Cadastre 2014: What Lies Beyond?

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Key words: Cadastre 2014; Post 2015; Steudler; Kaufmann

SUMMARY

Cadastre 2014 is a unique phenomenon in the land administration domain. Its striking simplicity enables it to speak to policy makers, managers and technicians alike. It enjoys an almost unprecedented role in guiding global land administration discourse, and has done so for almost two decades. In countless countries its impact upon land administration system design is profound. The previous sections of this book reflected on these achievements. Kaufmann and Steudler's (1998) date of inspiration for Cadastre 2014 arrives. The land administration community pauses for reflection, but also gazes forward. Does Cadastre 2014 remain relevant? What about the decade ahead? Is a new Cadastre 2014 required? What might drive such a vision? What would it include? Answering these questions is no small task: input from the broader disciplines is needed. Here, a humble start is made: each of the above questions is addressed from the viewpoint of the writer. The aim is to kick start a discourse for the post-2014 era: a discussion that should be of interest to land administration researchers and practitioners alike.

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1. INTRODUCTION

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2. DOES CADASTRE 2014 REMAIN RELEVANT FOR TODAY AND TOMORROW?

At the heart of Cadastre 2014 lie six visionary statements. Most observers would agree these remain relevant in 2014. Statement 1, relating to the breadth and nature of rights recorded in cadastres, remains a central point of discussion in most developed economies. Likewise, many contexts are still grappling at a strategic level with Statement 2: the need and requirement to merge mapping and registration components. The bold declarations in Statement 3 and 4, regarding the death of mapping, pen and paper, are largely correct for many contexts; however, many emerging economies continue to use manual approaches. Discussions focus on how and when a sustainable move to modelling and computerization might be achieved. Meanwhile, in this post-New Public Management era, the relative benefits of utilizing the private sector in land administration activities, outlined in Statement 5, remains hotly contested. The same applies to the need for cost recovery as mentioned in Statement 6. Whilst examples of self-financed 'business-like' cadastres can be cited, many organizations continue to be funded through conventional means.

The continuing relevance of Cadastre 2014 appears indisputable; however, the assuredness of the original statements is clearly up for debate. For various reasons, not all countries have achieved the statements. Moreover, many contexts may have no desire to implement them (yet). This tension represents strength in Cadastre 2014: the conviction in the statements provokes land administrators to a take a position. This promotes robust and critical discussion

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on the nature and design of the land administration system in question. Avoidance of Cadastre 2014 implementation neither implies failure for a country nor irrelevance for Cadastre 2014. Merely, it demonstrates that context matters. Since its publication in the late 1990s increasing acknowledgement has been afforded to the importance of recognizing local circumstances in land administration design. This philosophy, now embedded in the concepts like 'fit-for-purpose' and the 'continuums of land rights and recording' (Zevenbergen et al, 2013), can partially be ascribed to the provocative nature of Cadastre 2014. In this regard, Cadastre 2014 will continue to retain relevance.

Meanwhile, Cadastre 2014 should not be reduced to its mere six statements. Behind the statements lie significant amounts of data capture and analysis. This work focused on synthesizing the nature and design of many national and state land administration systems. It remains one of the more comprehensive efforts to benchmark global land administration activities. It acts as a touchstone for the range of new land administration evaluation tools being developed for the contemporary era: ones that go beyond the strategic, managerial, and operational aspects of cadastres and consider actual societal outcomes. This development is perhaps the most important legacy of Cadastre 2014.

3. IS A NEW 'CADASTRE 2014' NEEDED?

If Cadastre 2014 remains relevant, is there need of a new vision? When work on Cadastre 2014 was initiated by FIG in 1994, the overarching aim was to forecast ahead the role and nature of cadastres in the year 2014. Presumably, the vision was intended as one that all countries could aspire to, however, the idea of a definitive vision for cadastres is perhaps now outdated: efforts to consolidate a cadastral vocabulary, if not philosophy in the post-Cold War period, appear to have limitations when the complexities of any national system are unpacked. The idea that a vision could enjoy a shelf life of twenty, or even ten years, can even be questioned: in practical terms, most organizations don't bother attempting to strategically plan beyond five. In this frame, the motivation for a new Cadastre 2014 appears thin.

