

# Land Information System for Development (LIS4D): A Stakeholder Perspective

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## **Abstract**

Effective land ownership and management systems are important components for economic development in developing countries. In this paper we introduce the Sustainable Management of Land and Environment (SMOLE) project from Zanzibar, focusing on the development of a Land Information System (LIS) to fight poverty and empower local landowners. We argue that the stakeholder perspective could be a helpful lens to explore the project, and at the same time to provide lessons learned on how to include both the supply and the demand side in ICT4D projects. Furthermore, we introduce lessons learned from relevant research literature, to introduce both the research area of interest (LIS) and the area of interest (Tanzania and Zanzibar). So far, we have concentrated on the supply side (mainly governmental bodies at various levels), and more research is needed to explore the implementation of SMOLE within a localised context, and to analyse demand-side salient stakeholders influencing on the success or otherwise of the SMOLE project.

## **Keywords**

Land Information Systems, Stakeholder Theory, Development, Developing Countries, Zanzibar, Tanzania

## **1. Introduction**

Information technology has the potential to create and support development in developing countries, mainly through providing access to information and through building communication lines between people. In countries where the Internet and other technologies are less accessible, sources of information for personal development, business start-up and growth, or political participation are lacking. In addition, education is suffering, and people are not able to compete in the global economy.

The issue of access to information technology has two different perspectives. The

technical perspective consists of building the physical infrastructure for access. The social, mental or cultural perspective facilitates the process and allows people to take advantage of the infrastructure in order to develop their competence and skills and to participate in the global information society (Furuholt, 2009).

One area where access to information technology and the Internet can be particularly useful for the development of the least developed countries (LDCs) is as a tool for promoting good governance through e-government systems. Kristiansen (2004:11) states: "there seems to be a clear relationship between information asymmetry, corruption and bad governance". In recent years, governments from all over the world have tried to take advantage of information technology to improve governmental administration and communication with their citizens and businesses. Generally, however, developing countries are lagging behind in e-government adoption as compared to developed countries.

Development literature focuses strongly on the importance of land rights for development. Individual and secure land tenure rights are vital components in the agricultural sector, and crucial to poverty alleviation and economic growth. Defining and documenting landowners' legal rights and the extent of the landholding are important for simplifying land transactions, using land as collateral for credit, and enabling land administration (Hanstad 1998).

Land administration represents the governmental responsibility to provide security of tenure and information about tenure issues for property markets and governmental and private business activities. A land administration system provides an infrastructure for implementation of land-related policies and land management strategies. It includes institutional arrangements, a legal framework, processes, standards, land information, management and dissemination systems, and the technologies and people required to support and control the use of this infrastructure. When these infrastructures are based on modern ICT (hardware and software), the land administration system could be described as a land information system (Furuholt et al., 2015).

Sophisticated Land Information Systems (LIS) are to be found in most developed countries. Their main function is to support the active land market by permitting land to be bought, sold, mortgaged or leased. Modern LIS, based on land cadaster, is part of the basic infrastructure for economic development and environmental management (Huber et al., 2008:3).

Therefore, LIS is a typical e-government system. E-government refers to government agencies' use of ICTs that have the ability to transform relations with citizens, businesses, and other arms of government. These technologies can serve a variety of different ends, such as better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management (World Bank, 2015).

Sustainable development is not attainable without sound land administration. The lack of accurate information about land and land ownership is a major challenge for developing countries, and LIS is thus at the core of the research area ICT for development (ICT4D). Despite this important role, the research area of land information systems has been scattered within IS, as well as within the area of information and communication technologies for development (ICT4D) (Furuholt et al 2015).

Based on our own field work we have found that a large amount of actors both from the supply and the demand side are involved in LIS processes. These actors, or stakeholders, usually have common interests in establishing an overarching functional system for land management, but may have other conflicting interests. In existing relevant literature on LIS, the stakeholder relations have been described only to a limited extent. Examples include Walsham and Sahay's (1999) work from India, describing the efforts to develop and use geographical information systems (GIS) to aid district-level administration. Over 20 separate government agencies were involved, causing severe management challenges in coordinating the actions. In their work on land claims and law in Indonesia, Bakker and Moniaga (2010) found that regional governments and others attempting to control forest areas locally, found themselves in confrontation with the powerful Forestry Department, and that contestation and power struggle between officials within the state apparatus provided opportunities for many local groups to claim rights and formalize essentially illegal practices.

