

A Framework for Benchmarking Land Administration Systems

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Key words: Land Administration System, Benchmarking, Performance Indicators.

ABSTRACT

Currently there are no internationally accepted methodologies to measure and compare the performance of land administration systems. This is partly because land administration systems are in constant reform, and probably more importantly, they are part of the different national identities representing the societies' perceptions of land. This paper describes a research project, which aims to develop a framework to measure and compare the performance of land administration systems. The research is of particular relevance since it develops a management model which links the operational aspects of land administration to the strategies on policy level, which increasingly focus on sustainable development. This research project (2000-2003) is being carried out at the Department of Geomatics of the University of Melbourne, Australia with sponsorship from Land Victoria, Government of Victoria, Australia and from the University of Melbourne.

ZUSAMMENFASSUNG

Auf internationaler Ebene gibt es bisher keine anerkannten Methoden, um die Leistungsfähigkeit von Landadministrationssystemen zu messen oder zu vergleichen. Der Grund liegt teilweise darin, dass Landadministrationssysteme einerseits in ständigem Wandel sind, und wahrscheinlich wichtiger noch, dass sie Teil einer nationalen Identität sind, die sich u.a. in der unterschiedlichen Wahrnehmung von Land ausdrückt. Dieser Artikel beschreibt ein Forschungsprojekt, das die Entwicklung einer Methode zum Ziel hat, die Leistungsfähigkeit von Landadministrationssystemen zu messen und zu vergleichen. Das Projekt entwickelt ein Management-Modell, das operationelle Aspekte von Landmanagement mit Strategien auf politischer Entscheidungsstufe verbindet, die zunehmend auf nachhaltige Entwicklung ausgerichtet sind. Dieses Forschungsprojekt (2000-2003) wird am Departement für Geomatik an der Universität von Melbourne in Australien durchgeführt, mit Unterstützung von "Land Victoria" (Regierungsbehörde von Victoria, Australien) und der Universität von Melbourne.

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1. CONTEXT AND BACKGROUND

1.1 FIG Context

Benchmarking land administration systems became an issue during the work of FIG-Commission 7 in the period between 1994-1998. Working group 1 was looking at visions where cadastral systems might be in 20 years' time and thus produced the booklet "Cadastré 2014 – A Vision For A Future Cadastral System" (Kaufmann and Steudler, 1998). Under the leadership of working group 1, a first attempt to collect data and figures from more than 50 countries has been undertaken in 1997 (Steudler et. al, 1997). As a result of this work, it became apparent that monitoring and comparing systems with each other would be essential for improving and further reforming national systems. As a result, the new focus of working group 1 of Commission 7 for the period 1998-2002 became "Reforming the Cadastre" with benchmarking as a key issue. For the annual meeting of Commission 7 in 2001, a standardized country report had been established and replies of 13 countries were included in the final report (see web site of working group 1: www.swisstopo.ch/fig-wg71).

1.2 Land Administration Background

Land administration systems and their central cadastral component are increasingly evolving. Not only were traditional cadastral systems slow in responding to the changing needs of society (Dale and McLaughlin, 1988), but also the relationship of humankind to land is more dynamic. This tendency can also be observed in the resolutions of the successive FIG efforts: the FIG "Statement on the Cadastre" (1995), the UN-FIG "Bogor Declaration" (1996), the "Cadastré 2014" (Kaufmann and Steudler, 1998), and the UN-FIG "Bathurst Declaration" (1999).

Ting and Williamson (1999) identify different phases in the humankind to land relationship depending on the different rates of development of countries. They established a cumulative model of cadastral developments: (i) land as wealth, (ii) land as commodity, (iii) land as scarce resource, and finally (iv) land as a scarce community resource. They conclude that "each of these phases in the humankind/land relationship elicited a corresponding layer of complexity in the function of cadastral systems from a simple record of ownership and fiscal tool, to a cornerstone of land markets and then increasingly detailed land-use planning"; and that "the world is at different points in the continuum. Many developing countries are only just establishing more formal cadastral records for fiscal and also land market purposes... while ...western nations are rushing to create multi-purpose cadastres that take a community approach to sustainable development issues whilst maintaining private ownership."

Cadastres are evolving into broader land administration systems addressing a diversity of issues, ultimately supporting not only land ownership and land markets, but in a more global perception also sustainable development.

