

# **Implementing Innovative Land Tenure Tools In East-Africa: SWOT-Analysis Of Land Governance**

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**Key words:** Land Governance, Land Tenure

## **SUMMARY**

In developing countries, formal land administration systems and related land tenure processes are not able to keep up with the pace of development. At this contemporary land tenure recording rate, it would take centuries to deliver adequate coverage. Within this context, the its4land project aims to address the challenge of improving the formal recordation of land tenure information by producing a fit-for-purpose suite of innovative geospatial tools including small unmanned aerial vehicles (UAV's), smart sketchmaps, automated feature extraction and geocloud services that can be adopted by stakeholders in Ethiopia, Rwanda and Kenya.

To ensure that these technologies can be adopted and sustained, it is crucial to examine how these innovative geospatial tools need to be governed. As a first step, this paper explores the current land governance context to identify potential implications for implementation. Specifically, the three different case countries are analysed based on five different land governance factors, namely socio-economic country context, the types of tenure that exist, the operation of current land market, land reforms and organisations that are responsible for administering and regulating land tenure. Based on these factors, the preliminary SWOT-analysis identified preliminary insight into how current land governance conditions may or may not be conducive to the introduction and implementation of the geospatial tools.

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## **1. INTRODUCTION**

In developing countries, formal land administration systems and related land tenure processes are not able to keep up with the pace of development. At this contemporary land tenure recording rate, it would take centuries to deliver adequate coverage (Zevenbergen et al., 2013). Evidence from the ground shows that almost two-thirds of the global population does not have access to land tenure security, which implies that approximately four billion of the world's six billion land interests are not recorded nor known by governments (Bennett et al., 2008; Williamson et al., 2010). A major proportion of this problem exists in the Sub-Saharan regions (Roberge, 2012). Land administration and their land tenure related outcomes are nevertheless of major importance as it delivers land tenure security, dispute reduction, investment opportunities and manages sustainable use of land and natural resources (Bennett et al., 2008; Williamson et al., 2010).

Conventional systematic survey and mapping approaches adapted from western perspectives, like total stations or theodolites, have been found to be of limited value in supporting vulnerable communities in East Africa. To a certain extent, this can be ascribed to the fact that it is time-consuming and expensive process. However, the inability to fully accommodate existing contextual conditions also plays also an important challenging role due to the diversity of informal, social or customary land tenure types (Enemark, 2015).

For the purpose of improving the recordation of land tenure information, the 'its4land' project is proposing to produce a suite of innovative geospatial tools including small unmanned aerial vehicles (UAVs), smart sketchmaps, automated feature extraction, and geocloud services - aligning with the 'fit-for-purpose approach' - that can easily be used by communities and the public sector in three case countries of Ethiopia, Rwanda and Kenya. Instead of applying western oriented approaches, these innovative tools will be contextually developed taking the local capacity, technology, needs and challenges into account.

Although these innovations potentially offer technical opportunities for overcoming current land tenure recording challenges, their implementation poses a social challenge. Indeed, a significant body of literature demonstrates that many contemporary failures in technological innovations can be ascribed to neglecting the importance of governance aspects (Broucker and Cromptvoets, 2014; Ko and Fink, 2010; Manewick and Labuschagne, 2011). Governance here is broadly concerned with processes, structures, policy, legal framework, actors and decision making. Land tenure is intrinsically socio-political in nature and accordingly to Heeks (2002) this implies that it should fill the 'design-actuality' and the 'hard-soft gap'. The former one refers to the adaptation to local contextual needs and challenges. These important aspects need to be assessed beforehand to develop land tenure solutions. The latter focusses on the fact that land tenure tools are in fact hard

(referring to the information and technology input) in design but are aiming to support the soft (socio-economical-political) actuality (Heeks, 2002). To ensure that the potential of these technologies are capitalized, attention to how land is governed plays an important role in the innovation process since it gives a better understanding of the current context and how the tools can fit best in and adapt to that specific context. A failure to take this into account can undermine the application of the innovation which in terms can be seen as a failure to meet the expectations of the stakeholders.