There appears stronger incentive if the vision is reconsidered as a means for enabling global discourse. The value of a vision becomes clearer: strategic planning within countries; international and regional comparison; and plotting future research activities are enhanced. The content of Cadastre 2014 wasn't so important as its easily accessible graphical presentation and six-statement format. A globally shared language for discussing cadastral systems was created: a long-held and defining feature of the FIG agenda. From this perspective, there is a good argument for developing new visions.

With this ideal in mind, a group of researchers instigated discussions at the 2010 FIG International Congress in Sydney (Bennett et al, 2010b). The scope was limited to Australian cadastral systems. Drivers of change were hypothesized through political, legal, economic, social, technical, and environmental analytical lenses. Urbanization, unbundling of property rights, climate change, emergency and disaster response, and global economic integration were all forecast. In response, and in deliberate homage to Cadastre 2014, six design elements were drafted. From the Australian perspective, future cadastres would be: 1) eventually

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upgraded to survey-accuracy; 2) object-oriented allowing incorporation of unbundled property rights, restrictions, and responsibilities; 3) capable of 3D storage and visualization, and integrating with building information; 4) updated in real-time; 5) more standardized and interoperable both nationally and internationally; and 6) required to capture and represent ecologically inspired boundaries or green property rights (Figure 1).
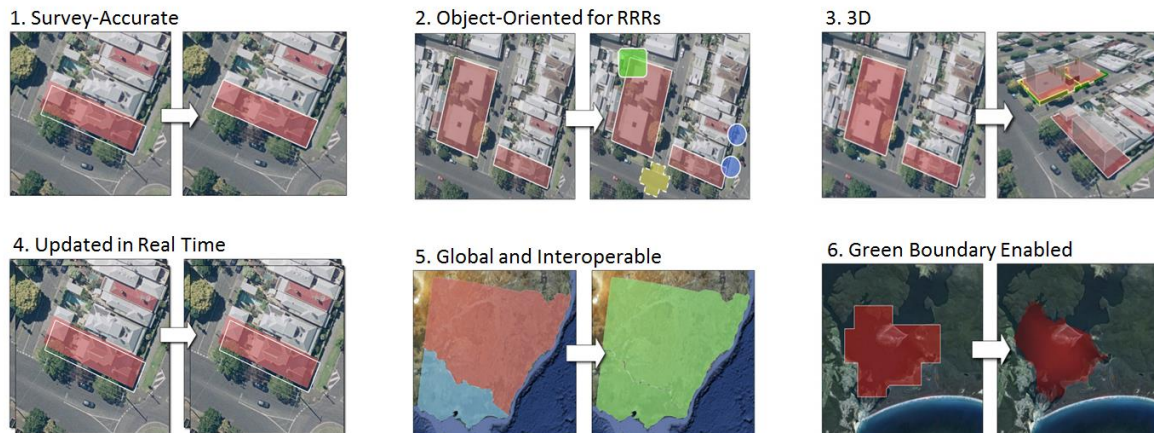

Figure 1. A first attempt from 2010 – for the Australian context

The preliminary vision sparked response, most prominently channeled through a series of articles and invited replies in GIM International (Lemmens, 2010a; 2010b). Responses were invited from key representatives of the World Bank, UN-Habitat, FAO, FIG, academia, and other national land administration officials, amongst others. Some commented on the relevance of the design elements, but implied the vision was too contemporary: more innovation was necessary. More generally, the preliminary vision was misinterpreted as applying globally – not only to Australia – as intended by the authors. Those from international agencies tended to criticize the vision for its focus on technological possibility, rather than the humanitarian demands of food security, clean water provision, adequate shelter, and good land governance. In these contexts 'pro-poor' and more 'fit-for-purpose' visions were required.

