How Innovations in Land Administration Reform Improve on Doing Business

Cases from Lithuania, the Republic of Korea, Rwanda and the United Kingdom

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Preface

Initiated in 2003, the World Bank's *Doing Business* report aims to deliver knowledge that catalyzes reforms and helps improve the quality and efficiency of the rules underpinning private sector activities. This tool allows economies to track progress over time and learn from good practices in business regulations.

Over the dozen years since its inception, the *Doing Business* report has inspired regulatory reforms around the world: in the past 12 years, over 2,600 reforms have been recorded globally in the areas measured by the report.

In the area of Registering Property, more than 300 regulatory reforms have been implemented in 133 economies. Those reforms focus on increasing the efficiency of property transactions thanks to the computerization of registries, streamlining of processes, and introduction of time limits.

In 2015, the Registering Property indicator—which used to measure the steps, time, and cost required to transfer a warehouse from one local business to another—is adding a new indicator to encompass aspects of the quality of land administration. In addition to the efficiency of property registration systems, the Registering Property indicator now assesses the overall quality of land administration with four specific dimensions: the reliability of infrastructure, the transparency of information, the geographic coverage of land administration, and aspects of dispute resolution for land issues.

By expanding its focus on regulatory quality, the Registering Property indicator opens a new area for reforms. The expectation is that the new data on the quality of land administration will provide information about good practices for policy makers. Thus it is worthwhile to explore and understand how certain economies have built some of the most advanced land administration systems in the world—taking into account local constraints and specificities.

The case studies presented in this report span the globe—from the Republic of Korea to Lithuania, from Rwanda to the United Kingdom—and provide lessons on what it takes to succeed in the area of land administration. Through such efforts, governments can increase the security of land rights, create wealth for the broader benefit of society, and contribute to the eradication of poverty.

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Abbreviations and Acronyms

ECA	Europe and Central Asia
EAP	East Asia and Pacific
EU	European Union
FM	Field manager
GIS	Geographic information system
GoR	Government of Rwanda
KLIS	Korea Land Information System
LAC	Latin America and the Caribbean
LAIS	Land Administration Information System (Rwanda)
LAQI	Land administration quality index
LMIS	Land Management Information System (Republic of Korea)
LTR	Land tenure regularization
LTRSS	Land Tenure Regularisation Support System (Rwanda)
M&E	Monitoring and evaluation
MENA	Middle East and North Africa
MINITERE	Ministry of Lands, Environment Forestry, Water and Mines (Rwanda)
MoCT	Ministry of Land and Construction (Republic of Korea)
MoGAHA	Ministry of Government Administration and Home Affairs (Republic of Korea)
MoLIT	Ministry of Land, Infrastructure, and Transport (Republic of Korea)
NETSVEP	Electronic Service of Real Property Transactions (Lithuania)
NGIS	National GIS Establishment (Republic of Korea)
NGO	Nongovernmental organization
O&C	Objections and corrections (Rwanda)
OECD	Organisation for Economic Co-operation and Development
OLL	Organic Land Law (Rwanda)
PBLIS	Parcel Based Land Information System (Republic of Korea)
PS	Para-surveyors (Rwanda)
REGIA	Service of Regional Geo-Informational Environment (Lithuania)
RNRA	Rwanda Natural Resources Authority
RF	Rwanda franc
SSA	Sub-Saharan Africa

1. How *Doing Business* Can Help Improve Quality of Land Administration

Evidence, Challenges, and Country Experience

How Innovations in Land Administration Reform Improve on Doing Business

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To situate the case studies contained in this brochure within the broader context of global land indicators, this section discusses why land governance matters for sustainable private sector development and how the "registering property" indicator under the World Bank's *Doing Business* project incorporated this concern. Evidence on the evolution of this index and its components over time in different regions is used to document that while it has been influential in promoting specific reform, its effectiveness could be enhanced by incorporating aspects relating to the quality of land administration. Evidence on indicators in this area, collected to feed into the 2016 round of *Doing Business*, points towards vast differences across countries and suggests that including these elements in the *Doing Business* ranking can indeed help make land administration more reliable, inclusive, and transparent. Key aspects of the four case studies described in more detail in subsequent sections are summarized to show that progress towards better land governance is possible irrespective of countries' initial income level and highlights the importance of monitoring instruments such as *Doing Business* to encourage reforms that take a long-term view, help maintain focus during implementation, and share good practices among top reformers.

1.1 CONCEPTUAL BASIS

Land and the property on it are among households' most important assets virtually everywhere. Institutions to document and record the legitimate owner of property are thus a key part of the institutional infrastructure of any economy. Clear assignment of rights to property is required to assure individuals they will be able to enjoy the fruits of any improvements they make to the land without fear of expropriation by others or the state. This is a precondition for sustainable land management, productivity-enhancing investment, and entrepreneurial activity with the associated social benefits. Documented rights to property are of even greater importance for women, especially if their ability to own or receive property (e.g., via inheritance) has been restricted in the past. In fact, a large literature documents sizeable downstream impacts of securing women's land rights on autonomy and welfare of the next generation.

Economic development is associated with specialization and moving part of the labor force out of the agriculture sector. This can create ample scope for efficiency-enhancing land transfers. But it is contingent on institutional arrangements to document ownership in a way that those who transfer temporary use rights do not fear the potential loss of their land while those who acquire land—temporarily or permanently—are assured they are

dealing with the rightful owner. Full realization of gains from trade requires that reasonably complete, current, and authoritative information on the assignment of property rights—normally provided by public registries—is available at low cost to a set of agents with sufficiently diverse skills to allow efficiency-enhancing transactions.

The immovable and virtually indestructible nature of land implies that, with sufficiently liquid land sales markets, it can provide ideal collateral for financial markets, boosting entrepreneurial development. But it can perform this function only if authoritative and comprehensive registry information on land ownership is available and can be routinely accessed at low cost by third parties such as banks and mortgage lenders.

Beyond the benefits to individual economic activity, having a comprehensive geo-referenced system of land records can improve quality and effectiveness of public service provision in a number of respects. It provides a basis for realistic land use plans that can be implemented swiftly, an issue that is relevant to facilitate urban expansion in a way that creates livable and "green" cities rather than gridlock and increased emissions. It also allows access to land by industry in ways that respect existing rights without incurring interminable delays and red tape, thus facilitating provision of jobs. Finally, with the rise of the information economy, having spatial information on land ownership and properties available in an interoperable format provides a wealth of opportunities for the private sector and local communities to add value to such data and provide location-based services.

Three reasons have traditionally prevented many countries from harnessing the full benefits from better land governance. First, creating and maintaining textual and spatial ownership records for land in an analog setting is technically complex, time consuming, and requires a large institutional infrastructure for mapping and record maintenance. Vast increases in computing power, connectivity, and availability of remotely sensed imagery at high resolution have reduced this cost to a fraction of its earlier level but can be exploited only if there is effective change management and the institutional setting is suitable. Second, most countries are characterized by large inter-regional variation in land tenure arrangements that calls for a flexible rather than a one-size fits all approach and very fragmented land institutions. As a consequence, decisions on land are made by a large number of institutions including ministries of urban development, agriculture, environment and forest, in addition to local governments. Failure to delineate responsibilities or share information creates potential for overlap and discretion, makes consistent monitoring difficult, and runs a danger of certain important issues not being addressed at all.[1] Third, land ownership and access have traditionally been closely linked to political power and the ability to make discretionary decisions on land use and ownership can be a source of rents that may be particularly large in settings where land prices increase rapidly. Efforts to increase transparency, eliminate overlaps, and improve coordination may be resisted by those who benefit from the status quo.

Thus, while technology opened up enormous new opportunities to improve land governance, improvements cannot come via "stroke of a pen" reforms but will take time and significant implementation effort to become effective. Taking advantage of new opportunities to improve land governance and the quality of service delivery in the sector will require a clear vision, strong political will, and ways to objectively document progress over time to keep reforms on track independent of short-term political considerations. All of these are issues that *Doing Business* can help with.

1.2 THE *DOING BUSINESS* APPROACH AND ITS EVOLUTION

By gathering and analyzing comprehensive quantitative data to compare business regulation environments across economies and over time, *Doing Business* aims to establish a global benchmark that encourages economies to move towards more effective regulation and can serve as a resource for interested parties. The annual *Doing Business* Indicators have become highly influential as an instrument to improve the business environment for private sector activity and to eliminate regulatory and bureaucratic red tape. The principle is straightforward: *for a total of 11 areas that are all very relevant for establishing or running a business (from registering a business to paying taxes),*[2] a typical transaction relevant for almost all types of entrepreneurs is identified. Key informants, mostly lawyers who, based on the advice they provide to clients and their involvement with the relevant processes, are familiar with what it takes to comply with official requirements in a specific area, are asked to identify the time and cost requirements associated

1. Using a spatial framework to assign responsibilities can help clarify such overlaps; in fact a number of countries have introduced "one map" policies to help bring about better inter-institutional coordination and sharing of information.
2. The areas considered are: (i) starting a business; (ii) dealing with construction permits; (iii) getting electricity; (iv) registering property; (v) getting credit; (vi) protecting minority investors; (vii) paying taxes; (viii) trading across borders; (ix) enforcing contracts; (x) resolving insolvency; and (xi) labor market regulation (which is no longer included in the aggregate).

with each step. After back-checking and reconciliation of data, information is published in annual reports that receive considerable media attention and that allow top performers to advertise their "business friendly" credentials to attract private and public investors.

1.2.1 *The Doing Business* "registering property" indicator

As access to land has consistently been identified as a key bottleneck for establishment and running of a business, an indicator on "registering property" has been part of the standard set of *Doing Business* indicators since 2005. Until 2015, this indicator focused exclusively on measuring the time, cost, and number of procedures required to transfer a commercial property, defined as a warehouse in the outskirts of the main business city that had already been registered and surveyed. To obtain this information, *Doing Business* records the full sequence of procedures required for a business (the buyer) to purchase a property from another business (the seller) and to transfer the property title to the buyer's name so that the buyer can use the property for expanding its business, as collateral in taking new loans, or if necessary, sell it to another business. The process starts with obtaining necessary documents, such as a copy of the seller's title, and conducting due diligence as per local requirements. The transaction is considered complete once it is opposable by third parties and the buyer can put the property to use, mortgage it for a bank loan, or resell it. The ranking of economies on the ease of registering property is determined by sorting their distance to frontier scores for registering property, which are the simple average of the distance to frontier scores for each of the component indicators.

Using the figures obtained in this way illustrates that, overall, registering a property considered in *Doing Business* takes 48 days, requires 5.8 discrete procedures, and costs 5.7 percent of property value (Table 1.1). Requirements differ significantly across regions: The number of days required for registration ranges from some 22 in the OECD to 98 in South Asia. By comparison, the number of procedures varies little around the mean of 6. Costs are, with 2.6 percent and 4.3 pecent, lowest in Eastern Europe and Central Asia and the OECD. The level obtained in Eastern Europe and Central Asia is about half of the cost to register a property in Latin America (6 percent), the Middle East and North Africa (5.6 percent), and South Asia (7.1 percent). In Sub-Saharan Africa, it costs more than three times (8.3 percent) to register a property than in the lowest-cost region. Inspection by country reveals that the level of costs is inversely related to the level of development, highlighting that in many of the poorest countries, affordability of the formal systems of property registration is an important concern and that efforts to reduce these costs will be required.[3]

Changes in key indicators over time suggest a reduction of cost and time for property registration: In the 11 years covered by the data, the number of days required to complete the

TABLE 1.1 Requirements for registering a property (2005–2006)

Region		Cost (% value)	No. of days	No. of procedures
World	2005	7.0	91.4	6.2
	2006–10	6.6	76.5	6.1
	2011–15	6.0	52.9	5.9
	2016	5.7	48.4	5.8
East Asia & Pacific	2005	4.5	96.0	5.3
	2006–10	4.3	103.3	5.4
	2011–15	4.3	78.6	5.2
	2016	4.5	74.5	5.3
Europe & Central Asia	2005	4.1	118.5	7.1
	2006–10	3.2	72.0	6.5
	2011–15	2.8	28.6	5.7
	2016	2.6	22.0	5.4
High income: OECD	2005	4.8	59.7	5.0
	2006–10	4.4	53.8	4.9
	2011–15	4.4	26.5	4.7
	2016	4.3	21.5	4.6
Latin America & Carribbean	2005	4.8	87.5	7.1
	2006–10	6.0	74.0	7.0
	2011–15	5.9	64.0	7.0
	2016	6.0	62.0	7.0
Middle East & North Africa	2005	6.6	47.7	6.1
	2006–10	6.0	41.1	6.1
	2011–15	5.5	32.2	5.9
	2016	5.6	29.6	5.7
South Asia	2005	7.9	136.9	6.6
	2006–10	6.8	125.5	6.4
	2011–15	7.3	100.5	6.3
	2016	7.1	97.6	6.4
Sub-Saharan Africa	2005	12.9	111.6	6.6
	2006–10	11.2	89.4	6.5
	2011–15	9.5	63.7	6.3
	2016	8.3	57.6	6.2

Source: Doing Business database.

3. Although information on cost is provided for every step, it is not possible to disaggregate costs in cases where one step comprises payment for several services (e.g., taxes and fees). For the 89 countries where costs are provided by the different elements, taxes account for 58 percent of costs.

registration process was reduced from 91.4 to 48.4, a change of more than 40 days. The number of procedures changed much less, from 6.2 to 5.8. Mean cost decreased by about one point from 7 percent to 5.7 percent of property value. This hides high levels of inter-regional variation and the fact that some countries undertook far-reaching reforms.

Eastern Europe and Central Asia emerges as the region where reforms had the most impact: the mean number of the days required for registration was reduced from 118 to 22, fees fell by one percentage point from 4.1 percent to 2.6 percent of property value, and the number of procedures was cut from 7.1 to 5.4. In South Asia, fees remained between 7 and 8 percent while the number of days was reduced from 137 to 98. In Sub-Saharan Africa, despite progress in reducing fees (from 12.9 percent to 8.3 percent), the number of days required to register (from 112 to 58), and the number of procedures (from 6.6 to 6.2), registering land remains expensive and lengthy. East Asia and the Pacific has lower fees (4.5 percent) but rather high time requirements (about 75 days). By comparison, Latin America and the Caribbean has much higher fees (6 percent) but slightly lower time requirement with 62 days, down from 88 at the beginning of the period. Countries in the Middle East and North Africa reduced fees by about 1 percentage point to 5.6 percent and the time needed to 30 days. In the OECD, fees went down by 0.5 point to 4.3 percent while the days required to register a transaction was cut from 60 to 22.

1.2.2 Nature and direction of reforms

While the above suggests that *Doing Business* helped to stimulate and create momentum for reform, a closer look at the nature of such reforms is instructive. The *Doing Business* website provides a list of reforms, categorized as major and minor as well as positive and negative. Analysis of reforms for the "registering property" indicator in the 11 years covered by the data highlights that some 80 percent of sample countries undertook at least one positive reform, in most cases a major one, although some 47 percent of countries had at least one negative reform, in most cases minor. To get a better understanding of the types of reform, reforms were categorized into five areas, namely: (i) changes in registration taxes (often referred as stamp duties); (ii) changes in registration fees; (iii) improved internal registry processes; (iv) easier data access for outsiders; and (v) improved linkages to other organizations, in particular the cadaster. Assigning a 0/1 score for whether or not, over the entire period, a country undertook a reform in a given area suggests that positive reforms are most frequently found in the areas of reducing transfer taxes (35 percent), reducing fees and simplifying processes (24 percent), improving access to land record data, generally via computerization (16 percent), and changes in the organizational structure to improve linkages (2 percent). Reforms coded as negative are dominated by increases in fees (53 percent), taxes (26 percent), more complex processes (12 percent), and more difficult access (10 percent).

The ability of *Doing Business* to prompt action implies that expanding the scope of the indicator to capture new information, e.g. coverage, the reliability of infrastructure, and transparency, can make it even more useful to promote new reforms. Doing so can also help to address two concerns that have been raised. First, the speed of registering a property transfer matters if, as assumed in the case study, the property is registered with unclear identification of both owners and physical boundaries. But in many developing countries, coverage with records is quite limited, the formal process of property transaction is not used by most people. Moreover, even if records exist, they may, for various reasons, fail to provide an unambiguous identification of either the legitimate owner or the boundaries of a land parcel and thus be contestable and fail to bring about desired benefits. Second, a single-minded focus on reducing the private cost and the number of procedures required to register property that fails to account for either the quality of services provided or the amount of resources spent by the public sector ignores the fact that transaction costs are the price paid for specialized institutions. In the extreme, this could lead to reforms that may adversely affect quality of service provision, equity, and sustainability.

In Saudi Arabia transferring a commercial property from one company to another takes less than a week and costs nothing in fees. But new data collected by *Doing Business* this year on the quality of land administration systems show that the Saudi system lacks transparency and the mechanisms for resolving land disputes are complex. Information either is not accessible to everyone or can be obtained only in person. And resolving a land dispute over tenure rights between two local businesses in Riyadh takes more than three years.

France has the opposite situation. *Doing Business* data show that the property transfer process is long and costly: transferring a commercial property takes 49 days on average and costs 6.1 percent of the property value. But the new data collected by *Doing Business* show that the land administration system has strong standards of transparency and effective mechanisms for dispute resolution. Thanks to fully digital records at the cadastre, anyone can consult maps and verify boundaries. Information about documents and fees for property transfers can be found online and on public boards. And resolving a land dispute over tenure rights between two local businesses in Paris takes between one and two years.

1.2.3 Incorporating quality of the land administration system

Reinforced by an independent panel review (Manuel *et al.* 2013), it was decided to broaden the scope of key *Doing Business* indicators to incorporate quality of regulations. The goal was to have *Doing Business* contribute to a regulatory environment consistent with effective provision of high-quality public services in ways that are accessible by all. For the "registering property" indicator, this meant greater focus on reliability, transparency, coverage, and dispute prevention, concepts discussed briefly below.

Reliability: Property registries need to provide authoritative information on property ownership and the ability to identify the property on the ground. As the main difference between contractual and property registries is that the latter define rights in *rem*, a boundary description allowing unambiguous identification of the property is essential. This does not require high-precision surveys but rather an approach that is "fit for purpose" (Enemark *et al.* 2014) and a link to ensure synchronization between records' spatial and textual components. To ensure reliability, it is essential that all transfers are registered and that proper checks to ascertain the absence of competing claims be conducted before an entry in the registry is made. Modern technology can make it easier to achieve these objectives but is a means to an end, not a silver bullet.

Transparency and access: A key reason for establishing public registries was the desire to put transactions on public record to make it easy for third parties to ascertain property ownership and to acquire data on the operation of property markets, particularly prices and transaction numbers to feed into economic decisions. This is impossible if records and maps are not easily accessible. A transparent system where all land-related information is publicly available, subject to legal confidentiality requirements, procedures are clearly defined, and information on fees and service standards is easily accessed, is key to keeping transaction costs low and guarding against discretion, informal payments, and other abuses.

Coverage: The utility of even the most reliable and transparent land administration system will be limited if it covers only part of a country's economically relevant land. This does not require the same standards to be applied uniformly over the entire country; in fact recognition of communities' rights in rural areas may be sufficient if boundaries of such land, right holders, and decision-making mechanisms are specified and known locally. But covering only a small fraction of relevant land may mean forgoing important external effects from land registration and may make those not covered vulnerable to loss of their rights through often speculative land acquisition.

Dispute prevention and resolution: In many economies, land-related cases make up a large share of disputes in informal and formal systems. As they are often due to low data quality or informality, a clear legal and regulatory framework with clear processes to ensure accuracy of the records used for land transactions, as well as the identity of transacting parties to make sure the transaction is possible, can be the most effective way of preventing future land disputes. At the same time, managing existing disputes requires effective mechanisms of dispute resolution that are accessible and implemented consistently.

1.3 GLOBAL EVIDENCE ON THE QUALITY OF SERVICE PROVISION

To operationalize an indicator incorporating quality aspects, a series of questions was included in the data collection for the 2016 *Doing Business* report. This section reviews evidence across regions regarding specific questions; it then describes the formula for aggregating these into an overall index and its associated values by specific regions as well as the four case study countries covered in more detail below.

1.3.1 Indicator construction and regional comparison

An index of the quality of land administration systems that ranges from a minimum of 0 to a maximum of 30 points, with higher values indicating greater quality, is constructed by summing up scores from subcomponents relating to: reliability of infrastructure (maximum 8 points); transparency of information (maximum 6 points); geographical coverage (maximum 8 points); and land dispute resolution (maximum 8 points).

The sub-index on *reliability of infrastructure* contributes up to 8 points by assessing six areas: (i) how land records are kept at the registry in the economy's largest business city, with a score of 2 if the majority of land titles are fully digital, 1 if most are scanned, and 0 if most are kept in paper format; (ii) whether there is an electronic database for checking for encumbrances, with a score of 1 if yes and 0 if no; (iii) how land parcel maps are kept at the mapping agency of the economy's largest business city, with a score of 2 if the majority of maps are fully digital, 1 if most are scanned, and 0 if most are kept in paper; (iv) if there is a geographic information system to record boundaries, check plans, and provide cadastral information, with a score of 1 if yes and 0 if no; (v) how the land ownership registry and mapping agency are linked, with a score of 1 if information about land ownership and maps are kept in a single database or in linked databases and 0 if there is no connection between the databases; and (vi) how immovable property is identified, with a score of 1 if there is a

unique property identifier and 0 if there are multiple ones.

The *transparency of information* sub-index has up to 6 points based on 10 components: (i) public availability of information on land ownership, with a score of 1 if such information is accessible by anyone and 0 if access is restricted; (ii) public availability of the list of documents required for completing any type of property transaction, with a score of 0.5 if this list of documents is accessible online or on a public board and 0 if not or if it can be obtained only in person; (iii) whether the fee schedule for completing any type of property transaction is publicly available, with a score of 0.5 if it is accessible online, on a public board, or in print free of charge and 0 otherwise; (iv) if the agency in charge of immovable property registration commits to delivering a legally binding document proving property ownership within a specific time frame, with a score of 0 if the service standard is accessible online or on a public board and 0 if it is not available to the public or can be obtained only in person; (v) if a specific and separate mechanism for filing complaints about a problem that occurred at the agency in charge of immovable property registration exists, with a score of 1 if a specific and separate mechanism for filing complaints exists and 0 if a general or no mechanism at all is available; (vi) whether official statistics tracking the number of transactions at the immovable property registration agency are publicly available, with a score of 0.5 if statistics on property transfers in the largest business city were published in the past calendar year and 0 if not; (vii) if land parcel maps are publicly available, with a score of 0.5 if such maps are accessible by anyone and 0 if access is restricted; (viii) if the fee schedule for accessing maps is made publicly available, with a score of 0.5 if the fee schedule is accessible online, on boards, or in print free of charge and 0 otherwise; (ix) whether the mapping agency commits to delivering an updated map for properties transferred within a specific time frame, with a score of 0.5 if such a service standard exists and is accessible online or on a public board and 0 if not; and (x) whether there is a specific and separate mechanism for filing complaints about problems at the mapping agency, with a score of 0.5 if yes and 0 otherwise.

The *geographic coverage* sub-index contributes up to 8 points to the total based on four components relating to the completeness of coverage with textual and spatial records for the main city and the economy overall. A score of 2 is assigned if all privately held land plots in the largest business city or the entire economy, respectively, are formally registered at the land registry or mapped, with a score of 0 if this is not the case.

The *land dispute resolution* sub-index contributes up to 8 points to the total by assessing the legal framework for immovable property registration and the accessibility of dispute resolution mechanisms. It has eight components: (i) whether the law requires registration of all property sales transactions at the immovable property registry to make them opposable to third parties, with a score of 1.5 if yes and of 0 if no; (ii) if the formal system of immovable property registration is subject to a guarantee, with a score of 0.5 if either a state or private guarantee over immovable property registration is required by law and 0 if no such guarantee is required; (iii) if there is a specific compensation mechanism to cover for losses incurred by parties who engaged in good faith in a property transaction based on erroneous information certified by the immovable property registry, with a score of 0.5 if yes and of 0 if no; (iv) if the legal system requires verification of the legal validity of the documents necessary for a property transaction, with a score of 0.5 if there is a review of legal validity, either by the registrar or a professional (such as a notary or lawyer) and 0 if no such review exists; (v) if the legal system requires verification of the identity of the parties to a property transaction, with a score of 0.5 if there is such verification, either by the registrar or a professional and 0 if there is no verification; (vi) if a national database to verify the accuracy of identity documents exists, with a score of 1 if yes and 0 otherwise; (vii) the time taken to obtain a decision from a court of first instance (without appeal) in a standard land dispute between two local businesses over tenure rights worth 50 times income per capita and located in the largest business city, with a score of 3 if it takes less than one year, a score of 2 if it takes one to two years, a score of 1 if it takes two to three years, and a score of 0 if it takes more than three years; and (viii) whether there are publicly available statistics on the number of land disputes in the first instance, with a score of 0.5 if statistics on land disputes in the economy were published in the past calendar year and 0 if not.