The aim of this paper is therefore to review the current governance approach in the target countries to their specific land context. Specifically, it focuses on the contextual processes and structures that govern land, which determine the intrinsically grounded patterns and frameworks of land, and therefore, how these tools may be introduced, used and managed.

The paper draws on key land governance assessment factors of Palmer (2009). A document, policy and literature analysis is used to build contextual understanding of land governance related challenges in Ethiopia, Rwanda and Kenya. Based on this review, a SWOT (Strength, Weaknesses, Opportunities and Threats) analysis will provide preliminary insight into how current land governance conditions may or may not be conducive to the introduction and implementation of the tools.

## **2. LAND GOVERNANCE**

During the past decades, governance has gained interest as a relevant topic of inquiry in a variety of study areas, e.g. ranging from (social) sciences to IT. The shift from government to governance was initially initiated around 1980 through public administration and public policy debates in the context of New Public Management (NPM) reforms. This shift was mainly characterised by a restructuring of state-society relations regarding the competence of public managing and decision-making (Hughes et al., 2005; Hyden et al., 2003). Where nation state authorities were previously the ruling coordinating and decision-making bodies, a dynamic shift towards a mainly trilateral collaboration between nation-state governors, the community and civil society took place (Corijn, 2009). In this way, governance can be distinguished from government as not only state, but also non-state, private and professional actors and sectors engaged in the governing process (Bevir, 2003; Goodwin and Painter, 1996; Jessop, 1997; Rhodes, 1997; Saito, 2008).

Consequently, governance is increasingly becoming a broad concept that is used in different ways and has a variety of meanings. Nevertheless, key factors like processes, structures, policy, legal framework, actors and decision-making are fundamentally common in governance definitions. From the field of land administration, governance is used in the context of land governance, which is defined by Palmer et al. (2009: 9) as “the rules, processes and structures through which decisions are made about access to land and its use, the manner in which the decisions are made, implemented and enforced, and the way the competing interests are managed”.

Aligning this definition, Palmer et al. (2009) developed an easily accessible three-part land governance framework for the analysis of political economy and decision-making related to land issues. An adapted form of this framework will be applied on the three case countries.

The first stage aims to get a better understanding of the county context. The second phase focusses on land reforms. The third stage is about managing a reform process, taking the first two stages into account. As the rationale of this last stage goes beyond the aim of this paper, this last step will not be applied and discussed in this paper.

In order to get a notion of land governance in the case countries, the first two stages will be merged clarifying the following factors:

- ***Socio-economic context for land:*** describes the broad socio-economic from a land perspective.
- ***The land tenure systems:*** discusses the contemporary existing land rights.
- ***Land reform content:*** describes the content and objectives of the proposed reform.
- ***Land market:*** clarifies the operation of the land markets, including the main constraints.
- ***Institutions:*** focusses on the institutions who are engaged with the regulation on tenure and markets.

The first factor will help to understand the overall country context. This is fundamental to step away from the western perspectives and adapt the governance of the tools to specific case countries. Discussing the land tenure systems, land reform content and land market will frame the land tenure gap by addressing the current and past challenges. Analyzing these factors will help to adapt the governance of the tools to land tenure related challenges and issues. In order to effectively govern the tools, a close collaboration with the land institutions is essential. As a first step, this final factor will help to identify the formal institutions while considering their performances.

### **3. LAND GOVERNANCE IN EAST AFRICA: ETHIOPIA, KENYA AND RWANDA**

#### **3.1 Ethiopia**

##### 3.1.1 Socio-economic context for land

Ethiopia occupies a total area of 1.000.000 square kilometres and has a total population of 99.4 million, which is the second-most of Sub-Saharan Africa. Their export economy is mainly based on coffee and minerals. During the past decades Ethiopia has undergone massive economic growth. Indeed, while the poverty rate was 55.2 % in 2000, this is reduced to 33.5 % by 2011 as measured by the international poverty line compiled by people living with less than € 2 per day (Worldbank, 2016).

