Thinking Local: Can Local Land Administration Systems Avoid the Pitfalls of National Land Systems?

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Abstract

Growing recognition of the importance of secure land rights to a robust and sustainable economy has prompted the international development community to invest heavily in efforts to create and support modern, national land registrations and cadastral systems in emerging markets. These expensive projects have, time and again, struggled with cost, sustainability, and technological challenges.

This has prompted some in the land sector to investigate the feasibility of local, smaller scale systems. Land information systems have a better track record when implemented at a smaller scale; whether due to the size of the country and the transaction volume, or because the systems are implemented at more localized levels - municipalities, customary groups, or self-identifying communities such as slum dweller associations. These local groups often have more of a vested interest in maintaining the data, whether because of an interest in potential property tax revenue, a need to protect the property rights of community members, or interest by outside investors in acquiring land. Localized systems have another edge on national systems, they do not require the same complexity in terms of workflows, historical data integration and information technology infrastructure. Lastly, because such small scale systems are often implemented by community members with local knowledge, they tend to be more equitable, provided the responsible actors are committed to addressing the rights of disadvantaged groups within the communities, including women, and are trained in the nuances of laws pertaining to land rights. This paper explores the potential for local land information systems to avoid the pitfalls of national systems and outlines a planned pilot to test the feasibility of local land information systems.

Key Words:

Land Information System, Registry, Cadastre, Open Source, Open Data

Overview

According to the World Bank, an estimated 70 percent of the land in emerging economies is undocumented. This lack of documentation creates insecurity, inefficiencies, and is a significant barrier to development. To address this, countries around the world have launched efforts to create modern national land administration systems -- with mixed results.

Sustainable modern computer based workflow driven national land registration and cadastral systems have proven to be difficult to sustain.Adopting countries have found that the systems are costly, both to implement and to maintain, require significant expertise that is often unavailable in emerging economies, are difficult to keep up to date, and can be unwelcome and actively undermined by entrenched bureaucracies.

Given the failure of many emerging economies to establish and sustain functional, up to date, national administration systems, land management is currently still largely a local affair across most of the world.

It is often conducted informally - whether through collective memories, visible monuments, generally accepted boundaries or reliance on a trusted leader. While effective at a small scale, it is difficult for outsiders to access and understand, and is often unrecognized and undermined by actions at the national level.

As pressure on land increases both because of population growth and increased interest in land purchases and leases from outsiders, more local institutions - such as slum dweller associations, religious organizations, traditional rulers, neighborhood associations or local governments are eager to formalize their currently informal land system to strengthen security.

This has prompted local organizations, communities, and non profits to explore the feasibility of creating and sustaining local level land information systems supported by communities, local officials, or non-profits.

This comes at a time when recent innovations in technology are revolutionizing efforts to document and strengthen land rights around the world. These technologies present an opportunity for sustainable local

level land information management - in effect putting robust tools into the hands of local scale land governance actors.

Technology, such as global position systems (GPS) and drones now allows us to collect information and document land rights efficiently and effectively. Off the shelf smartphones and tablets now can be used to easily capture and transmit evidence of land rights. In addition, cloud computing allows this information to be stored and accessed by anyone with an internet connection. These tools are also becoming more accessible and user friendly, and with much of data collection and management possible by mobile phones, a technology that in Africa is used to access the internet far more often that traditional computers or tablets, the barrier to entry presented by a need for technical expertise is significantly lowered.

This paper considers the challenges faced by national systems, examines early evidence of suggesting strong benefits to a more localized approach to implementing land information systems, analyzing under what conditions such a system would be applicable and successful, how to ensure sustainability, and finally how it might be tied to local level tax collection.

Challenges of National Enterprise Systems

National land information systems, whether built on open source or proprietary solutions, have had very limited success rate. Despite many tens of millions of dollars having been spent by donor agencies, the simple fact remains that the vast majority of citizens have not been incorporated into formal tenure regimes.

This poor track record for long term sustainability and success of land information systems in emerging economies can be partially attributed to a number of issues: government capacity, scarcity of IT professionals, lack of funds for maintenance, government centralization, transitioning paper-based systems, corruption, lack of political will and technological hurdles. We will discuss each of these below.

Government Capacity

In many emerging economies, existing staff of registry and cadastral offices have little, if any, experience working with computers for professional activities.. Replacing government staff with others that might have more relevant qualifications is often not an option, and therefore capacity building is critical. Too

often however, insufficient time and budget is allocated to building skills of staff through formal training, and critical on the job training and support. Often, officials underestimated the training needed. And they often set overly aggressive, and unrealistic, timelines for implementation which doesn't allow for proper training to allow the system to not only become operational, but also institutionalized within government. It is critical for staff within the land agency to be comfortable using and administering the system. This takes time and support.