Mean values of the land administration quality index by region point towards large gaps between potential and actual situations, together with considerable variation overall and for specific categories. The land administration quality index is highest in the OECD (22.7), followed by Europe and Central Asia (19.4). A middle field is composed of East Asia and Pacific (13.0), Middle East and North Africa (12.5), and Latin America and the Caribbean (11.5), whereas Sub-Saharan Africa (8.4), and South Asia (7.6) rank at the low end, obtaining less than a third of the maximum score (Table 1.2).

Three observations seem worth noting. First, the fact that despite very similar levels of per capita income Eastern Europe is well ahead of other regions with comparable income levels (such as Middle East and North Africa, Latin America and the Caribbean, and East

TABLE 1.2 Quality of land administration index by region and for study countries

	Max.	East Asia and Pacific	Europe and Central Asia	Latin America and the Caribbean	Middle East and North Africa	High Income: OECD	South Asia	Sub-Saharan Africa	Rwanda	Lithuania	Korea, Rep.	United Kingdom
Reliability	8	2.9	5.9	3.2	3.7	6.8	1.3	1.6	8	8	8	8
Transparency	6	2.2	3.6	2.5	1.9	3.6	1.5	1.8	1.5	4.5	4.5	5
Coverage	8	3.2	3.8	1.1	2.6	6.3	1.5	0.7	8	8	8	4
Disputes	8	4.6	6.2	4.6	4.4	6.0	3.4	4.3	7.5	8	7	7
Total index	30	13.0	19.4	11.5	12.5	22.7	7.6	8.4	25	28.5	27.5	24

Asia and Pacific) suggests that income alone is not a good predictor of the quality of land administration. This is in line with qualitative accounts attributing higher relevance to political will and pursuit of a long-term vision. Second, while the gap between the most advanced and the most backward regions is wide for reliability and coverage, it is narrower for the sub-indicator on disputes, which includes issues pertaining to the legal framework. To the extent that the underlying information is accurate, this suggests that most countries are characterized by a large "implementation gap" that can be bridged only if coverage is expanded and measures (which may include clear regulations for implementation) are taken to ensure provision of authoritative, accurate, and up-to-date information. The number of cases where legal provisions are the binding constraint seems extremely limited. Finally, the low level of coverage in Latin America and the Caribbean stands out: the region's mean score (1.1) is below that of South Asia.[4]

While Europe and Central Asia's ability to exceed the performance of its peers suggests that non-income factors play an important role, it does not answer the question whether very poor economies, in particular in South Asia and Sub-Saharan Africa, may be able to catch up with top performers. A look at land administration quality index rankings in Rwanda, Lithuania, the Republic of Korea, and the United Kingdom, four examples of high-performing economies in Africa, Europe and Central Asia, East Asia, and the OECD, respectively, suggests a strongly affirmative answer to the second question (see Table 1.3: Key Dimensions of Land Administration Quality in Sample Countries, cols. 9–12). Despite wide variation in levels of economic development, these countries all achieve a land administration quality index value well above the OECD average. While these cases are discussed in more detail in subsequent chapters, they are briefly summarized here and some general lessons drawn below.

1.4 HOW TO IMPROVE LAND ADMINISTRATION QUALITY?

Following passage of the 2005 Organic Land Law, Rwanda embarked on an ambitious process to adjudicate and subsequently register rights to 10.5 million urban and rural land parcels in a participatory and cost-effective (US$6 per parcel) process over a period of three years. Success was contingent on: (i) strong political will, a clear vision, and strong leadership; (ii) a carefully crafted policy and legal framework that was constantly adjusted in light of new evidence including from contemporaneous evaluation; (iii) rigorous and careful piloting on a very limited scale to fine-tune processes, adapt them to local conditions, and establish targets for a national roll-out over a three-year period that was followed by a rigorous evaluation; and (iv) effective community participation and regular consultation. While this implies that the first step has been completed successfully, the country's active land markets—with 3–5 percent of parcels sold every year—create significant challenges for sustainability that need to be urgently addressed. Doing so will require: (i) adjusting fees to make registering transactions affordable for rural people; (ii) identifying institutional options for the Rwanda Natural Resources Authority to become self-financing and help local governments effectively deliver land services in a decentralized setting; and (iii) increasing access to land data by public and private players to ensure the full social value from such data is realized.

Since independence in 1990, Lithuania has established global good practices in e-governance and in integrating land information, including management of cadastral information via a web-based cadastral map. The main institution, the State Enterprise Centre of Registers, is completely self-funding, with fees set to cover costs and allow for system development such that the institution can

4. Efforts to obtain a more differentiated picture are currently underway. To proxy coverage, the number of registered real property units relative to population and the extent of mapped to total economically used area would be more appropriate, whereas the number of registered sales transactions—possibly differentiated by different groups—is a good proxy for sustainability of the system.

TABLE 1.3 Key dimensions of land administration quality in sample countries

Reliability of infrastructure	Rwanda	Lithuania	Korea, Rep.	United Kingdom
In what format are most title or deed records kept in the largest business city?	Fully digital	Fully digital	Fully digital	Fully digital
Is there an electronic database for checking for encumbrances?	Yes	Yes	Yes	Yes
In what format are most maps of land plots kept in the largest business city?	Fully digital	Fully digital	Fully digital	Fully digital
Is there an electronic database for recording boundaries, checking plans and providing cadastral information (geographic information system)?	Yes	Yes	Yes	Yes
Is the information recorded by the immovable property registration agency and the cadastral or mapping agency kept in a single database, in different but linked databases or in separate databases?	Linked databases	Single database	Linked databases	Linked databases
Do the immovable property registration agency and cadastral or mapping agency use the same identification number for properties?	Yes	Yes	Yes	Yes
Transparency of information				
Who is able to obtain information on land ownership at the agency in charge of immovable property registration in the largest business city?	Interested parties	Anyone who pays the fee	Anyone	Anyone who pays the fee
Is the list of documents that are required to complete any type of property transaction made publicly available–and if so, how?	Yes, online	Yes, online	Yes, online	Yes, online
Is the applicable fee schedule for any property transaction at the agency in charge of immovable property registration in the largest business city made publicly available–and if so, how?	Yes, online	Yes, online	Yes, online	Yes, online
Does the agency in charge of immovable property registration commit to delivering a legally binding document proving property ownership within a specific time frame–and if so, how does it communicate the service standard?	No	Yes, online	Yes, online	No
Is there a specific and separate mechanism for filing complaints on problems that occurred at the agency in charge of immovable property registration?	No	No	No	Yes
Are there publicly available official statistics tracking the number of transactions at the immovable property registration agency?	No	Yes	Yes	Yes
Number of property transfers in the largest business city in 2014:	N/A	35,571	273,493	1,320,813
Who is able to consult maps of land plots in the largest business city?	Interested parties	Anyone who pays the fee	Anyone	Anyone who pays the fee
Is the applicable fee schedule for accessing maps of land plots made publicly available—and if so, how?	Yes, online	Yes, online	Yes, online	Yes, online
Does the cadastral or mapping agency commit to delivering an updated map within a specific time frame & if yes, how it service standard communicated?	No	Yes, online	Yes, online	No
Is there a specific and separate mechanism for filing complaints about a problem that occurred at the cadastral or mapping agency?	No	No	No	Yes
Geographic coverage				
Are all privately held land plots in the economy formally registered at the immovable property registry?	Yes	Yes	Yes	No
Are all privately held land plots in the largest business city formally registered at the immovable property registry?	Yes	Yes	Yes	No
Are all privately held land plots in the economy mapped?	Yes	Yes	Yes	Yes
Are all privately held land plots in the largest business city mapped?	Yes	Yes	Yes	Yes
Land dispute resolution				
Does the law require that all property sale transactions be registered at the immovable property registry to make them opposable to third parties?	Yes	Yes	Yes	Yes
Is immovable property registration subject to a state or private guarantee?	Yes	Yes	No	Yes
Is there a specific compensation mechanism to cover for losses incurred by parties who engaged in good faith in a property transaction based on erroneous information certified by the immovable property registry?	Yes	Yes	Yes	Yes
Does the legal system require a control of legality of the documents necessary for a property transaction (e.g., checking the compliance of contracts with requirements of the law)?	Yes	Yes	Yes	Yes
Does the legal system require verification of the identity of the parties to a property transaction?	Yes	Yes	Yes	Yes
Is there a national database to verify the accuracy of identity documents?	Yes	Yes	Yes	No
For a standard land dispute between two local businesses over tenure rights of a property worth 50 times gross national income (GNI) per capita and located in the largest business city, what court would be in charge of the case in the first instance?	Intermediate Court	Vilnius District court	Seoul Distr. Court	Land Reg. Division
How long does it take on average to obtain a decision from the first-instance court for such a case (without appeal)?	Less than a year	Less than a year	Less than a year	Less than a year
Are there any statistics on the number of land disputes in the first instance?	No	Yes	No	Yes
Number of land disputes in the largest business city in 2014:	N/A	71	N/A	863

continuously drive innovation, including a cost-saving move to give legal superiority to electronic documents. Its registry and cadaster are fully integrated with each other and with population, address, mortgage, and business registries; any changes are reflected in real time so as to prevent fraud. This, together with maintaining the highest quality standards for information to be registered, is key to preventing disputes: with 95 percent of disputes settled using extrajudicial procedures, out of some 6 million parcels, less than 400 disputes end up in the courts every year. Public reporting of aggregate statistics and private sector access to all data (except a few fields protected by privacy legislation) help to increase transparency in the property market and to reap the social benefits from the land information system not only by facilitating land taxation but also by increasing citizens' voices and allowing utilities and private companies to integrate land information into their business processes and planning.

In the Republic of Korea, lack of accurate spatial information on land undermined the ability to implement urban plans and to capture for public benefit some of the gains from enormous land value increases associated with rapid urbanization and industrialization. This led to formulation of a national master plan for GIS development, followed by open and interoperable standards to govern production and sharing of information, simplification of land use regulations that were too complex to be implemented transparently, and institutional change to eliminate duplication and include other players such as the Ministry of Justice. In view of high costs (about USD 415 million), implementation was sequenced to start in large and medium cities where demand was strong and the potential benefits highest. While meticulous checking of all the country's 37 million land plots required a huge commitment of human capital, the resulting system now provides the basis for all urban planning, land administration, public land management, valuation and taxation, and zoning in development planning. It greatly reduced corruption and increased transparency of processes. For the 2007–11 period alone, an annual cost savings of about US$200 million was realized. The Republic of Korea is now expanding service delivery, while adapting to the growing use of mobile devices by clients, and integrating land administration in the overall e-governance program to better serve the business community and promote economic development.

A long evolution from recording deeds to a voluntary and then a compulsory title registration system supported by a state guarantee characterizes the United Kingdom's H.M. Land Registry, which covers some 24 million titles with a total land value of some GBP 4 trillion, about a third of which is mortgaged. The complexity of the legal process and the fact that land information is not held centrally imply that transferring property takes rather long. The cost of service delivery is reduced by the use of general boundaries rather than fixed boundaries, unless requested. All of Land Registry's innovations are carefully tested before roll-out for value added, feasibility, cost-effectiveness, and robustness. Special products were developed for firms that use land registry data most intensively. Land Registry strives for sustainability and its innovations helped to reduce costs and strengthen the revenue base without jeopardizing its public service delivery mandate.

These four cases include a number of common elements. First, none of the reforms was simple to implement and all required persistence to follow the agreed path even in the face of temporary setbacks. None of the settings was ideal and strategies had to build on the historical context. This implied a need for constant piloting to test different approaches and a willingness to learn and adjust based on new evidence. Second, their legal, technical, and institutional aspects were closely intertwined. Laws and regulations had to be adjusted in light of emerging evidence and institutional arrangements and business models developed to ensure sustainability. Finally, and probably most importantly, they all provided large benefits not only in terms of cost-savings and greater transparency in delivery of public services but also in enhanced economic activity. While only the Rwandan case quantifies the latter, benefits from a national system were particularly high for female-headed households who had previously suffered from high levels of insecurity.

This note lays out the rationale for including land administration quality index in the standard "registering property" indicator by *Doing Business* and discusses initial evidence from the global sample, showing that many countries, including some that have performed well on *Doing Business*'s traditional ranking, have a long way to go to establish a system of land administration that is reliable and transparent, achieves sufficient coverage, and minimizes disputes. The cases in this brochure document that by smartly deploying new technology, countries can make progress in this direction irrespective of their initial income level. Continued monitoring and learning from experience at all levels had an important role in facilitating such progress. *Doing Business* will contribute to this agenda by elevating the profile of land governance, tracking countries' performance with respect to land administration quality index, and fostering global exchange and learning from good performers.

CHAPTER 1 REFERENCES

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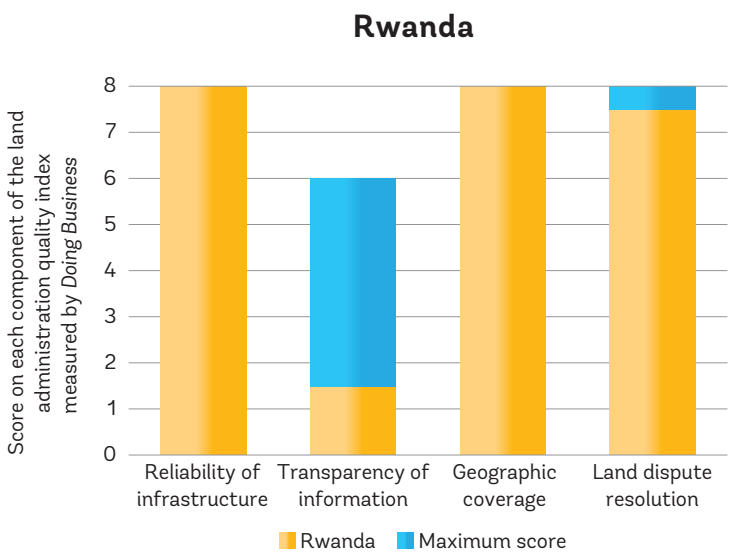
2. Implementing and Sustaining Land Tenure Regularization in Rwanda

Emmanuel Nkurunziza

Rwanda is the only country in Africa that has succeeded in documenting all rights to land. In 2015, all 10.67 million land parcels were demarcated and entered through the Land Tenure Regularization (LTR) and entered in the land administration information system (LAIS) database. Of these, 87 percent (9.1 million parcels) have full information on claimants. Four percent are registered in the name of government organizations, covering 8.5 percent of land area. These outcomes were achieved at a cost of US$6[5] per registered lease. As a result, Rwanda is ranked 12th globally on the "registering property" indicator of the World Bank's *Doing Business* index, and is one of the better prepared nations in Africa to meet future challenges in land administration (Figure 2.1).

The LTR achievement is attributable to 15 years of dedicated reform efforts, which started with a comprehensive review of Rwanda's policy legal and institutional framework, now regularly updated. Preparations for implementation immediately followed, starting first with piloting to identify scalable approaches for achieving the government's ambitious targets, with concurrent monitoring and impact evaluation helping to identify problems that could then be discussed by policy makers. By describing the path Rwanda traversed

FIGURE 2.1 Rwanda's ranking on the global LAQI (actual vs. potential)



5. LTRSP (2013).

and pointing out the benefits from doing so, this chapter draws out lessons that may be relevant for other African countries aiming to improve their ranking with respect to "registering property." It highlights remaining challenges for Rwanda to ensure that these achievements are sustained and that the country can reap the associated benefits in terms of sustainable social and economic development.

2.1 THE IMPORTANCE OF LAND IN RWANDA

Rwanda, the country of a thousand hills, has a population of 11 million people, 30 percent of whom live in cities. It has a predominantly agrarian economy, with an average population density of 479 people/km^2, one of the highest in Africa. Rwanda's land scarcity has produced incessant land-related conflicts and its failure to meet land governance challenges has been identified as contributing to the 1994 genocide. After the war ended, many were displaced and about 800,000 refugees returned to Rwanda after decades in exile. Multiple claims were made over agriculture and housing land, property, and buildings, and about 250,000 families ended up homeless and landless. Emergency responses included land sharing and degazetting some protected areas for settlement. Pressure increased on the government to develop policy to address tenure insecurity and land-related conflict, for stability and as a precondition for sustained growth.

2.2 PUTTING THE POLICY AND LEGAL FRAMEWORK IN PLACE

2.2.1 The choice for land reform

The then-prevailing land laws and land administration system were deemed insufficient to meet these urgent challenges. The previous laws were rooted in colonial laws with a dual system approach to registration, which did not serve the needs of rural areas. Land was state owned unless titled, but covered a very limited, mostly urban area. Land-related responsibilities were scattered in different ministries and government institutions could not cope with the growing demand for land-related services. However, Rwanda had no regulatory frameworks that would have allowed it to develop a new land policy, improve the legislation, quickly overhaul the outdated land administration system, and provide the effective means for its implementation (Sagashya and English 2010).

The Rwandan government made land policy reform a policy priority to clarify and secure land rights for all Rwandans and thus create conditions to spur economic development (GoR 2000 and 2004). Getting land reform right is critical to both poverty reduction and the peace and prosperity of a country. It required far-reaching legal and institutional changes, starting from scratch, to overcome a history of land-related conflict and inequity, end discrimination in land access, ensure equity in inheritance, and provide a framework for optimal use of available land resources.

2.2.2 Prioritizing women's rights to land

The first output was enactment in 1999 of the Law of Matrimonial Regimes, Liberalities and Successions. The genocide and war led to a large number of female-headed households and there was an urgent need to protect women's rights to remain on and manage the land of their husbands or fathers. The Law's aim was to bring inheritance within the scope of the state justice system and to break with discriminatory aspects of customary law. This implementation was supported by continuous awareness-raising supported during the LTR, producing real changes in society, as more women got their share of inheritances. Gender issues were mainstreamed in the LTR roll-out; a large number of staff—including those in the field—were women, and joint titling was actively encouraged under the LTR. The LAIS data show that 24 percent of registered parcels (and 24 percent of the area under individual land) are in the name of women only, 62 percent are jointly owned (by men and women and other combinations, covering 59 percent of land area), and 14 percent are in the name of men (covering 17 percent of land area) (Rwanda Natural Resources Authority 2015).

2.2.3 Land policy and the Organic Land Law

Over the last 20 years, the government has consistently supported land policy development and nationwide land tenure regularization (LTR). Given the high sensitivity of land issues and the sociopolitical and economic upheavals the country had gone through, the process started with a broad consultation in 1999 that provided crucial input for land policy and legislation. To achieve long-term tenure security and effective land use, a National Land Policy (NLP) was established first to guide the process of land reform and implementation (GoR 2004). After extensive consultation and adoption of a new constitution in 2003, the NLP was approved in 2004, followed by enactment of the Organic Land Law (OLL) in 2005, made possible by the strong support of the government and Parliament. The OLL was abrogated in 2013 and replaced by a new law governing land in Rwanda.

The OLL was a broad, overarching law that governed everything to do with land in Rwanda. Its main purpose is to increase security of tenure and to ensure proper land management and land administration. The OLL stated that land is the "public domain for all Rwandans" and will be held on a long-term lease with the state as the guarantor of the right to own and use land. Most former customary land in rural areas

is under an emphyteutic lease for 99 years. The length of the lease is shorter for other types of land use, such as for forest, marsh, vacant, or residential land. The OLL explicitly recognized customarily acquired land, but also makes compulsory first-time registration and recording of follow-up transfers. Land registration thus became mandatory, which required setting up a nationwide land registration system to enable the formalization of customary rights, the legal foundation for the LTR program. The OLL introduced wide-ranging and radical reforms in land administration and planning and established a unified legal and administrative tenure system and a national cadastral system, linked to a registry that records and guarantees the integrity of subsequent transactions.

2.3 TESTING THE PROCEDURES BEFORE ROLL-OUT

2.3.1 Testing LTR procedures and implementation process (2006–2009)

Following the enactment of the OLL, the government immediately started with the design and testing of the implementation program. The new Ministry of Lands, Environment Forestry, Water and Mines (MINITERE) was in charge of implementation and decided that given the urgency of clarifying tenure, a fast roll-out and nationwide coverage were needed, requiring systematic registration of rights. The government's meager financial and human resources led to the selection of low-cost options that allowed working at scale. The government moved away from the conventional cadaster survey approach and opted to use general boundary principles and high-resolution aerial orthophotos to identify and mark parcels. Other innovations were to involve the community in adjudication and dispute mediation and to work with para-surveyors (PSs). Rwanda also decided to digitalize all data and develop a central land information system.

The decision to pilot the procedures first was critical for the LTR's success and helped minimize operational risks. Piloting was judged essential to test the feasibility of the technical approach given the lack of successful precedents in 2005 of low-cost and massive, first-time registration approaches; it would also evaluate the sociopolitical aspects given the sensitivity of land issues and the country's historical legacy. The trial program would identify any unforeseen issues related to implementation and establish the metrics required for project planning at scale, determining the resources needed for national roll-out of a time-bound, cost-effective strategy for implementation of the OLL with a land administration system and procedures. The results of the trial, supported by primary data gathering, would then inform the drafting of secondary legislation to reflect specific implementation issues on the ground.

In 2005, MINITERE embarked upon the process of developing and fine-tuning a methodology for the LTR. First, extensive field consultation took place over a nine-month period in 2006. The results were used to design a pilot in four cells covering 14,908 parcels with an area of 3,448 hectares, owned by 3,513 households. The four cells reflected some of Rwanda's social, economic, and geographic diversity, which might have implications for the LTR's implementation. The pilot had to test acceptability, levels of buy-in, and the appropriateness of the systems, and had to satisfy a number of other imperatives, such as

- Developing a methodology that would permit the process to go ahead more or less simultaneously across the entire country;
- Ensuring that the process was transparent, legitimate, and did not lead to people (especially the more vulnerable) being dispossessed of their land; and
- Ensuring that the process could adequately deal with any resultant disputes.

Field trials lasted six months, between March and December 2007. Upon completion of the field trials, the project team conducted in-depth analyses of both the process and results. They also calculated work rates, costs, and other resource requirements for designing the Strategic Road Map (see 2.4.1). In 2008, a high-resolution aerial survey was carried out for the entire country[6] Throughout this period, a considerable amount of work was directed toward the legal and policy studies necessary for completing the secondary legislation for the LTR, as well as developing strategies for communications, monitoring and evaluation, and capacity building.

2.3.2 Impact evaluation of the pilot

A socioeconomic impact evaluation was undertaken in 2010, 2.5 years after completion of the trial, in collaboration with the World Bank. To rigorously compare outcomes between treatment and control, a household survey covering those in close proximity to the boundary of pilot cells was conducted.

The impact on investment was found to be very positive, particularly for female-headed households. Individuals whose parcels had been registered almost doubled their investments in soil conservation and female-headed households almost tripled them. These overall positive findings of the LTR pilot were in marked contrast to a large body of literature that documents either failure or irrelevance of efforts in Africa to secure land rights through

6. Up to 11 centimeters in urban areas and up to 25 centimeters in rural areas.

documentation of rights. These results are even more remarkable because the LTR trials involved significant learning and focused on demarcation rather than issuance of title; and little time had elapsed between the completion of the trial and the impact survey.

The evaluation results suggested that the LTR addressed key constraints to environmental protection, agricultural development, and female empowerment in Rwanda. It concluded that the program's positive impacts could be enhanced or potentially negative ones avoided by addressing areas where policy was unclear, ambiguous, or at variance with practice on the ground and by carefully and continuously monitoring performance in high-risk areas. Prominent among these areas were: rights of women who are not legally married; unaffordable fees to register subsequent transactions; and subdivision restrictions that the majority of landholders are unable to comply with. The government immediately addressed the issue of informal marriage in the context of the LTR and successfully adjusted the LTR procedure (Ali *et al.* 2011).

2.4 PREPARING, MANAGING, AND MONITORING THE LTR ROLL-OUT

2.4.1 Strategic road map for the LTR

The Strategic Road Map (SRM) for the LTR was another landmark in the LTR preparation phase and was the product of more than 200 meetings held in 2007 across the country. During the SRM preparation, the government insisted on accelerating the roll-out and proposed to register 50 percent of plots in each district by the end of Year 1. The reason was that the ever-growing urgency of land tenure challenges made fast-tracking and a nationwide approach a necessity. This target required a major review of the process, as the initial drafts of the SRM proposed a phased introduction of the LTR, starting with "hotspots" first and gradually extending to nationwide coverage over a period of 15–20 years. The SRM was adjusted to a "fast-track scenario," including cost implications, management requirements, and an incremental approach to deal with capacity constraints.

The SRM was subsequently discussed and approved by the Cabinet in 2008. It clarified key strategic issues (legal, institutional, and technical); presented an M&E framework for programs, timelines, and costs; and developed structures for donor, public, and civil society organization consultation. Development partners supported the SRM and the LTR Support Program. They established a so-called basket fund with a value of about US$50 million to facilitate an aligned and harmonized approach and reduce the administrative burden for government. The UK's Department for International Development (DfID) in particular played an important role from 2002 onwards, becoming an anchor in Rwanda's land reform process. The consistent support and flexibility of donors and their openness towards innovation was important for achieving the LTR's systematic registration. Financial sustainability of the established system, however, is based on an internal strategy, combining cost recovery through fees and central government transfers, requiring the Ministry of Finance to recognize the importance of land administration services for business and economic development.