To address the lack of LIS research in general, and stakeholder analysis on LIS projects in particular, we are here introducing a case study from Zanzibar, the SMOLE (Sustainable Management of Land and Environment) project. At Zanzibar, a semi-autonomous part of Tanzania, three central government agencies are in an early phase of developing LIS, working to improve land management through planning at village, township, district and national level, through mapping and surveying of land and through registering land titles in a national registry. By discussing this case, we aim to explore issues such as:

- Who are the main stakeholder groups? What are their stakes, and how does that influence the possible design, implementation and use of the LIS?
- How do the main stakeholder groups evolve during various project phases?
- Which stakeholder groups' values do the LIS address? Are there any conflicting values between various stakeholders?

The rest of the paper is structured as follows. In Section two, we present the context of our case, namely Tanzania and Zanzibar and the land registration background. Section three describes our theoretical framework, and in Section four, the research methods are explained. In Section five, we present and discuss our preliminary findings, and Section six concludes the paper by describing its main contributions and future work avenues.

## 2. Zanzibar and Tanzania

The United Republic of Tanzania, a merger of Tanganyika and Zanzibar, is a multiparty democratic republic that became independent from the UK in 1964. According to the 2012 Population and Housing Census, Tanzania has a population of 45 million. (Tanzania National Bureau of Statistics 2013), and with an area of 945,000 square km, Tanzania remains one of the least urbanized African countries; only 23 percent of the total population live in urban areas. . Kiswahili has become the lingua franca of eastern Africa and is the official and common language. From secondary school level, all teaching is in English, the second official language of Tanzania (Furuholt and Kristiansen 2007).

Zanzibar is an island state within Tanzania and has its own semi-autonomous government led by a president, with its own House of Representatives and cabinet ministers for all matters which are not union affairs. Zanzibar is an archipelago made up of several islets (see figure 1) located in the Indian Ocean. It is dominated by the two main islands

Zanzibar and Pemba. Zanzibar Island (known locally as Unguja) is occupying a total area of approximately 1,000 square miles, while Pemba has a surface area of 600 square miles and is located about 30 miles north-east of Unguja Island.



Figure 1. Tanzania and Zanzibar (Source: ZanzibarNet)

According to the 2012 census, the current population of Zanzibar is 1.3 million inhabitants, 900.000 live at Unguja and 400.000 at Pemba. The largest concentration is Zanzibar City with approximately 300.000 inhabitants. Zanzibar consists of a multiracial and multicultural community, primarily of Arab and African decent and blended with local culture. Islam is the dominant religion, and practiced by most Zanzibaris, although there are also followers of Christianity and Hinduism.

Fishing and agriculture are still the main economic activities for local people. Although traditional products like coconut and spices constitute important export revenue, tourism has been ear-marked as the primary source for retrieving foreign exchange, with a continuously growth of tourists each year. Currently, the numbers are low (less than 100,000 annually) and the potential for attracting more tourists is high (Zanzibar Commission for Tourism 2014).

The first formal land registry in Tanzania was introduced during the German era in 1903, and was replaced in 1923 by the British Land Ordinance which in essence continued to be the principal legislation on land tenure until 1999. Since 1999, the Land Act and the Village Land Act officially determine land use and land tenure in Tanzania. Quite similar to the colonial ordinances the new land laws declare all land as “public land vested in the President as trustee on behalf of all citizens. These new land laws initiate a shift towards a market orientated land policy. The following land types are distinguished: reserved land (e.g. protection areas), village land, which declared as being the land falling under the jurisdiction and management of a registered village, and general land, which is neither reserved land nor village land e.g. all urban areas. The Tanzanian society is now in a (slow) transition from customary rights to a right of occupancy system accompanied by its moving from the tradition of oral adjudication towards written documents concerning business and property issues (Huber et al. 2008).

### 3. The Stakeholder Approach

The stakeholder approach focuses on identifying groups or individuals who affect, or are affected by, ongoing or planned projects (Freeman, 1994).

