eBook: Real Estate Registration and Cadastre. Practical Lessons and Experiences

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Key words: Cadastre; Land management; Professional practice; Tenure Security

SUMMARY

This is a summary on the paper: eBook: Real Estate Registration and Cadastre. The presentation of the eBook at the FIG 2021 e-Working Week aims to raise awareness about the book and how it can be used, share lessons learned and to look forward, as the new challenges, such as covid-19 pandemic, create new opportunities. Some countries managed to respond fast to the new health, social and economic challenges, while others were left behind and the existing gaps became even bigger.

Practical Lessons and Experiences. Following requests from a number of fellow professionals, an eBook entitled Real Estate Registration and Cadastre. Practical Lessons and Experiences" was drafted and made available for free on the website **https://gadlandreg.com** in February 2020. It has been reviewed and frequently downloaded by almost 2,500 different people from 118 different countries so far. The book focuses on practical experiences in projects - establishing, and making sustainable, real estate registration and cadastre systems in countries that needed to make changes or to establish their systems for the first time.

The intended audience is those who would lead or be involved in such projects or programs, including senior staff in government agencies and team leaders from financing partners or bilateral donor agencies and consultants (local or international) working in the sector. The eBook can be used as the basis for training, taking one chapter at a time, or for a workshop lasting two or three days, or just for reading about experiences and lessons learned in other projects and programs. The eBook gives the reader a good basis to 'do it yourself' rather than wait on multiple visits by foreign visitors – something that is increasingly more difficult in the current times.

Recently the RICS invited the authors to produce a shorter version as an 'Insight' paper that builds upon the knowledge, understanding and wisdom found in the eBook. Dictionary.com refers to: 'knowledge' as an acquaintance with facts, truths or principles; 'understanding' as the comprehension and personal interpretation of the knowledge; 'wisdom' combines knowledge and understanding with just judgement as to acts; and 'insight' as seeing into the inner character

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or the underlying truth. 'Insight' requires an accurate and deep understanding. Much of the content of the eBook provides the required knowledge and wisdom, including much of the basic theory, many empirical examples and a detailed annex with a literature review.

You can access the book here: https://gadlandreg.com

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1. INTRODUCTION

Why is it that many countries progress socially and economically, while others seem to languish in poverty and disorder? Some countries have vast amounts of natural wealth (such as the oil and mineral reserves of Venezuela and Nigeria), yet the benefits are not apparent to the majority of the population.

There are many excellent examples where improved property registration systems have contributed towards improving the economic and social wellbeing of the population. In those countries that have established and maintained successful real estate registration systems, the improvements are usually part of a bigger national reform aimed at improving the economy, eliminating corruption and improving the wellbeing of the population. The leadership from the government at a senior level is crucial. Although establishing an effective cadastre and registration system will not make the economy work and provide social benefit on its own, the failure to have such systems makes it much more difficult to improve economic development and social cohesion.

Clearly there are other, probably more important, issues that keep many countries poorer than they need to be, such as war and internal conflicts, a lack of the rule of law, corruption, dictatorial rule or mafias, but the lack of secure property rights and a registration system that helps government to manage land effectively and facilitates the use and benefits to society is a key issue. The covid-19 pandemic not only created new challenges to all countries, but deepened the pre-covid-19 existing challenges.

Secure tenure is linked to multiple Sustainable Development Goals, such as SDGs 1, 2, 5, 12, 15, 16. It is a fundamental safety net and basis for empowerment for vulnerable women and men around the world. It's an essential precursor to many land-based climate change mitigation and adaptation strategies, an enabler of food security, the basis for infrastructure and economic growth. The clock is ticking and the little time left till 2030 to achieve the global objectives requires sharing good practices, lessons learned and working together.

Following requests from a number of fellow professionals, an eBook entitled *Real Estate Registration and Cadastre. Practical Lessons and Experiences*", drafted by Gavin Adlington with contributions by Rumyana Tonchovska, FAO of the UN, Tony Lamb and Robin McLaren was made available on the Website *gadlandreg.com* in February 2020. In the following several months it was shared or downloaded by more than 2,400 different people from 118 different countries.

