Adoption of volunteered geographic information into the formal land administration system in Kenya

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ABSTRACT

Individualization of tenure through title registration programmes introduced in many African countries after independence with the promise of security of tenure and increased agricultural productivity has, instead, had the opposite effect. Informal land arrangements continue to emerge as a result of the slow pace of land adjudication (formalization) and updating of land information systems. The trend towards computerization of land information systems has only put focus on already existing formal land tenure arrangements, leaving out the informal social tenure arrangements. As a result, there are now many efforts worldwide motivated by the introduction of the Social Tenure Domain Model (STDM), and freely-available and easy-to-use technology tools to identify, document and map land in support of informal land administration arrangements. Actions are made towards the use of community-generated information to support land administration. Using theories from the interplay between formal and informal institutions, this paper discusses the potential outcomes in adopting Volunteered Geographic Information (VGI) in land administration in Kenya. Two case studies are presented that demonstrate the complementary-accommodating, versus the substitutive-competing approaches. These are then compared with the formal land adjudication process in Kenya. It is established that because of the direct involvement of the national mapping agency in land adjudication where VGI is utilized, the outcome is a case of formal adoption of VGI, while in the other case, where there is little or no involvement by the national mapping agency, the outcome is more of competition and substitution. The latter is an example in which the VGI is used just like any other information to inform policy making, rather than taking it as the authoritative source. We argue that since informality is – and will always be – part and parcel of land administration in many African countries as a result of ingrained social relations and power structures, adopting crowdsourced land information into existing formal land administration systems should consider the particular land administration process, satisfying innate demands and requirements, thus re-engineered to accommodate VGI.

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1. Introduction

A common argument during the history of colonial and post-independent African states was that customary systems of tenure contribute to low agricultural productivity. As part of an attempt to facilitate development and increase agricultural productivity, most African governments introduced land reforms in the form of individualization of tenure through title registration programmes – either freehold or individual leasehold on state-owned land.

This paradigm of individualization of tenure through title registration programmes has had the mixed results in many African countries (Besteman, 1994). This is partly due to the fact that land tenure reform has got more to do with social relations and power structures than with reforms of land use. In addition, title registration and subsequent land subdivisions have led to uneconomical fragmentation of land, thus undermining the very initial goal of improving, among others, agricultural productivity.

To put a case for title registration also, De Soto (2003) in his book "the Mystery of Capital", explained why capitalism only thrives in the West and fails everywhere else. He observed that although a large percentage of the people in the world are poor, the poor own houses, crops, and businesses, but they are all extra-legal. Therefore, without titles, deeds, and articles of incorporation, the

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poor cannot use their extra-legal property, and therefore termed as "dead capital". In fact, most developing countries have less than 30 percent cadastral coverage – which means that over 70 percent of the land in many countries is generally outside the land register (Lemmen, 2010). This has caused problems for countries with regard to land management issues, especially in the rural and peri-urban areas. Moreover, dynamics in land administration and the obvious lengthy processes and lags in updating land information systems present opportunities for informal arrangements to emerge and persist.

The trend towards computerization of land information systems has not helped the situation either, since the focus has been on already existing formal land tenure arrangements, leaving out the informal social tenure arrangements. Whereas the Land Administration Domain Model (LADM) is an effort focused on formal systems, the Social Tenure Domain Model (STDM) represents the same effort targeting informal systems. In fact, the STDM came to be on the premise that LADM did not consider customary and informal social tenure arrangements. The essence of STDM and its widespread applications demonstrates that informality is – and will always be – part and parcel of reality in land administration – at least in the case of developing countries.

The development of customary and informal land tenure systems based on the STDM has given rise to another interesting trend in land administration, the involvement of the community (citizens, crowd) in mapping social tenure arrangements, those particularly considered to be informal. The main reason for this is the lack of reliable data about informal settlements due to the fact that their existence is often, for political and economic reasons, only unofficially recognized by local authorities and national governments (Panek and Sobotova, 2015). The incorporation of Volunteered Geographic Information (VGI in this context is considered as informal on the basis that disparate groups of individuals who are not professionally-trained are involved in geographic data collection) into existing formal land administration frameworks is considered an overarching and crosscutting theme.