Ethiopia has undergone two phases of decentralisation. The first phase started around 1991, aiming at improving local governance and regional self-rule. In reality, however, this was not capable under the former framework, that is why the national government decided to further devolve powers and responsibilities to the Woredas in 2001. This involves more decision-making responsibilities

for the local government. In this regards, regions can proclaim region specific regulations and directives to implement the national policies and laws issued by the federal government. Subsequently, there is still a high dependency on national government for funding and resources (Gebre-Egziabher and Berhanu, 2007). The current government administration structure includes: 1 central (federal) government, 8 regional states, 2 chartered federal cities, 85 zones, >800 districts (Woreda) and >15.000 neighbourhoods (Kebele) (Government of Ethiopia, 2006).

### 3.1.2 Land tenure system

In Ethiopia, all land is owned by the state. The types of land tenure systems depends mainly upon the geographical location of the land: In urban areas, there is a system of leasehold tenure, while in rural areas, user rights are more common (UKAID, 2010). The contemporary land tenure systems are described in Table 1.

Table 1: land tenure systems in Ethiopia

Tenure arrangement	Description
Leases	The government leans land up to 99 years. The lean period is region and land use dependent and the government has the right to take back the land on the purpose of land development improvements and after the payment of compensation (UKAID, 2010). However, farmers also allowed to lease the land to other farmers or investors, but for a shorter period than the government (LANDac, 2016).
User rights	The government allows farmers to use the land bounded by the planned land use (LANDac, 2016).

Critics have observed, however, that these governmental ruled process are not always transparent, inclusive and participatory, making it unclear whether the land allocation outcomes are prominently positive for the local communities or for the more general political and economic context (Grover and Temesgen 2006; Deininger et al. 2003).

### 3.1.3 Land reform content

As a response to limitations of the first certification attempt (e.g. failure of digital and individual plot registration), a new certification round was initiated steered by two land administration programs, namely the Ethiopia Strengthening Land Tenure and Administration Program (ELTAP, 2005-2008), Ethiopia Land Administration Program (ELAP, 2008-2013). Millions of certificates were delivered on a participatory manner via local land administration committees. A fit-for-purpose approach was used: preliminary non-tradable certifications were created and a book of holdings generated. This second round of land tenure approach went beyond the first scope as it also contains policy reform, capacity building, and public information and awareness campaigns on land rights (Deininger, 2008; USAID, 2015). Nevertheless, even after the second round of certification, challenges still remain present. The most common challenges are the lack of information access, lack of a national system and coordination, poor local facilities, weakness in registering subsequent transfers of land and uncertainty concerning funding to sustain the system once established (Alemie et al., 2015; Bennett and Alemie, 2016; Bruce, 2014).

### 3.1.4 Land market

As stated before, all the land in Ethiopia is owned by the government. In this way, formal land delivery is mainly planned by the government, which is characterized with cumbersome restriction laws regarding the transfer of land. These restrictions creates a lack of access to land for immigrants and causes problems for people who wants to move to other areas, fearing to lose their original holding. Therefore, informal land markets are increasing. Informal access to land is generally established through informal market sale by getting a ‘permission’ to occupy the land. Sales agreements are informally endorsed by local administration officials, community associations, or by power of attorney. In order to counteract these trends of informality, the government offers land leases on annual lease rent or under the conditions of the formal land use plan. (UKAID, 2010; USAID, 2010).