This book is not a typical treatise, text or explanation of the subject of real estate registration and cadastre. The book focuses on practical experiences in projects establishing, and making

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sustainable, real estate registration and cadastre systems in countries that needed to make changes or establish their systems for the first time. In the words of Professor Peter Dale, who wrote one of the forewords: *"As in many areas of professional activity, there is theory and there is practice. The former tends to be based on the ideal, or what is assumed to be, while the latter deals with hard facts and reality and is the starting point for this book."* It is a description of the key things to consider when trying to reform, establish or renew such systems. It is written by practitioners who have been involved in dozens of projects and programs in multiple countries.

The intended audience is those who would lead or be involved in such projects or programs, including senior staff in government agencies and team leaders from financing partners or bilateral donor agencies and consultants (local or international) working in the sector. The book can be used as the basis for training, taking one chapter at a time, or for a workshop lasting two or three days, or just for reading about experiences and lessons learned in other projects and programs.

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The nine chapters of the e-book can be logically split as follows:

Chapter 1 *The purpose of these training materials – an introductory chapter* explains why real estate registration is important from an economic and social perspective and what such systems look like and achieve. Chapter 1 also addresses the key considerations when implementing projects within the sector.

Chapters 2-5: These chapters provide the overall considerations and lessons for preparing, implementing and managing a project that is geared at reforming the sector.

- Chapter 2 *Know Your Country, Know Yourself and Know Your Team*
- Chapter 3 *Preparing a Project or Reform*
- Chapter 4 *Implementing the Project of Reforms – the 9 C's*
- Chapter 5 *Project Management and Institutional Development*

Chapters 6-8: There are three key technical elements in any project to introduce or reform a registration or cadastre system: the law and property rights; the surveying and property boundaries; and the computer systems that ensure the registration and cadastre system functions well in the modern environment. Thus, three chapters written by the specialist in these specific fields are included.

- Chapter 6 *Legal Framework*
- Chapter 7 *Boundaries and Cadastral Survey*

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There are three Annexes to the eBook. The first will be extremely useful to the reader as it provides a good list of books and other available resources and reading materials together with a description of what is in those books and documents. The other annexes provide a glossary of terms and a list of the projects involving registration of property rights that the World Bank have been involved with during the last 24 years. Most of the practical examples and lessons learned in the eBook come from these projects.

The presentation of the eBook at the FIG e-Working week aims to raise awareness about the book and how it can be used, share lessons learned and to look forward, as the new challenges, such as covid-19 pandemic, created new opportunities. Some countries managed to respond fast to the new health, social and economic challenges, while others left behind and the existing gaps become even bigger.

2. THE PURPOSE OF THESE TRAINING MATERIALS (CHAPTER 1)

Chapter 1 focuses on why it is important to register property at all. In fact, land is fundamental to our very existence because there is nothing that we do that does not rely on having access to and use of land – whether it is for having somewhere to live and protect us from the elements, somewhere to grow our food or to acquire the wealth found by exploiting the minerals, precious stones or the life within the earth or the waters that cover it. Even the labor for which we are paid, and the wealth created from companies in the financial markets rely ultimately on access to land and utilizing it efficiently.

As it is such an important commodity it is important for any government and society to keep a good record of land ownership, occupation and land use.

Real estate is registered for two good reasons:

– **governments need to know who lives where and who owns what** so that they can manage land resources optimally and for taxation purposes, providing income to help run the government. We often focus on the 'tax' part, but a good government needs to know who lives where and who owns what so that they can provide the services that are needed to society, such as garbage and sewerage disposal, provision of utilities, locations of schools, transport networks, social services and hospitals, etc;

– **the business community and people in general need to know with clarity who lives where and who owns what** so that they can be secure when buying, selling, leasing, mortgaging or otherwise dealing with real estate. This is needed both if you want to stay on the land and not be removed by some other person or group (*for tenure security*) and if you want to deal with the real estate safely and securely for business purposes or to change habitation.

The link between real estate registration and economic growth has been made for many years, with The Economist of May 29, 2003 stating that "land and property markets, including construction, may contribute as much as 15 per cent to GDP in a developed economy". In the UK there is approximately US$5 trillion in the value of housing and US$2 trillion in the value

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of commercial properties. The web site of National Association of Home Builders estimates that the contribution from housing is15-18 per cent of GDP taking into account, professionals working in the real estate sector and various rents etc. This probably rises to over 20 per cent when commercial property is included. Mortgages registered at the Land Registry in England and Wales amount to over US$1.2 trillion. (Land Registry Business Strategy for 2017 to 2022). This is a huge amount of investment that has an enormous impact on the economy as a whole and for many countries the driving force for implementing a project is the economic benefit that is expected. However, experience has shown that project involving the registration of real estate rights will have the greatest impact on the overall economy if it is part of wider economic reforms.