Scarcity of IT Professionals

While line staff using the system need to have basic IT skills, as well as a thorough understanding of the land information systems in place, system administrators and programmers are required to have robust and deep information technology knowledge. These higher level staff are expected to manage and configure user accounts, provide routine maintenance, manage security and backup processes, maintain the hardware, and as needed, provide ongoing system adjustments. One can imagine how the simple act of changing the fee charged by the government for a particular type of transaction might require software adjustments. Such an adjustment, while minor, may require editing of computer code. Even more complex changes to the land governance framework and workflows - for example a new type of land right, such as customary tenure, would require even deeper IT skills.

While the number of dedicated IT professionals is growing, they are still in short supply in many countries. Where they do exist, they are in such demand that a government position with often low pay, is not appealing. Even if a government could hire or train existing staff during the development phase of a system, it is commonly very difficult to keep such high-skilled workers over time.

Lack of Funds for Maintenance

In other instances, system failure can be attributed to lack of government resources to maintain these expensive systems. While donors generally fund the software development and/or configuration, software installation, hardware purchase and installation (including high cost items like generators, battery backup, air conditioners and voltage regulators that need not be accounted for in advanced economies), training and business process re-engineering, ongoing maintenance is left to government. Most government land offices don't have the budget for this, nor do they have realistic sustainability plans to keep the system operational. National governments are often unwilling or unable to increase funding to cover ongoing costs such as the annual maintenance costs of proprietary software and the high priced specialized

experts to maintain the system.

Government Centralization

In many areas in emerging economies government offices are rare in rural areas. This means rural dwellers who want to ensure a land transaction is legally documented must spend a day or two traveling to the nearest government office. Many farmers cannot afford the opportunity cost and never register the transfer -- contributing to the government's registry quickly becoming outdated.

Transitioning From a Paper-Based System

Transitioning from a paper driven manual process inevitably leads to a need for changes in policy and practice, and often even law. Within paper based systems, procedures often call for physical reviews of documents and surveys with accompanying stamps or signatures before being passed on to the next actor in a workflow. Within digital systems there are no such paper documents that can be stamped. This new system necessitates a change in workflow and process; which inevitably calls for a time consuming review process.

Corruption

Corruption also remains a critical issue in the land sector. According to Transparency International, land agencies are the third most corrupt government agency globally, behind only the police and the judiciary (Transparency International, 2014). At the time of the survey, an estimated 21 percent of citizens had someone within their household pay a bribe to a land officer over the previous 12 months.. A modern enterprise land information system is, theoretically, very difficult to manipulate. No transaction can occur without a system user being logged in, the actions they can perform are limited by their role, and every adjustment to data in the system is logged through an audit trail. Thus, the ability to manipulate the system is extremely curtailed - and for staff in the land agencies of emerging economies that are not paid a realistic living wage, and can now no longer supplement their income by moving an application to the "top of the pile" for a bit of lunch money, their is very much a disincentive to support a transparent and traceable system.. At the other end of the spectrum, national elites - whether financial or political - who have previously used an opaque system to enrich themselves also oppose a transparent system.Lack of

Political Will

It's important to recognize that these countrieshave received donor funds for a reason - they need help

developing. The problem they face can never be cured with a single IT solution. In many ways the technology is the easy part - the challenges lie in the political will.

Inappropriate Technologies

Looking at the landscape tenders, it is clear that some contain inappropriate (or functionally impossible) specifications. Too often systems specifications are developed without a thorough understanding of the local context and realities. Donor organizations must ensure that systems take into account the existing local legal framework, staff capacity, and the realities of ongoing maintenance. Too often a "Rolls Royce" system is designed for a country that, figuratively speaking, doesn't yet have roads.. It's easy to forget that the foundations of a functioning land administration system isn't forged overnight, nor is it fixed by a software solution - effective land governance mechanisms evolved in many countries over decades, if not centuries, and we shouldn't expect countries without such a tradition to simply "get it" overnight thanks to a new computer system.

Land information systems in Europe and North American evolved incrementally. We have no evidence to support the idea that land information systems in other regions should develop at any greater speed. Given our experience with national systems, and ongoing pilots, it is plausible that a better recipe for success is to begin with more localized systems, either geographically or contextually, and which can be adapted and expanded upon incrementally. Simply put, the systems should be fit-for-purpose.