### 3.1.5 Institutions

The Ministry of Agriculture (MOA) is issued with land coordinating responsibilities and is accountable for the broad titling and land certification reform. Regional governments are accountable for administration and regulation of land. Every regional government has, however, their own institutional arrangements for land administration. Local governments (woreda and kebele level) are accountable for daily management of land issues. Whereas the kebele administrators are accountable for administration and taxation, the woreda administrators are accountable for registering land certificates. However, the regional and local governments are facing capacity challenges, which means that the flow of financial and infrastructural resources and staff members from is not equally decentralised compared to their responsibilities (USAID, 2010; LANDac, 2016)

## **3.2 Kenya**

### 3.2.1 Socio-economic context for land

Kenya covers an area of approximately 592.000 square kilometers and has a population of more than 47 million people (UN-data, 2016). Around 80% of Kenya’s land is categorized as arid or semi-arid, with only 15% of this suitable – and fully used – for agricultural production (Mclaren, 2009). And yet, agriculture and natural-resource related sectors continues to form the backbone of Kenya’s economy, accounting for over 40% of GDP and 70% of overall employment (Chokerah et al., 2016). Although Kenya’s economy is one of the most advanced and biggest of sub Saharan Africa, it is still a low income country where 38% of the people live in absolute poverty (VLIRUOS, 2014). Kenya’s longer-term strategy is, however, to achieve middle-income country status by 2030 (Government of the Republic of Kenya, 2007).

Since 2010, Kenya has undergone a political and governance transition, which is declared through the new Constitution. Starting from than, Kenya’s administrative structure is a devolved, which results in two levels of authority: the national government is composed of 47 counties, which are in theory equal partners and engage on the basis of consultation and cooperation (World Bank, 2016). Further, it prescribes a three-tiered governance and management system including city (500.000 residents), municipality (250.000 residents), and town (10.000 residents). In reality, however,

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decentralization does not perform properly as the transfer of capacity and resources is still hampered centrally (Chokerah et al., 2016).

### 3.2.2 Land tenure system

Officially, land in Kenya is designed as public, private (freehold or leasehold tenure) or customary land (figure 2):

Table 2: Land tenure systems in Kenya

Tenure arrangements	Description
Private land (freehold and leasehold)	Includes two options: freehold (exclusively for Kenyan citizens) or leasehold (both for Kenyan citizens and foreigners). This land tenure arrangement continues to be grossly unattainable, less than 10% of the country's land is designated as private ownership (LANDac, 2016, USAID, 2010; Walley, 2011).
Public land	Includes all land related to 'public domain': protected forests, rivers and reserves and land occupied by the government and cannot be leased out. More than 10% of the country's land is designated as public ownership (USAID, 2010).
Community land/ Customary land	More than 70% of Kenyan land holdings are customary land, which is characterized by shared ownership in family, community, (religious) group or tribe. In this way, land is managed by leaders for the benefit of resident communities. Group ranches are also formally classified under this category. (Palmer, 2009; USAID, 2010).

### 3.2.3 Land reform content

The 2010 Constitution guarantees all Kenyans equal access to land and requires that land is used to the benefit of local communities as well as prohibiting the misappropriation of public land. This has manifested in a series of legislative, regulatory and policy reforms including the National Land Policy of 2009, the Land Act 2012, the Land Registration Act 2012, the National Land Commission Act 2012, and more recently, the Land Bill 2015, the Community Land Act 2016 and the National Urban Development Policy of 2016. These constitute regulatory and institutional reform aimed at improving land governance by providing recognition and protection of different land tenure types and aligning land use policy to the constitution. In particular, the new Community Land Act will introduce community titles in Kenya to address the issues experienced in customary land, where lack of legal title has led to many communities being displaced through fraudulent land sales. However, this is unlikely to be implemented while regulations under the Act are being developed. Other land tenure related reforms include the establishment of a national titling center in 2014 and new processes related to assessment and payment of stamp duty services were delivered to support bulk titling and generation of new titles, as well as the digitization of land and property registries (Chokerah et al., 2016).

Despite these efforts, bureaucratic hurdles and persistent mismanagement has manifested in informal markets, assuring their status as the de facto avenue for accessing land: to date, there are less than 20,000 registered mortgages in Kenya (World Bank, 2016). In addition, information gaps stemming from outdated information in the land registry and registry maps, absence of complete

information on titles (e.g. encumbrances and easements) and lack of coordination between different levels of contribute to ongoing fraudulent sales of land (Mwathane, 2017).