2.4.2 LTR procedure for systematic, first-time registration of rights

The Rwandan LTR procedure for the recognition and registration of all existing rights to land parcels and their conversion into legally recognized leases was implemented in 14 steps (Box 2.1). It involves all landholders in the "notified area." As seen from the steps below, an elaborate quality assurance system was developed to prevent errors as much as possible, as these could produce future disputes and undermine trust in the system. Demarcated maps were printed out and displayed in villages to give all a chance to review and object. Errors could be captured and corrected in the system and complaints could be lodged. Registration information was printed out and manually cross-checked with paper records. Care was taken in the step of certificate issuance, whereby critical information on the draft certificates was circled in red for officials to double check printed certificates before sealing and packing for dispatch.

2.4.3 Managing big operations: work at scale, monitor details, and adjust where needed

Rwanda did not wait for everything to be ready to start—the LTR reform. When the LTR started, the scale of its operation was not fully understood. The approach used was both careful and ambitious. Field LTR implemented too quickly risked outpacing developments in policy and legal procedures and institutional capacity, resulting in compromises in registration procedures and legal outcomes that would adversely affect the outcome for individuals. Changes in procedures and documentation thus needed to keep pace with developments on the ground. Moving too quickly would also run the risk that the full consequences and outcomes were not fully assessed nor errors identified on time, which could create land conflicts and disputes. On the other hand, hesitating too long would not produce results. Maintaining momentum of the nationwide LTR implementation while also creating space to test and make changes where needed was important too.

The LTR evolved as it progressed but with careful and continuous

BOX 2.1 Steps for Rwanda's LTR procedure

1. *Notification of areas for the LTR program*
   District, sector, and cell authorities are notified about the LTR commencing within the next three months.
2. *Cell index map and field sheet production*
   The cell[7] boundary dataset is taken from the National Institute of Statistics of Rwanda (NISR) and overlaid onto the orthophoto image. The Field Manager (FM) then walks the cell boundary with the Cell Executive Secretary. If necessary, the boundary is corrected. Next, numbered rectangular polygons are arranged to cover the entire cell area with an overlap of 5 percent. Open-source software packages are used for batch printing of hard-copy maps from the orthophotos to make it easier for people to identify houses and pertinent features.
3. *Information, and mobilization*
   On a cell level, general meetings led by the FM are held to ensure that the public are well-informed and aware of their rights under the new laws, of the LTR and its implementation, and how they will be involved in the process and what was expected from them. These meetings started at the district level involving all leaders at district, sector and cell level to ensure that they were familiar with the process and well equipped to mobilize the population for cell meetings. Flyers and booklets are distributed. Special sessions are organized for women only.
4. *Training of para-surveyors (PS) and Adjudication Committee*
   10 PSs are recruited in each cell during cell level meetings from amongst the population in attendance, with tests and final selection done in presence of everyone in the meeting for transparency. The selected were trained on how to read a map and trace a physical boundary on a field sheet. The composition of the Adjudication Committee was spelt out in the law and self-constituting. It consisted of all cell land committee members (5 people) together with an elected village council or committee (5 people). In total there number was 10 members who were then trained in legal matters around the LTR by the FM.
5. *Demarcation and identification of disputed parcels*
   The PS traces the parcel boundary on the field sheet, walking around the parcel with the claimant, neighbors, and the village leader. No boundary markers are placed. A unique parcel number (UPI) is given and annotated. The claimant then gets a Demarcation Receipt and is instructed to take it immediately to the Adjudication Committee to register a claim. This is the first occasion to pay the registration fee of RF 1,000 (RF 5,000 in Kigali).
   The boundary of the disputed parcel is demarcated and marked on the field sheet and referred to the Adjudication Committee, the village leader, or a special mediator for resolution. Disputes that are unresolved are entered into the dispute register and the parties are referred to a mediator or a court.
6. *Adjudication*
   The Adjudication Committee signs off the adjudication records in the claims and dispute register before they are handed over for data entry.
7. *Data entry and checking*
   Data from the claims register, dispute register, field sheets, claim receipt books, and dispute receipt books are entered sector by sector into the Land Tenure Regularisation Support System (LTRSS) database at the Zonal Office and checked for plausibility.
8. *Parcel digitization (parallel to step 7)*
   Field sheets are scanned and then georeferenced (in QGIS, another open-source software). Heads-up digitization of all parcel boundaries follows under their UPI and calculation of the area in m^2. Finally, a cell map is printed, with villages color-coded and parcels denoted by their UPI.
9. *Objections and corrections (O&C)*
   O&C starts in all cells of a sector at the same time under the responsibility of the FM and lasts two weeks. All claimants can inspect the cell maps and their data for errors and omissions or dispute claims made by others. If necessary, changes can be made of every data point collected. The adjudication committee oversees this process.
10. *Data corrections after O&C (parallel to step 11)*
    The LTRSS database is corrected with the information obtained during the O&C period.

7. Rwanda has five levels of local administration: four provinces (North, South, East, and West) and the city of Kigali; 30 districts (of which three are within Kigali); 416 sectors; 2,146 cells; and 14,876 villages (*umudugudu*).

Box 2.1 Continued

11. *Post-O&C parcel correction in the GIS, cadastral extract generation*
    With all geometric data now corrected and confirmed, an extract is generated for each parcel, showing the parcel and its adjacent neighbors, with the UPI.
12. *Lease preparation*
    A (collated) lease document contains four pieces: original and duplicate lease contract, certificate of emphyteutic lease, and parcel cadastral extract. The certificate is sealed, whilst the contract and extract are stamped.
13. *Lease issuance*
    After another intensive public awareness campaign, the inhabitants of a cell are informed that the lease issuance shall begin and will last for four weeks. The claimant who has not yet paid the fee will be required to pay on lease collection, unless exempted. Duplicate contracts have to be signed by the claimant, now new registered lease holder, before scanning and archiving.
14. *Migrating LTRSS data to the Land Administration Information System (LAIS)*
    All data are migrated sector by sector from the LTRSS to the LAIS Maintenance Database. While this happens (a few days), the LTRSS is blocked for ongoing transactions, after which the LAIS takes over this task.

monitoring. Having clear targets as set out in the SRM was important to focus program efforts and guide implementation. The aim was to maintain the quality of the process used in the pilot, while working at scale with tight deadlines, performance targets, and resource constraints.

A second approach used to manage risks and enhance operational capacity was to break the project workflow down into manageable steps. The same approach was applied to building capacity. This pragmatic approach helped to build capacity quickly and ensured that the reform program stuck to its implementation timeline.

2.4.4 Hands-on management and a "living" operations manual

The project team was very hands-on, with active engagement of the Rwanda Natural Resources Authority (RNRA) leadership, which took full ownership for the LTR project. RNRA management made frequent visits to communities, which gave them the opportunity to discuss any issues. They attended biweekly LTR management meetings and actively monitored the LTR support team's performance. These regular biweekly meetings gave the RNRA the opportunity to discuss any issues with the support team. They made quick decisions based on lessons learned in each previous week's field and back office operations, integrated those decisions in the operations manual, and made sure that all staff were informed of the updates.

The LTR process's key steps were documented in the "Operations Manual for the Systematic Regularisation of Land Tenure in Rwanda" under the responsibility of the Office of the Registrar of Land Titles. The manual provides guidance to different practitioners on all steps of the LTR process. The manual describes in detail the procedures for implementation of the LTR by mobile teams in campaign-style, which followed directly from the provisions of Ministerial Order N° 002/2008 of 01/04/2008 (Determining Modalities of Land Registration) and were further enriched by extensive consultation, discussion, and debate with key stakeholders. These ministerial orders were developed at the end of the pilot, and further developed, refined, and then officially adopted by subsequent ministerial orders. The operations manual started out in 2009 as a 100-page document, and was amended continuously throughout the LTR process to address gaps and new issues. By the end of the LTR process, the manual was 1,000 pages, and had become an exceptionally rich repository to guide day-to day implementation of a massive, systematic registration process.

The Land Administration System (LAS) manual was developed later and describes: (i) Procedures for land transactions and registration; (ii) Forms for all envisaged transactions; (iii) Requirements for each transaction; and (iv) Responsible parties.

2.4.5 Building capacity while rolling out the LTR

Faced with a shortage of professional surveyors, the government recruited thousands of PSs from local villages and trained them on map- and photo-reading skills. They carried out detailed demarcation on the map sheets in the presence of all relevant stakeholders such as landowners, their neighbors, and village leaders. Training for locally recruited PSs was practical and hands-on, using the most competent PSs from one cell to train those in another, and so on. This approach worked as an efficient mechanism for training a large number of people over a large area.

Communities also took on a significant part of the LTR work. Village Adjudication Committees comprise members from the land committee and from the

village committee. Training for Adjudication Committee members was also practical and hands-on. Adjudication Committee members were introduced to the claims register, the disputes register, the claims receipt, the objections receipt, and the fee receipt. They received a small compensation for the time they spent during the systematic registration in their area. Most disputes can be settled by Adjudication Committees.

The government also needed people with ArcGIS or data-entry skills; once annotated maps came back from the field, the government digitized the maps using ArcGIS and entered detailed data on land parcel ownership and use. Aware of the skills gap in the country, the government carefully designed project workflow and the training sessions so that everyone engaged in the technology-intensive steps had only a small piece to add and only needed to be trained for that specific task. In the map digitization step, the government initially had only one staff member with GIS skills. It recruited students from national universities and taught them GIS; they in turn trained new people. In a short span of time, hundreds of people could do the GIS work.

Over the lifetime of the program, 110,000 people were employed, of which 99 percent were drawn from the communities in which the work was carried out. This equates to approximately 1 percent of the Rwandan population. Employment of women was high: 70 percent of staff field managers and 40 percent of PS positions were filled by women, possibly encouraging women's participation in the LTR process (Baldwin 2012).

2.4.6 Monitoring of the LTR roll-out

Learning by doing was the approach chosen and the design was very much a trial-and-error process but required investment in monitoring data collection efforts. Effective and fast M&E of the LTR was needed to take "calculated risks." An independent consulting firm was contracted to undertake process monitoring. Their reports were used by management to make necessary process adjustments.

Although monitoring was a central activity to assess the program's progress and the support team's performance, it was less effective in informing implementation. One issue was that the indicators used did not always track priority issues for the LTR's success and they were adjusted several times throughout the LTR project without a robust assessment of the implications of these changes on what was actually tracked, or wrongly analyzed. For example, it was initially missed that relatively few people were collecting their lease documents and gender aspects were not well tracked or interpreted.

While the LTR project set up separate data collection systems, it was actually sitting on an increasingly valuable "gold mine" of process information and land data produced by the LTR process itself, such as numbers of parcels digitized, entered, approved, and printed in the LTR system, while data on numbers of objections and corrections and of leases issued and collected could be derived from Zonal Operations Manager Reports. Such information generated throughout the LTR process would have provided easily accessible opportunities for the RNRA to assess progress, reassess priorities, and conduct strategic planning for necessary changes at the district level, but was hardly used.

2.4.7 Communication, information and awareness raising

The success of land reform and land administration requires that citizens are fully informed and understand the implications of the new laws and procedures for their rights; this also enhances public buy-in for the reforms. Thus a comprehensive mass information strategy was established; communication and mobilization campaigns were organized to ensure that people understood the LTR process and the procedures used to ensure the fairness and accuracy of the information recorded. The OLL and the LTR have significant implications, particularly for inheritance issues and future disposals of land. Moreover, the LTR procedures are complex and require time to understand, even by educated land administrators. Communication and information campaigns are thus a continuous requirement and are still ongoing, now addressing, for example, the importance of formalizing transactions.

Awareness creation under the LTR was a large and complex task as it had to communicate the details of a completely new concept to a population that is mostly illiterate. The LTR used traditional methods of mass media, as well as posters, flyers, and booklets, but to reach the most marginalized groups, greater innovation was needed. Songs, plays, and dances were thus created to illustrate the LTR process. The program established a "helpline" to assist with claimants' queries. Based on this experience, a poster of "Frequently Asked Questions" (FAQs) was produced in the Kinyarwanda language to be displayed at every Cell Office. The program had a specific gender strategy to ensure that men's and women's equal rights were recognized and put into practice, including for inheritance.

2.4.8 System design of the LAIS—use of open-source solutions

Creation of digital land records traditionally required significant investment in licensed commercial software packages. The LTR adopted a mix of commercial software and open-source solutions. While the GIS unit predominantly used commercially licensed software, the LTRSS and LAIS were

developed solely using open-source solutions. The LTR was the first large-scale land registration program to demonstrate the use of open-source software for data processing, and the first of its kind to use the technology for systematic registration. The use of open-source software provided a cost-effective option for the data processing required for such a large-scale program. The decision to use a mix of open-source and commercial software on the LTRSS was based on breaking down data-processing activities into small component tasks and choosing the most appropriate software or combinations thereof to complete each task. However, this approach also had a downside as the lack of an overall data infrastructure created space for inconsistencies. Later on it was sometimes difficult to link the various pieces effectively, ensure interoperability, and use the LAIS data for policy analysis. It took much longer than planned to have a fully operational LAIS.

2.5 FROM LTR TO SUSTAINABLE LAND ADMINISTRATION SYSTEMS USED BY STAKEHOLDERS

After completion of the LTR, the RNRA through the Department of Lands and Mapping embarked on the establishment of a financially sustainable land administration system, with the key component the quality of land information and how it is updated, stored, shared with different key stakeholders and used to inform policy. The LAIS can contribute to enhancing accountability and transparency in the land sector, supporting the country's planning process (especially in sectors such as agriculture, housing, and urban planning), and analyzing the land sector's contribution to the country's economic development.

2.5.1 Impact and remaining challenges

Landholders initially did not fully understand why completing the process for recording rights was important nor that lease pick-up was needed to do so. Halfway through the LTR process, the monitoring data revealed that lease pick-up was lagging behind. By June 2012, only 42 percent of leases had been collected. This collection rate of printed certificates was well below the expected target; improving it became a priority because left unaddressed it would undermine the LTR's sustainability.

Research was commissioned to understand the issues. The main concern that emerged was landholders' alternative perceptions of tenure security. Despite the legal obligation to register, many felt sufficiently secure after identifying their land on the map with their identity noted and receiving a claim receipt (which they started using in other transactions that also remained informal). They did not see the utility of having a lease certificate. Another reason given for not collecting the lease was the requirement to pay a fee[8] and the fear of tax obligations.

The government subsequently introduced exemptions for the poorest and organized information campaigns on land and property tax obligations (most rural landholders were already exempt). This policy change improved the collection rate: up to 99 percent of those on waiver lists collected their lease. By 2015, most of the approved leases had been collected.

2.5.2 Keeping the LAIS up-to-date: registering all transactions

A key priority for the RNRA is ensuring that land data are updated continuously, requiring that all transactions are registered; thus preventing informality was another concern for the RNRA. Between January 2014 and March 2015, 26,000 sales transactions were formally registered, but this figure appeared too low. Preliminary results of a World Bank study on LTR impacts found that only 32 percent of transactions in rural areas were officially registered, with another 52 percent remaining informal, and 16 percent registered with the village leader.

Having a considerable number of land transactions not formally registered undermines the quality of the registry and can unravel the achievements of the LTR process. As unregistered transactions are not legally recognized, they can become a source of dispute.

Addressing this issue requires a multifaceted approach. The first step is a continuous information and communication strategy on why registration is important for tenure security and how the process of registering transactions works. As a second step, the RNRA introduced a "land week campaign" where staff from RNRA head offices and zonal offices, district land officers, and sector land managers hold meetings in all districts to: inform landowners about land-related services and encourage them to register land transactions; answer questions; provide notary services for those who transacted their land; etc. This annual land week campaign lasts for one month. A third step is to improve access to land administration services by accelerating decentralization and bringing services closer to landholders; doing so requires complete staffing levels at the sector land offices with sector land managers and LAIS availability at the district level.

Another barrier to formalizing all transactions is the flat transaction fee, which is affordable for most landholders in urban areas, but is very high compared to the land value in rural areas. An ongoing policy review is identifying

8. RF1,000 (approximately US$1.5).

possibilities for introducing progressive land transaction fees related to land value, and introducing exemptions for registration of land inheritance below a certain size and for *umunani*. Surveying costs, required in the case of subdivision, should also be reduced. An alternative option to formal surveys is the use of sufficiently trained PSs.

2.5.3 Financial sustainability of land administration services

Different approaches and resources are required for the registration phase compared to the maintenance/expansion phase. Ending the LTR and entering the phase of sustaining the system and building out service delivery also require a restructuring of the RNRA organization. The need to supervise a big management operation and "LTR brigades" working all over the country is over, with the RNRA now becoming a more "normal" government agency in the delivery of land administration services. A different staff set up and budget structure are thus required.

Sustainability requires a self-financing land administration system, which in turn requires an analysis of possible revenue streams for the system, but without jeopardizing access to services and risking more informality. Reviews of the land registry mandate to enable income-generating activities and of the law on land-based revenues are also essential.

2.5.4 Promoting use of the LAIS for policy design and economic development

The interoperability of land data is an important aspect of promoting the use of land data. After completing the first registration, the RNRA migrated the IT infrastructure to a new platform, the LAIS, which combines a register with a cadaster and incorporates such functions as transfers, transactions, and mortgage registrations. The LAIS was upgraded to enable the integration of parcel spatial data with legal data. A manual on the new integrated system was developed and distributed across the country so that land users, banks, and other businesses can take advantage of its convenient features. The RNRA also made an inventory of land information data requirements in other agencies, organizations, and the private sector.

This work is combined with exploring the use of protected internet routes to ease information sharing, improve service delivery, and develop a geoportal. The RNRA is working on further expanding these linkages and strengthening interoperability for other entities (courts, city planning authorities, tax authorities, ombudsmen, and the Ministry of Agriculture). Linking land data with tax maps is one of the priority actions.

2.5.5 Tracking progress: Land Governance Monitoring System

The LAIS will become the basis for a Land Governance Monitoring System. The priority indicators are the documentation of rights and land, and gender-disaggregated data. The aims of the Land Governance Monitoring System are to: help set targets and guide the design and location of specific activities; improve the quality of service delivery; improve transparency; assess and reward improvements in land governance at local level; and identify and help prioritize gaps in legal and institutional environments that need to be addressed for better land governance. Policy interest in and use of monitoring results will provide support for improving land data availability and investing in analytical capacity.

The key land governance indicators selected are: (i) the share of different types of land mapped with rights documented; (ii) the share of rights to land registered in women's names; (iii) the number and prices of registered land transactions; (iv) land tax collected by local entities; (v) area expropriated and amounts of compensation paid; and (vi) the number of land-related conflicts in the courts.

These indicators highlight again that linking different administration systems and data sources offers tremendous benefits for improving service delivery and provides the government with an instrument for monitoring the development of the land administration system.

2.5.6 Impact evaluation for policy guidance

Ever since this first impact evaluation, Rwanda's program has been characterized by its emphasis on research on impacts and rigorously tested methodologies. The LTR commissioned studies on important issues that arose, such as the slow collection of leases by landholders, to identify potential improvements in adopted methodologies, as well as unexpected field issues that seemed significant.

Using research for evidence-based policy interventions became even more important after the first wave of registration because the issues involved are more complex and require research to aid appropriate intervention. Continuous impact evaluation studies are used for in-depth policy review and preparation of policy briefs for a wider audience on the status of land administration and its impact on the country's socioeconomic development. Of course, evaluating the full consequences for the national economy, and individuals and households in particular, requires further research and monitoring to ensure *inter alia* adequate social protection.

Impact evaluation was essential to adjust the program during implementation, document its impact, and identify the needs for sustaining the system, as land issues are complex, very context-specific, and continuously evolving.

Urbanization, urban land management, and affordable housing, for example, are now becoming a key policy field. There is an absolute need to invest in an improved understanding of these issues and to avoid making assumptions when developing policies. Rwanda's land reform agenda has consistently used monitoring and research to question and inform all key interventions. The Rwandan experience showed that it is worthwhile to invest in generating scientific information to give everyone a chance of success as well as to ensure accountability.

2.6 CONCLUSIONS

Rwanda's LTR program is a major achievement that started with approval of a legal and institutional framework in 2004 and was completed in 2013 when all land was registered. Rwanda succeeded in completing this work due to a combination of: strong and consistent political support; demonstration of the urgency and importance for the country's socioeconomic development and stability; broad public engagement and support, the result of an approach that fully involved communities in the process; clear targets and a core team constantly on the look-out for "fit-for-purpose" technological and organizational innovations, enabling the achievement of ambitious targets; and a careful process of testing and evaluating before scaling up. The hands-on management approach was a pragmatic and incremental implementation guided by clear targets and characterized by learning by doing and systematic monitoring. RNRA management visited communities regularly and used biweekly meetings to review the approach, identify issues on time, and develop solutions that were added immediately to the operations manual and widely shared.

Rwanda receives many requests to share its experience and intends to develop a more systematic approach to serve other countries. The RNRA is developing a repository that will serve as a Resource Centre as well as a Knowledge & Information Management System. Such a system will be hosted under the existing RNRA website, with the ability to share information, data, and knowledge. The system is expected to interoperate with land repository models in other countries or universities in the region. Rwanda also learns from other countries and various adaptations were inspired by south-south exchanges.

With the development and roll-out a nationwide LTR program to record and map all primary interest in land completed, Rwanda now has to ensure the system's sustainability. In many ways this poses challenges no less daunting than those confronted in establishing the system. To do so, two areas will be critical. The first is to streamline the LAIS, establish data-sharing protocols between public and private sector agencies, and make aggregate statistics available to the public at regular intervals. A stakeholder needs assessment has already been carried out to provide input for this. The second area is to develop an appropriate institutional structure and fee schedule to remove impediments to system maintenance and regular update of land records and to provide guidance to local government on land administration and management. In taking the next steps, Rwanda can benefit from exchange of experience with other top *Doing Business* performers while at the same time helping countries interested in first-time land regularization build on the lessons it has learned in this context.

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3. Land and Property Administration Reform in Lithuania

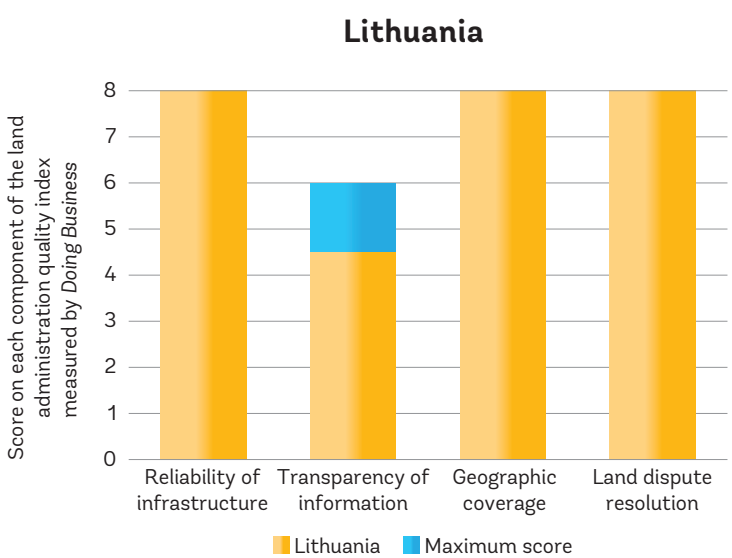
Kęstutis Sabaliauskas and Aidas Petrošius

Lithuania's current property administration system is one of the most modern in the world, reflected by the country's 2nd place rank on the "ease of registering property" indicator in the World Bank's 2016 *Doing Business* survey (Figure 3.1). Although the system was established from scratch when Lithuania regained independence in 1990, this Baltic state's political will was sufficient to develop a modern real property administration system. Lithuania's Parliament (Seimas), the State President, and the government view the *Doing Business* survey results as universal, objectively measurable goals for assessing the country's public sector performance and efficiency and are striving to further improve its rankings, including on the indicator for property registration.

3.1 LAND REFORM

Lithuania is a dynamic northeastern European country with a population of 3.5 million people, two-thirds of whom live in urban areas. When Lithuania gained independence in 1990, it adopted a transition strategy towards a market economy. Land reform started immediately, following a half century of Soviet occupation that renounced private property of land and other real estate. Its registration system separated land registration from that

FIGURE 3.1 Lithuania's ranking on the global LAQI (actual vs. potential)



of buildings and premises that were recorded in so-called Bureaus of Inventory. The system's functioning was also hampered by bureaucracy and corruption.

One priority was thus the restitution of land and property and the decollectivization of state-owned land as part of a more comprehensive land reform. Furthermore, Lithuania strived to be a member of the European Union (EU), which required it to adjust some laws and build institutions, including on property rights. Lithuania joined the EU in 2004.

3.1.1 Legal framework

After independence, Lithuania adopted all basic laws necessary to establish a framework of real property administration that would create favorable conditions for the economy, market, and business development and made significant efforts to harmonize its national laws with EU legislation before accession. The country now has a coherent set of laws on land administration and a robust institutional system to implement its policies.