1.3 Research Project

On the basis of this above-mentioned context, a four year research project commenced in April 2000 at the Department of Geomatics at the University of Melbourne, with this paper describing the current state of the research. The authors spent several months at the World Bank in Washington DC in late 2000 exploring this research topic.

2. DEFINITIONS AND BENEFITS

2.1 Definition of Land Administration

For the purpose of the research project, a definition of land administration was adopted. In its "Land Administration Guidelines", the UN-ECE (1996) defines land administration as "the processes of determining, recording and disseminating information about the tenure, value and use of land when implementing land management policies. It is considered to include land registration, cadastral surveying and mapping, fiscal, legal and multi-purpose cadastres and land information systems. In many jurisdictions, land administration is closely related to or facilitates land use planning and valuation/land taxation systems, although it does not include the actual land use planning or land valuation processes."

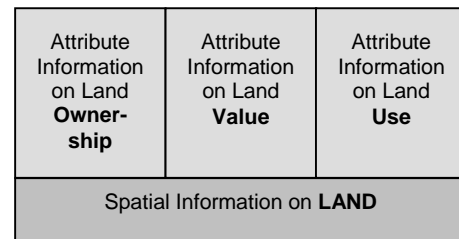


Figure 1: The four basic components of land administration.

The processes for the traditional cadastres – land registration and cadastral surveying – are often carried out by two separate professional groups in often two separate organizations. For the definition of land administration in this project, a fourth component has been added considering the spatial component as the one component underpinning the other three (see figure 1).

2.2 Definition of Benchmarking

Modern industrial benchmarking had its origins in 1979, when Xerox decided to examine its unit costs and to compare them with those of Japanese competitors. Xerox found that the Japanese competitors sold their products for the same amount that it cost Xerox to just produce them. Camp (1989) later established a widely recognized reference for an industry standard for searching for best practices and establishing benchmarking procedures.

The benefits from benchmarking can be big in terms of improvements to processes such as service delivery, time taken to manufacture, warehousing or distribution. But benchmarking is not a one-time project; it needs clearly defined objectives and a long-term commitment by the top management. The AusIndustry-Best Practice Program (1995) accordingly defines benchmarking as "an on-going, systematic process to search for and introduce international best practice into your own organization, conducted in such a way that all parts of your organization understand and achieve their full potential. The search may be for products,

services, or business practices and for processes of competitors or those organizations recognized as leaders in the industry or specific business processes that you have chosen."

Other sources make plain references to benchmarking and its benefits:

- "You can't improve what you can't measure !"
- "If you cannot measure it, you cannot manage it !"

2.3 Benefits in Benchmarking Land Administration Systems

Land is one of our most valuable resources and the administration of this good deserves an optimized approach. As mentioned, no common standardized approach has been established so far in the international land administration community. But the benefits in benchmarking land administration systems can be extensive:

- Facilitating cross-country comparisons in land administration performance;
- Providing a basis for comparisons over time;
- Demonstrating strengths and weaknesses of land administration systems;
- Justifying why a country should improve its land administration system and identify areas/priorities for reform;
- Helping to draw links to other issues and sectors (financial, governance, environmental, social, etc.);
- Justifying an investment to improve;
- Monitoring improvement.

3. ELEMENTS FOR AN EVALUATION FRAMEWORK

3.1 The Four Evaluation Elements in NPM

The task of looking at different land administration systems and evaluating them against each other in a balanced and culturally non-biased way is not obvious (Williamson and Fourie, 1998). Some guidance can be found in "new public management" (NPM) developments that swept through government administration over the last decade.

In a World Bank Seminar, Baird (1998) emphasized four elements that are central in how to evaluate the performance of an organization or system, be it private or public:

- Well-defined **objectives** – to know where to go to;
- Clear **strategy** – to know how to get there;
- Outcomes: monitorable **indicators** – to know if on track;
- **Evaluation** of results – to gain input for improvements.

This schema can further be explained by the approach that has been taken in the cadastral surveying context in Switzerland, where NPM principles have been introduced over the last few years (Selhofer and Steudler, 1998). NPM principles have been introduced increasingly

within the Swiss Federal administration in order to overcome the shortcomings of the traditional input-oriented approach. With NPM, the Swiss Federal administration attempts to use a more output-oriented approach, emphasizing the products, performance, and outcomes rather than the input-oriented approach of using up the remaining budget at the end of the year.