#### 3.2.4 Land market

Access to land in Kenya can be associated to access of power, whereby state land is allocated to powerful people with strong political or socio-economic networks. Moreover, formally registering the transfer of land in Kenya is an expensive (4,2 % of the property value) and time consuming process (approximately 64 days), whereby the land administration officers suffer from a lack of land information and capacity. Due to this, informal land markets are increasing, including the rental market in the informal settlements (UKAID, 2010; USAID, 2010)

#### 3.2.5 Institutions

Aligning the new Constitution and as a response to the mismanagement housed in the previous Ministry of Lands, Kenya's land institutional framework has undergone a structural change. Under the Ministry of Lands, state power was abused to redistribute land to the advantage of rich and powerful people, such as provincial administrators and politicians. In order to counteract this problem, powers of Ministry of Lands, Housing and Urban Development (current title) was transferred to the new independent National Land Commission. In this way, Ministry of Land changed to Ministry of Lands, Housing and Urban development remained accountable for residual roles like policy formulation and resource mobilization. Nevertheless, this transaction of power did not went smoothly as the Ministry of Lands, Housing and Urban Development undermined the National Land Commission, which is an ongoing struggle.

According to the 2009 National Land Policy Act, local land governments should be established through democratically elected District and Community Land Boards, which are accountable to manage land locally. The former were established with the 2012 National Land Commission Act, the establishment of the latter is still uncertain (LANDac, 2016).

### **3.3 Rwanda**

#### 3.3.1 Socio-economic context of land

Rwanda is a small (26.338 square kilometers) but one of the highest populated countries in Sub-Saharan Africa (471 inhabitants/km<sup>2</sup>). The country is characterized by hilly landscapes, which are mainly covered by grasslands and small farms. For this reason more than 85% of the population is dependent upon agriculture as an important source of income (Ali, 2014).

Rwanda's trade economy is mainly based on minerals, coffee and thee. Although Rwanda has made substantial progress in rehabilitating its economy after the 1994 genocide, still 39% of the population lives below the poverty line (VLIRUOS, 2016).

Rwanda's administrative structure is highly decentralized with one central government is divided in 5 provinces, 39 districts, which are subdivided in 416 sectors and then to 2148 cells. Within these cells, the 14837 villages are the smallest units (NISR, 2014; Republic of Rwanda, 2012). Although

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decentralization is formalized in theory, recourses and decision-making power are still very centrally concentrated (Rurangwa, 2013; Tilburg, 2008).

### 3.3.2 Land tenure system

Unlike Ethiopia and Kenya, Rwanda does not have a long land administration or national cadastral history (Bennett et al., 2013). Before the 2000s, land belonged to the State and the citizens had only user rights (Deininger et al., 2010). None of the land was formally regularized nor registered. Nevertheless, the post-genocide efforts to clarify land rights paid off. In this way, land ownership in the country has evolved from customary law to a system of state or individual ownership. In this way, the following forms of land tenure can be distinguished (figure 3):

Table 3: Land tenure systems in Rwanda

Tenure arrangement	description
Public land (state ownership)	Includes all land related to 'public domain': protected forests, rivers and reserves and land occupied by the government and cannot be leased out.
Private land (state or individual ownership/ freehold or leasehold)	Includes two options: <ul style="list-style-type: none"> <li>- State ownership: land can be alienated or leased out up to 49 years depending on the designated land use.</li> <li>- Individual ownership: the individual is the private owner of the land. This land right can be transferred in conformity with the conditions and methods provided by law. The land can also be leased out through an emphyteutic leasehold, which is a form of leasehold up to 99 years (LANDac, 2016)</li> </ul>