The Benefits of a Local Approach to Land Information Systems

Land information systems have the potential for a better track record when implemented at a smaller scale, for a variety of reasons: system size, simple workflow, no legacy issues, local vested interest, fewer geographic barriers, less opportunity for corruption, reduced cost, and local expertise. We will explore each of these below.

System Size

Local systems implemented by a single organization often have minimal hardware needs - perhaps just a single computer and a printer/scanner..

Simple Workflow

Localized systems also do not require the same complexity in terms of workflows with multiple actors

and perhaps multiple agencies, needing to discuss, prioritize and sign off on changes. Instead, most of the steps of the workflow are accomplished by just a handful of dedicated individuals with a clear understanding of what is needed in reality and what will actually produce benefits to the local community.

Legacy Issues:

Localized land information systems often do not face the same barriers in terms of incorporation of legacy data. In many countries, a first step in working towards a modern land information system is the digitization and indexing of legacy records. Often these historic records are written on crumbling paper in antiquated hand writing and are therefore difficult, if not impossible, to interpret. Historical survey records are also notoriously difficult to rectify with the current situation on the ground - whether due to the survey equipment being antiquated and inaccurate, use of out of data coordinate systems in old surveys, or a reliance on l boundaries or markers that are no longer evident on the ground. As a result, data integration is often costly and time consuming. Local land information systems are more often focused on the actual situation on the ground today as opposed to the historical record - as such data can be collected based on the de facto evidence available.

Vested Interests

Local institutions often have more of a vested interest in maintaining the data, whether because of an interest in potential property tax revenue, a need to protect the property rights of community members, or interest by outside investors in acquiring land. Because such small scale systems are often implemented by community members with local knowledge, they tend to be more equitable, provided the responsible actors are committed to addressing the rights of disadvantaged groups within the communities, including women, and are trained in the nuances of laws pertaining to land rights.

Geographic Barriers

Not only is collecting the initial property rights data much easier task when it is locally based. But it is also easier to keep up-to-date.

Land information systems at the local level are not without challenges however. In the past, these systems were paper based or oral, due to the high cost of technology and low rates of literacy. Even in more recent history, the few examples of local land systems were often implemented on a single desktop computer; leaving them vulnerable to theft or hardware and software failure. Furthermore, the data in

such a desktop system is difficult to share with partners, beneficiaries or relevant parties and there is often little potential for customization. Accessing additional data streams that might be of relevance, such as high resolution satellite imagery, can also be very challenging. The lack of a data standard, in the event the data is to be migrated to another system, or into the formal registry and cadastre, has proved to be a challenge.. Finally, the number of available purpose built land information systems for registry and cadastre at the local level have been limited. Offerings like Open Title from Thomson Reuters help fill the niche as a quality maintained and proprietary system. But there is an associated license and maintenance fee that might place it beyond the reach of many actors. The STDM product from UN Habitat is another example of a tool for managing local land information, this one open source, however it still has room to mature as a product.

Recognizing some of the inherent challenges with local level systems developed to date, there is a clear need for an alternative, open source and cloud based platform for collecting and managing land rights data.

New Local LIS Pilot

To explore if localized land information systems can be sustainable, equitable and cost effective, particularly when managed by trained local community members, Cadasta and Kartverket, Lantmäteriet will pilot the implementation of a local land information system. The pilot will attempt to address these challenges and both manage property rights and to allow for more effective property tax collection at the local level.

The key to the pilot's success will be tangible improvements for the local community funded by increased property tax income made possible by the LIS.

The land information system relies on a combination of low cost and fit for purpose tools, including drones for imagery, the open source software of the Cadasta Platform for data management, mobile applications and paper based tools for data collection.

The Cadasta Platform provides a tool that is designed to document the relationship between people and the land and resources they rely on. The platform creates a digital record of land and resource rights, and the user can define what data needs to be collected, in a platform that is designed to be flexible and

capture a wide variety of data, from GPS coordinates and land boundaries visible from imagery, to video interviews with tribal chiefs and documentary photographs.The platform is designed to be easy to use, and includes global high resolution satellite imagery - 80% of the land surface is at ½ meter or better resolution.

The technical platform allows for a robust web based land information data management, while also providing security, data backup and high resolution satellite imagery. Furthermore it allows data to be exported or imported according to the Land Administration Domain Model (LADM), as well as its subset, the Social Tenure Domain Model (STDM).

