioners, and other interested parties to consider.

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ACKNOWLEDGMENTS

The authors thank the other members of the LR project team for their contributions to this article: Armando Carbonell, Department of Planning and Urban Form, Lincoln Institute of Land Policy; Pia Mora, ProUrbana, Public Policy Center, Catholic University of Chile; Julio Poblete, DUPLA/Urban Design and Planning; Alejandra Rasse, Catholic University of Maule; Francisco Sabatini, Institute of Urban and Territorial Studies, Catholic University of Chile; and Martim Smolka, Program on Latin America and the Caribbean, Lincoln Institute of Land Policy.