As stakeholders have legitimate interests, they should all have equality of opportunity and considerations (Bailur 2006). The theory of stakeholder salience (Mitchell et al. 1997) offers sound theoretical arguments to explain why some stakeholders are salient, whereas others are not, depending on the relationship between power, legitimacy and urgency (Table 1). The sum of the attributes determines the salience of a stakeholder, where salient stakeholders possess all three attributes and are more salient than those who possess only one or two of the attributes.

Power	Defined as "...the ability of those who possess power to bring about the outcomes they desire" (Salancik and Pfeffer 1974: 3). Sources of power can be coercive (physical force, violence or restraint), utilitarian (material or financial resources) and normative (based on symbolic resources). Power is variable, meaning it can be acquired and lost, and it may or may not be exercised.
Legitimacy	Defined as "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, beliefs and definitions" (Suchman, 1995: 574). Legitimacy is evaluative, cognitive and socially constructed and may be defined and negotiated differently at different levels of social organisation (typically individual, organisational and societal) (Mitchell, et al. 1997).
Urgency	Defined as "the degree to which stakeholder claims call for immediate attention" and is something "calling for immediate attention". It consists of two attributes: "(1) time sensitivity, the degree to which managerial delay in attending to the claim or relationship is unacceptable to the stakeholder, and (2) criticality, the importance of the claim or the relationship to the stakeholder" (Mitchell et al. 1997: 867).

*Table 1. Attributes determining a stakeholder's salience (Sæbø et al. 2011)*

The stakeholder theory may be a helpful approach to identify various (and potentially contradictory) value set among stakeholder groups. In traditional management literature stakeholder theory is meant as a tool to identify stakeholders' groups to which management or owner of an organization should pay attention, is also useful to identify which stakeholder groups will act to protect their interests. Recent work within the e-government area has successfully applied the salience perspective using a more narrative approach (e.g. Sæbø et al. 2011) that is also in line with the approach applied in our case study.

### 4. Research Methods

Our study is an interpretive case study, focusing on SMOLE. The basis for our work was a literature review on Land Information Systems for Development (LIS4D), identifying more than 100 research contributions on LIS from the last 10–15 years, and categorizing a limited amount of relevant articles (See: Furuholt et al. 2015). In addition to this, we found a small amount of works, specifically dealing with land administration issues in Tanzania and Zanzibar.

Before visiting SMOLE, we also did a pre-study of the presentations, published reports and articles from the SMOLE website (SMOLE 2015). While visiting, we conducted group-

interviews and participated in discussions at the SMOLE office, including the project manager and key project officers. Finally we observed demonstrations of the various system modules. The findings reported here is based on the literature review, presenting contributions we find appropriate within the context, and our findings specifically related to the supply side of SMOLE, discussed in light of the stakeholder approach.

## **5. Findings and Discussion**

### **5.1 Findings from the literature with relevance to the case context**

#### **5.1.1 LIS and Land registration activities in Tanzania.**

Huber et al. (2008) states that only 11% of the land properties in mainland Tanzania are legally registered. The value of extralegal Tanzanian assets is estimated to 29.3 billion US\$, capital that goes largely underutilized due to the lack of protection by the Government. Hence, creating the legal and organizational framework to make these assets accessible for private investments and taxation is high on the national agenda.

Providing land tenure security is a highly complex task in Tanzania, with overlapping legal systems, up to 8 years waiting line to register parcels, and where the regulatory intervention is seen as means to dispossess vulnerable groups. Nevertheless, there is a common understanding of the need for certified proof of ownerships, as well as to decrease current land disputes. There is a vicious circle including disordered land tax collection depriving Government's resources needed to develop an effective system of land registration, to provide land tenure security and finally increase land tax collections (Huber et al. 2008). According to Mithöfer (2008:18), several pilot studies have been conducted to develop procedures and test new technologies addressing the complexity needed for land registration and management, based on a government initiative from 2005, which outlines the reorganisation of the land registration in Tanzania and the implementation of GIS technology

#### **5.1.2 Land Disputes and Conflicts in Zanzibar**

The revolution in Zanzibar in 1964 brought changes in Government who implemented land reforms including redistribution of land. A presidential decree declared all land to be public and vested in the Government. Clove and coconut farms were nationalized and the land apportioned in the Three Acre Plots (TAP) and distributed to peasants, with a caveat not to transfer ownership and inheritance. Since customary lands mostly became individualized, rural land in Zanzibar became either under individual or state ownership.