### 3.3.3 Land reform content

Since 2009, a legal land reform process was initiated by Rwanda Natural Resources Authority (RNRA) under the guise of gender recognition, overall equity, land security and avoidance of land disputes. This state-led process or so-called Land Tenure Regularization (LTR) aimed to regularize all existing lands under private, leasehold, and state tenures. Therefore, customary tenures and informal arrangements would no longer carry legal recognition. The LTR managed to register more than 10.3 million parcels and delivered more than 9 million of land certificates countrywide. As this process was undertaken on a participatory manner, the policies were generally received positively. (Biraro, 2014; Ali, 2014; Rurangwa, 2013). Evidence from the field showed that the LTR had a positive impact on land disputes (Biraro et al., 2015). Nevertheless, some major challenges can be distinguished: inconvenient land use implementation of the Master Plan at the district and sector levels, weak national coordination of the urban system, lack of planning of grouped settlement sites discourages resettlement (e.g. less than 10% of villages surveyed by the Ministry of Local Government in 2012 had lay-out plans that facilitated housing and infrastructure development), limited capacity of local government (district, sector, cell and village level) to support rural land management and keep registries up to date. Furthermore, it is suggested that the LTR is mainly

steered by central decision making, without taking rural conditions into account (Anseeuw and Alden, 2010; Biraro, 2014; Republic of Rwanda, 2012; MINECOFIN, 2013).

#### 3.3.4 Land market

In Rwanda, land registration is mandatory. In this way, the government has delivered almost 9 million parcels titles in order to regulate transactions and offer Rwandan citizens a range of social, legal and economic benefits perceived to be derived from holding titles to land, indicative in statements such as, “Clear and secure land ownership is critical to production and livelihoods for the rural population and is the number one determinant of rural investment and growth” (MINECOFIN, 2013: 46). In this way, every citizen of Rwanda can access a freehold title by maximum of 5 hectares of land (LANDac, 2016). Nevertheless, the government also benefits from those land certifications as it comes with mandatory fees. These transaction and other mandatory fees are, however, considered too expensive compared to the monthly income of the citizens (Biraro et al., 2015). Aligning this problem, is the fact that land holders have not issued a title according to their desired land use and zoning regulations suitable to their budget (land zoned for agriculture is less expensive than land zoned for infrastructure), which leads to informality (Niyonsenga et al., 2015).

#### 3.3.5 Institutions

Rwanda natural resources authority is responsible for management of natural resources, which includes land, water, forest, mines and geology. For every specific section, a specialized department is established. For land, the Lands, Mapping & Registrar of Land Titles Department is accountable for land administration, land management and cadaster maintenance. In order to support the maintenance of the registries at local level, the government established Land Technical Operations Division (RNRA, 2017). Decentralization at sector level is often established but is still an ongoing process. However, the local governments cannot perform properly due to a lack of infrastructural, financial resources and staff (LANDac, 2016).

### **4. SWOT-analysis**

Based on the previous land governance related section, a SWOT analysis is conducted from the perspective of the implementation and use of the innovative geospatial tools. In this way, the main strengths, weaknesses, opportunities and threats are discussed based on the land governance context derived from the five factors from the previous section. This analysis is conducted in order to obtain preliminary insight into how current land governance conditions may or may not be conducive to the introduction and implementation of the tools.

#### 4.1.1 Strengths

Ethiopia has a long time tradition in land administration and is currently doing some effort in registering land, which can work as a strength since the fundamental but basic geospatial knowledge, will probably be in place. Kenya is from economic point of view a relatively strong country and derived from the developments of the last decade (e.g. new constitutions involving

reformation of public government and land laws), the country seems open to innovations. Although Rwanda has no long time history in land administration, the country is quite successfully catching up by implementing a registration program like LTR. This can probably suggest that there is a nationwide desire to improve and maintain land related services, which can help to implement the innovative land tenure tools.

#### 4.1.2 Weaknesses

Although decentralization principles are formally implemented, all the counties are facing decentralization challenges and constraints. In this way, there is a lack of financial and infrastructural resources and capacity support going from the national to the central government. These shortcomings contribute to the lack of quickly updating the current land tenure system. The former has important implications for the latter and vice versa, so before the innovative tools can be governed efficiently, a minimum base of resources and capacity needs to be in place. Moreover, land decision-making power seems still to be concentrated at national and/or regional level. In order to successfully implement the innovative tools, it will be important to have the leading land governments on board. In Kenya and Rwanda, land decision-making power is still concentrated at the central level and to a lesser extent at regional and local level. In Ethiopia, however, the land responsibilities and policies are split between national and regional government, so for this country it is especially important to work closely together with both governmental levels. Apart from potential issues related to decentralization, it is still important from a fit-for-purpose perspective to involve stakeholders from all governance levels and also stakeholders like Non-Governmental Organizations.