The 1992 Constitution enshrined the legal protection for the rights of ownership of property and specified to whom the rights of ownership may apply. All civil legal relations, including those relating to real property, are now governed by the 2001 Civil Code, which introduced real rights, and specifically: rights of possession, ownership, trust, servitude, usufruct, development, long-term lease, mortgage, pledge, and administration of another person's property. It established that ownership of a land parcel can include buildings and other constructions on it. The new Civil Code repealed the compulsory registration of real property and rights, but unregistered transactions may not be enforced against third parties. In the event of competing claims to real rights in the same property, the first person to register the transaction is considered vested with the rights in question.

A first version of the Law on Land was adopted in 1994; this is the primary general law on the regulation of ownership, management, and use of land. It was amended in 2004 to avoid duplication with provisions in the Civil Code and other laws. Additional laws were enacted to guide land governance, such as the: Law on State Registers; Law on the Real Property Register; Law on the Real Property Cadastre; Law on Cartography and Geodesy; Law on the Notoriety; Law on Electronic Signature (which complies fully with the EU Directive on Electronic Signature); Law on Tax Administration; Law on the Tax on the Immovable Property of Enterprises and Organizations; Law on Land Tax; Law on Property and Business Valuation; and Law on Inheritance Tax.

3.1.2 Land restitution

The 1997 Law on Land Reform and the Law on the Procedure and Conditions for the Restitution of Citizens' Rights to Real Property replaced a 1991 law on restitution that had severe restrictions on land use and purchase and other limits to full property rights. The 1997 law was amended several times, though not always consistently (which caused disputes later on). This law: (i) established a framework for land reform and the restoration to Lithuanian citizens of rights of ownership to land; and (ii) introduced a new system of land management and ownership based on free-market principles. It governed the implementation of land reform and included general provisions on land restitution, criteria for entitlement to private landownership, and the procedure for privatization of land. The law: (i) set out the conditions applicable to the restitution process; (ii) specified the types of land that would not be restituted and were subject to purchase by the state (such as roads, land for state defense, state forests, and national water bodies); and (iii) outlined the procedure for applying for restitution and recourse to the courts. Compensation was in kind (land) or in money when the former was no longer possible.

The deadline for application for restitution was December 2001, with documents to be submitted by December 2003 (proof of citizenship, heritage rights, or parental relation to the owner [e.g., birth certificate], and documents proving the former owner's property rights or secondary proof like extracts from taxation or mortgage documents and neighbors' testimonies). Decisions were rendered within six months. About 9,500 claims for private houses were submitted; in rural areas, around 749,900 applications for the restoration of ownership rights were made, representing a surface area of 4.2 million hectares (ha).

Surveying and measurement was a condition for restitution in order to achieve a certain standard of data quality to develop a modern cadastre system, to guarantee legal certainty, and to have a basis for further economic development. Most available maps (some even dating from the 1920s) were out of date as the parcel structure changed completely during the Soviet era; further, many heritages of properties had to be divided between several heirs. The land restitution process included land valuation, calculated on the basis of soil maps, restrictions on land use, infrastructure, and so on, according to fixed methods prescribed by law since the land market was still poorly developed in the 1990s.

Surveys were imprecise, however. To speed up the survey process, the government decided that non-geodetical measurement would be sufficient for restitution, with geodetical measurement required for further land transactions, such that improving survey quality was a gradual process. The survey process was initially guided by

the State Land Survey Institute (SLSI), which had existed during Soviet times and was gradually liberalized from 1994 onwards, with private surveyors taking over an increasingly large share of the work.

The work was done very quickly. By January 2004, 89.5 percent of the land area indicated in the applications, or 3.8 million ha, was restored and compensated. Thus about half of Lithuania's total area (6.5 million ha) was in private hands. Much of the remaining state-owned land was leased by agricultural companies, private farmers, or household farmers. The remaining state-owned land, neither claimed by former owners nor leased or retained from privatization for special reasons (protected area, infrastructures, public use) was only 0.1 percent of total area. The government institutions responsible for restitution implemented the reform in collaboration with citizens and NGOs at different levels, with civil society playing an active role in the process. The general consensus was that historical justice was achieved without detriment to any parts of society, minorities, or other specific groups. The outstanding smaller group of claims took a longer time to resolve, however, and resulted in high burdens of compensation to pay to individuals and to religious bodies. For example, the manner, size, and recipients of compensation for property expropriated from the pre-WWII Lithuanian Jewish community (91 percent of whom were killed during the war) took almost two decades to determine, as the political and financial price of those decisions accumulated.

The rush to complete the property restitution reform resulted in a wide array of problems: applicants' unmet expectations; cadastral survey errors; unanticipated roads, easements, and special conditions of land use; and abuse of power and corruption.

The restitution process was subject to constantly changing political influences; the law was amended many times, motivated by short-term political interests. This affected both the legal and institutional frameworks, creating confusion and complicating the reform. Some of the remaining unsettled claims are the result of different interpretations of the law due to these changes. Also, some measurements were of lower quality due to the decisions to: (i) speed up the reform to meet the deadline by dropping geodetical measurement; and (ii) recruit additional surveyors who were trained very quickly ("two-week-surveyors"). Subsequently, problems and disputes arose during transactions (e.g., about borders when the property of more than one owner was concerned). Correction of these errors requires additional time and costs, and restitution-related land disputes will continue to be an issue for the next decade in Lithuania.[9]

3.1.3 Building on global best practice to establish a single land information system

Lithuania's first attempts to computerize land registration were made as early as 1992, with varying degrees of success. Although the Law on Land was adopted in 1994 to regulate land management, ownership, and use, more radical institutional and technological reforms were needed to establish a modern and efficient system of property registry. Lithuania decided to reorganize and combine the State Land Cadastre and Register and registration of land, buildings, and facilities within a single registry handled by one institution.

Known today as the State Enterprise Centre of Registers, this institution was established in 1997. Led by a team of young technocrats and progressive theorists, the Centre of Registers was assigned to combine all information on existing real property as well as cadastral data into a single multi-purpose system and to take over cadastre mapping. The technical and administrative means used for the process of restitution led to awe-inspiring modernization in several domains, noted internationally. By the mid-2000s, Lithuania's registry and cadastral administration was one of the most advanced systems in the world.

Building on the guidance of the just-published UNECE Land Administration Guidelines (1996), and taking into account the best practices of countries leading the field of property registration at the time, Lithuania's modern, real property management system was set into motion within a year. Over time Lithuania's land registry has experienced an exponential rise in data volume and scale of operation and services, but the basic principles hardcoded into its registry system in 1997 remain valid today, ensuring its quality and integrity.

International cooperation and twinning with sister agencies played an important role. Especially close links were made with property administration agencies in Denmark, Sweden, Finland, the Netherlands, Switzerland, and the United States. In the context of Lithuania's EU accession, the most important multilateral actor was Brussels, which provided funds and assistance for the transition period towards membership and made it possible for Lithuania to cooperate with experts and institutions from various EU countries and international organizations.

In 2006, the Centre of Registers signed Agreements for the Provision of Information from the Real Property Register and Cadastre through the European Land Information System Program (EULIS) with Kadaster (the Netherlands), H.M. Land Registry (England

9. Kasperavičius (2015).

and Wales), Lantmäteriet (Sweden), and Norsk Eiendomsinformasjon AS (Norway). In 2007, similar agreements were signed with Property Registration Authority (Ireland) and Land Registry of Iceland. Customers in these countries, including Lithuanian ones, are now able to access real property cadastre and register information in other countries via the internet.

The Centre of Registers is currently actively involved in cooperation with Swedesurvey AB (Sweden), Kadaster (the Netherlands), the National Land Survey of Finland, the Estonian Land Service, the State Land Service of Latvia, and others. Over the past 10 years, delegations from Estonia, Latvia, Ukraine, Turkey, Egypt, Finland, Tajikistan, Azerbaijan, Cyprus, Romania, Kosovo, and multiple African countries have visited the Centre of Registers to get familiar with Lithuania's real property administration, cadastre, and register system and its organization and management principles. The Centre receives up to 15 delegations annually.

3.2 INSTITUTIONS ENGAGED IN REAL PROPERTY GOVERNANCE

3.2.1 Main institutions

Before analyzing the State Enterprise Centre of Registers in more detail, this section presents Lithuania's current system of land administration and the main institutions involved in real property governance:

- The *Ministry of Justice* supervises lawmaking and manages activities of the State's main registers and legal institutions. Under the Ministry's supervision, *private notaries* attest property transactions and mortgages, issue succession certificates, and at the new owner's request, apply for property registration on his/her behalf.
- The *Central Mortgage Office* under the Ministry of Justice keeps the Mortgage Register, Register of Property Seizure Acts, Register of Marriage Contracts, and Register of Wills.
- Established in 2001, the *National Land Service* under the Ministry of Agriculture is responsible for possession, management, and administration of state-owned land; it governs land reforms, cadastre, geodesy, and mapping.
- The *Territorial Planning and Construction Inspectorate* under the Ministry of Environment supervises territorial planning and construction.
- *Municipalities* perform territorial planning, issue construction permits, and allocate addresses.
- As a central tax administrator, the *State Tax Inspectorate* under the Ministry of Finance keeps a Register of Taxpayers, collects property taxes, and recovers unpaid ones.
- The *State Enterprise Centre of Registers* is a public entity of limited civil liability incorporated by the government on the basis of state-owned property. The Ministry of Justice exercises the rights of ownership of the Enterprise. The Centre of Registers serves as a center of excellence, is a main source of reliable data, and is the connecting link in Lithuania's present system of land administration.

3.2.2 State Enterprise Centre of Registers

The Centre of Registers acts under a set of laws, primarily the Civil Code, the Law on State and Municipal Enterprises, the Law on Public Administration, and the Enterprise's own articles, approved by the Minister of Justice. Registry-specific regulations include the: Law on Land, Law on Real Property Cadaster, Law on Real Property Register, Law on Geodesy and Cartography, Law on Construction, Law on the Management of State Information Resources, and Law on Electronic Signature.

The Centre of Registers is responsible for: keeping the Real Property Cadastre and Register and other main registers of the state; registering property; providing public e-government services; and gathering and distributing data and information on land and other real property.

The Centre of Registers' registration offices are located throughout the country, making it easy to register property or its transactions. After introducing an electronic real property transaction service (NETSVEP) in 2008, registering property became even easier as it was no longer necessary to visit a notary office to attest the transaction, a process that involved up to two visits to a notary and three days of procedures.

Organizationally, the Centre of Registers operates within a central office (Central Registrar) and has an extended network of 46 branches and smaller registration offices (Regional Registrars) distributed evenly throughout the country. The Enterprise's central office hosts management, registry-specific departments, the Central Registrar's Commission for Dispute Resolution, and an IT center. The latter: handles the central registry's database and information systems as well as the exchange of data with external systems and services; carries out provision, development, and testing of software; maintains IT infrastructure; ensures cybersecurity; and monitors the activities of registries and other systems.

3.2.3 Financial sustainability

The Centre of Registers was set up to be self-funding, meaning no budgetary funding, except for payments for works and services commissioned by government agencies acting as a client (e.g., mass valuation of property for taxation purposes). Those payments represent up to 2 percent of the Centre's annual revenue.

To sustain itself and to raise funds for further development of registries and its services, the Centre of Registers

is permitted to provide paid public services as well as number of commercial ones. By default, pricing of public services is cost-based, with a minimal margin of profit permitted to fund service development. Commercial services include registry data distribution, real property market analysis, cadastral surveys, and property valuation.

The price list for land registry and other Centre of Registers services is approved by the government or the Minister of Justice, depending on whether the service is public or commercial. The complete price list is publicly available, and can be obtained from various independent sources, including the Centre of Registers' website, regional registration offices, and the online Register of Legal Acts.

To prevent any abuse or competition breaches, the Centre of Registers' public and commercial services are closely monitored by the Competition Council and the supreme audit institution—the National Audit Service of Lithuania—not to mention the permanent oversight of the Ministry of Justice.

Under these conditions, the Centre of Registers is self-sufficient, earning up to 4 percent annual profit to fund its development. The main source of the Enterprise's funding to date is property registration fees, which account for more than 60 percent of overall revenue. In the future, the Enterprise's main strategy is to stimulate further demand for registry-driven-data—an ever-growing area of modern economies.

The self-funding model of management of the state's main registers by the State Enterprise constantly falls under scrutiny. Some of Lithuania's public sector institutions seek to get more gratuitous data, increasing the operational costs of the Real Property Cadaster and Register. At the same time, private businesses complain about property registration fees and the price of data distributed.

3.2.4 Land dispute resolution

In Lithuania, up to 400 land disputes end up in court every year. In land dispute resolution, extrajudicial procedures are mandatory in most cases to be heard in court. In court, administrative litigation solves disputes arising from land lot formation, registration, or other administration procedures. And civil litigation solves the civil disputes of landowners and other parties involved or determines damages and the magnitude of compensation.

As for extrajudicial procedure, disputed decisions of land formation or further administration may be appealed within 20 days after adoption to a regional branch of the National Land Service under the Ministry of Agriculture. Bureaucrats' questionable actions or inaction may be appealed to the head of the National Land Service. Complaints must be resolved within one month and overdue terms of extrajudicial appeal may be renewed by separate decision. If overdue, the cause must be solid; in some cases, a court decision may be needed to restore the terms of appeal. Notably, all of this is standard procedure in Lithuania; similar rules and terms are applied to all administrative disputes.

As for disputes occurring during property registration, the extrajudicial dispute resolution procedure is very similar to the one just described. A disputed decision of the Regional Registrar (regional branches and local registration offices of the Centre of Registers) may be appealed to the Central Registrar within 30 days after its adoption. Complaints must be resolved within one month and overdue terms may be renewed.

Approximately 95 percent of all land disputes in Lithuania are solved during extrajudicial procedures. Those that go to court are resolved within a few months, depending on the difficulty of the case. Lithuania exercises one of the shortest administrative litigation processes in Europe, although some cases of restitution and privatization experience extremely lengthy litigation, lasting many years.

Three main groups of procedures can provoke or reveal land disputes in Lithuania: (i) formation of land lots; (ii) registration of land in the public register; and (iii) procedures of further land administration.

Formation of land lots is a residual issue of Lithuania's land reform, which started almost 25 years ago. Most land administration procedures must end with a legal registration of changes applied to the land lot. The requirement to register changes provides an opportunity to question decisions that were not disputed during previous administration procedures.

Complete restitution of ownership was (and still is) an ambitious plan. Other land reform activities such as privatization, consolidation, and spatial planning are relatively easier to deal with when disputes occur. In many cases, the conflict is between private interests and those of the state. By imposing stricter regulations on land use, establishing easement, or reducing property size, municipal and government bodies often end up in a dispute with the affected owners. On the other hand, owners may instigate a dispute while seeking to enhance the utilization and thus the value of their land by means that reduce a neighboring property's utilization and value.

3.3 LAND INFORMATION STRUCTURE

The backbone of Lithuania's land administration system is the centralized registry system managed by the

Centre of Registers; it is defined by the Real Property Cadaster and Register, which operates within a unified electronic database deeply integrated with the state's other main registers.

Lithuania's Real Property Cadaster and Register covers the entire country and contains more than 6 million registry objects. All land is recorded via cadastral and spatial data, including use of orthophotography, and every privately owned land lot is registered.

The Centre of Registers' commitment to the versatility of the land registry's application determines the volume and particularity of data and information it provides. In short, Lithuania's land registry contains detailed cadastral and geospatial data on land itself, the buildings and infrastructure located on it, and any premises and appurtenances. Information on use of real property is found here as well as ownership and other real rights and restrictions; address information banded with precise geographic coordinates makes tenures easy to identify; and average market value, based on actual transactions of similar properties, provides a relevant base for property taxation.

3.3.1 Type of land data in the registry

As mentioned, the amount and contents of the land registry data are determined by the versatility of its application. In Lithuania, the Real Property Cadaster and Register covers all aspects of a property concerning physical features, value, location, rights, legal facts, and the basis of registration of any particular aspect listed above. Land registry records contain textual data as well as graphical data on real property objects. Objects registered in the Real Property Cadaster and Register are defined as land parcels, structures, apartments in multi-apartment houses, premises, and fixtures to those objects. Every registered object is provided with a unique number that does not change throughout the object's entire existence.

Cadastral data of a land parcel cover the main purpose, type, and nature of land use, and the area of the plot and its composition according to type of land (arable land, meadow, pasture, forest, road, built-up territory, land occupied by water bodies, swamp, etc.). For land located within protected territories, data on special use conditions and protection regulations are provided (including protection of cultural monuments and cultural heritage). The coordinates of the parcel are provided in a national coordinates system (including coordinates of boundary vertex points).

As for buildings, premises, or engineering structures occupying a land lot, cadastral data include location of the structure on the land parcel, number of floors and premises within the building, main purpose of use and type of the structure, its dimensions, and building materials used as well as characteristics of interior utilities; year of construction (reconstruction) start and finish, percentage of building completion and physical deterioration calculated, and so on. The latest addition to the cadastral dataset is information on buildings' certified class of energy efficiency, including average heat energy consumption.

Graphical cadastral data provide detailed layouts of land lots, plant arrays, water bodies and buildings located on it, interior layouts of buildings, and any separate apartment or premise located within; roads and railroads are represented as well as urban infrastructure.

The Real Property Cadaster and Register data store all information on real rights to the property described. The rights recorded in the registry may include ownership, right of trust, right of possession as a separate real right, servitude, usufruct, right of development (superficies), and long-term lease (emphyteusis). Holder of real rights is described regardless of whether it is a legal entity, a natural person, or the state. Description of the rights holder includes name, family name, unique personal code, and place of residence of the natural person, or name, unique code, and office address of the legal entity.

The registry records all legal acts related to real rights and their origin, end, or amendments. That includes transactions, agreements of co-owners, inheritance, seizure, court rulings, and decisions of any institution that affect the physical properties of the land or structure itself, real rights related to it, and the legal status or features of the rights holder.

Additional data recorded in the registry as notes of the Registrar list details on contracts concluded (e.g., purchase, exchange, gift, property trust agreements), common joint and common partial ownership, and legal status of the family property. Information is included on agreements of co-owners on use of property, division of family estate, court rulings in force, litigation in process, mortgage, seizure, life annuity for annuity beneficiary, transaction in progress, and any other legal encumbrances on real rights.

Any data and information listed above are linked to the specific legal document providing the source of origin of any given entry of registry. All related documents are stored in the registry's archive, available on demand, with a list included in the excerpt of the registry.

An important feature of Lithuania's land registry is that its data are integrated with the state's other main registries, such as the Register of Legal Entities, Register of Addresses, and Register of Population. If the data in one registry change, say, the owner's surname or place of residence, that change is automatically reflected in

the Real Property Cadaster and Register. When such change occurs, the registry automatically provides the historic list of changes to help data users understand the context.

3.3.2 Technology for registry database management

In its operations, the Centre of Registers relies on lean yet pragmatic technological solutions, determined by the principles of self-funding and efficiency. The Oracle database management system provides just enough muscle to consolidate within itself the central database of the Centre of Registers, containing the state's main registers, databases for tracking and accounting for services provided, data and document exchange, archive of electronic documents, and so on. Software applications to run services and data management are based on Java Server Page (JSP) technology.

The vast majority of the Centre's internal and external services are JSP-based web interfaces, so users only need standard software to access and use them. This also means that all services can run on computers with very modest technical parameters while maintaining speed of operations. JSP-based applications of the Centre of Registers range from land data processing, to registering property, to generating registry excerpts online (HTML), to serving and auditing data users' activity. The XML format makes data exchange with other informational systems and registries possible regardless of their database model.

Managing a central database via application servers ensures easy system administration and a high level of security while maintaining low costs. All registry management operations are executed on a remote database under strict authentication and close monitoring. Malpractice and abuse have been reduced to negligible probability, since any error can be traced to the precise workstation, specific person, and exact second it was made. Persistent and recurrent assessments of registrar personnel help maintain high qualifications and keep mistakes to a minimum.

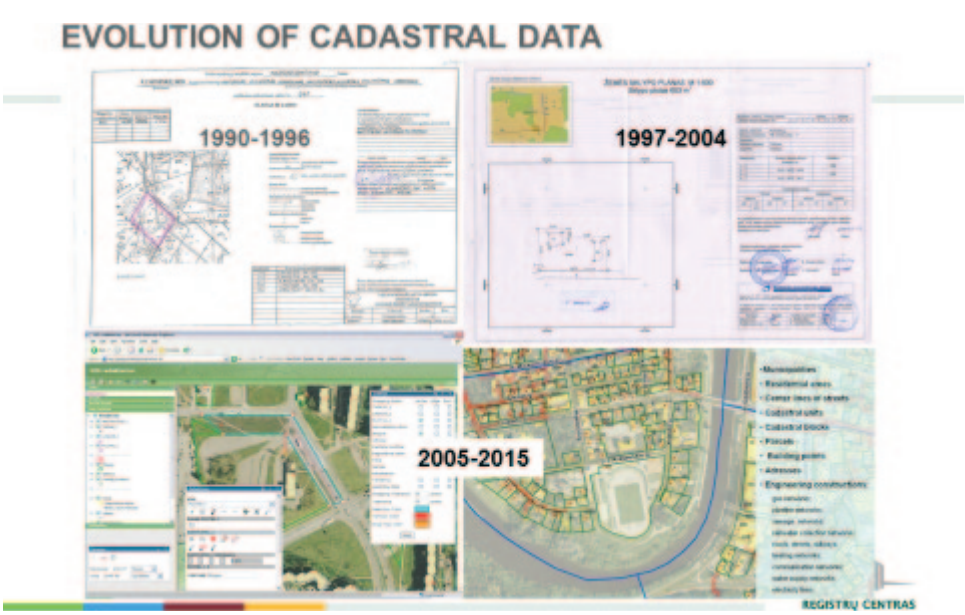
The Centre of Registers' server infrastructure is built upon the principles of server clustering and virtualization. Implementation of the former principle enables high availability and reliability of services, while the latter provides space for a growing number of applications to run while maintaining a relatively compact hardware infrastructure.

The hardware infrastructure itself is adequately secured, with independent power supplies, power backup-generating capabilities, microclimate support, gaseous fire suppression, and a flood water drainage system. The data backup and recovery system provides data copies that are stored at an undisclosed location.

3.3.3 Introducing Electronic Service of Real Property Transactions (2008)

In 2008, the Centre of Registers introduced the Electronic Service of Real Property Transactions (NETSVEP), bringing its transactions into the digital age. Lithuania executes a Latin Notary system, which requires mandatory notarization of all real property transactions. Historically, a notary directed the collection of documents

FIGURE 3.2 Evolution of cadastral data in Lithuania



necessary to conduct a transaction, decided whether a transaction would happen at all, and prepared the transaction agreement. The burden to collect necessary documents usually fell on the counterparts of a transaction.

Nowadays NETSVEP provides a notary with all information and most of the data necessary to conduct a transaction. It maximizes the number of automatic procedures and minimizes human involvement to prevent errors and possible misconduct. The electronic service automatically compiles an electronic transaction agreement or refuses to do so if any legal impediments are indicated that would make the deal illegal or invalid. Data for transaction agreements are compiled automatically from the state's registries. When it starts preparation for a transaction, NETSVEP indicates if a deal is ongoing in the Real Property Cadaster and Register to prevent parallel transaction of the property. Those restrictions are lifted only after a deal is concluded or reversed.

When a notary approves a property transaction by electronically signing an agreement, NETSVEP informs the registry about the conclusion of the deal and the change of real rights and provides information on the transaction value and the new owner's personal details. Thus NETSVEP reduces the time requirements and improves the overall simplicity of property transactions while considerably enhancing their security.

3.3.4 Public access to land data

As already stated, the Real Property Cadaster and Register data are made public by law. It is very easy to get detailed information on any land parcel or structure, with a few limitations concerning protection of personal data. Data and information (including cadastral and spatial data, current owner, or legal status of property) may be acquired at the Centre of Registers or via the internet.

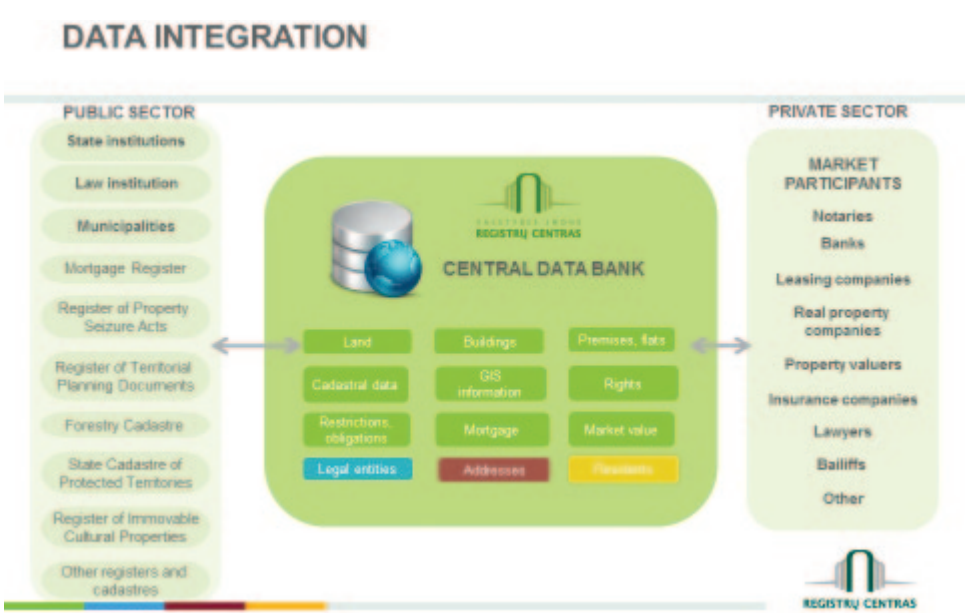
To make things absolutely transparent, all of the registry's operations are monitored. Since 2007, owners have been able to track any activity related to their property. That includes reports on all operations of the registrar, especially handy when sharing property with others. It is also possible to monitor any review of one's property made by another person or official. Any private or public user of registry information is obliged by law to explain his/her motives if approached by the owner.