From a global perspective, the criticisms were entirely relevant. There is little doubt that the largest challenges for land administration lie beyond the more developed contexts. A cadastral or land administration divide exists (Bennett et al, 2013): estimates suggest only thirty (30) to fifty (50) of the world's two hundred (200 approx.) countries maintain complete land administration systems. Four (4) billion of the world's six (6) billion land tenures remain outside formal governance arrangements (Roberge, 2012; Zevenbergen et al, 2013). In these cases, information about people and the land they use remains unrecorded and obscure to governments. This situation impedes all sorts of development activities: land tenure insecurity enables land grabbing and promotes land disputes; land value uncertainty impedes markets and tax governance; land use and development activities (e.g. land readjustment and consolidation) for food security and climate change can neither be designed nor implemented

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properly. These facts figures have been put forward numerously since 2010.

With regards to the vision, this cadastral divide begs the question: Can (or should) these two land administration discourses, the more developed and the developing, be merged? Could (or would) a new Cadastre 2014 play a uniting role? Or alternatively, as they often do, will these discourses remain in disparate rooms in our conference venues? That is, will distinct Kyoto Protocol-esque visions for specific country groupings prevail? It appears there is room for debate: the future vision of cadastres is up for grabs.

4. POST 2015: A NEW PLAYING FIELD FOR CADASTRES?

At the 2013 World Bank Conference on Land and Poverty in Washington D.C., Michael Anderson, Special Envoy for the U.K. Prime Minister on the UN High Level Panel of Eminent Persons for the post-2015 development agenda, outlined the new framework for international development (post the UN Millennium Development Goals in 2015) (McLaren et al, 2013). In the new framework, land and especially transparency on land ownership, were identified as a key issue. He argues that allocating 'polygons to people' ought to be a straight forward exercise. The gap between these expectations and current land administration output in many countries could not be starker. Nonetheless, Anderson lays the challenge for the international land administration sector: deliver innovative ideas for accelerating land information to developing countries, and do it fast, cheap, and fair.

The Post-2015 development agenda will impact upon all countries, even the more developed. For example, in the Netherlands, the Ministerie van Buitenlandse Zaken already maintains an active interest. In a letter addressed to the Voorzitter van de Tweede Kamer der Staten-Generaal on the topic of Land Grabbing (Landroof) in May 2013, Minister Lilianne Ploumen outlined the actions, results, and future plans of the Dutch Government with regards to Land Grabbing (Ministerie van Buitenlandse, 2013). Specific mention was made of EUR 16,3M allocated to the Global Land Tool Network (GLTN) for the development of affordable tools for promoting optimal land uses. The Ministry maintains a similar philosophy on the role of land administration for its other key area of interest: food security, law and governance (Ploumen, 2013), and climate change response. Through the Ministry's activities, the Netherlands argues good land information is an important pillar for development.

What role can cadastres play in all this? The short answer: potentially plenty. However, there may need to be changes to the focus on existing cadastral designs and research. Existing developments in cadastres can be understood as being driven by two forces: 1) technological advancements in geoinformatics (e.g. UAVs, GNSS, HRSI, webGIS); and 2) emerging societal problems that land administration, or cadastres, can help to solve (e.g. rapid urbanization, land grabbing, food security, and climate change). Additionally, two broad application areas are evident as identified by Lemmens (2010b): 1) countries maintaining complete land administration systems (e.g. OECD countries); and 2) those with incomplete or emerging systems (e.g. much of sub-Saharan Africa).