The countries are facing issues regarding informal land markets. As the formal land markets fail to deliver the desired expectations, informality is becoming more popular. Finally, land mismanagement is still in place in Kenya, which raises questions about the efficacy of current land reforms and the reliability of the governance system. These informal and mismanagement processes cannot be neglected but are very hard to monitor, which makes it very difficult to take informality into account while examining the implementation and maintenance of the tools.

#### 4.1.3 Opportunities

These three East-African countries are all working on economic development aiming to get out of poverty and reaching the status of at least a middle-income country. If the tools are effectively be implemented and used, the scope can be broadened to other land related issues like land use or vegetation monitoring etc. Furthermore, The three cases are not dealing with isolated issues, but are reflecting the typical land tenure recording situation across much of sub Saharan Africa, and other parts of the developing and even developed world. Since the three selected use case areas provide vignettes into common land governance challenges across Sub-Saharan Africa, there may be potential transferability of lessons to other contexts in Sub-Saharan Africa, and perhaps beyond.

#### 4.1.4 Threats

The socio-economic context is fundamental both for land governance and governing the innovative geospatial tools. These contexts can, however, rapidly change due to political or environmental fluctuations. Today, land is politically assumed as an important aspect to deal with. However, when

new governments come to power or political, economic or social unstable circumstances arise, the effect on land administration can be tremendous through changing policy priorities. It is therefore important to be aware of the fact that unpredictable future aspect will also have a mayor impact.

## 5. Conclusions

Before innovative geospatial tools can be implemented effectively, a decent understanding of land governance is crucial. For this purpose, three east-African case countries (Ethiopia, Rwanda and Kenya) are analysed based on five different land governance factors, namely socio-economic country context, the types of tenure that exist, the operation of current land market, land reforms and institutions that are responsible to regulate land tenure.

The preliminary SWOT-analysis results identified that socio-economic factors are essential to examine before tools can be implemented and used effectively because the overall country context in developing countries is still different from developed countries. The factors discussing land tenure systems, land reforms and land markers identified specific land governance challenges, which may present barriers to introducing and sustaining the new technologies. Besides, these factors are also important to understand the fundamental land country context. The institution factor identified that central governments will be an important stakeholder to cooperate with. Nevertheless, land tenure services are unlikely to be able to perform properly if decentralization is not supported by the required transfer of financial, and administrative authority, recourses, functions and responsibilities.

Although, a more in-depth land governance understanding of the countries is still needed, the analysis of the main land governance factors can contribute as an important exploratory first step in the process of the potential implementation, organisation and use of innovative geotechnical tools. More broadly, many papers concerning this subject are often written from the technical perspective of western countries, so an assessment from the perspective of developing countries, as well as from a social orientation, may offer some alternative insights and opportunities for additional research.

## ACKNOWLEDGEMENTS

This paper is supported by European Union's Horizon 2020 research and innovation program under grant agreement No 687828, project its4land (Geospatial technology innovations for land tenure security in East Africa).

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## **BIOGRAPHICAL NOTES**

Starting from July 2016, Ine is working at the KU Leuven Institute of Public Governance as a doctoral student for an Horizon 2020 project called ITS4LAND, an innovative project aiming to develop land tenure recording tools inspired by geo-information technologies, that responds to end-user needs and market opportunities in sub Saharan Africa, reinforcing an existing strategic collaboration between EU and East Africa.

Ine’s part in the project mainly concerns the development and valorisation of governance models by aligning end users conditions, technological opportunity, business models and capacity building requirements.

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