Since then some of the TAPs have been sold as granted parcels, changed into residential/commercial lands, been subdivided, or been inherited contrary to provisions of the decree. Based on various sources (e.g. agricultural census data and numbers from the TAP programme), Lugoe (2012) has calculated the total number of 282,868 land parcels for Zanzibar's two Islands. And, in 2012, less than 10% of these parcels were formally (digitally) registered.

Conflicts and disputes have evolved due to the statutory non-transferability condition attached to them, the illegal occupation of state farms, and squatting in urban and peri-urban lands. Uncertain land ownership and boundaries has fueled disputes concerning TAPs all over Zanzibar, and efforts to facilitate and formalize the land reform processes

have been slow and less effective. In the interim, land use has been bogged down by disputes that have put many properties out of production and development (Lugoe 2012).

Land is critical to the economic, social and cultural development and crucial in order to achieve economic growth, poverty reduction and gender equity. Issues concerning land were among the reasons for the 1964 revolution and still remain politically sensitive. The Government argues that Zanzibar is running out of land, thus the use has to become more effective. Hence, they have developed a new Land Use Policy in order to minimize improper land use. Important objectives include the reduction of land conflicts among different stakeholders, to assure farmers easy and timely access to land without compromising their agricultural operations, and maintain political stability. On the contrary, Zanzibar's political elite and investors who occupy huge chunks of land may reluctantly support the new land policy which aims to make changes in land usage and ownership (Yussuf 2013).

In 2006, the Zanzibar Land Tribunal (ZLT) was established by an Act of parliament, a public institution established to deal with land disputes and conflicts. There are now 4 magistrates of the ZLT, two on each of the islands of Unguja and Pemba. In 2012, an accumulated total of 1,609 cases had been filed and only 383 had been determined by the ZLT. As the years go by the gap between the number of cases filed and the cases determined continues to widen.

As the numbers show, the magistrates are addressing only a small part of the disputes. In a situation where almost 90 percent of the possible 282,000 land parcels are not registered, and in a situation where land acquisition is not by Government allocation but from the market or inheritance, many more disputes could be expected. It is likely that most disputes do not find way to established dispute resolution centers, but could be underground and probably surrounded in injustice or people taking the law in their hands. In order to solve this increasing problem, land owners should have their lands entered in an efficient, modern register, and it is possible to register all lands in Zanzibar within 1-2 years since the most expensive tools are already available (Lugoe 2012).

## **5.2 Findings from the SMOLE project.**

Under the Land Use Policy, Zanzibar is aiming towards a modern land management system including property registration through the Government of Finland financed SMOLE-project, initiated in 2005. The project has been carried out in two phases, SMOLE I from 2005 to 2009 and SMOLE II from 2010 to 2014. The SMOLE II budget was originally Euro 9 million over 4 years, where the contribution from The Revolutionary Government of Zanzibar was 0.4 million Euros. An additional 1.8 million Euro was allocated for an extension year (2014-15).



Figure 2. The SMOLE Logo

The development objective of SMOLE is to contribute to the reduction of poverty through environmentally sound land management, addressing goals set by the Government of Zanzibar Strategy for Growth and Reduction of Poverty (MKUZA), and by the Government of Finland's development policy. The key objectives that are supported by SMOLE II include:

- Aiming to ensure that 50% of the current productive land is demarcated and registered by June 2015
- Supporting women's access to productive resources including land
- Reducing environmental degradation
- Conservation and sustainable utilization of forests
- Protecting water catchments
- Increased capacity to mitigate and adapt to climate change
- Promoting community participation in natural resource management

The project consists of two main Components:

1. Support to Land Management and Administration, implemented in three Departments under the Ministry of Lands Housing Water and Energy:
  - a) Department of Lands and Registration
  - b) Department of Urban and Rural Planning
  - c) Department of Surveys and Mapping
2. Strengthening Environmental Management and Renewable Natural Resources management, implemented through two departments under the Ministry of Agriculture and Natural Resources:
  - d) Department of Environment under the First Vice President Office
  - e) Department of Forestry and Non-renewable Natural Resources (SMOLE 2015).