Cadastral surveying was among the first areas where such principles were introduced, and the same four evaluation elements as mentioned above were at the core for re-organizing the financial and administrative relations between the Federal and local (cantonal) government levels. The Federal agency – being responsible for cadastral surveying – established

performance contracts with each of the 26 Cantons, which are responsible for carrying out cadastral surveying.

The performance contracts are based on a controlling system monitoring the results and outcomes by means of performance indicators.

The performance indicators are used to re-evaluate the

processes and targets every one respective four years in a periodical controlling cycle (see figure 2).

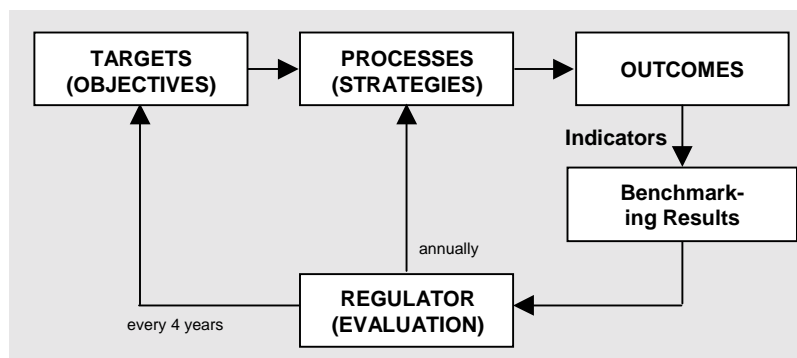


Figure 2: Basic controlling cycle for performance monitoring in Swiss cadastral surveying (Selhofer and Steudler, 1998).

The basic terminology in this performance monitoring system corresponds with the four evaluation elements above: the targets represent the objectives, the processes represent the strategy, while the indicators and benchmarking results provide the information for the "regulator", which is basically the mechanism to re-evaluate the objectives and strategies.

The relationship between the performance monitoring system with the four evaluation elements confirms and supports their use as part of the basic evaluation framework for land administration systems. In the context of land administration, the four evaluation elements might look at the following aspects:

- Objectives:** what are the defined objectives of the national land administration systems; what do they have to respond to from an economic, social and environmental perspective, and how are these objectives fulfilled.
- Strategies:** what are the chosen processes and what is the strategic approach that has been adopted to reach the objectives; what financial, organizational, structural and technical definitions have been established.
- Performance / outcomes:** what are the outcomes and what is the performance of the chosen processes and strategic approaches, and what are the effects.
- Evaluation of results:** how is the land administration system managing change; how are the objectives and strategies re-evaluated.

3.2 Three Management Levels

The above-mentioned four evaluation elements have a strong link with the three management levels, which are often used to define the different control levels within an organization. The policy level is responsible for deciding on the objectives that the organization wants to achieve and what resources are to be applied. The management control level is responsible for the reasonable and effective use of the resources and of setting up the appropriate organization and structure. The operational control level carries out the specific tasks as efficiently as possible.

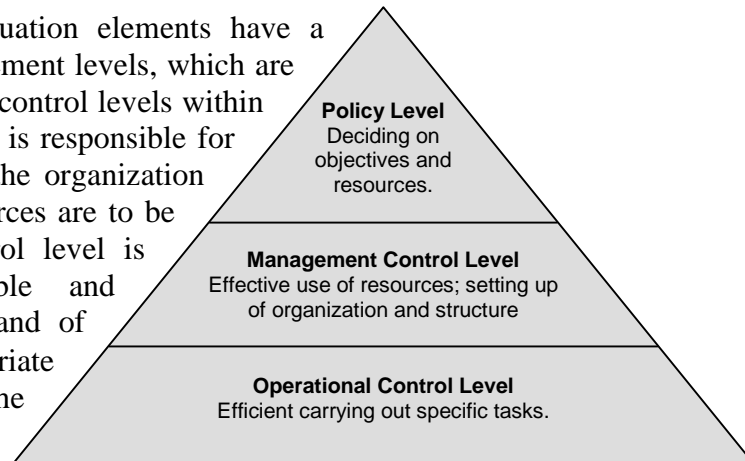


Figure 3: Three management control levels within an organization.