The Centre of Registers' online self-service provides owners with a detailed history of their property reviews as well as the option to subscribe to alerts on feature reviews. The service automatically sends subscribers an email alert of any review of the property data detected. Exceptions are made only for national security and law enforcement agencies, since disclosure of their activities may obstruct justice. Even those agencies' registry data use is monitored internally.

3.3.5 Building registration procedures to prevent land disputes and fraud

The Centre of Registers asserts that property disputes are better prevented by technological means (such as preventing registration of overlapping claims and ensuring overall quality of land governance data) than by the more

FIGURE 3.3 Data integration in Lithuania's Centre of Registers



traditional approach of administrative procedures. That notion is reflected in the way electronic services for land governance are being developed.

As the keeper of the registry, the Centre of Registers is liable for compensating for damages that occur due to faulty decisions of the registrar. The reparation fund accumulates constantly and procedures to apply for damage reparation are prescribed by law. If damage is found to be done, reparation must be dispensed within one month. Yet instances of damage inflicted to real rights during registration of property are extremely rare in Lithuania (fewer than 10 cases in the last decade).

As for registration of property, the Real Property Cadaster and Register usually serves as a firewall that filters out most mistakes of previous procedures and prevents violation of ownership and corresponding rights. Upon registration, all digital cadastral data are compared to a web-based cadastral map. Registration is denied if any conflict of data occurs, such as overlapping borders.

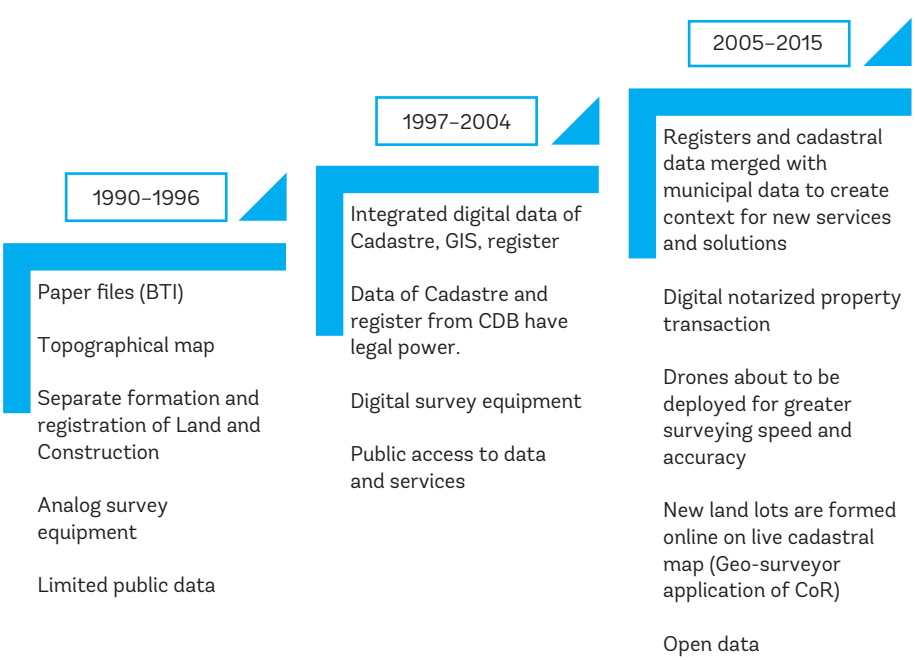
For instance, Lithuania's web-based electronic cadastral map is one of the Centre's earliest creations. Its graphical interface reflects the real-time status of land parcels and structures from the perspective of the Real Property Cadaster and Register. When used to register new cadastral objects, the electronic map prevents the recording of overlapping plots and buildings, thus preventing damage to the real rights of registered property owners.

To push the boundaries of dispute prevention even further, the web-based GIS application "Geo-Surveyor" was introduced. Based on the electronic cadastral map, Geo-Surveyor provides surveyors with a private layer of map and tools to plot new land parcels in an up-to-date, real-life context. The application indicates any potential conflict with boundaries of existing property or infrastructure. It even lets users observe preliminary projections of new parcels plotted by other surveyors to keep context in mind.

Lithuanian law provides for "*prima facie*" (legal superiority) of an electronic excerpt of the Real Property Cadaster and Register over the printed one to prevent fraud and document forgery. Public institutions as well as businesses are encouraged to check information about property online, directly at the central database of the registry, instead of relying on paper. This policy serves a few goals: it saves clients time, reduces paperwork, and increases the overall reliability of operations, making it forgery-proof.

Regarding the legal superiority of digital land registry data, Lithuania went so far as to refuse the concept of the printed property deed altogether. Owners still have the option to receive a printed excerpt of the registry from the Centre of Registers or to print it directly from the registry database via the online self-service. Since the excerpt of the registry is now equivalent to a property deed, a printed excerpt may be provided as proper proof of ownership in some less binding procedures. It has a limited validity of 30 days, though, to prevent damage in the event that ownership or other real rights change.

FIGURE 3.4 Timeline of historical developments in Lithuania's Land Data Registry



Last but not least, since providing an electronic excerpt of the registry rather than a printed one involves fewer personnel operations, it costs less. For example, a printed excerpt of the land registry costs €3.2 (US$3.5) while an electronic one costs only €0.58 (US$0.64).

As a result of the policy described above, the rate of crimes involving forged ownership documents dropped to virtually zero over the past 10–15 years. When such crime does happen, it is more likely to involve forgery of identity documents than manipulation of ownership documents.

3.4 EXPANDING THE USE OF LAND DATA

Accurate and relevant data on real property are available for the general public and even more so for businesses. In the most recent decade, Lithuania observed a substantial rise in the use of registry data and underlying services, such as geospatial information, data on transactions, market values, etc. An open software development platform was provided for businesses and entrepreneurs to stimulate creation of an informational ecosystem in which new registry data-driven services are created for popular use as well as for the specific needs of the real estate development, assessment, insurance, and banking sectors.

3.4.1 Market value-based property mass valuation

Since all cadastral and spatial data are located within a single informational system in the registry, which also contains information on every property transaction concluded, it was relatively easy to implement a system of market value-based property mass valuation for taxation purposes in Lithuania.

Mass valuation relies on cadastral data, on valuation models based on a sales comparison approach, and on a high level of automatization. The method is quick, precise, transparent, and cost-efficient. The cost of evaluation of a land lot or other object using mass valuation is €1 (US$1.1) while an individual assessment would cost at least €100 (US$110.6).

Based on real-life transaction data, mass valuation was used to calculate the average market value of every registered land parcel and to provide the means to determine the value of unregistered property (e.g., state land held for sale). Since valuation data cover all of Lithuania, accurate value projections were possible even in areas within vague land markets and those that otherwise lacked comparative objects for individual assessment. To prevent mistakes and to make mass valuation as transparent as possible, public hearings on value maps were held. And a mechanism of appeal exists to adjust the mass valuation-based taxed property value by providing an individual evaluation report from a licensed private assessor.

Lithuania performed its first land mass valuation in 2003. It provided maps of values, defining value zones in which objects of similar properties were worth similar prices. Four years later, in October 2007, the Institute of Revenue Rating and Valuation presented the Centre of Registers with an award for Excellence in Valuation for creation of an innovative property valuation system.

Land values determined by mass valuation were used to determine the lease rate of state land and to calculate compensation for land expropriated for public needs (e.g., to build roads and bypasses). The average market value of all citizens' property is also used to identify whether a person is eligible to receive social assistance.

Until 2013, land values determined by mass valuation were used exclusively for purposes other than taxation. It took almost 10 years to find the political will to use mass valuation for taxation purposes and set land tax on average market value.

Presently all property taxes in Lithuania are based on the average market value determined by mass valuation. When combined with taxpayers' information, mass valuation data provide an accurate forecast of tax revenue.

3.4.2 Land data for public information on real property markets

Mass valuation data as well as transaction data and statistics gathered from the land registry are used to increase public awareness of Lithuania's real property market. Since 2004, the public has received monthly updates on real property market activity, expressed by the number of land parcels and other properties purchased/sold; quarterly reports list the current prices of dwellings and farmlands throughout the country; and annual overviews provide detailed information on the results of mass valuation (overall value of all property of the country in comparison with previous years) and about the land fund (accounts of all registered land, its type, use, ownership type, and other features).

The Centre of Registers' reports on real property statistics are perceived as the objective insights of an impartial market observer. Its reports commonly make the headlines in mass media, and the banking sector and real estate developers use the figures to provide additional comments on the *status quo* of the state's property market and the economy in general.

3.4.3 Land data use by the private sector

Over the last decade it became common for businesses to run their operations based on information and data provided by the Centre of

Registers. Private surveyors use either Geo-Surveyor or privately developed land-plotting software that uses the land registry's cadastral map. Property and business assessors are most likely to use real property transaction data and other market analysis produced by the Centre of Registers. And architects, real estate developers, construction companies, banks, and telecommunication companies need direct access to the Real Property Cadaster and Register's central database to function efficiently in an information-saturated, competitive market.

To meet the ever-growing demand for land registry data and real property market analysis products, the Centre of Registers must rely on private partners, especially when it comes to narrow, sector-specific needs. A number of pilot projects were implemented over the past few years in joint effort with private software developers to determine the best models of cooperation and set the rules of the game, two of which are discussed in the next sections.

A number of new registry data-driven applications, including mobile ones, designed and developed by private partners will be introduced in the next few years. The Centre of Registers is pushing to create a software development platform to enable more private initiatives to add even more value to land registry data.

3.4.3.1 Property transactions monitoring

In 2013, a local start-up funded by one of the biggest local IT companies launched the project "ntsandoriai.lt" (literally, RealPropertyTransactions.lt) to provide household users and real estate brokers with relevant, accurate transaction data trimmed to the specific case of selling or assessing property.

At its core, the service represents a search for past transactions. By defining type and other physical features of the property as well as location (up to the district and name of the street) and date interval, users are provided with a list of all relevant transactions that have taken place. Search results are stripped of sensitive information that could violate privacy and the location of each transaction is simplified to an address interval (e.g., King Street 50 to 100). Users may choose any transaction from the list for further examination—10 transactions are considered the standard service package for household users.

After paying for the data, users are provided with transaction details including basic cadastral data and the purchase price of the land lot or structure. Thereby, for less than €6 (US$6.7) household users can ascertain the real-time context to determine the most likely sell/purchase price of any property. Real estate brokers and assessors utilize ntsandoriai.lt in a similar manner, differing only in the size of data package purchased.

3.4.3.2 Financial sector tools

Another pilot application introduced in 2014 was developed by Lithuania's largest credit bureau, Creditinfo Lithuania. It was designed especially to provide the banking sector with a tool for real estate market monitoring or assessing any property based on "live" transaction data. The application puts to best use the options provided by NETSVEP; i.e., since information of any property transaction is available within a few hours after the deal is concluded, it is possible to monitor the market or assess property in near real-time. The service has direct access to the Real Property Cadaster and Registers' central database, and the system itself runs on dedicated virtual resources inside the data warehouse of the Centre of Registers.

The Creditinfo application is used by banks on a daily basis to determine loan policy, to anticipate and respond appropriately to real property market fluctuations, and to minimize operation risks by assessing loan portfolios covered by mortgages.

3.4.4 Service of Regional Geo-Informational Environment

In 2013, the Centre of Registers strongly pushed the development of web-oriented GIS services by introducing the REGIA service (www.regia.lt), or the Service of Regional Geo-Informational Environment. At its core, REGIA contains the official map of the Address Register laid over an interactive cadastral map of Lithuania. Layer after layer, it contains data and information of all registries managed by the Centre of Registers and those of other governmental institutions. Free to use, it provides municipalities and other institutions with a simple yet effective tool for information management and spatial data-based decision making. Each institution is provided with its own layer(s) to put together data and information, ranging from utility and transport infrastructure to pointing out licenses issued and tourist attractions. REGIA depicts boundaries of land parcels, buildings, and zoning information, providing comprehensive context for publishing documents of spatial planning and other areas of development. Detailed plans and information on issued construction permits make it easy to organize public hearings of those plans, ensuring transparency of urban development. Publication of objects privatized and integration with the service of e-auctions also serve the public interest.

The user-friendly interface and vast yet easily manageable amount of public information encourage the population's active involvement in local governance. At the same time, publicity of REGIA promotes efficient utilization of property. The taxation value of any property is publicly available on REGIA as well as information on abandoned land whose owners are to receive penalties of maximum taxation tariffs.

Besides being informative, REGIA was created to be interactive on many levels. REGIA is preprogrammed to serve as an event management service, providing functionality for reporting municipal-level issues and tracking their solutions. For instance, people can report location-based problems (such as damaged roads, windfall and so on) to municipalities, adding either textual or graphical information or both. While managing reported issues, municipal servants indicate the progress of the work and interact with applicants via REGIA. Adding to this, REGIA's compatibility with mobile devices presents a whole new concept of strategic local governance. REGIA would be impossible without the deeply integrated, high-quality land registry data. In turn, this web-oriented GIS service itself improves and enriches the registry data.

It is assumed that the high local government use combined with the population's willing involvement in REGIA will eventually attract business. On that account, REGIA will provide a new dimension for business interactions. The first examples are already available: utility companies such as the electricity distribution company LESTO and the natural gas supplier Lietuvos Dujos put their distribution infrastructure on REGIA's map to attract new clients by indicating potential connections to their networks.

3.5 ISSUES AND NEW INITIATIVES

For Lithuania to proceed to the next level of quality and accessibility of land registry data, the Centre of Registers in particular must address a number of issues, as follows.

The strategies to improve the Centre of Registers' land registry and other registries and informational systems are based on best practices as well as visionary ideas brought in and refined under close cooperation with other countries and international organizations. In 2014, the EU twinning project "Modernization of the Real Estate Tax Administration in Egypt—Developing Capacities of the Real Estate Taxation Authority" was implemented by the Centre of Registers in conjunction with the Association of Dutch Municipalities (VNG) and the Dutch agency Kadaster. Centre of Registers specialists take part in various international organizations' activities, such as the International Association of Surveyors (FIG), the European Land Registry Association (ELRA), EuroGeographics, the European Group of Valuers' Associations (TEGoVA), and others. In 2013, during the Lithuanian Presidency of the Council of Europe, the Centre of Registers took over presidency of the European Union Permanent Committee on Cadastre (PCC). In June 2015, the Centre of Registers hosted the Conference on Property Valuation and Taxation for Fiscal Sustainability and Improved Local Governance in Europe and Central Asia, organized by the World Bank and the Food and Agriculture Organization of the United Nations.

But Lithuania has yet to overcome the ghosts of its past as well as modern-day challenges. The incomplete process of restitution of ownership rights to property expropriated during the Soviet occupation (1940–1990) is an issue, as a number of long-standing land disputes caused by restitution reform remain unsolved. This has created a pool of fragmented land lots too small to be economically efficient or with owners that have several small dispersed plots. Reform towards land consolidation is still in the early stages and has yet to prove itself.

Institutional overlap also exists. Politicization and officialdom of the central government and municipal agencies has hampered cooperation and coordination between bodies responsible for land governance. In some cases, it has led to duplication of land data or governance functions.

E-governance is an ongoing challenge. In 1998, the Government of Lithuania disbanded the Ministry of Communications and Informatics, charged with directing the development of e-government services. A number of institutions have since tried to take the lead, but Lithuania still struggles to navigate its way toward a more developed informational society. Global demand for IT specialists led their wages to skyrocket, with better-skilled personnel gravitating to the private sector. Most of Lithuania's public sector is unable to compete in salaries and thus lost IT staff. Self-funded state enterprises are becoming the few oases of competence, able to provide relevant quality control of e-government services.

In spring 2015, the Government of Lithuania recognized the need to better coordinate and consolidate the state's informational resources. It decided to gather existing registries, informational systems, and services of government institutions within four centers of excellence. Those hubs of excellence, of which the Centre of Registers is one, will: provide adequate infrastructure and technical support; guide and implement further development of registry systems and e-government services while maintaining a rational approach; and further integrate public sector data and services, ensuring data and information exchange as well as quality of services and self-sustainability of the centers of excellence. With the reform just starting, it is too early to predict the outcome. But if implemented reasonably, this may take the state's registries and e-government services to a whole new level of quality and usability, while simultaneously significantly improving Lithuania's business environment.

The main vectors of further development of Lithuania's land administration system outlined by the Centre of Registers are directed toward expanding and enriching cadastral data, promoting private initiatives to create

new registry data-driven experiences for customers, expanding web-oriented GIS services, and acting as an international pilot for innovations.

The Real Property Cadaster and Register already provides still images and digital design drawings of property along with other data and information. Yet another landmark is about to be reached to enable more 3D and 4D cadastre features. Testing of surveying drones is ongoing, aiming to engage in 3D modelling of terrain and buildings' exteriors/interiors. Use of unmanned aerial vehicles operating calibrated high-definition optics is being considered to provide *ad hoc* mapping of the rapidly changing environment. The high level of data integration within cadasters and registers under the Centre of Registers provides a fair chance of prompt results in this area.

As mentioned, the software building platform is under development to enable businesses and entrepreneurs to provide customers with new products based on registry data. The Centre of Registers seeks to create an entire ecosystem of such services by sharing open data and registry-driven web services, acting as software building blocks, providing its own infrastructure for development, testing, and distributing products and services created within. Web and mobile applications created to meet sector-specific demand, as described previously, have so far proved to be beneficial for all parties involved, encouraging further moves.

The case of REGIA and other land registry-based innovations presented here may be too costly to implement in many countries. Lithuania has the advantage of being a small country. The short history of this independent state (i.e., the absence of longstanding, rigid traditions of governance) and its fairly small land area and other properties made creation of an advanced registry system possible. Dynamic political will made possible the existence of the Centre of Registers. Given its openness to extensive international cooperation, experience in innovating, and cognizance of its strengths and weaknesses, Lithuania may provide a fertile test field for piloting more advanced initiatives that would bring better land administration not only for local needs, but also for international benefit.

If successful, Lithuania may very well proceed with further optimization of property registration. That would mean fewer procedures and less time and/or money spent to register property. In a technologically developed country such as Lithuania, this advance would also affect other areas of doing business, including starting a business, dealing with construction permits, getting electricity, getting credit, and resolving insolvency.

CHAPTER 3 REFERENCES

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4. Development of a Unified Land Information System in the Republic of Korea

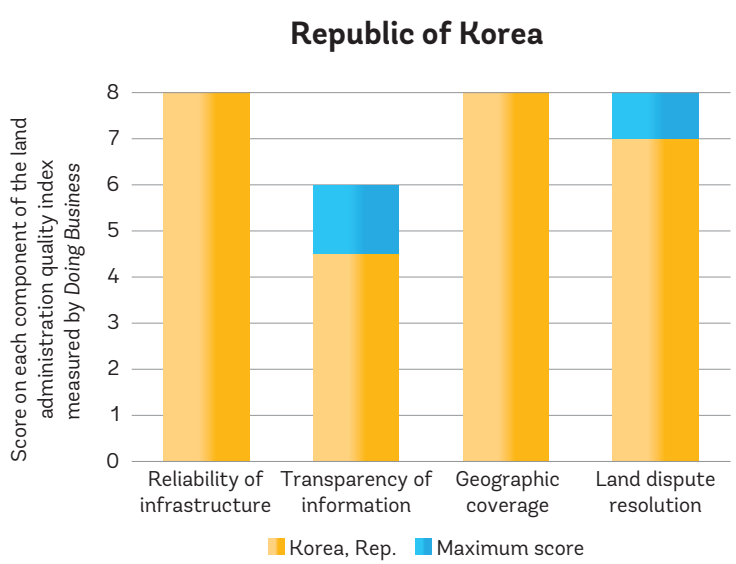
Beckhee Cho and Jaeyong Yoo

Over the last decades, the Republic of Korea has digitalized and unified its land information systems, which contain a wide range of data such as records on rights, cadastral information on parcels, and land use development information, an important government responsibility in this rapidly industrializing and urbanizing country. The integration of the Parcel Based Land Information System (PBLIS) and its Land Management Information System (LMIS), completed in 2006, was successful, with the resultant Korea Land Information System (KLIS) producing much more efficient service provision and easier access to land information. The KLIS has evolved into a pillar of the Republic of Korea's e-government, recognized globally as one of the top land information systems. It has brought about transparency, efficiency, reliability, and better service for the Republic of Korea's citizens in a cost-effective way. It's ranked 40th globally on the "registering property" indicator of the World Bank's "Ease of Doing Business" index (Figure 4.1).

4.1 ECONOMIC TRANSFORMATION AND CHANGING DEMANDS FOR LAND ADMINISTRATION

The Republic of Korea's dynamic economy was built from scratch after its economic advancement began in the 1960s, guided by robust

FIGURE 4.1 Republic of Korea's ranking on the global LAQI (actual vs. potential)



government-driven economic plans that established the basis for rapid industrialization and modernization. The economic transformation required investment in numerous land development projects, such as for housing, construction of industrial complexes, and infrastructure (e.g., development of social overhead capital from expressways, railways, and harbors). Since the 1960s, urban developments have been implemented by the designation of zoning, greenbelts, and districts according to the urban planning law for growth-oriented urban policies. Zoning has implications for land rights, as do land development projects, which may require expropriation, in turn leading to issues of compensation and valuation.

Rapid urbanization followed the migration of the rural population to cities. The Republic of Korea now has a population of over 50 million people, 82 percent of whom live in urban areas. Land markets changed and the price of real estate and housing rose. In large cities and development districts where the population started to concentrate, land and housing prices skyrocketed. The overheated real estate market affected its economic growth from the 1980s onwards. Between 1974 and 2004, land prices increased nationwide an average of 1,900 percent (inflation was 1,000 percent or 10 times). In urban areas, this increase was 30 times, and for Seoul itself, 37 times (a 3,700 percent increase). Speculation for land lots and apartments became common around development districts. Due to a lack of accurate and comprehensive data on land properties, the government was not able to control the situation, leading to serious problems such as illegal transactions, corruption, unearned revenues, and inequity in land use opportunities.

Decentralization of many land administration functions and weak oversight at the central level also limited the government's ability to act effectively. Land-related administration includes a wide range of areas such as policy, ownership, transaction, use control, development, and management. The central government had entrusted local governments with most land-related matters, including the provision of statistics, except for the establishment of land policies and supervision. But local governments also struggled with heavy workloads, handling hundreds of thousands of land-related civil complaints every year. Land-related issues were overly time-consuming and their socioeconomic costs were excessive. Thus it was evident that the current land policies had their authoritative limitations.

The division of responsibilities between the central and local governments required a system to integrate and manage a broad range of projects, but coordination between central agencies and local governments was not systematic. The central government had difficulty accurately and promptly collecting information for land policies, and as a result frequently failed to deal with land-related problems in a timely manner.

Due to the excessive amount of land legislation and the complexity of land-related administrative work in local governments, policies to control real estate speculation were ineffective. The government realized that a new land policy was needed, with a land usage plan and a strategic plan for land administration to protect property rights and improve land use efficiency as well as to control speculation.

A "National GIS Establishment Master Plan" was developed in 1995 (see section 4.2.3 for more detail). Policies were introduced to address: land use planning and management (including government-oriented land use planning); land subdivisions and land supply (with a public agency leading one land development project); real estate market control and management; mortgage control; property taxation; a development impact fees system; and development permission systems. All of these land policies were strongly related to the performance of land administration systems. Moreover, the need to modernize and further advance the cadastral system was clear, given its central role in land use. Improving management of the cadaster and registry would also strengthen the protection of property rights. And strengthening land data management would provide the government with policy statistics on, for example, transactions and land values to deal with the overheated real estate market.

4.2 DIGITALIZING AND LINKING LAND ADMINISTRATION SYSTEMS AND SERVICES

4.2.1 Origin of cadaster and registry

The first land survey project was performed between 1910 and 1918 (during the Japanese colonial period) to record boundaries and ownership to facilitate tax collection. Most land was held by landlords, a trend reversed at the end of the 1950s, when most tenants had become owners, facilitated by land reform. Responsibility for cadasters was transferred to local governments in 1962 when agricultural land tax became a local tax, but was returned to the national government in 1977.