A focus on the economic impact of recording property rights can have unintended negative consequences if the impact on the poor, indigenous or customary right holders is insufficiently protected. A project can help those in rural communities or in informal or sub-standard housing areas, and it can encourage and facilitate the development of small businesses in those communities if there is a well-designed program to do so. It can have an impact well beyond the immediate need to clarify real estate rights and promote the real estate market to operate if it is completed as part of wider reforms aimed at improving the lives of the poorer members of the community. When analyzing the results of projects, it is important to gather information about the impact and benefits to people, other than just giving them certificates. This is required for political support and justification of the large amounts of money that will have been spent.

Chapter 1 of the eBook is primarily an introduction laying out some of the history behind the process of registering property rights and the key considerations and impacts from the economic perspective and the social perspective. It is the foundation and background needed that leads into the subsequent chapters that get into the specific issues to be addressed, the examples and stories about successes, including the important lessons learned in practice. Although the projects are usually very challenging, they can be highly beneficial if implemented correctly taking into account all the lessons learned and described in the e-Book.

3. OVERALL CONSIDERATIONS AND LESSONS FOR PREPARING, IMPLEMENTING AND MANAGING A PROJECT (CHAPTERS 2-5)

Chapters 2 to 5 of the eBook are key for the project managers. The technically interesting chapters follow later in the eBook, but it is important to realize that no matter how good the lawyers, surveyors, IT specialists and GIS team members may be, it is the project manager that will ensure that the overall objectives of the project are met. The objective of a project is *NOT* to register property rights. The registration of property rights is a means to achieving certain outcomes. Ultimately the citizens of a country want to see improvements to their standard of living, where there is peace and social stability and good use of land for their wellbeing and their descendants. Thus, the impact of projects on the good use of land and prevention of the abuse that may lead to pollution, erosion and adverse climatic influences must be taken into account. It is important that all feel that their land rights are secure and that the public trust the systems in use whether they are rich, middle income or poor. Also, whether they have customary rights or are indigenous inhabitants; or whether they are female or elderly or minors or vulnerable in some other way. Important outcomes may also include seeing real estate

markets expand, inheritance being more secure, investments using land as collateral increase, government revenues increase and better governance through integrated land systems. The project manager has to keep all of these factors in mind, while they work out how to understand the country context and history, the individual people that are involved and what is achievable in the current political economy. The chapters also address the skill sets needed by project team members, institutional arrangements and how they work and the importance of *knowing what you don't know* as well as what you do.

When actually running a project, there is a simple rule of the 9 'C's. Take these into account and it will make sure that you don't miss out on key factors:

1. The **Champion** within country is by far the most important. If he or she is dedicated and making the changes needed, then the prospects for success are very high. If there is no Champion, it requires much more effort in project management, and it is much more difficult to get the best results.

2. **Corruption** is by far the biggest problem to solve. It is very likely that there is corruption within the sector, even if it is not admitted or talked about. There are various signals that can identify corrupt practices and some straightforward, practical responses to eliminate or reduce them.

3. The **Customer** is the most important person. Customers are the prime beneficiary and only if a system is functioning efficiently will people actually trust and use the system, and thus the economic and social benefits accrue to the country.

4. **Computing**, or rather Information Communications Technology as a whole, is a fundamental requirement in any modern system. The complexity, cost and time to complete systems is nearly always underestimated and failure rates are very high. A separate chapter is dedicated to this very important topic.

5. **Consultants** are utilized in most projects. There are common mistakes made as reports are too long and address problems rather than solutions. It can be difficult for the consultants because they have two masters – one is the company or development agency hiring them and the other is the government counterpart. This section focuses on ensuring that the consultant performs as required and that the right person is hired in the first place.

6. **Cadastral survey** is required in any project because the boundaries of land parcels (or property units within a land parcel) must be uniquely identified. The question then arises to what level of precision or accuracy?

7. **Communications** should be an integral part of any project and be appropriately funded. The use of good advertising, public awareness activities, slogans and distinctive brands and uniforms can all help. If members of the public remain unaware and do not participate in projects or use the system, it will fail.