In addition to systematic land registration and other land management components, improved revenue collection components will be supported for the Zanzibar Revenue Board. Revenue collection application development started in August 2008 and the Zanzibar Integrated Tax Administration System prototype was completed at the end of 2009. The data entry and testing of the developed modules started in January 2010 under SMOLE, and the revenue collection components use the building footprints and parcel boundaries as their key geographic layers.

The data base can also be used for the management of garbage collection and waste water fees collection by the Zanzibar Municipal Council, addressed by the new module

(Land Administration and Revenue Generation – LARGE). The main users of the LARGE application include the Department of Lands and Registration including Land Registrar's Office, the Department of Surveys and Urban Planning, Zanzibar Municipal Council, Zanzibar Revenue Board, and Stone Town conservation and Development Authority (Nieminen and Heinonen 2010).

The computerized part of SMOLE is ZALIS (Zanzibar Land Information System). ZALIS is a GIS-enabled land registration, management and information system on the basis of digital maps derived from aerial photographs of the two main islands. ZALIS makes use of low-cost, mobile equipment to facilitate frequent aerial photography updates necessary for accurate land use, tenancy and land-bases resources monitoring. The equipment consists of digital cameras, laptops, GPS receivers bunched in a portable unit to be quickly installed to airplanes. Digital outputs can be transferred directly into GIS programs (e.g. ZALIS) for further use and analyses.

During SMOLE Preparatory Phase from 2003 to 2005 a detailed aerial photography was completed in scale 1:3,000 and 1:8,000 for the Stone Town (the historical centre of Zanzibar City) and its suburbs, and for the rest of the land area of the islands in aerial photography scale 1:25,000.

Thus Zanzibar has got an excellent base material that can be used for digital mapping, urban and regional planning, environmental management, public utilities management, and promotion of tourism activities (Nieminen and Heinonen 2010).

The importance of land registration and certification is illustrated by a press release from The Embassy of Finland in Dar es Salaam, saying that:

the 27<sup>th</sup> of March, 2013 was a historical day in Zanzibar: the State House and fourteen home owners in Zanzibar Stone Town area received title deeds for their property as a result of a long cooperation between Zanzibar and Finnish governments... The event was officiated by President Ali Mohamed Shein while the Finnish Ambassador Sinikka Antila gave a speech to celebrate the important day (SMOLE 2015).

In her speech, the Finnish Ambassador put emphasize on the urgent need for a modern LIS for development of Zanzibar:

The pressure on land has increased tremendously in Zanzibar as the population is growing, people are increasingly moving to urban areas and tourism continues to gain ground in Unguja and Pemba islands. The severe competition for access to natural resources endangers mainly the poor majority of Zanzibaris. The old tenure system in Unguja used to be based on trees, so that the owner of coconut palms also owned the land. Now the tenure is becoming more and more commercialized and it is transformed to a more land based tenure system. The coastal communal lands have become subject to strong private and commercial interests and have largely lost their communal status.

In and around the Zanzibar town there is a huge and expanding area of informal but permanent settlements. This has also increased disputes over land rights and endangered areas of crucial importance for livelihoods of people: an example is the deforestation and building of houses in the Masingini-Dole area which provides for the water needs of Zanzibar town residents. Sustainable management of land and environment is crucial for the future of Zanzibar (SMOLE 2015).

Registration takes place in to steps, the first step is the adjudication, where formal papers (inheritance documents and birth certificates) are checked, and the second step is issuing

the land ownership certificates.

So far, registration has first been piloted in Stone Town, in Ngambo area next to Stone Town, and in Chake Chake (Pemba Island). According to the project manager, it has been at times “painfully slow” and only during the last few months before our last visit (September 2014), the speed increased and the first Land Certificates were handed over to owners. SMOLE then aimed to continue registering plots in Unguja and Pemba and to register half of the plots there by 2015. There were five teams working to register plots, starting from urban and coastal areas as well as the areas of economic growth where there is a lot of pressure and risk of land grabbing.