The title registration system started in 1912 based on Japanese real estate law, but was systematically reorganized after the enactment of the Real Estate Registration Law in 1960. Maintaining paper-based registry books was labor-intensive, and problems arose with standardization and accuracy because of disconnects between the various organizations engaged in title registration.

4.2.2 Digitalizing the land books

Information was lost due to the poor storage and neglect of land books, which stimulated the start in 1975 of a cadastral computerization project of land and forestland books. All property information noted in land books was entered into a database. Completed in 1985, the database included about 32 million parcels nationwide.

In addition, a national online network—connecting 15 metropolitan cities/provinces and 260 municipalities—was established for instant processing of land information data and new transactions. This improved public services by making access to and issuance of cadastral books' information faster. The land book computerization project also improved public confidence in cadastral books by preventing their falsification and established a systematic data management system. Land-related information necessary for evaluation, taxation, transaction, usage planning, and so on was henceforth provided promptly and accurately.

4.2.3 Master Plan for National Geospatial Information System

The digital revolution in the 1990s enabled modernization of the Republic of Korea's land information system. Technology related to geospatial information was introduced to a number of local governments and public corporations, making possible the digitalization of geospatial information including cadastral maps and forestland maps available on paper form. Accordingly, in the mid-1990s the government began to pursue digitalization of cadastral maps and forestland maps as part of its effort to modernize administrative works.

With the awareness of the importance of geospatial information, the government established fundamental plans for a national geospatial information policy. In 1995, the government enacted the "Master Plan for National GIS Establishment" (NGIS), composed of four plans that have been implemented consecutively every five years since 1995. The government also started setting up the infrastructure for both the public and private sector to share geospatial information. The first and second Master Plans for NGIS mainly focused on computerizing and organizing land administration data and constructing the database, as paper-based administration required considerable time and labor, and the public wanted faster and more accurate service.

The first NGIS Master Plan included digitalization of cadastral maps and the "informatization" of land management and related works, which was planned as part of a public system development project for the utilization of geospatial information. The NGIS Master Plan specified that projects for the establishment and utilization of major GIS databases were to be implemented under the initiative of the government and that the established GIS databases were to be open to the public to foster related industries in the private sector.

Accordingly, the Ministry of Government Administration and Home Affairs (MoGAHA) undertook the task of digitalizing individual or single cadastral maps under the Parcel Based Land Information System (PBLIS). At the same time, the development of seamless cadastral maps and land policy systems was led by the then Ministry of Land and Construction (MoCT, or the Ministry of Land, Infrastructure, and Transport today) under the Land Management Information System (LMIS).

4.2.4 Development of the Parcel Based Land Information System (1996–2002)

The PBLIS was developed from 1996–2002 by the MoGAHA. It handled three areas of work with 430 related subsections based on single or individual parcel-based cadastral maps. The goals were to protect people's property rights and to improve the country's land administration capacity.

The PBLIS was a project to effectively store, manage, and process various types of attribute information connected to drawings of buildings and urban planning, especially individual lots of land. It constructed a database of numerical files of cadastral maps to be integrated with land registers and other systems. It also aimed to computerize and automate the procedures of information search and management, and to promptly and comprehensively provide the government and public with land-related information. The project allowed both the central and local governments to integrate and utilize data on land registers and cadastral maps and forestland registers and their maps.

The completed PBLIS held, managed, and processed parcel map information and various data on attributes. The system increased the productivity of tasks like filing records and maps and ended the need for movement and arrangement of cadastral maps, contributing to improved effectiveness, consistency, and precision in the management and processing of cadastral information.

A paper-based registry book conversion system was developed to store the information in the electronic forms recorded by various registry offices around the country. Land register data for 34 million lots of land were computerized nationwide, followed by computerization of the resident registration data of 43 million individuals at the MoGAHA. Officially appraised land prices of 26 million lots were computerized at the MoCT. These datasets were integrated into the newly established

and operated "National Land Information Center."

Next, Automated Registry Office Systems (AROS) were developed to digitalize processes of registration, access to and issuance of certified copies, statistics, and so on, improving the productivity and convenience of the registry. An internet-based registry office service was added in the 2000s, enabling online issuance of land ownership certifications and other land-related documents and improving public access to the system.

Digitalization of land registers was the first step in the creation of the land information system that was to: establish the foundation for systems to prevent falsified names in real estate transaction (known as real name real estate transaction system); stabilize land prices; and root out real estate speculation. In turn, it would provide the foundation to deliver accurate information on land properties in a timely manner for policy making and help create a sound and efficient taxation system that was both consistent and fair for citizens and generated revenue for the government.

4.2.5 Development of the Land Management Information System (1998–2005)

While the PBLIS was being developed by MoGAHA, sections in the central and local governments in charge of planning and land resource management recognized the need to build edge-matched cadastral maps (named "seamless cadastral maps") at district levels for efficient land use and management. The Republic of Korea had 80 laws in place concerning land use and more than 170 land use zoning maps. Land regulations were so complicated that even local government officers did not understand all the details and restrictions on land use. The types and content of geospatial data regarding land management also varied, including attribute data like public records, topographic maps, cadastral maps, and urban plans. Most land-related data were handled manually, which caused problems with data duplication, data entry errors, and lack of consistency. Checking or viewing land records and issuing them was a very long process.

To address this, the MoCT in coordination with pertinent sections of local governments developed the Land Management Information System (LMIS) to streamline land policy making, systematically integrate and manage geospatial, attribute, and legal data, and link land-related affairs specified in laws. The scope of work included the real estate transaction reporting system and management of development impact fees, real estate agencies, assessed land prices, land use zoning, and foreigners' land acquisition. The system aimed to support land-related works and policies so that users could see in real time changes taking place in different regions of the country, including land use, the volume of transactions taking place on a property, and land prices. Key to realizing such objectives, edge-matched or seamless cadastral maps were created to be used as the main database.

Started in 1998, the LMIS was completed in 2005, overseen by the MoCT (now the Ministry of Land, Infrastructure, and Transport, or MoLIT) as a supporting system for national land use and administration. Unlike the PBLIS, the LMIS was constructed based on seamless cadastral maps. Also referred to as serial cadastral maps, seamless cadastral maps are a series of cadastral maps conjoined sequentially with adjustments to correct inaccuracies that may have occurred (and thus, "seamless"). They are also referred as district-level cadastral maps because a series of maps covers an entire district. The LMIS carried out work in six areas subdivided into 90 subsections based on district-level cadastral maps (discussed in subsequent sections).

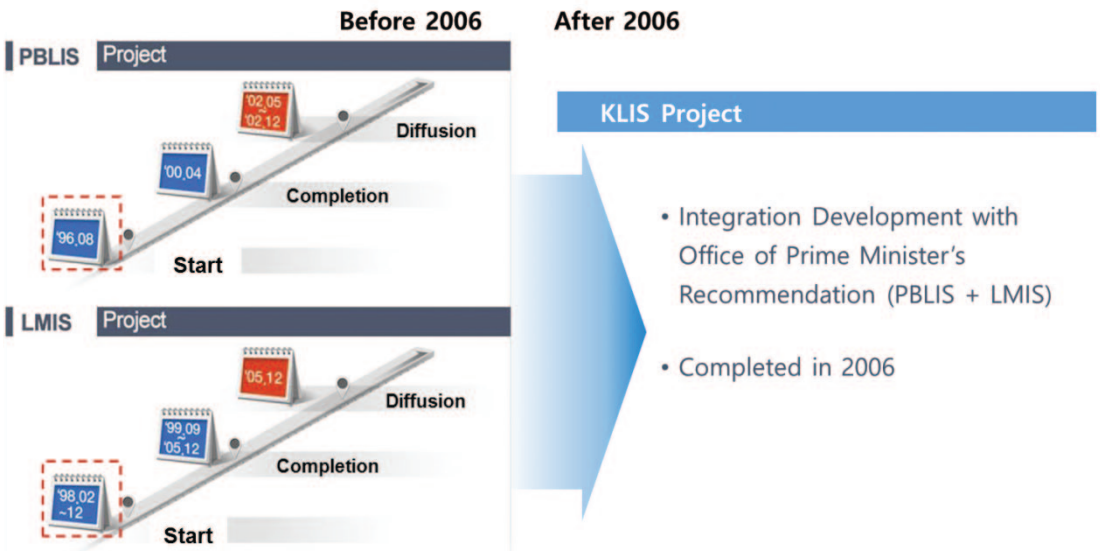
4.2.6 Addressing growing inefficiencies due to two systems

By 2000, it was apparent that with the LMIS and the PBLIS, dual administrative processes had emerged, which gave rise to operational problems, as procedures and working practices were very complicated. The public had to duplicate effort in conducting land administrative business, which led to unnecessary expense and was time-consuming. Moreover, the lack of compatibility and synchronized updates between the systems brought about duplicate investments, inconsistency, and uncertainty. It was increasingly realized that having dual systems was leading to duplication of data management and tasks and equipment purchase, thus creating inefficient use of the government's budget and other resources.

In addition, data compatibility was a problem. Cadastral data were not consistent between the two systems' databases. The LMIS was not connected to the land register that contained information on land attributes, and had to link to the administrative management systems of cities, counties, and districts through a middle ware connection.

The need for a unified system became increasingly clear to improve public officials' productivity and to prevent budgetary waste. A comprehensive information system was needed to secure information to establish adequate land policies, to systematically integrate and manage geospatial, attribute, and law data on land use, and to organically link land-related works specified in individual laws. The deterioration of the land administration situation made the need even more urgent; a solution was needed to provide correct information in a timely manner to the government

FIGURE 4.2 Republic of Korea's Dual Land Information System and Integration to KLIS



using an ultra high-speed national network, linking the Ministry of Land, Infrastructure, and Transport with 17 metropolitan cities and provinces, and 229 cities, counties, and wards

and citizens, who were filing a growing number of civil complaints.

To address this matter, the Office for Government Policy Coordination held a meeting in December 2001 on the integration of the LMIS and the PBLIS, the direction of integration, and the new system's basic structure. In attendance were representatives from the MoCT and MoGAHA, the Board of Audit and Inspection, ETRI (Electronics and Telecommunications Research Institute), the Korea Cadastral Survey Corporation (LX, Land and Geospatial Informatix Corp today), and the Korea Research Institute for Human Settlements (KRIHS). The result was an agreement to construct the Korea Land Information System (KLIS), which would perform all functions of the LMIS and the PBLIS.

The first main objective behind the establishment and operation of the unified KLIS was to streamline land policies and land administration works and to efficiently manage geospatial information. The second objective was to efficiently carry out various land-related works in local governments and to comprehensively manage land projects. In streamlining land policies and works, the KLIS aimed to: secure fundamental data to be used for the formulation of land policies; establish and implement accurate land policies and improve their quality; and handle land-related administrative affairs more efficiently. A third objective was to expand the 1995 NGIS towards the "seamless cadastral maps" started under the LMIS as the basic geospatial foundation for the country.

The KLIS was designed as a 3-tier system, handling civil services in real-time. Moreover, its design ensured that the work scope of the two ministries would not overlap in any way and the ministries would equally split the cost of the system's development. The electronic resources owned by local governments were to be integrated into the KLIS through a middle-ware connection. Other land related systems like the G4C (Government for Citizen) or internet public service system were utilized in a similar manner.

At the same time, to enhance public services for citizens, a system was developed to access documents either online or through vending machine-like kiosks. The system and database were simultaneously used by the central government and 16 metropolitan cities and provinces and 230 local offices at the city, county, and borough level. These also were linked to 93 other systems outside the main government system.

The KLIS is now a pillar of the Republic of Korea's e-government, recognized globally as one of the top land information systems. Today's KLIS has 35 million parcels, 750,000 digitalized maps, and over 10 different versions and formats of land-related maps integrated into *one map*. The application was developed to be able to carry out 530 different tasks in nine areas related to land. With a cost-benefit ratio

surpassing 3.0, it has brought about transparency, efficiency, reliability, and better service for the Republic of Korea's citizens.

4.3 KEY ELEMENTS IN THE DEVELOPMENT OF THE KLIS

4.3.1 Review of legal framework

When the development of digitalized land information systems started in the Republic of Korea, three different laws were in place concerning its three main components—the Cadastral Act, the Act on the Utilization and Management of the National Territory, and the Real Estate Registration Act—under the jurisdiction of three different ministries—MoGAHA, MoCT, and the National Court Administration. The two ministries had been working on the development of their respective systems (PBLIS and LMIS), but much overlap and duplication of work existed. Thus, not only did the laws need to be revised but the ministries' mandates also needed to be rearranged to reassign the different tasks. As a result, the MoGAHA's cadastral division was transferred to the MoCT in 2008. The National Court Administration's Registration Data Computerization System was also linked to the new KLIS. The overall result was that the Republic of Korea was able to successfully construct a national spatial information infrastructure within 10 years.

New laws were created or revised for the KLIS in accordance with legislations concerning geospatial information and land use. These laws still apply today:

- The National Spatial Data Infrastructure Act stipulates the production, utilization, and distribution of geospatial information as well as national geospatial information infrastructure.
- The Land Survey and Waterway Service and Cadastral Act defines cadastral survey and cadastral administration and management.
- The Act on Planning and Utilization of the National Territory covers various types of land use zoning and urban planning.
- The Restitution of Development Gains Act defines the restitution of development gains.
- The Act on Special Cases concerning the Acquisition of Lands for Public Use and the Compensation for their Loss regulates individual land prices while the Real Estate Brokerage Act is pertinent to fostering sound real estate agencies and their responsibilities.
- The Aliens Landownership Law covers foreigners' land acquisition.

4.3.2 Review of existing institutional framework for land modernization and standard setting

The government worked on institutional adjustments and standardization to transform the analog settings that ruled the production, utilization, management, and dissemination of land information toward a digitized environment. Specific standards were set up for various aspects including production of seamless cadastral maps and land use zoning maps not defined by existing laws as well as the drawing production method. Also regulated was the standardization of documentation such as for confirmation of land use plans or publicly assessed land value in addition to procedural matters.

Specific guidelines were created to: correct and renew existing maps produced in analog methods; convert numerical geographic map files to GIS data; extend individual cadastral maps; and moderate zoning map data input. More specifically, guidelines for LMIS, regulations concerning establishment and operation of land-related comprehensive information networks, and guidelines for drawing district and zone topographic maps were newly stipulated to comply with the LMIS. For the PBLIS, the guideline for computerization of cadastral maps was specified as reference. In addition, after the LMIS and the PBLIS were integrated, separate regulations for the KLIS were stipulated, while those for land use zoning and operation were newly released to comply with KLIS operations.

4.3.3 Financing the KLIS

The task to create the KLIS was comprehensive: digitalization of cadastral maps; creation of seamless cadastral maps; construction of various databases, including thematic maps; development of an application system for land-related affairs; and adaptation of hardware equipment for system operations. The costs were massive and the need for human resources was also very high. To develop and operate the KLIS, large-scale financial resources were needed.

The central government bore the cost of one part of the project but the rest was borne by local governments, at times an overwhelming financial burden. This lack of funding initially prevented the nationwide distribution of the KLIS. The project was instead undertaken on a step-by-step basis, beginning with larger local governments first, and eventually covering the entire nation. Under the circumstances, the government decided to first distribute the KLIS only to major large and medium-size cities (about 250), where demand was strong, and to later expand into small cities and counties.

The cost of digitalizing cadastral maps and geospatial data, promoted as part of a larger project for the informatization of all government agencies under MoGAHA administration, was covered by a national fund with an outlay of US$415 million. The MoGAHA secured 100 percent of the central government's budget for the PBLIS project. It invested 120 billion Republic of Korean won (around US$120 million) in the PBLIS until 2005. Since 2006, the Ministry has spent around 40 billion Republic of Korean won (around

US$40 million) for KLIS operation and management. In total, it has invested about 380 billion Republic of Korean won (around US$380 million) for the KLIS.

The cost of establishing the LMIS and its database including the geospatial data, seamless cadastral maps, and land use zoning maps, was co-funded by the central and local governments. The investment for this project was initially funded by the central government, but was later split evenly between the central and local governments. This scheme allowed earlier local government involvement in the distribution of the LMIS nationwide. The MoCT procured the funds to establish the geospatial information database including seamless cadastral maps and land use zoning while local governments purchased the computer equipment and GIS software for the LMIS operation. From 1998 to 2005, the MoCT invested 120 billion Republic of Korean won (around US$120 million) for the LMIS while local governments contributed about 100 billion Republic of Korean won (around US$100 million).

4.3.4 Organizations involved and capacity building

The allocation of funding proved to be challenging, but more difficult was sourcing the human capital to develop the KLIS in both the public and private sectors. The modernization of land-related administration and work was a national project that involved many government agencies as well as local governments. Education and training programs were conducted in universities in major regional area especially for public servants involved in the project but also for those in the cadastral divisions in the local governments to raise their awareness about the KLIS.

In addition to the central government, local governments, research institutes, and private geospatial information agencies participated in the KLIS project. The central government acted as the general project coordinator, planning and budgeting the KLIS and adjusting related institutional systems such as laws, rules, and regulations. Local governments secured the budget to establish the KLIS in their respective regions, inspected the digitalized geospatial and attribute databases, maintained the KLIS database, and operated and maintained KLIS information systems.

In particular, the MoCT and the MoGAHA played leading roles in promoting the development project, respectively carrying out the development and integration works of the PBLIS and the LMIS. These two ministries established an operation and management system that improved the functions of the LMIS and the PBLIS. KRIHS participated as an entrusted research center in the early stages, but the MoCT and the Land and Housing Corporation (LH) took responsibility after the KLIS was fully operational. As for the PBLIS, tasks were conducted mainly by the MoGAHA and the Korea Cadastral Survey Corporation (LX today) until the Ministry's cadastral division was transferred to the MoCT in 2008 (when it was assigned jurisdiction over the KLIS and renamed the MoLIT). It should be noted that a considerable portion of the work that was to be carried out by the MoCT and local governments was outsourced to expert groups and the private sector. System Integration (SI) companies developed technologies for database construction, application, hardware, and network building.

4.3.5 Piloting the system design and development

A number of datasets related to land administration were produced, utilized, and managed by the central and local governments, including various documents, records, public reports, and notices, as well as attribute data and drawings such as national land use plans, urban plans, and current land price maps. Before the KLIS, much of these data were produced manually. In addition, existing land-related attribute data were in different forms depending on the source; duplication and discrepancies existed in the records. Land-related geospatial data included topographic maps, cadastral maps (forestry), land use zoning maps, and cadastral maps matched with the topographic maps.

With this in mind, prior to the full-blown development of the land information system, a pilot study (2003–2004) was conducted to understand the current conditions, situation, and possible problems of the LMIS project, and to come up with the methodologies, content, and institutional measures to solve existing problems. The system architecture, application architectures, and data model of the LMIS had been designed on the basis of the pilot project in the early stages of the LMIS. These architecture and data models were applied to the KLIS without any changes. The KLIS was designed with an open architecture to support the distributed computing environments of local governments, consisting of a hierarchical 3-tier system: the clients, the application server, and the database server. The application server was operated on the basis of CORBA (Common Object Request Broker Architecture), which mainly consisted of the data provider, the edit agent, and the map agent.

4.3.6 Setting standards for the KLIS database

The KLIS database consists of cadastral data, geospatial data, attribute data, various types of legal data, and meta-data; one unified network was created based on these. Object-oriented database technology was adopted for data sharing because of the outstanding data modelling capacity, work analysis, and database design. To share geospatial data, such international standards as ISO/TC211 standards for geospatial information,

Open Geospatial Consortium (OGC) standards for open geospatial information, and standards for geospatial data transmission (SDTS) were followed.

For cadastral maps, existing types of map sheets were produced as series datasets combining land register information and geospatial data. Land use zoning maps were produced on the basis of topographic maps and seamless cadastral maps, and renewal became possible. For cadastral maps matched with topographic maps, seamless cadastral maps were combined with digital topographic maps as part of the NGIS project, and the standards for production were released separately.

After the standardization was worked out, the KLIS database was established with a combination of register and spatial datasets. To rearrange records datasets, regulations concerning land records preparation, utilization, and management were modified accordingly. Duplicate or similar items in the records such as public documents were also revised and combined. Geospatial data were standardized for data sharing.

As for the database design, OMT (Object Modeling Technique), adopted at ISO/ TC211, was used as the data model to share geospatial, attribute, and legal data. The main geospatial datasets contained cadastral control points, cadastral information, edited cadastral maps, administrative area boundaries, true elevation, and digital topographic maps of roads, railroads, major buildings, and hydrosphere, which were all set and extracted as the framework data. Thematic maps such as land use zoning maps were established based on seamless cadastral maps. An attribute database including land registers was established in the utilization of Relational Database Management System (RDBMS) in compliance with the standards for data models and content.

4.4 CHALLENGES BUILDING THE KLIS

4.4.1 Bringing two government agencies together

The new KLIS brought together systems managed by two different ministries. Although the integration was mandated by the Audit and Inspection Board and coordinated by the Policy Coordination Office, the MoCT and the MoGAHA clashed on issues regarding the structure, function, and scope of the integrated system. One flashpoint was the location of the geospatial information system architecture given that this decision would determine which organization would be in the lead to build the integrated system. This conflict between the two KLIS project operators substantially delayed the project, though both ministries ultimately found common ground on the effectiveness of the integrated system and were able to put aside the tension over which system was more important.

Both the PBLIS and the LMIS were national information systems with legitimate justification for their development. The PBLIS's major users were local government officials, for whom its system architecture and model were designed. In contrast, the LMIS architecture was designed in consideration of land-related experts, private companies, and the public as well as public officials in charge of land use services. With this in mind, the two systems were integrated by redesigning the PBLIS as a 2-tier system and the LMIS as a 3-tier system (client server application versus web-based application). In addition, adjustments were made to create the institutional framework for the operation of the KLIS including the transfer of the MoGAHA's cadastral division to the MoCT.

4.4.2 Ensuring high-quality land use zoning maps and parcel accuracy in the attribution database

Existing land use zoning maps based on the topographical foundation had cadastral discrepancies when compared to seamless cadastral maps. Thus ensuring the quality of thematic maps, such as the accuracy of land use zoning maps, presented a challenge. A related problem in land management was that cadastral discrepancies of land use zoning often caused public complaints.

Public officials in charge of parcel management thus meticulously examined and confirmed the attribute information of about 35 million parcels around the country before issuing public documents. An extensive amount of time and effort was spent on securing the quality of land use zoning maps and the attribute database in the development of the KLIS. To this end, a large number of public officials, system operators, and database architects were assigned to this job.

4.4.3 Establishing the seamless cadastral map database

One of the biggest obstacles in the establishment of the KLIS database was the quality of the paper cadastral maps, which dated back to the 1910s and had to be digitalized and transformed first into digital cadastral maps and then to seamless cadastral maps. This proved to be challenging as the measurement skills and tools used to produce these maps in the early 1990s produced serious distortion. Moreover, many of the more than 100-year-old maps had been damaged over time, creating significant errors. Mismatches existed between past and present cadastral

control points, leading to inaccuracies, while the loss of cadastral control points caused cadastral discrepancies.

Cadastral and forestland maps' scales were significantly different, which made it difficult to combine related maps. Since individual cadastral maps placed sequentially did not necessarily create a correct version of the entire district, adjustments had to be made deliberately to correct the inaccuracies. Map production was delayed as the methods to use to reflect cadastral information in the serial drawings remained undetermined for a long time.

To solve this problem, the central government collected cases of cadastral discrepancies from among local governments and created standardized instruction on how to combine seamless cadastral maps, an initiative that put production of the seamless cadastral map database back on track. The boundaries of land use zoning in various types of urban planning maps were determined in reference to the seamless cadastral maps produced. As a result, different stakeholders were able to share the land use zoning map database and settle cadastral discrepancies.

4.4.4 Matching district maps

During KLIS development, the land value appraisal system was introduced and local governments began to implement it. The government of each local region produced its own seamless cadastral maps for land value appraisal, each ending up with its own maps and systems. Consequently, the map of official land prices for each local office was different from that of the others.

Under such circumstances, the district-level cadastral map of one locality could not be linked to that of another because when placed together, they did not match and discrepancies arose. Often the boundary of a parcel in a cadastral map did not match the boundary of the same parcel in the subsequent map, making it impossible to provide an integrated public service.

It was concluded that adjustments had to be made on the seamless cadastral maps. It was agreed that just for administrative purposes and not for land transactions, seamless cadastral maps would be produced using the cadaster of each individual parcel without the obligation to guarantee accuracy but only to serve as district-level cadastral maps. Moreover, it was agreed that seamless cadastral maps would not have the legal authority to be used in land transactions. The government is currently carrying out a nationwide cadaster reinvestigation project that will eventually correct this situation.

4.5 THE IMPACT OF THE KLIS

4.5.1 Economic benefits

One quantifiable effect of the KLIS is the significant time savings for both users and service providers. The cost of issuing civil documents as well as the processing times were reduced in civil service. The establishment of the KLIS contributed to increased efficiency of cadastral administration, modernized the process, and improved accuracy. It made it possible to computerize works on land use in various areas based on standardized seamless cadastral maps, and greatly enhanced the quality of public service on land use by local governments.