8. **Capacity Development** of the stakeholders involved in registration and related fields is necessary to ensure sustainability. Initially the existing institutional and private sector capacity must be examined, and a human resources strategy developed for the new

institutions. Training needs for the institutions and the private sector are then developed. Academia should be engaged in this process.

9. **Continual adaptatio**n is key. A successful project should lead towards the establishment of a sustainable efficient organization that no longer needs outside support.

4. LEGAL FRAMEWORK (CHAPTER 6)

There are various challenges that lawyers will encounter when attempting to develop the legal framework for a more efficient and effective registration system. The insights for anyone undertaking this task are:

- Do your due diligence in advance of your first visit to a country. Find, read and assess all the relevant laws.

- Get a local lawyer to help. Local knowledge will not only make the review and drafting processes quicker, it will save you from embarrassment. A local sociologist might also be helpful, particularly for non-urban areas.

- Consider not only what the laws say but what they don't say – what is missing. This is often the hardest thing to do. You can only identify what is missing if you know in advance what the laws should say. So make a list of the main points that need to be addressed before you start reading the laws.

- Start with the constitution (obviously) and see how you can work within its parameters. Then review the other land related laws and also the laws of general application, such as civil law, family, divorce and inheritance laws. Once you have looked at the major laws, then move on to laws of relevance, such as those on electronic communications and IT, gender and archiving.

- Take extra care where there are multiple legal systems. Sometimes, there are laws and ways of legal thinking inherited from previous regimes and these can influence or restrict what you can do. This is another case where doing your homework before you start discussions and drafting is essential.

- In developing the legal framework, try to work with what you have at first, while at the same time working on substantial reforms (if they are necessary) that will take time to be considered and adopted.

- There are plenty of materials around on how to deal with legal issues and draft laws well. You just need to look for them. No need to re-invent the wheel. However, it is extremely rare for published materials to be fully applicable to a new situation so no matter how good the existing materials are, their advice needs to be applied to your situation with great care.

- There will be many contentious topics, such as parcel area discrepancies, dispute resolution, corruption opportunities, gender issues, customary and/or informal rights. So expect many arguments and discussions, which are often time-consuming.

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- Don't forget the transitional and consequential provisions in a law. These are commonly left to the last minute or completely ignored, but transitioning from one system or approach to another can often throw up serious problems and loss of legal and/or economic rights. You need to think through the consequences of the changes and make provision for them accordingly.

- Reality check the draft with people who know how the system works or should work. And focus on the more common cases, not the unusual or unique cases. Although the unusual cases are more interesting, they are by definition rare. Better for the law to provide for the most common cases and then make special provision for rare or unusual situations, including by policies or procedural approaches.

- Try to draft the regulations in parallel with the new law or amendments so that nothing is missed and you do not lose valuable time. Keep a list of items that need to be addressed in the regulation and add to it while you as you are drafting the law.

- Expect up to three iterations of the law to be adopted before it takes a final form. It is very rare for laws on major reforms to get everything right at first.

- There is no single best way to do something, so have an open mind. Just because you do something in a particular way in your country does not mean it is the best or the most appropriate way to do it in another country. Challenge your own ways of doing things by asking what would work most successfully in the country where you are working.

5. BOUNDARIES AND CADASTRAL SURVEY (CHAPTER 7)

Boundaries, boundary markers and surveys have been necessary for identifying properties and their ownership for centuries. *The primary purpose of describing or surveying a boundary is so that the location of that boundary can be found when someone is unsure of the extent of the land (such as a new owner) or there is a dispute.* From earliest days, deeds that record transfers of ownership always included a description. This is sometimes in simple terms such as the name of the property or its address, and sometimes by 'metes and bounds', where the 'metes' specify the distance and direction of a boundary and the 'bounds' describe the boundary itself or the abuttal with someone else (e.g. running along the main road or adjacent to the field owned by Mr X). It is now more usual for a registered plan to be included, with reference to markers that exist at corner points and/or coordinates of the corner points. If the boundary is physical, such as a wall, fence, stream, tree line or hedge, it is usually only necessary to be able to relocate that feature. If the neighbors are satisfied about the location of the boundary then it is counterproductive to start telling them that the boundary is elsewhere or that they must specify precisely where that boundary lies – to the centimeter. In fact, most courts around the world consider the commonly accepted locations and evidence from the community as more important than coordinates or lines found on drawings and plans.