Conventionally speaking, design and research tends to focus on one of the drivers and/or one

side of the divide. For example, work focused on developed countries and technological advancement includes: survey-accurate solutions (Buyong et al, 1991; Elfick, 1995; Spaziani, 2002; Fradkin and Doytsher, 2002; Rowe, 2003); standardization (Oosterom, van, et al, 2006; Kalantari et al, 2008); object orientation and integration of rights, restrictions and responsibilities (Kaufmann and Steudler, 1998; Bennett et al, 2008a; 2008b (and many others); and real-time cadastres (or Temporal Accuracy) (Van der Molen, 2002; Rajabifard et al, 2005; Wallace and Williamson, 2006). Additionally, works on 3D and 4D cadastres (Stoter et al, 2003; Coors, 2002; Billen et al, 2003; Lemmen and Oosterom, 2003; van der Molen, 2003; Oosterom et al, 2006a; Oosterom et al, 2006b; Aien et al, 2013); global cadastres (or regional standardization) (Wallace et al, 2006; Oosterom et al, 2006a; Kalantari et al, 2009; Martin-Vares and Salzmann, 2009) and green cadastres (or incorporation of natural boundaries) (Duckham and Bennett, 2009; Bennett et al, 2010a; Bennett et al, 2012a) also tend to focus on developed countries, albeit with specific societal challenges in mind. Meanwhile, discourses on using volunteered geographic information (RICS, 2011); pro-poor land records (Zevenbergen et al, 2013; Hackman et al, 2013); gender equality, and social tenure recording (Lemmen et al, 2010; Lemmen, 2012) tend to focus on the societal challenges and technical opportunities for less developed contexts.

These existing cadastral discourses are the seeds of the innovations called for by Anderson and Ploumen. However, now an new wave of geoinformatics innovations and conceptual developments await application in the domain of land administration: UAVs, crowdsourcing (via GNSS), laser point clouds, wireless sensor networks (WSNs), geospatial analytics tools, and so forth. Additionally, land administration systems are being asked to better inform responses to the emerging issues of land grabbing, food insecurity, and climate change by supporting equity, dispute prevention, and other pro poor land activities.

The Post-2015 development agenda provides a new impetus to fuse research relating to these new societal demands and technologies (Figure 2). A specific focus is needed to further develop and operationalize the concepts of green cadastres (or ecologically driven property boundaries), crowdsouced cadastres, and globally integrated cadastres. All are underpinned by the new technologies, and may be important tools for responding to land grabbing, food insecurity, and climate adaptation. New global commercial software and hardware providers emerge in these areas (e.g. Thomson-Reuters), whilst existing players intensify their focus and restructure product offerings (e.g. Trimble). A strong argument can be made for independent research programs of design, application, and evaluation: ones that use cadastres to better inform responses to land grabbing, food security, and climate change.

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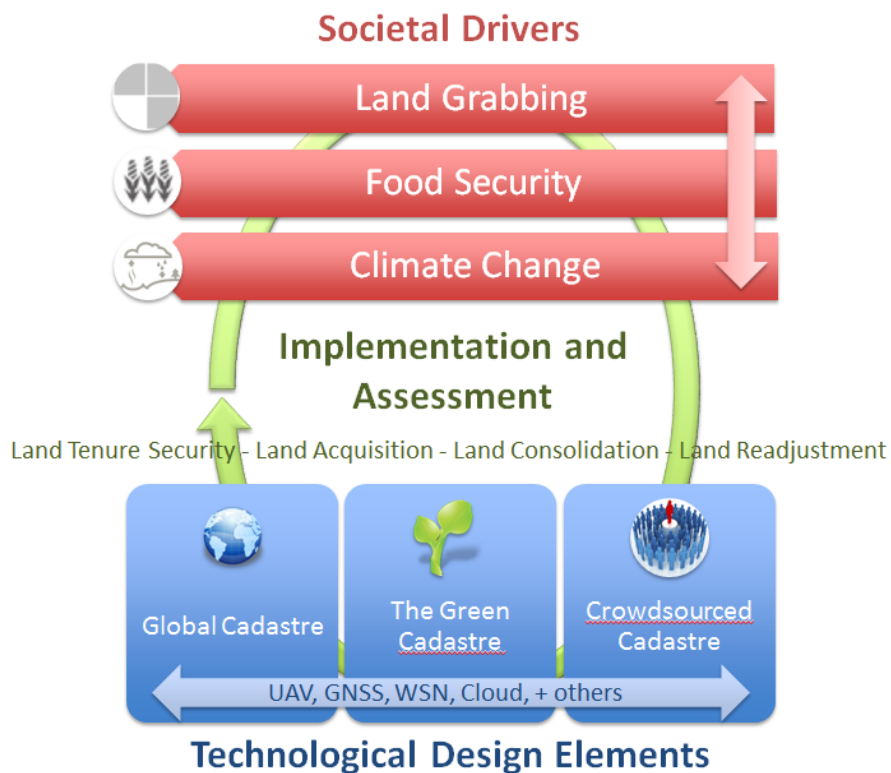Kuala Lumpur, Malaysia, 16 – 21 June 2014