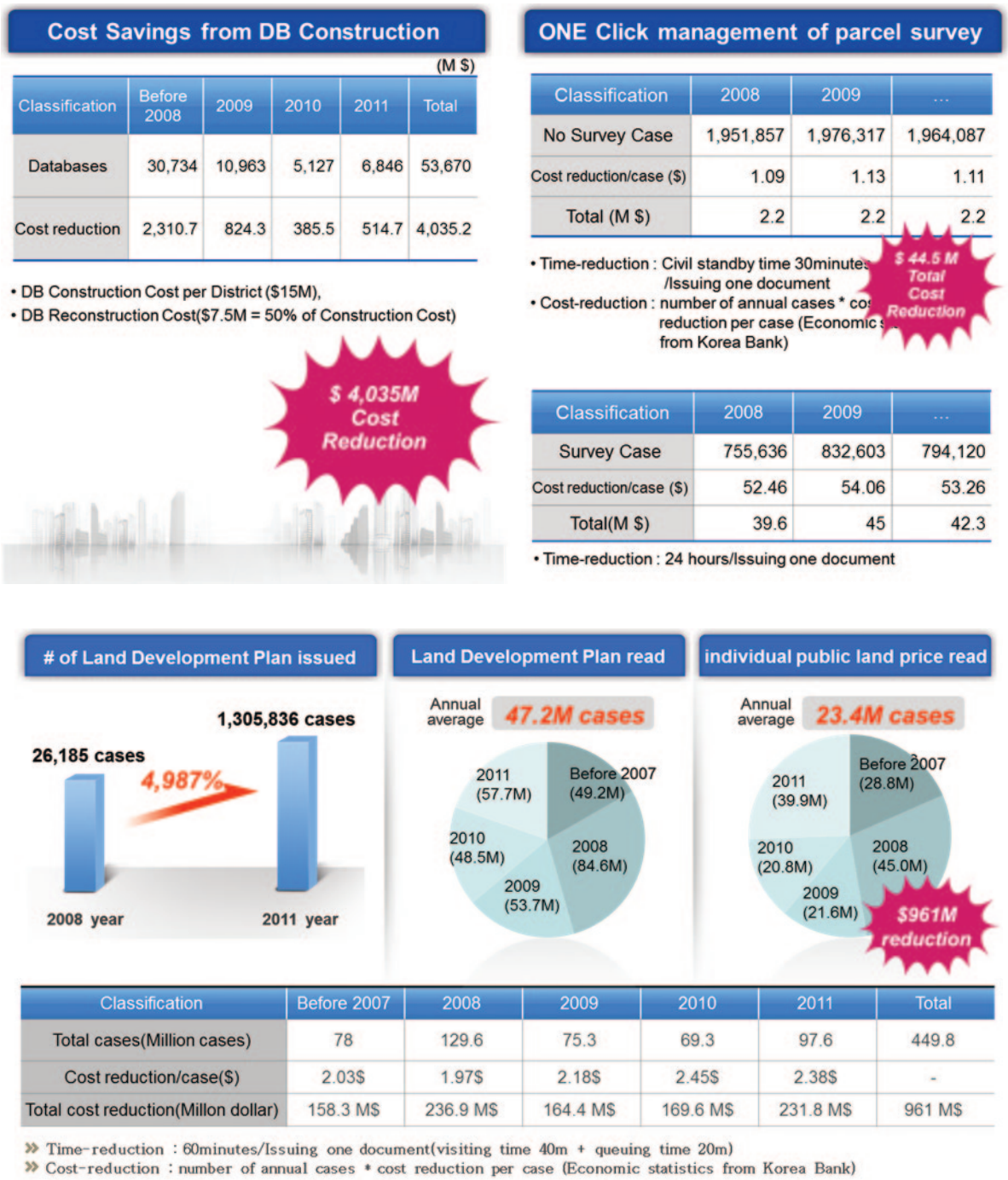
With establishment of the KLIS, people can view online or at kiosks in public service areas documents now open to the public, like land use planning confirmations and individual land prices. To receive this service in the past, one had to visit a local government agency and request to view the information at the desk.

The PBLIS's client/server (C/S) structure connected the server directly to clients, so it depended on a GIS engine with a polygon management tool. This environment was not conducive to inquiries or remote issuance of documents, necessitating inconvenient procedures. Since the LMIS server did not include this service, real-time connection with individual cadasters and seamless cadastral maps was not possible. As a result, it took an extended time to issue a public document with the land transfer result reflected on it. The integrated KLIS greatly improved this situation: documents are now issued not only at local government offices but also online, and applicants may view the information on such websites. As individual cadasters and seamless cadastral maps are processed in one system, land transfers are reflected in real-time, speeding up the public documentation process.

For instance, the process of submitting opinions/objections on a publicly appraised land value was shortened from 10 days to 3 minutes. The process of land transaction permission was shortened from 10 days to 1 day. While the work of real estate agencies took 5 days in the past, it was shortened to 1 day after the KLIS was established. Judgment of development impact fees took 3 days in the past but with the new system can be carried out on site. Issuing confirmations of land use planning and estimates of publicly appraised land value took 15 minutes and 10 minutes in the past, respectively, but are now issued immediately.

According to figures by the Republic of Korea Bank in 2011, estimates of the value of time savings associated

FIGURE 4.3 Estimated cost savings associated with the KLIS



with the new system were noteworthy. The construction of database with accurate information on land and land use led to a cost reduction of over US$4 billion. The ability to either view or issue documents online reduced costs by US$44.5 million in the case of parcel survey services. From 2007 to 2011, an annual average of 23.4 million cases of individual public land prices were viewed online. The time saved from actually travelling, requesting, and waiting in a public office to receive this information reduced costs by US$961 million (Figure 4.3).

Since the KLIS is linked to the urban plan information system, government and publicly owned land information systems, electronic payment systems, cadastral survey management systems, national defense facility integration systems, urban information systems, and other cadastral/land information systems, duplicated investment for the same work is prevented and data renewal expenses are saved.

4.5.2 Increased efficiency and reliability of land information on transactions and land values

In the past, it was difficult for a citizen to learn about land information outside his/her region of residence. With the establishment of the KLIS, the public can access information on land transactions and prices at the zone, region, or parcel level. Moreover, the public can now follow real-time information about land transactions at the city, county, and borough level, even in zones and regions with speculation tendencies.

Public service at the local level has been greatly enhanced as land-related documents can be issued even at the offices of the smallest local government unit or through automated kiosks. Not only is precise information on land available, including the current condition of land use zoning, restrictions, and publicly announced land prices, but it is easier for users to understand the content of civil documents because they contain drawings and descriptions.

4.5.3 Enhanced transparency

The transfer of work from analog form to a digitalized system eliminated the danger of irregularities and corruption in the process of handling land-related works. Land-related regulations, not to mention the content of designating land use areas or zones, were so complex and intricate that with the exception of the public officials in charge, it was difficult to have an accurate grasp of the content. The administrative process of carrying out such tasks was not transparent, which created the risk of irregular intervention by the public official in charge in either deciding land use zones or regions or for development plans of a certain area of land. At times, processes for land registration or other public services were expedited by such officials. The use of geospatial information, facilitated by construction of the KLIS, made administration work more clear and transparent, reducing the risk of corruption in public service.

The KLIS broadened the public's understanding of development restrictions such that both citizens and administrators can determine in advance landholders affected by land use zoning, enabling development projects to take into full account all stakeholders' factors. This allows for better development and urban planning in the pursuit of sustainable development. In this regard, the KLIS is evaluated as having contributed to the Republic of Korea's social and economic development.

4.5.4 More efficient land policy and land use planning

The KLIS has contributed to more evidence-based land policy making. With a systematic land administration system among the central government and different levels of local governments, it is possible to collect data promptly and accurately and to comprehensively analyze even the most recent changes across the country. Land policies today are formulated in a timely and streamlined manner, with national land developed and managed more efficiently.

Accordingly, the central government has punctual access to precise information on where and when land transactions take place and on the swift changes in land transaction prices. With this information, the government can develop and execute land-related policies in a more timely and appropriate manner, greatly improving the quality of land governance.

In addition, information on buildings and structures are registered and managed on the KLIS's seamless cadastral maps, while roads, rivers, and urban plans registered on its topographic maps can be managed simultaneously, contributing to an efficient work process among those in charge of cadastral management and urban planning.

Lastly, the KLIS created a sound taxation system that is fair and transparent. Now that the price of land, its features, and the latest land transactions are open public information, a standard revenue system that is consistent and fair is applied nationwide. Everyone partaking in a land transaction shares a common expectation of what kind of taxation will take place once land is bought or sold.

4.6 CONCLUSION

The creation of the KLIS, and the registration of all land areas and rights to land, revolutionized the way that land and land use are managed in the Republic of Korea. The KLIS is evaluated as having successfully created a geospatial information infrastructure that is utilized in all sectors of society, and the Republic of Korea's globally renowned e-government was built on this foundation. The KLIS is recognized globally as one of the top land management information systems. With a cost-benefit ratio that surpasses 3.0, it has brought about transparency, efficiency, reliability, and better service for its citizens.

Construction of the KLIS was not an easy task. The Republic of Korea had its share of errors and U-turns when well-intended initiatives at times turned out to be misguided or inadequate. For example, the initial pursuit of a land information system led to the development of two different systems, which produced inefficiencies, unreliable data, and even conflicts between government agencies. And the high costs of integrating the two systems

to create the KLIS required an incremental roll-out rather than the planned nationwide coverage.

The KLIS is not a static system. It is constantly under development, its data updated regularly to reflect the constant changes and transformations in land transactions and land use. For example, the KLIS was recently extended to include real estate and buildings.

As such, the system itself has to be updated and upgraded to fit and accommodate changes in data. One such current effort is the reinvestigation of cadastral maps nationwide. Once this reinvestigation is complete, seamless cadastral maps will not be needed as they can be replaced by the new series of accurate cadastral maps that will serve as the basis for all land-related works and administration. Finally, the KLIS is moving forward to include mobile technology for easy access to the latest information on land and land use. The KLIS continues to innovate to improve its contribution to the economy and service delivery, while integrating new developments such as e-governance, the spread of mobile devices, and other advancements around ICT that are changing the ways people connect to government.

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5. Building Business Resilience—the Experience of H.M. Land Registry for England and Wales

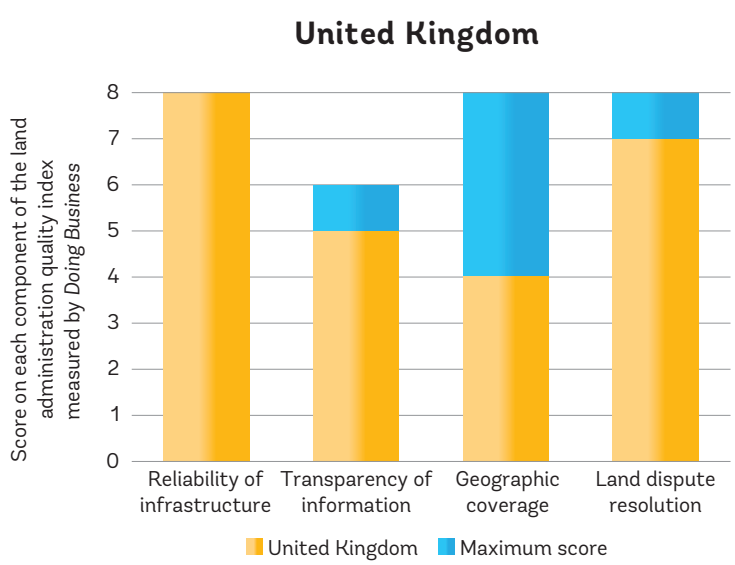
Julie Barry

H.M. Land Registry for England and Wales was overhauled in the last decades to improve its performance and adapt service delivery to new demands, improve reliability and reduce the risk of fraud, and strengthen its contribution to business performance. This chapter presents H.M. Land Registry's change process, its achievements, and lessons learned in implementation. Land Registry's achievements over the past 20 years are the result of a corporate effort, with each part of the organization making an active contribution to land registry business stability against a growing demand for innovative new services in the economy. What started as an internal exercise to computerize internal records evolved into a service delivery organization on a scale unimaginable when the process started. It should be noted that Land Registry's data are of great importance to the UK economy and underpin one of the most active property markets in the world. The value of land registered in England and Wales is estimated to be approximately £4 trillion, £1.3 trillion of which is mortgaged.

5.1 HISTORY OF LAND REGISTRATION IN ENGLAND AND WALES

The first attempt at land registration in the British Isles can be traced back to Roman times. In the parts of Britain occupied by the Romans,

FIGURE 5.1 UK's ranking on the global LAQI (actual vs. potential)



regular censuses were held where the ownership and productivity of land was recorded. The information gathered by these censuses formed the basis of a land tax called "*tributum soli*." After the Roman's departure, their measurement systems for parcels of land continued but the recording system itself fell into disuse (Pemberton and Mayer 2000).

The next serious attempt at recording land ownership was the famous Domesday Book prepared for King William (William the Conqueror) in 1086. This true feat of administration accomplished a comprehensive record of tenure and land use in his kingdom, enabling tax revenues to be assessed and collected. The Domesday Book is now commonly accepted as the last land register in England and Wales created for taxation purposes.

After the Middle Ages, the need for accurate land records once again became a focus of attention. Epidemics of the plague had decimated the population of England by a third and labor scarcity pushed up wages. As people became wealthier, the need to protect their landholdings became more important. Agitation for reform led to the introduction of deeds registries in three areas of the country and some registration of title was introduced in the 1700s, by which time serious defects in the deeds registration system had become evident.

After much debate and resistance to any proposal for modernizing land recording, the first Land Registration Act was passed in 1862, enabling a voluntary system of title registration for London only. This Act is still considered the basis of the modern day system in England and Wales. Its requirement for fixed boundaries and its voluntary nature were flaws, however, which took time and further statutes to overcome. The requirement for boundaries to be fixed by survey was abolished with the passing of the Land Registration Act 1875 but even with another significant piece of enabling legislation in 1925, only one million titles had been registered at Land Registry by 1950. Compulsory registration was introduced and extended gradually across England and Wales, the final phase being introduced in 1998.

Today, more than 24 million titles are registered at Land Registry, which equates to 86 percent of geographical coverage. It is believed that the registered extent of the country now includes almost all economically active land, with the remaining unregistered land comprising mostly uninhabited areas or land used for infrastructure such as railways and roads. In summary, the land registration system in England and Wales has evolved into a compulsory title registration system (deeds registration no longer exists) supported by state guarantee. Land Registry's statutory role is to provide information and protection of interests during the property buying process (also known as conveyancing) and to provide registration of title services to individuals or organizations who become landowners or who own interests in land. Title to land has legal effect only upon the act of registration.

A point to mention here relates to the disparate nature of land registration across the United Kingdom. No single authority exists for the whole of the United Kingdom. Although the United Kingdom is one sovereign nation, its devolved nature means that administrative functions, such as land registration, are managed by individual parts within the Kingdom. Scotland and Northern Ireland both have separate devolved responsibilities for land registration. *Registers of Scotland* is the registration authority based in Edinburgh. *Land and Property Services Northern Ireland* is the mapping, registration, and valuation authority for the province of Northern Ireland.

5.2 *DOING BUSINESS* RANKINGS

Given the United Kingdom's devolved approach to land registration and thanks to the way in which the capital city of a country is used to benchmark a property transaction by the World Bank for its *Doing Business* report, England and Wales' performance counts for the whole of the United Kingdom, as London is its capital city.

In 2015, the United Kingdom ranked 45th for registering property as defined by the World Bank report (Figure 5.1). On the face of it, this is not a comfortable position for an advanced nation such as United Kingdom, and is a focus of great interest for the government and Land Registry as they seek improvements. A study of the contributory factors makes it evident that three key elements currently adversely influence the UK's performance:

(i) The complexity of the legal process. The legal process in England and Wales has its origins in feudal times and the system has grown over centuries into one that is both complex and time-consuming. The two key actions in the legal process are exchange of contracts and registration of title. Equitable title passes from seller to buyer on exchange of contracts, whereas legal title passes only when the purchaser lodges his transfer deed for registration at Land Registry. As much as one month can pass between these two events and many legal experts believe that this is an area for future reform.

(ii) Land information is not held centrally. One area of great difficulty and frustration for solicitors dealing with purchases of land relates to the

decentralization of information they need to satisfy themselves that the purchase is a good investment for their clients. Land information is held by Land Registry, local authorities, coal and water authorities, and in the case of leasehold titles, management companies. These organizations have varying speeds of service over which the solicitor has no control. Over and above this, whilst most information is "official" information held by statutory authorities, this is by no means the case for all information providers. Statutory bodies almost always have published quality and service standards and possibly even standard pricing, but it is much more difficult to hold private organizations accountable for poor performance. The consequence of this situation is a delay in gathering all the information needed, as the solicitor can only go at the speed of the slowest information provider.

(iii) Lengthy conveyancing timescales. Largely as a consequence of the complexity of the legal process and given that land information is not held centrally, current estimates for conveyancing (as opposed to registration of title) state that it takes between 10–12 weeks for a property to be sold in England or Wales. By contrast, registration of title at the end of the conveyancing process is typically much quicker. Land Registry completion statistics currently show that 79 percent of applications received are processed in less than 12 days.

As a relatively small, self-contained institution, it is perhaps easier for Land Registry to make improvements to its own systems and processes than it is for the entire conveyancing industry to do the same. Hence it becomes a statement of fact rather than a criticism that improvements in Land Registry's performance are not currently matched in the wider conveyancing process. That is not to say that Land Registry is complacent. Knowledge of its customers and their needs is an ongoing investment to which Land Registry has committed for many years.

5.3 STRUCTURE AND FUNCTIONING OF LAND REGISTRY

Land Registry is one of the largest stand-alone title registries in the world. It has no statutory remit for mapping, land valuation, or land taxation although strong relationships and some linked ICT systems exist with some of the UK government bodies responsible for these functions.

Land Registry is a non-ministerial government department, executive agency, and trading fund and is responsible for land registration in England and Wales only. Its official title is H.M. Land Registry but it is commonly referred to as simply "Land Registry." Its status as an executive agency and trading fund gives Land Registry certain freedoms that enable it to run in similar ways to a company, rather than as a traditional government department allocated funds by Parliament. It is a self-financing organization that relies entirely on its income from services provided and makes no call on money from taxpayers. Its income in 2014/15 was £297,080 million. Its operating surplus before dividends in the same financial year was £36,600 million.

As well as being the statutory keeper of the land register, Land Registry keeps two other registers: the Land Charges register (which relates to interests or encumbrances on unregistered land) and the Agricultural Credits register. In 2014/15, Land Registry processed 28,569,636 applications, 87.5 percent of which were received through online channels. This is a 10 percent increase over the 2013/14 figures. Over 24 million titles are in the land register (all in digital, intelligent format), which equates to 86 percent of geographical coverage of England and Wales. It keeps 110 million scanned deeds and documents to support the information in the land register. Land Registry has had an open register since 1990. For a small fee of a few pounds, anyone can view any information held by Land Registry, and discounts apply for online applications.

Land Registry has 12,000 account holders (140,000 individual users), most of whom are solicitors. In recent years, its customer base has diversified as a growing range of other business customers in the public and private sectors have started to use its data for their own purposes.

Land Registry was founded in 1862 to handle the registration of titles in London. It began with a staff of six people. After reaching a peak of 12,000 in the early 1990s, its workforce now stands at just over 4,300, 60 percent of whom are women. The average age of employees is 47 and the average length of service is 23 years. Staff turnover is low, at 5.3 percent. The workforce is employed as UK civil servants.

Land Registry has 14 locations in England and Wales. Land Registry's Head Office is in Croydon, in the Greater London area. It has an in-house IT capability based elsewhere in the United Kingdom. Most of the workforce processes applications for registration, which is presently not automated. Caseworkers process their work in accordance with strict operating procedures.

Strict protocols mean that caseworkers need only to refer the casework falling outside the operating procedures to a small cadre of Land Registry lawyers, who make up a small percentage of the workforce. In addition to making decisions on complex casework, the

lawyers' role is largely one of handling litigation cases and providing corporate legal advice to the executive team.

The innovation undertaken in the last years has had dramatic benefits for Land Registry, which handled 16 percent more applications and saw a 24 percent increase in productivity, with 39 percent fewer staff than it had in 2011. This contributed to an operating surplus of £36.6 million in 2015.

5.4 LAND REGISTRY BUSINESS GOVERNANCE

Strong governance underpins Land Registry to ensure that its operation is undertaken at a cost that is affordable and demonstrable.

Audit and governance: Land Registry is part of the Department for Business, Innovation and Skills (BIS) and a member of the Public Data Group within BIS. There is a Secretary of State of BIS, a Land Registry's Minister, a Land Registry's Chief Executive, and a Chief Land Registrar, who is also the Accounting Officer for Land Registry and has reporting responsibility for Land Registry's overall performance to BIS, to other government departments such as H.M. Treasury, and to Parliament. To help the Chief Executive undertake his duties effectively as Accounting Officer, he is supported by an in-house audit team whose role is to ensure compliance with government rules and regulations regarding the management of public finances and effective use of resources.

External audit controls: Independent audit of Land Registry's accounts is undertaken by the National Audit Office (NAO), which scrutinizes all public spending for Parliament. Its public audit perspective helps Parliament hold government to account and improve public services. It certifies the financial accounts of all government departments. The NAO has statutory authority to examine and report to Parliament on whether departments and the bodies they fund have used their resources efficiently, effectively, and with economy. The NAO is independent of government and its staff are not civil servants. This autonomy ensures impartiality from the civil service and Parliament.

Internal controls and governance: Land Registry has both a Land Registry Board (LRB) and an Executive Board. The remit of the LRB is to support, constructively challenge, and provide guidance to the Executive Board, to supervise the development and delivery of the agreed business strategy, and to ensure appropriate governance of the activities of Land Registry. The Executive Board handles the day-to-day running of Land Registry, including:

- Monitoring Key Performance Indicators (KPIs) and overall budget;
- Managing risks to the organization;
- Taking financial decisions;
- Managing and controlling the trading fund;
- Dealing with customer issues;
- Working with the Public Data Group to develop strategies to work together and to support the property market; and
- Escalating important issues and decisions to the LRB for review.

Key Performance Indicators: In April each year, Land Registry publishes an annual set of business targets that it negotiates with its minister, H.M. Treasury, and other government stakeholders. The targets cover key aspects of Land Registry's performance against its four strategic objectives—efficiency, data, assurance, and capability—and are set to be challenging but not unachievable. Processes to measure progress towards the targets are inherent in Land Registry operations, and the evidence gathered during the year is assessed by official auditors to determine whether or not the targets have been met. In 2014/15, six out of seven KPI targets were achieved. A staff bonus scheme is aligned to this process to reward successful performance. If only some of the KPIs are met, the amount paid to staff is reduced.

5.5 INFORMATION HELD BY LAND REGISTRY

By definition, the key dataset held by Land Registry is the land register. The term "land register" can be used to describe the sum total of all separate land titles as a collective description. It can also be used to refer to each individual land title. Each individual land title comprises a written register (the land register) and illustrative map (the Title Plan), which show the physical extent and appurtenances attached to that piece of land. Each title is allocated a unique property identifier, the Title Number. The land register itself comprises three parts:

1. The *A Register* (the Property Register) gives a physical description of a property, its address, and details of any beneficial rights attached to the land. It also sets out details of any exclusions from the property such as subsoil strata or mines and minerals under the land.
2. The *B Register* (the Proprietorship Register) sets out the names of up to four registered proprietors of a property, their address for service, and any restrictions on their power to sell the land in future.
3. The *C Register* (the Charges Register) sets out the details of any encumbrances on the land, such as mortgages, reserved rights, and any restrictions on how the land can be used.