Boundary surveys are just one task in support of a person's need to ensure that their legal rights in a registration system are protected. The survey is not an end it itself, it is required for a specific purpose in support of a legal need - or sometimes the need for a taxation or a planning program. The chapter of the e-Book looks at the history of measuring boundaries and the

equipment used. It includes examples and stories that illustrate the need for the levels of precision and the improvements over time. The survey usually does not usually need to include topographic detail and must be 'fit for the purpose' of the task it is supporting (protecting a person's legal rights), taking into account the costs, time and funding available. Systematic mass registration programs organized by governments covering millions of properties will require different methods and approaches than individual boundary surveys or surveys for land development projects requested by a private client.

There have been four main revolutions in the way to measure property boundaries. The original simple methods using ropes, lines of sight and measuring rods were replaced with more accurate and precise methods using equipment that was invented in the early nineteenth century and gradually improved over the next 100 years. These were replaced for mass systematic survey by aerial photography for registration purposes after the Second World War, and then by Electromagnetic Distance Measurement (EDM) and angle measurement devices (later combined in 'total stations') for individual surveys in the late 20th century. The use of GNSS[1] systems has been prevalent in the 21st century for both systematic and sporadic registration programs and the latest technology using drones and LiDAR is coming into much greater use as we write. High resolution satellite imagery is now readily available and provides adequate information on boundaries for most purposes. The next phase is likely to be simply 'walking the boundary' with tablets or mobile phones that have accurate GNSS systems and high resolution imagery built within them.

With modern technology the measurement itself is a relatively simple exercise that can be completed by someone with minimal training – school leavers take to recording properties on a tablet, pressing the buttons for a GPS coordinate and recording the necessary details after a few weeks training. In fact the question arises: now surveying work is so simple, *why do we need licensed surveyors at all?* It is more because of history and the fact that old surveys used old technology, and it is necessary to have someone who can understand this and how errors occurred as old surveys are matched with the boundaries seen on the ground and the evidence from the interested parties. The licensed surveyor should also understand the law, appreciate how to adhere to town plans and other legal requirements when preparing plans showing property boundaries and any relevant easements. Their role to measure can be delegated to lower grade technicians, but their overall tasks dealing with disputes and ensuring that legal requirements are met cannot. We may need far fewer of them, but they will be required for some time to come. **Gavin**

6. IT SYSTEMS FOR CADASTRE AND PROPERTY REGISTRATION (CHAPTER 8)

This chapter of the book provides some tips to consider at the time of a new systems planning, design, development and implementation, and issues related to sustainability and the use of emerging technology.

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[1] Global Navigation Satellite Systems – such as GPS

It is often challenging to implement an information technology (IT) system for property registration and cadastre and there are many lessons which have been learned. The World Bank investments in IT for property registration and cadastre in their Europe and Central Asia region exceeded US$ 900 million over the past 20-25 years (56 per cent of the overall investments in land projects in that period - US$ 1.6 billion). Innovative technology contributes to better governance of land tenure through improved services from efficiency, effectiveness, transparency, support the decision making process in responses to natural disasters, including the covid-19 pandemic, limiting opportunities for corruption, improved accountability, accessibility, equity and cost perspective, making those services more affordable for all.

Nowadays, the available technology can generate huge amounts of data in a short period of time, which previously would have taken a year or longer. Computing capacity and cloud technology are increasing, connectivity is improving. However, establishing a well-functioning IT system has never been an easy and straightforward process. There have been tears and unhappy people following the very frequent failures in system development.

The implementation of property registration and cadastre IT system often fails in terms of delivering in the defined time and scope or does not provide the benefits. IT is just a tool - people are trying to replace one technology with another or try to automate the manual processes, assuming that it will be easier, quicker or simpler than it really is. Hard as it may be to go through the specific necessary stages of implementation and ensure that the right people with the key skills are involved, including high-level champion, business and IT experts and an independent quality assurance and control, is essential if you want success. Data digitisation and data quality are issues that have to be dealt with in parallel with the IT system development. System interoperability with other key registers has to be planed from the beginning and international and national standards should be considered, such as ISO 19152:2012 Geographic information — Land Administration Domain Model (LADM).

Even if the system is implemented successfully, the next difficulties are waiting for you – how to keep the system running after the project is closed? System sustainability is an issue and has to be planed from the beginning: network, hardware, licences, capacity development, help desk support, system maintenance and further development. What could the role of the private sector here?