4. DEVELOPMENT OF A FRAMEWORK

4.1 Analogy to Accounting System

In a paper presented in Bogotá at the "1st International Seminar on Cadastral System, Land Administration and Sustainable Development", Kaufmann (2000) introduced a new perspective of how cadastres can be looked at in relation to land management and land administration. He makes the analogy that the cadastre – with its role of administering information on rights, restrictions and responsibilities on land and its resources – can be considered as a form of "accounting system" for land issues, ultimately supporting sustainable development. Like the accounting system of an organization or business, the cadastre has to follow certain rules and principles. For the cadastre, these principles have traditionally been to provide reliable and systematic information on land issues, primarily in support of land markets or land tax.

For sustainable development and land administration purposes, another principle of the accounting system has to be considered: the principle of adaptability. When there is a new project or a new client, the accounting system of a business-oriented company simply adds another account into the system. For land administration issues, very similarly, another layer or topic can be added to the cadastre, administering all legally binding issues (compare figure 4).

Level	General Business	Global Development
1.1.1. Strategic (goal setting)	Sound economic development	Sustainable development
1.1.2. Management (measures to meet Administrative business processes)	Company management Administrative unit	Land management, resource management Land administration
Operation (tools for documenting and monitoring)	Accounting system <ul style="list-style-type: none"> • accepted principles of bookkeeping • reliable • complete • appropriate to needs • adaptable to development 	Cadastre <ul style="list-style-type: none"> • accepted principles of documentation of rights/restr. • reliable • systemactic • appropriate to needs and laws • adaptable to development • public

Figure 4: Cadastre in relation to land management and administration (Kaufmann, 2000)

4.2 Structure for Evaluation

By taking this analogy a step further, the whole land administration context can be looked at in a more structured way, which may provide the basic framework for evaluating land administration systems. As Kaufmann argues, land administration as a whole can be regarded as society's task, as it is up to societies respective their governing bodies to look after and "take account" of their own land and related resources.

This "land business" can be considered to have the three management levels as mentioned above. It is however important to keep the actual land management and administration processes apart from the data/information processes. On the *policy level*, there would be "Land Policy" and "Land Information Policy" defining the rule of the law, the use and ownership of land, and how and what information is to be administered. The *management control level* includes "Land Management" and "Land Information Management" as the processes to manage the land resources and the related information. The *operational control level* then would include "Land Administration" as the functions involved in the actual implementation and the "Land Information Systems" for managing the data and information (compare figure 5).