Another Land Registration pilot area is the Nungwi peninsula, which is one of the tourist areas in Zanzibar, with more than 40 tourist hotels and restaurants, traditional village settings, and a dhow building centre. Although the land registration exercise in Nungwi started some time ago, the main problem realized was that many residents were lacking necessary documentation. After first to have failed the land adjudication process, a solution was sought through introducing a Land Registration One-Stop-Centre with easy access to land registration expertise which brings services closer to the people, and speeding the adjudication process.

Although they have managed to develop a computerised land registration system, by September 2014 they have only achieved the adjudication of nearly 30,000 parcels of land, and registration of about 2000 parcels, according to the project manager. Compared to the total number of 282,000 parcels, and the original target of 50% of the current productive land to be demarcated and registered by June 2015, this is considerably lower than the expectations.

In order to better understand and explain this lack of success, we have chosen to use the stakeholder theory to identify the roles and describe the activities and play between the various actors in these processes.

Our description illustrates that a wide variety of stakeholders are involved in land-related issues, either on the supply side as described above, or on the demand side (e.g. farmers, fishermen, and local businessmen). Altogether, so far, we have identified a large number of supply side stakeholders:

- Ministry for Foreign Affairs, Government of Finland (The Embassy)
- Revolutionary Government of Zanzibar
- Department of Lands and Registration,
  - including Land Registrar’s Office
- Zanzibar Land Tribunal
- Department of Urban and Rural Planning
- Department of Surveys and Mapping
- Department of Environment under the First Vice President Office
- Department of Forestry and Non-renewable Natural Resources
- The SMOLE II Project team, including
  - Project steering committee and project management
  - 5 land registration teams
  - ZALIS IT development staff
  - Training personnel
  - One-Stop-Centre staff (Intermediaries)
- Zanzibar Revenue Board

- Zanzibar Municipal Council
- Stone Town conservation and Development Authority

Early 2015, however, the SMOLE work stopped. According to the manager:

We are still here but only to use the remaining project funding meaning the project will be operational until the end of May this year, after which it will close. At the moment it looks like Finland are pulling out of Zanzibar to focus on mainland Tanzania. Unless another donor comes along the departments will be left to progress activities without any financial support. It's a real pity as we are now actually making some real progress after many years of Finnish support.

The last update of the SMOLE website was on March 16<sup>th</sup>, 2015, and their Facebook account has not been active since late 2015 (SMOLE 2015).

## 6. Conclusion

This study followed the process of introducing modern, digital based land registration systems in an economically poor context. We conducted stakeholder analysis from the perspectives of mainly supply side stakeholders, such as local political authorities and government agencies, and the external funder and external consultants.

Our main objectives for this work are to identify influential contextual issues and potential benefits and disadvantages land registration systems may have in order to better understand how to design and implement such systems to address local needs, and to contribute to development. By describing best practices for land registration systems in this context, we will be able to give policy recommendations to public and private actors within the area.

The study offers several contributions. First, it identifies the large amount of stakeholders within this area, and the complex relationships among them, that may lead to land conflicts. Second, it examines the research areas of LIS implementation in developing countries, an area which so far has not been coherently studied. Third, it offers a suitable analytical lens, the stakeholder theory, to understand the ongoing work and processes. We intend to analyse the data more in depth in order to reveal the level of salience of each stakeholder and their impacts in this complex system. By doing so, we expect to draw a clearer picture of the relationship among the actors and identify who can do what when resolving land conflicts.

After the Finnish grants have stopped, it will be interesting to follow the progress of the land registration and LIS implementation, based on the local funding and initiatives. While identifying the main stakeholder groups in this phase of our work, the next step will be to identify demand-side stakeholders, i.e. to study the local implementation processes at village level and interview local officers and local users (citizens and business communities). At the same time, we will describe their salience, and thus influence, on the project. For example, in the case of land certification, farmers may have a high level of urgency but a low level of legitimacy since they have no ownership rights over the land that they are cultivating and lack power. Furthermore, future involvement is needed in order to better understand the needs and the enabling and inhibiting factors influencing the potential success of SMOLE.

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