Key Messages:

- – Political will is critical. You need a champion at the high level.

- – Technologies are available. Think about services and data first.

- – Fit-For-Purpose – the most complicated IT system does not always bring the change needed.

- – Think Big-Act Small. Adopt a step-by-step approach.

- – Establish a clear management and reporting mechanism.

- – Plan support for IT contracts management and independent quality assurance and quality control.

- – Adopt a national data model standard for property register, based on LADM.

- Adopt a modular approach – no need to wait until the whole system is ready.
  - Plan sufficient funding for IT training together with legal and procedural training. The IT training alone does not bring the results, as people may not be familiar with the new workflow.
  - Plan measures to deal with the cybersecurity, personal data protection and intellectual property rights in parallel with access to data.
  - Plan to establish a sustainable business model before the system is fully implemented.

7. LAND INFORMATION SERVICES (CHAPTER 9)

Land Administration agencies have traditionally been at the heart of initiatives to facilitate comprehensive Land Information Services (LIS) that provide interoperable information about all aspects of land and the marine environment to support an integrated approach to land management and ensure the sustainability of land and marine environment within a country. This will then drive evidence based policies and decision making and provide knowledge and insights and not just data. LIS have a key role in delivering good land governance and sustainable development.

Sound land governance requires a legal and regulatory framework, operational processes and capacity to implement policies consistently within a jurisdiction or country in sustainable ways. In this regard, land administration systems and associated LIS provide a country with an infrastructure for implementing land policies and land management strategies in support of sustainable development.

This chapter focuses on experiences in designing and implementing LIS and the underlying land information infrastructure. LIS are complex and particularly difficult to implement due to the wide range of interoperable land information required, and the diverse set of stakeholders involved in creating and managing the land information. Many LIS initiatives have failed by being too ambitious in the early implementation phases, not adopting a sustainable business model and not having sufficient political support to mandate data standards and to build effective partnerships across the public and private sectors.

John McLaughlin presented "Towards a National Spatial Data Infrastructure (NSDI)" at a conference in Ottawa in 1991. This triggered the LIS era with early implementations in Australia and Canada providing the foundations for many subsequent National LIS worldwide.

There are two basic approaches that have been adopted in developing LIS. The most common approach simply creates land / geospatial data and hopes that the data will be used by the public and private sectors and information services will emerge. The subsequent development of information services is ad hoc and not always successful. The alternative approach is to drive the development of the data and services within the LIS to support priorities for government land policies and market needs. This much more focused approach generates greater political support and funding, raises the profile of the LIS initiative, is not too ambitious and is generally

more successful and sustainable. Selling the LIS concept within a country requires politicians and senior decision makers to be convinced of the benefits of the investment.

This chapter of the book provides guidance on how to successfully implement a LIS, including governance arrangements, unlocking and sharing data, key registers, building partnerships, thinking beyond data to services and insights, ICT infrastructure, financing a LIS, developing a value proposition, baselining the current situation using a diagnostic tool, and capacity development.

The key insights of the lessons learned in implementing LIS include:

- The development of a LIS must be driven by user needs and the most effective way is to drive the development of the data and services within the LIS to support priorities for government land policies and market demand. This focused approach generates greater political support and funding, raises the profile of the LIS initiative, is not too ambitious and is generally more successful and sustainable.

- A key success factor in implementing a LIS is ensuring that the underlying data are fit-for-purpose, findable, accessible, interoperable (comply with agreed national standards), reusable, affordable (open data, where possible) and maintained. Only then can innovative, land information services be built from a diverse set of land / geospatial data. Too often projects fail or are seriously delayed due to inadequate data or insufficient budgets to support data improvement and maintenance programs.

- Several countries have initiated and driven their LIS initiatives through the creation of what are termed 'Key Registers'. These interoperable registers include information about individuals, businesses, real properties, buildings and addresses, for example, and underpin a wide range of public services and business applications. These have been very successful and delivered significant benefits.

- Designers of LIS should support the concept of applications / services that lead customers (citizens and professionals) through a business process and provide them with answers and insights rather than expecting them to perform the analyses themselves using geospatial data.

- Selling the LIS concept within a country requires politicians and senior decision makers to be convinced of the benefits of the investment. However, land professionals normally use a very technical professional language that is quite different from political speak. Therefore, it is recommended that economists form part of the LIS team to conduct robust socio-economic analyses, create strong value propositions and use the appropriate language to convince decision makers.