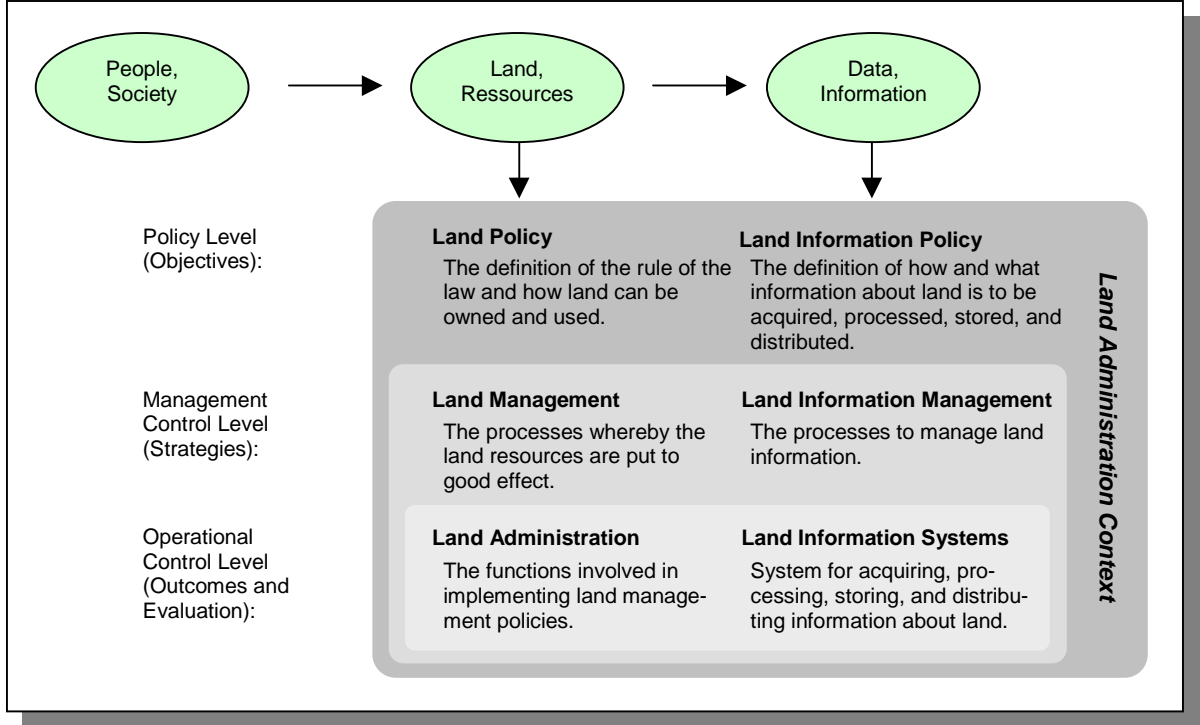


Figure 5: Management levels in the land administration context.

4.3 Areas and Examples of Indicators

Expanding the suggested structure in figure 5, the management levels can be regarded as the areas in which a land administration system may be evaluated. The evaluation could address the following issues:

Land Policy – if, how, and what economic, social, and environmental objectives are defined; how the land administration system is supporting sustainable development; and how it supports good governance.

Land Information Policy – would include issues such as the definition of data standards, privacy issues, access to data, and pricing policy.

Land Management – would evaluate the structure and organization of how land issues are administered, for example what rights are included in the registry system (bundle of rights), what government agencies are involved, if they are centrally or decentrally organized, and their efficiency.

Land Information Management – is the area where the organization and structure of land administration data is evaluated. For example what information is registered, how it is administered in a centralized or decentralized manner, what is the role of the private sector, is there a custodianship principle, and how are the users being served.

Land Administration – is the area where the financial input and return are evaluated, what efficiency (performance, reliability, timeliness) the system is providing, and what human and technical resources are involved. Indicators could for example be: total number of properties and parcels, number of disputes, annual number of transactions, time for transactions, cost and fees for transactions, etc.

Land Information Systems – in this area, the technical part of the land administration context are evaluated, for example how the information actually is administered. There may be big differences in the different countries in terms of fitness for use of the land information (paper vs. digital data, data exchange and distribution mechanisms), what human and technical resources are involved and what is the financial input and return.

5. DEVELOPMENT OF PERFORMANCE INDICATORS

For monitoring and comparing land administration systems with each other, indicators need to be developed that can represent the performance of the systems in each of the six areas within the land administration context. The development of performance indicators is however rather difficult, as many different understandings have to be brought into a common framework.

An approach that has been developed by Kaplan and Norton (1996) may provide some help. Kaplan and Norton recognized some weaknesses and vagueness of previous management approaches and introduced the "Balanced Scorecard" system providing a clear prescription as to what companies should measure in order to "balance" the financial perspective against other perspectives. They describe the balanced scorecard (BSC) as follows: "the BSC retains traditional financial measures. But they tell the story of industrial age companies for which investments in long-term capabilities and customer relationships were not critical for success." The BSC suggests viewing the organization from four perspectives and to develop indicators, collect data and analyze it relative to each of these perspectives:

- learning and growth** perspective;
- business process** perspective;
- customer** perspective;
- financial** perspective.

The BSC method might provide a methodology to assist in developing performance indicators for the six areas in the land administration context. However, further research is necessary before the approach can be used.

6. CONCLUSIONS

This paper describes an on-going research project that aims to develop a framework and methodology to evaluate and compare land administration systems with each other. The framework takes into account four evaluation elements of "new public management" and three management control levels. It considers the management functions of the land and its related resources separately from the management functions of the related data and information. As a result, it suggests breaking down the context of land administration into six areas, which for benchmarking would have to be looked at separately from each other. The method of the balanced scorecard then may lead to the development of key performance indicators in each of the six areas.

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The content of this paper is being used as a basis to prepare a journal article to be published in an international journal in the near future.