The Title Plan: To accompany the information set out on the land register, Land Registry prepares an individual title plan for each registered title showing the extent of the land included in the title. Most title plans are prepared

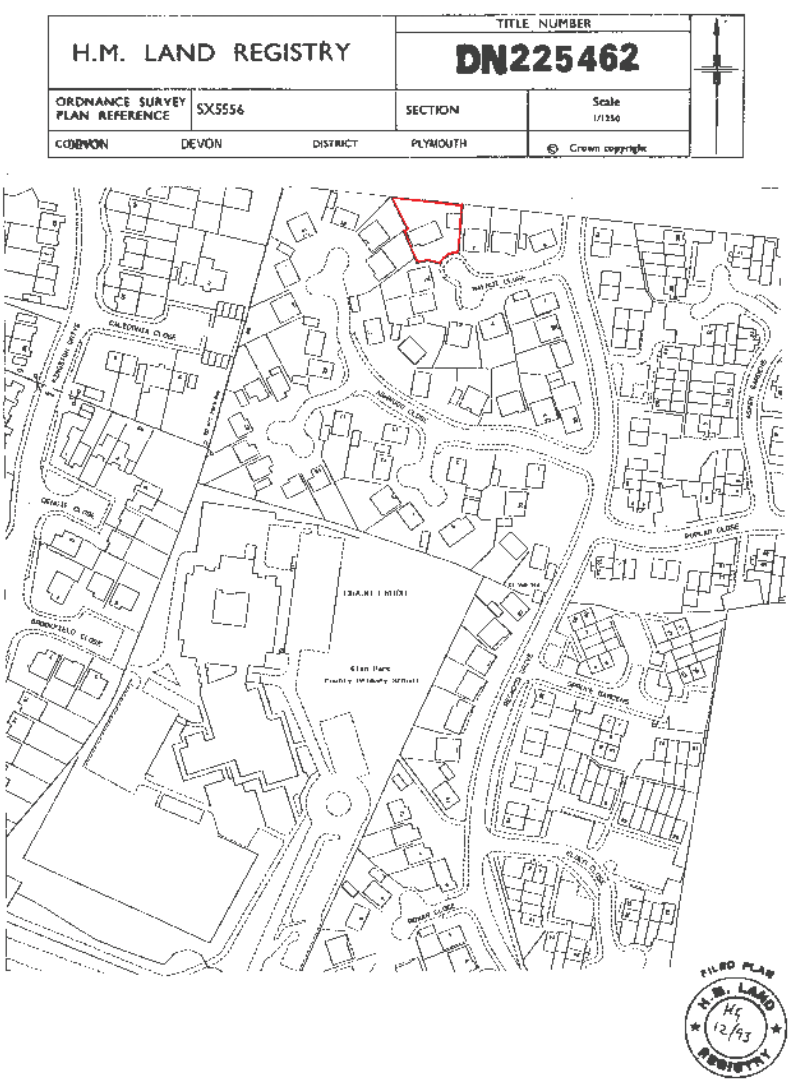
FIGURE 5.2 Example of the Proprietorship (B) Register in H.M. Land Register

B: PROPRIETORSHIP REGISTER
THIS REGISTER SPECIFIES THE CLASS OF TITLE AND IDENTIFIES THE OWNER. IT CONTAINS ANY ENTRIES THAT AFFECT THE RIGHT OF DISPOSAL
TITLE ABSOLUTE

1. *(10.11.1993) PROPRIETOR: %COLIN RICHARD SMITH% AND %GLENYS MARY SMITH% OF 6 WALNUT CLOSE, PLYMPTON, *PLYMOUTH* PL7 2FX.*
2. *(10.11.1993) The Transfer to the proprietor contains a covenant to observe and perform the covenants referred to in the Charges Register and of indemnity in respect thereof.*
3. *(02.01.2004) RESTRICTION: No disposition by a sole proprietor of the registered estate (except a trust corporation) under which capital money arises is to be registered unless authorised by an Order of the Court.*

END OF B REGISTER.

FIGURE 5.3 Example of a Title Plan in H.M. Land Registry



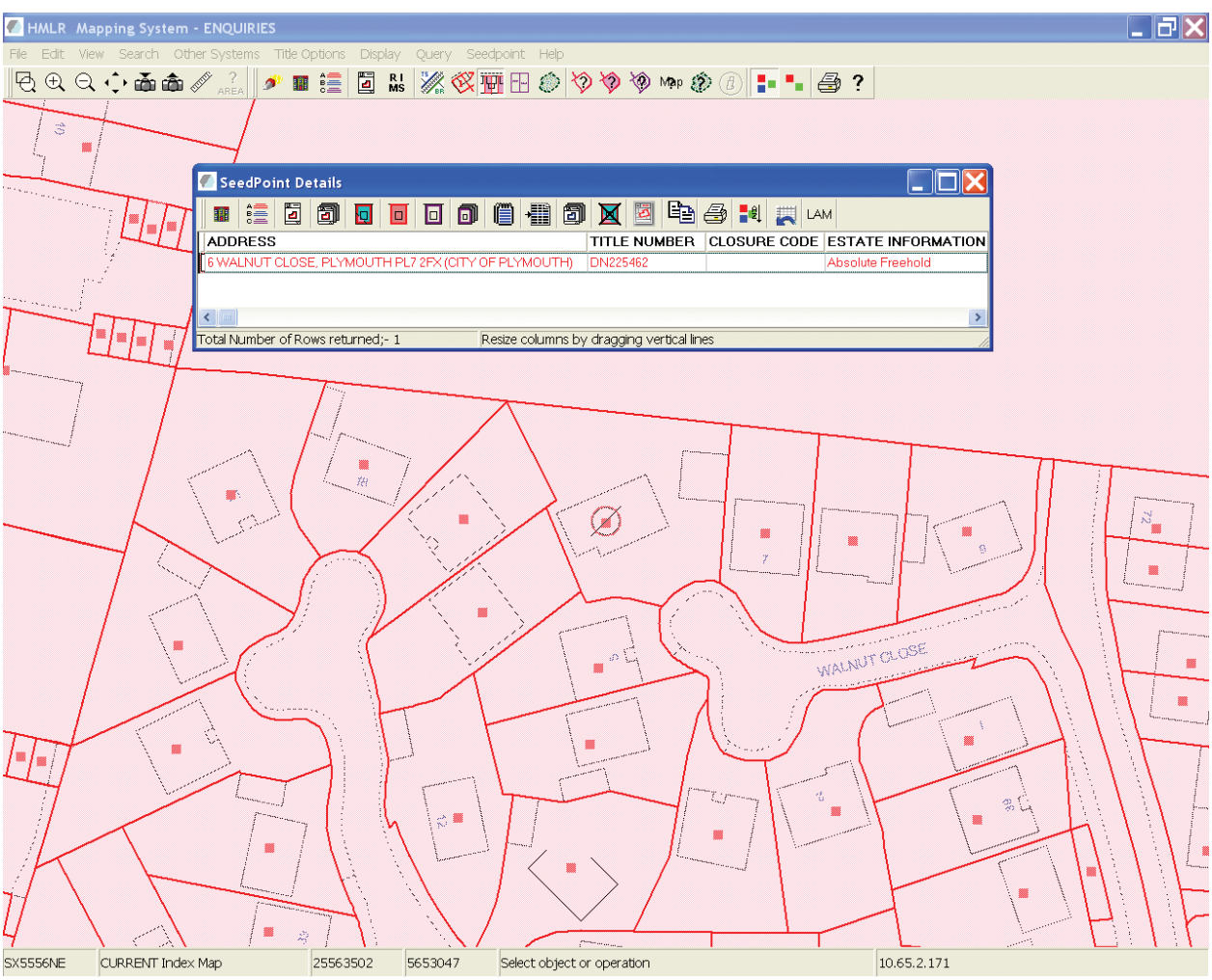
at 1/1250 scale, although 1/2500 or 1/10560 scale maps are also used for more remote areas.

Land Registry does not use fixed boundaries unless requested, and only a very small percentage of titles are now mapped with fixed boundaries. Since the Land Registration Act 1875 was passed, England and Wales have used the "general boundaries" rule, which leaves undefined the precise position of the legal boundary. In an agricultural economy, which England was at that time, the flexibility of general boundaries was an advantage as it allowed for the movement of natural features (such as hedges) over time without compromising the extent of ownership, which would naturally align accordingly.

The Index Map: The extent of all 24 million registered titles is shown on the Index Map. It is based on the Ordnance Survey 1/1250 scale topographical map and is a searchable online database of titles. It is the route to all registers and title information.

House Price Index (HPI): Land Registry holds historical information on house prices gathered from the transfer instruments received upon registration. Land Registry has collected this information since January 1995 and now publishes current house prices and historical house price datasets. The HPI uses Land Registry's dataset of completed sales. It is the only index based on repeat sales. The index compares the average house price today to prices in January 1995, with the index set then at 100. Figures are provided at national, regional, county, and London borough level. The HPI achieved accreditation from the government's Chief Statistician in 2013 after complying with UK statistics guidelines.

FIGURE 5.4 Extract of the Index Map in H.M. Land Registry



Transaction Data: Land Registry now publishes monthly Transaction Data, which provide information on the number and type of applications it has completed in the preceding month. Property commentators and other analysts use this information for forecasting purposes.

Online availability of services: All land registers, any deeds or documents referred to on the register, and title plans are available online through Land Registry's website (www.gov.uk). Land Registry is developing an application for a "citizen-friendly view" of registered titles.

Future data: Land Registry will become the statutory holder of new land datasets currently held by 420 local authorities in England and Wales. It currently costs local authorities in England and Wales £70 million to process requests for land-related information. Land Registry believes it can provide the same service for less. New laws have been passed that permit Land Registry to be the provider of these new land-related datasets. In addition, it will introduce digital charges (mortgages) and release all open or licensable data by 2018. This implies that Land Registry will become the "de facto" custodian of UK land and property data, while also encouraging the re-use and exploitation of that data by others in the market. Clearly there are issues of privacy to consider so all information released is compliant with the Data Protection Act.

5.6 PROCESS FOR INNOVATING AND EXPANDING LAND REGISTRY SERVICES

5.6.1 Land Registry's approach to innovation and engaging with stakeholders

Land Registry is conscious of its status as a monopoly service provider and goes to great lengths to make sure it does not abuse this position. As alluded to earlier, the scale of Land Registry's operation and the sophistication of the property market in which it operates mean that mistakes can be extremely costly and have a dramatic adverse effect on reputation and efficiency. Land Registry's solution to this potential issue was to adopt a cautious delivery timescale and a customer-centric approach that puts the customer at the heart of everything it does.

Customer centricity underpins its service proposition development but this customer-centric approach also goes to the core of other Land Registry operations. Encouraging as many touch points with the customer as possible, recording and analyzing their feedback, and ensuring strong governance are also a critical part of ensuring that Land Registry gets it right the first time.

Customer teams: Land Registry currently achieves operational efficiency by allocating work to dedicated customer teams, all staffed by in-house trained lawyers and caseworkers. Its 145 customer teams are centered in 14 Land Registry locations throughout England and Wales. They are encouraged to develop relationships with the customers they interact with so that there is a direct feedback channel into Land Registry. This works for the benefit of Land Registry too; the direct relationship enables Land Registry to work directly with customers to improve their understanding of its systems and processes to achieve a reduction in the numbers of defective applications received.

Account managers: Large customers have a dedicated account manager to manage the relationship, identify new innovations, and help resolve any issues. Managed as part of a New Business function area, Land Registry has 12 account managers, all of whom are trained in-house.

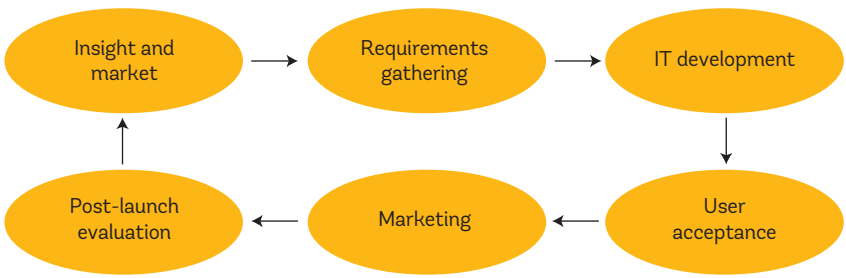
Customer Relationship Management: Land Registry purchased an Oracle Customer Relationship Management (CRM) software system in 2012. Every touch point with a customer is entered into CRM by Land Registry staff, a process that has accumulated an extremely powerful dataset on what matters to its customers. It is guided by evidence from CRM to identify how to improve efficiency and improve customer experience. All caseworkers have access to a CRM system, which they are required to use to log all touch points with customers, including customer feedback, complaints, or praise received by phone, letter, or visitors to an office.

5.6.2 Digitization of Land Register and the Index Map as the basis for innovation

Digitization of Land Register and the Index Map was a catalyst for two decades of innovation and new service development for Land Registry and its customers. It should be noted that these Land Registry innovations started initially for purely internal reasons, as the register was still private. Later on, it quickly became evident that to improve Land Registry service delivery, greater understanding of customer needs and their change readiness was required. Figure 5.5 illustrates the points in the service development process at which Land Registry engages its customers.

Conversion of paper land registers into computerized format: This process started with the conversion of paper records held by the comparatively small Land Charges Department in the mid-1970s. The conversion of paper land registers into computerized format in Land Registry started in 1986. Development of internal computerized casework systems also began in the early 1980s and rolled out to offices on a piecemeal basis between 1986 and 1992.

FIGURE 5.5 H.M. Land Registry's Service Proposition Lifecycle



Upgrading computerized map records: Computerized map records were upgraded to their current status in 2001 when Ordnance Survey introduced its digital map "OS MasterMap." Thanks to Ordnance Survey's program of continuous revision, the map is never more than six months out of date, and Land Registry receives daily digital feeds of revised survey information. From time to time, Land Registry undertakes positional accuracy exercises to make sure that registered extents are reconciled with new map data.

5.6.3 Building online services delivery

Incremental introduction of e-conveyancing: Land Registry introduced an ambitious e-conveyancing program in 2001 that encompassed business transformation, stakeholder management, and IT development within a PRINCE2 project managed environment. A range of service propositions were developed and discussed with stakeholders, mostly from the conveyancing and lending professions, who were also clear that radical change was not a strategy they would favor. As a consequence, Land Registry developed a cautious timeline for delivery of new services based on a modular, incremental change approach. Each module of electronic releases would make sense on its own. Each increment of new services would build upon ones that had gone before (see Figure 5.6).

Differentiated data access channels (mixed channel economy): In addition to determining its strategy for online services, Land Registry decided to introduce a "mixed channel" economy that would enable customers to choose the channel access most suited to their needs. A brief description of each channel is given in Figure 5.7.

5.6.4 Protocol for service development with private sector (solicitors)

Around 130,000 solicitors in England and Wales use Land Registry's services. They work in firms ranging in size from 2 to more than 100 solicitors. Having their practical support and active take-up of new services is vital to Land Registry's effective working and its desire to move to a more digital way of working. With such a high number of customers, it is important that Land Registry does not adversely affect their business operation or distort their section of the market, and it goes to great lengths to ensure that new services are not overly advantageous to one customer segment.

To protect against this outcome, Land Registry developed an extremely robust and sophisticated customer interaction procedure that ensures customers' active involvement at every stage of the process. Requirements gathering and IT software development are done using the incremental "Agile method." Prototypes are prepared at an early stage and refined iteratively based on user feedback. Figure 5.8 provides an illustrative example of the nature of the activities typically involved at each stage.

FIGURE 5.6 Online release schedule for H.M. Land Registry Services

Service type	Introduced	Service description
Information services	Upgrades from 1999 onwards	"Direct Access," "Connect Direct," and "LR PORTAL" for basic online information services
Electronic discharges	2004	A service for lenders to remove paid off mortgages from the register; synchronous and asynchronous options available
Applications to change the register (not on sale)	2008	A range of basic application types such as change of address, etc.
e-DRS	2014	Electronic transmission of documents between customers and Land Registry

FIGURE 5.7 H.M. Land Registry's channel access release schedule

Channel type	Customer description	Year introduced
Private VPN channels	Lenders	2002
Web channel (Portal)	Low-volume users	2008
XML channel (Business Gateway)	High-volume users	2009
B2B channel (Veyo)	Solicitors	Not yet introduced (first non-Land Registry developed channel)

FIGURE 5.8 H.M. Land Registry's service proposition development with stakeholders

Activity area	Activity description
Insight and market research	■ 1:1 discussion with key decision makers in firms likely to be interested in a new or enhanced service ■ Discussion with industry representatives and/or statutory regulators ■ Full consultation ■ Independent market research
Requirements gathering	■ Small workshops with targeted stakeholders to gather high-level and low-level requirements, agree on the costs and benefits for a Business Case, and prepare an assessment of risks attached to the proposed service (using the Agile methodology)
IT development	■ 1:1 discussion with firms on the technical aspects of connection to a channel ■ 1:1 discussion with firms regarding proposals on the technical aspects of a new service ■ Industry consultation on technical capability or inhibitors preventing take-up of a new service ■ Iterative development using prototypes under Agile methodology
User acceptance testing	■ Active testing environment at a Land Registry office to test the customer experience of using a new service and its usability
Marketing	■ "Go to Market" strategy developed and validated by customers
Post-launch evaluation	■ Benefits validation—Feedback sought from customers to enhance the first release, which feeds back into the Insight and market research activity

5.6.5 Evaluating performance of new instruments

Introduction of "MapSearch": Anyone who wishes to know details of land ownership can apply to Land Registry for a "Search of the Index Map" by giving an address or physical description of the land in which s/he is interested. Staff at Land Registry will pull the relevant map section and provide details of any title number under which the land being searched is registered, as well as details of the class(es) of title (e.g., freehold, leasehold). By contrast, "MapSearch," introduced in late 2013, is a self-serve, web-based service offering an online map of England and Wales. It was developed under Agile methodology. Figure 5.9 Take-up of MapSearch versus "Search of the Index Map" Applications—April 2013–May 2015 shows how customers have migrated from the traditional service offering to MapSearch's self-service option. "Search of the Index Map" applications have reduced by 50 percent, to approximately 1,000 per day, while the new service has around 8,500 applications per day.

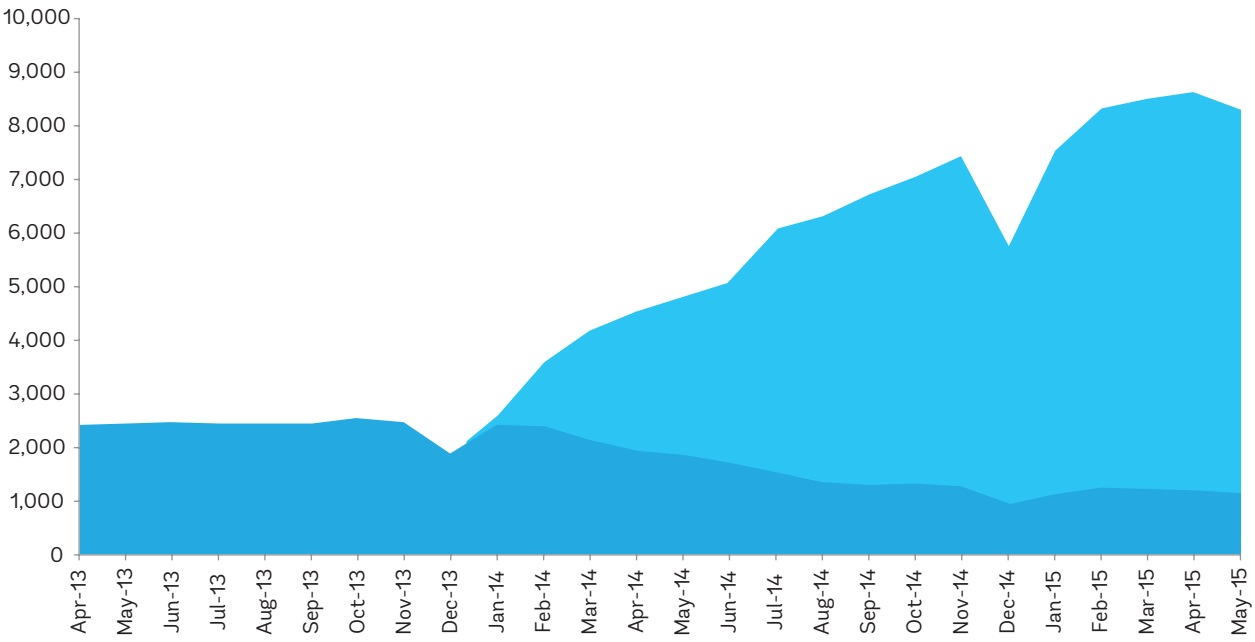
Introduction of new B2B channel, Business Gateway: During market research preceding the introduction of the Land Registry Portal, high-volume conveyancing firms expressed a wish for direct XML connection from their case management systems into Land Registry systems. To meet this demand, Land Registry developed a new channel, now named Business Gateway. This was not a new demand but one that fell within the agreed approach to develop a mixed channel economy. Seventy-five customers now use Business Gateway, through which Land Registry handles 1,679,495 applications per year.

As this new channel would potentially only appeal to a small audience, Land Registry had to be convinced of the business benefits and so set stringent success indicators, as follows: (i) take-up of 75 percent of target audience; (ii) demonstrable protection against registration fraud through reduced indemnity costs and numbers of cases; and (iii) reduction in handling costs of £17 per application. Business Gateway success indicators as defined for customers were: (i) total integration = reduction in manual processes, errors, and postage; (ii) speed and ease of registration increased; (iii) more secure than paper; (iv) audit trail; and (v) facilitates payment of land purchase tax.

Monitoring showed that the Business Gateway channel was successful in the case of large customers:

- 75 percent of the target market integrated their case management software systems with Land Registry, and submitted 1,679,495 completely automated applications in 2014.

FIGURE 5.9 Take-up of MapSearch versus "Search of the Index Map" Applications—April 2013–May 2015



- Applications have grown 20.8 percent annually since the introduction of Business Gateway.
- Revenue in 2014/15 was £15 million.

Business Gateway was also successful for customers and a number of mutual benefits were identified from adopting an incremental approach to service deployments and expanding the number of channels for customers to use. These are: faster processing times; environmental benefits; financial savings; greater security—e-security can identify which users have undertaken which functions in firms, reducing the possibility for fraud; and accessibility 24/7—service availability is not limited to UK office opening hours, enabling offshore conveyancing firms to lodge work wherever they are based.

5.7 LAND AND PROPERTY DISPUTE RESOLUTION

In England and Wales, a number of different options exist for resolution of land or property disputes, although not all options available involve Land Registry. It should be mentioned again that separate procedures apply in Scotland and Northern Ireland.

(i) Direct appeal to an independent tribunal: Owners, landlords, or tenants can go directly to the First-Tier Tribunal (Property Chamber—Residential Property) to resolve disputes. The Tribunal is independent of government and listens to both sides of the dispute before making a judgement.

(ii) Lodge an objection to a future purchase at Land Registry: Land Registry may sometimes be unable to complete registration where it has notification of a prior, third-party objection. It first considers if the objection has grounds and therefore any chance of success. If it cannot possibly succeed, whether on the facts or the law, the objection is cancelled. If the objection is not groundless, the applicant is given details of the objection so that negotiations might take place.

The vast majority of disputes are settled by agreement, but where the parties are unable to resolve their dispute by agreement, Section 73(7) of the Land Registration Act 2002 says that Land Registry must refer any case where "it is not possible to dispose by agreement of an objection." Disputes not capable of being resolved are also referred to the First-Tier Tribunal (Property Chamber—Residential Property). The Tribunal will normally hold a hearing, but does have the power to direct one of the parties to commence court proceedings instead (section 110(1) of the Land Registration Act 2002). In certain circumstances, which are set out in the Tribunal procedure rules, the Tribunal can determine a dispute without holding a hearing.

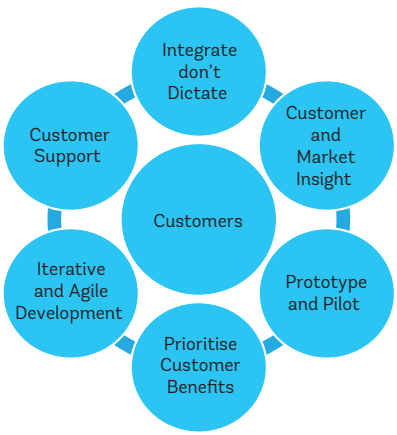
(iii) Court action: A party might decide to refer the matter to court rather than use either of the other two options. If Land Registry has referred a dispute to the First-Tier Tribunal, it is likely that the Tribunal will adjourn the proceedings to await the outcome of the court proceedings.

5.8 LESSONS LEARNED AND FUTURE OUTLOOK

The obvious lesson is that the customer really does know best. The secret of success lies in understanding what customers need rather than what they want. This enables customer benefits to be prioritized and ensures that solutions are delivered at a cost that is affordable to both service providers and customers (see Figure 5.10).

Land Registry is mindful of the market in which it operates. Favorable treatment was an accusation levelled against Land Registry by customers fearful of losing market share. To mitigate against distortion of one sector of the market in comparison to the others, Land Registry's release schedule was done deliberately over many years and Land Registry was and is prepared to abandon prototypes or proposed services that do not prove popular with customers. It refines new services with the help of customers eager for service enhancements. Land Registry never mandates the use of any new service, believing that "if a service is good, people will want to use it. If it is bad, they shouldn't be made to."

FIGURE 5.10 Lessons learned—put the customer at the heart of everything you do



Land Registry's next business strategy will build on the successful approach of engaging and testing it has used to date, and will include a complete overhaul of its IT systems to take on new datasets, cope with rising demand from a growing number of customers requiring land-related information, and provide even greater security to protect against property fraud.

The strategy is to grow the range of information held by Land Registry, and release as much as possible to customers free of charge, compliant with the Data Protection Act, while encouraging the re-use and exploitation of that data by others in the market. Some data will only be issued under license and will be chargeable and the income from chargeable activity must be sufficient to fund the release of increasing volumes of free data.

To conclude: Land Registry has come a long way over several decades; in the process it has gained experience in how to engage with customers, adjust to new demands, and initiate innovations, but cautiously and incrementally to minimize risks of disruptions or even failure. Land Registry is reaping financial, operational, and reputational benefits and will continue to develop transformational programs to derive even more benefits and greater efficiency in the future.

CHAPTER 5 REFERENCES

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