8. CLOSING REMARKS

You can't change the world, but you can change that little bit of the world that you are in contact with. If others do the same, then together we can change the world.

Joe Parker. Colleague and Lecturer, Borehamwood College of Higher Education, 1975

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The authors would like to convey the message that it would be possible to add other chapters to the eBook, but these require different authors, for example: the social impact – including impacts on vulnerable, indigenous or otherwise disadvantaged groups; capacity development and training programs; real estate market development, providing financing or credit for smallholders and small enterprises; land economy and valuation; local government and other influences on land use, planning, address systems, etc.; state land management; property related issues to climate change, natural disasters and responses to crises, such as covid-19 pandemic.

You can access the book here: **gadlandreg.com**

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Gavin Adlington – MSc, Cert Ed, FRICS. Over the years Gavin Adlington has developed a unique breadth of knowledge and a deep understanding of all matters relating to land registration and cadastre systems, especially with regard to the successful implementation of projects involving mass systematic registration of title and the establishment of institutions that can successfully manage real estate registration and cadastres. He has worked in 46 countries on projects in this sector and visited another 20 in order to assess their operations. He has worked primarily for the World Bank through the last 20+ years of his career, eventually becoming the global lead specialist for land and geospatial matters worldwide for the World Bank. He retired in 2015 but has since then continued to work as a consultant in the same sector.

Tony Lamb – BA, LLM, MDR. Following specialisation in property law at university, Tony began work as a legal officer at the New South Wales, Australia Land Titles in 1989 and was engaged in document registration, property litigation, drafting of new laws and regulations, and providing education and advice to the public and professions. During that time, he completed a masters degree in dispute resolution and instituted a program for resolving contentious cases, including in relation to boundary disputes. In 1995, while still with the Land Titles Office, Tony began providing technical assistance, first in Laos and then a series of other countries. Since then, he has worked in over 30 countries worldwide, having left the government in 2005 to concentrate on consulting. His work in Laos in the late 1990s formed the basis of a Master of Laws degree, for which he won the university medal. His work with the World Bank, UN FAO and other organisations over the years has formed the basis for a variety of publications, several of which are cited in this book. He also co-authored the zero version of the Voluntary Guidelines on Governance of Tenure.

Rumyana Tonchovska, M.SC, is a Senior Land Administration-Information Technology Officer of the Food and Agriculture Organization of the UN (FAO), based in Rome. Rumyana holds a Master's Degree in Information Technology with practical experience in 26 countries in Eastern Europe, Asia and Africa in design, development and implementation of largescale complex information systems for land tenure, indirect finance and building Spatial Data Infrastructure. Before joining the FAO in 2009, Rumyana worked as UNISYS Senior Project Manager, IT Director at the Bulgarian Ministry of Justice, Head of the EU Funded Program Department at the Bulgarian Customs Agency (Ministry of Finance) and assistant professor at Technological University in Sofia. Rumyana is leading various innovations to test new approaches and technologies, aiming at improving tenure governance, making best use of the available geospatial data and technologies, and building local capacity for evidence based policy making. She has been actively involved in the development of the Integrated Geospatial Information Framework and its implementation at country level.

Robin McLaren is director of Know Edge Ltd, a UK based, independent management consulting company formed in 1986, specialising in the application of geospatial information, and is a prominent consultant in land administration. He has been at the forefront of the GIS revolution and is recognised as an expert in Spatial Data Infrastructures and Land Policy. He

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works extensively with United Nations agencies, World Bank and EU on land policy / land reform / NSDI programmes and is on a mission to ensure that Land Professionals are delivering appropriate land administration services to the citizen. He was the lead consultant in formulating the UK Location Strategy. The company has also supported Canada, Western Australia, Hungary, Romania and Albania in establishing their NSDI strategies. Robin is an Honorary Fellow at the School of GeoSciences, University of Edinburgh where he teaches. His research interests are focused on how crowdsourcing can be used to support land administration. He has co-authored the GLTN publication on 'Fit For Purpose Land Administration: Guiding Principles for Country Implementation' and most recently drafted the 'Strategic Pathway 3 Finance' of the Integrated Geospatial Information Framework Implementation Guide published by UN-GGIM in 2020.

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