REFERENCES

- AusIndustry (1995). *Benchmarking Self Help Manual - Your Organization's Guide to Achieving Best Practice*. AusIndustry-Best Practice Program, second edition 1995, Australian Government Publishing Service, Canberra, ISBN 0 644 43110 5.
- Baird, M. (1998). The Role of Evaluation. In *Public Sector Performance – The Critical Role of Evaluation, Selected Proceedings from a World Bank Seminar*. Editor Keith Mackay, World Bank Operations Evaluation Department, Evaluation Capacity Development, Washington D.C., April 1998, p. 7-12.
- Camp, R.C. (1989). *Benchmarking: The Search for Industry Best Practices that Lead to Superior Performance*. ISBN 0-87389-058-2, © by ASQC Quality Press.
- Dale, P. and McLaughlin, J.D. (1988). *Land Information Management*. Clarendon Press, Oxford; Oxford University Press New York, ISBN 0198584059, 266 p.
- FIG (1995). *Statement on the Cadastre*. Report prepared for the International Federation of Surveyors (FIG) by Commission 7 (Cadastre and Land Management). <http://www.fig7.org.uk/> (accessed on 15 August 2000).
- Kaplan, R.S. and Norton, D.P. (1996). *Balanced Scorecard: Translating Strategy Into Action*. Boston, Mass., Harvard Business School Press, 322 p.
- Kaufmann, J. (2000). Future Cadastres: The Bookkeeping Systems for Land Administration supporting Sustainable Development. Paper presented at the *1st International Seminar on Cadastral System, Land Administration and Sustainable Development* in Bogotá, Colombia, 3-5 May 2000.

- Kaufmann, J. and Steudler, D. with Working Group 7.1 of FIG Commission 7 (1998). *Cadastré 2014 – A Vision for a Future Cadastral System*. Rüdlingen and Bern, Switzerland, July, 51 p.
- Selhofer, K. and Steudler, D. (1998). Swiss Cadastral Surveying and New Public Management. *Proceedings of XXI International FIG Congress Brighton 1998*, Commission 7, Cadastré and Land Management, Special Session 31, July 1998, pp. 595-604.
- Steudler, D., Williamson, I.P., Kaufmann, J. and Grant, D.M. (1997). Benchmarking Cadastral Systems. *The Australian Surveyor*, September 1997, Vol. 42, No. 3, pp. 87-106.
- Ting, L. and Williamson, I.P. (1999). Cadastral Trends – A Synthesis. *The Australian Surveyor*, Vol. 44, No. 1, June, pp. 46-54.
- UN-ECE (1996). Land Administration Guidelines. Meeting of Officials on Land Administration, UN Economic Commission for Europe. ECE/HBP/96 Sales No. E.96.II.E.7, ISBN 92-1-116644-6, 111 p.
- UN-FIG (1996). *Bogor Declaration on Cadastral Reform*. Report from United Nations Interregional Meeting of Experts on the Cadastré, Bogor, Indonesia, 18-22 March 1996.
- UN-FIG (1999). *The Bathurst Declaration on Land Administration for Sustainable Development*. Report from the UN-FIG Workshop on “Land Tenure and Cadastral Infrastructures for Sustainable Development”, Bathurst, NSW, Australia, 18-22 October 1999.
- Williamson, I.P. and Fourie, C. (1998). Using the Case Study Methodology for Cadastral Reform. *GEOMATICA*, Vol. 52, No. 3, pp. 283-295.

BIOGRAPHICAL NOTES

Daniel Steudler: graduated from the Swiss Federal Institute of Technology (ETH) in Zurich in 1979, earned the Swiss license for licensed land surveyor in 1985, and did his M.Sc.Eng. degree at the University of New Brunswick, Canada from 1989-91. Since 1991, he is working with the Swiss Federal Directorate of Cadastral Surveying with the responsibilities of supervising and consulting Swiss Cantons in organizational, financial, technical, and operational matters in cadastral surveying. Since 1994, he is involved in the activities of FIG-Commission 7 as a working group secretary, where the topic of the current working group is "Reforming the Cadastré". In April 2000, he started his PhD at the University of Melbourne under the supervision of Prof. Ian P. Williamson. His main research topic is to develop a framework and methodology for evaluating cadastral systems in the larger context of land administration.

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