A local organization will be trained to fly drones and collect and process the imagery which will create a very high resolution base map. The map can be used for:
- Demarcating boundaries on a computer,
- Be loaded to mobile applications for field verification of boundaries with property occupants, or
- Used through a paper based approach to collecting spatial data using the Field Papers application - .a web-based tool for easily creating a printable map atlas with an imagery backdrop for sketching boundaries and notes in the field, taking a picture of the map, and uploading the georeferenced data into the Cadasta platform

Through using technically appropriate tools and using local solution providers, we will demonstrate the feasibility of creating a cost effective, and indeed, revenue generating, land information system. Going forward, the community will have a local, sustainable land registry wholly managed at the local level with data that can be accessible for local and central government offices and other stakeholders when needed.

Involving the local community is the key success factor. Therefore, we will hire and train local community members to collect the property rights information in the field. We will work to ensure that the data collection team is gender balanced. And we will ensure the team is sensitized regarding the need to ensure property right claims reflect not just the head of the household, but spouses and all heirs. We recognize that it is often not as simple as showing up at a doorstep and asking who the property owner is, but that instead more nuanced questioning and checking is required to ensure equitable documentation of property rights.

To ensure commitment and sustainability as well as capacity building, the local staff will be trained in the technical tools used and working procedures, approaches and best practises for information collection and management as well as relevant property rights related laws and policies.. In addition, the selected national level land administration specialist will be involved and trained. Furthermore, we will work to develop sharing protocols, with the community and national government, between local and national systems, with a priority on ensuring that no information is shared without the community's consent and that when data is shared it is shared in a usable format.. This involvement of both the local community and the government land administration representatives will enable a faster route from local to, if so decided, formal recognition by the government of the collected data. This involvement by government officials ensures that the lessons from the first pilot can be taken and potentially replicated to the next local community.

The local land information system piloted will be configured to allow for transparent and equitable property tax assessment. In order to demonstrate the local value, for property tax collection, we propose to utilize project funds for small community level project(s) - either with infrastructure focus (e.g. wells, road improvements or community buildings) or social focus (e.g. day care service, women and children health program, education). The initial community level efforts will be funded by the project, with possible partial repayment accomplished by the revenue from tax collection. The main purpose is to demonstrate that increased tax revenue from efficient land administration will have a direct positive impact for the local community. The money will be spent where it is collected in the way the local community decides.

Pilot Project Location

In electing where we might pilot this program, we recognized the need to focus on the African context given the immense land administration challenges faced on the continent. We also want to focus on the urban context for a number of reasons. Habitat III, illuminated the need for improved land administration. Further, urban areas face immense population pressures. For our pilot area, we are focused on a peri-urban community of approximately 1,000 households.

In selecting the country, there were a number of factors which were considered:
- Legal and institutional acceptance of the use of drones for data collection in both rural and urban areas;

- A local organization(s) that possesses, flies and processes imagery from drones;
- Devolved authority for the management of property rights to local offices/organizations;
- Peri-urban communities where property rights data is of interest; and
- A commitment by the national government to improve the land administration sector.

Tanzania is one option as it meets all of the relevant criteria outlined above, however we have not yet finalized a project location site.

Factors for Success

Key factors for the success of this project relate to the need for **community engagement, participation, and documentation of rights** as this is intended to demonstrate a bottom up approach. We also recognize that it is critical that all hardware and software be **fit for purpose, using tools that can be acquired and maintained locally**. Lastly, it is crucial that implementation be done in an equitable and gender balanced way, ensuring that also **women have an active role,** using **gender equity** as a tool to reach the project objectives. As such, we will ensure that women and marginalized community members are involved - not just in a passive way of receiving information, but also in the entire process of collecting, vetting, and managing data - unleashing the women's potential for the good of the community.

Outputs

The direct project outputs foreseen are:
- Geospatial, gender aligned data focused on land rights available for the selected community.
- Securely stored in a data structure and format allowing integration, transformation and sharing,
- Improved living conditions for the residents of the local community, through the small pre-funded community level project - chosen by the local community.
- Increased technical skills and land management knowledge for the project participants from the local community
- Basis for increased property tax revenue collection

Outcomes

The project will strongly contribute to the outcomes below:
- More tax revenues collected, using the information gathered and experienced made in this project as a basis, allowing locally and centrally funded initiatives to improve the living conditions,

especially for the poor and vulnerable citizens;

● Increased trust in land management authorities;

● Secured ownership for citizens in the local community allowing them easier access to credit and a long term home secured for themselves and all heirs;

● Citizens willing to register ownership and pay property tax increases.

Impact

Over the long term, this project will contribute to improved land administration including the eventual implementation of a nationwide land information system using the data collected from this and other projects.

Documenting land rights, even in one small peri-urban community should secure land rights and create a more efficient land and real property market, enabling investments. This will, if managed correctly, create a solid foundation for the community's social and financial development..