Against this backdrop, this article presents a general framework for the adoption of VGI (informal practices) into formal land administration systems using two case studies from Kenya. The framework is based on the theory on the interplay between formal and informal institutions/systems (Helmke and Lavitsky, 2004). The rest of this paper is organized as follows: background on land administration and VGI, theory on formal and informal systems, an outline of the methodology and case studies, presentation and discussion of results from case studies, followed by preliminary conclusions relating the formalization of VGI data into formal land administration systems in Kenya.

2. Land administration and volunteered geographic information

The land administration arrangements within any jurisdiction reflect the nature of people to land relationships as a result of social-cultural and power arrangements that exist. Among the public administration systems, land administration is considered the most important because it provides the infrastructure for implementing land-related policies and land management strategies in support of sustainable development (Williamson et al., 2010).

The practice in land administration systems is to develop systems that are formal, although informal systems continue to emerge and change. In practice, the implementation of LADM focuses more on formal systems, while the STDM – the fact it is pro-poor and recognises those informal tenure rights that are often outside of the formal freehold parcel based tenure systems – focuses on informal systems.

The LADM, as one of the first spatial domain descriptive standard within the ISO (ISO, 2012), is a conceptual model that ensures domain-specific standardization to capture the semantics of the land administration domain. LADM provides a shared ontology that allows communication between professionals involved in land administration for system design, system development and system implementation purposes, and for purposes of data exchange and data quality management (van Oosterom and Lemmen, 2015; Lemmen et al., 2015).

The STDM is a specialisation of the LADM, which means that there are some differences in terminology and the application area. The gap that often exists between the conventional (formal) land administration systems and informal tenure cannot be handled easily, and this created the need for complementary approaches for land administration. The STDM supports the recognition of a range of rights and claims in order to extend security of tenure to more people, including the poor in both urban and rural areas (Augustinus, 2010). The STDM thus bridges the gap by providing a standardized way of representing people to land relationships independent of the level of formality, legality and technical accuracy.

Considering the varied nature of both the formal and informal land administration systems, the World Bank and the International Federation of Surveyors (FIG) made a declaration that require jurisdictions to develop fit-for-purpose systems that consider available resources and capacities. Through this approach, the systems are expected to be flexible and focused on serving the purpose of the systems, and can be incrementally improved over time. Among the elements of a fit-for-purpose land administration system is to allow for participatory (mapping) approach in relation to data capture and use, ensuring community support (FIG, 2014).

A participatory approach in developing a fit-for-purpose land administration system entails identifying and recording the various legal and social tenure rights associated with occupancy and use of the land. Participation can be considered at different levels in the process, either during the identification or during the mapping. In traditional land adjudication programmes, the communities were required to be present and participate in the identification of their rights, while a professional land surveyor could then demarcate and map the identified boundaries (i.e., top-down scheme). In modern times, and as a result of availability of technology, communities can be involved both during the identification of rights, and also during mapping of legal and social tenure rights (i.e., bottom-up scheme). The bottom-up scheme of participation in land administration through the crowd, i.e., crowdsourcing, is being proposed and seen as a way of getting citizens to collaborate in land administration, leading to the enhancement of transparency and decrease of costs (McLaren, 2011), and also to bridge gaps that administrative authorities, such as National Mapping Agencies (NMAs), cannot handle, e.g., volume of data, shortage of manpower, growing types of data (Olteanu-Raimond et al., 2016).

In the early 1990s, the Mapping Science Committee in the US released a report (NRC, 1993), which described new ideas in respect to mapping practices. Among the new ideas, the report had presented the issue of patchwork working-practice, suggesting that mapping agencies need not provide uniform coverage of the country being mapped, but alternatively, to publish standards and protocols that will meet a number of bodies or entities who will create the required infrastructure: scale, coverage and accuracy might vary as needed. VGI concept was 'born' from similar premise: a collection of people working independently ("crowdsourcing") while responding to the needs of the local committees working together to create a patchwork mapping coverage.

Crowdsourcing is a method of gathering data or information, which involves contributions from a large and heterogeneous group of individuals to accomplish a sizeable work (or project) usually