Figure 2. Delivering design, implementation and assessment tools that satisfy emerging societal drivers – a vision for future cadastres?

5. POST 2015: A NEW PLAYING FIELD FOR CADASTRES?

In summary, this short discussion hopes to provoke a wider discourse for the post-Cadastre-2014 era. There is no doubt that Cadastre 2014 remains one of the most comprehensive efforts to benchmark global land administration activities. Most of its six visionary statements remain highly relevant today, although the assuredness in them is clearly up for debate: discourse has moved from its one-size-fits-all approach to discussions on 'fit-for-purpose' and the 'continuum of land rights'. For this reason, future visions for cadastres remains up for grabs. Whether a new vision could enjoy the twenty year shelf-life of Cadastre 2014 is quite uncertain. If the vision is reconsidered as a tool for generating a global discourse then motivation appears quite strong. Meanwhile, any new vision must go beyond mere technical and organizational possibilities to more comprehensively consider the role of cadastres in pressing humanitarian demands including those described in the Post-2015 global development agenda. Fusing these societal demands with technological possibility is a challenge for all countries, if not all cadastres.

To conclude, another set of starting points is offered: ten (10) themes accompanied by ten (10) questions. These are derived from the above impetus. All land administrators and

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cadastral experts are welcomed to ponder, criticize or contribute further:

1. **Land Grabbing:** Should cadastres play a role in recording spatially the land rights conflicts generated by large scale land acquisitions? If yes, how?
2. **Food Security:** Does the right to food (use, access, and availability) have a spatial footprint and should cadastres be used to record it?
3. **Climate Change:** How might cadastres be used to record climatic dependent land rights?
4. **Crowdsourced Cadastre:** Which cadastral procedures can be provided by the crowd? Which cannot? Why? How?
5. **Green Cadastre:** How can the ecological boundaries of green property rights be adjudicated, surveyed, and recorded? Do cadastres have a role?
6. **Global Cadastre:** What are the infrastructure requirements of a global cadastral network?
7. **Land Tenure Security:** Which innovative spatial tools used to build cadastres are working well in which contexts?
8. **Land Acquisition:** Will new cadastral concepts (e.g. global cadastre, green cadastre, and crowdsourced cadastre) actually improve the governance of land?
9. **Land Consolidation:** In which contexts are land consolidation programs appropriate and how can grass-roots cadastres support better governance of these programs?
10. **Land Readjustment:** How can cadastres be better used to support the governance of land readjustment programs, particularly in less developed contexts?

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BIOGRAPHICAL NOTES

Rohan is an Assistant Professor working in Land Administration. He holds a PhD in Land Administration from the University of Melbourne. He also holds degrees in Engineering (Geomatics) Science (Information Systems) from the same institution. From the University of Twente he holds a university teaching qualification. His research focuses on supporting concerns relating to food security, 'land grabbing', and climate change – through technological developments in cadastres. He is currently working on design elements including crowd sourced cadastres, the global cadastres, and green cadastres – and the process of land consolidation. His educational experiences are broad and cover both the harder and softer elements of land administration. Recent consulting work includes activities in Ethiopia, Uganda, and Vietnam. Rohan acts as a reviewer on for around 20 journal and conference series. He has co-supervised numerous PhDs and over 20 MSc theses, in both the Netherlands

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