

Flexible Land Information System Championing Reform Towards Formal Cadaster in Developing Countries

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Summary

Establishing flexible land information systems is crucial in developing countries where land governance and service delivery are weak as a result of ineffective land administration systems. The current global challenges related to climate change, food security and drought cannot be addressed without reforming the traditional approaches in land administration. The over-reliance of conventional systems has continuously failed to address the land tenure question and in effect fueled escalation of land conflicts leading to displacement of people, informal settlements, and poverty. Access to land for majority of the urban and rural poor has become untenable because of the complex procedures and high technical standards that are required for land registration, thus making them way too expensive. This also means the ability to invest on the land is limited and because the poor cannot access any form of credit for economic development without official documents on land. Due to these constraints a paradigm shift in the development of cadastral system is needed to close these gaps and accelerate recording of land cognizant of the continuum of land rights. New innovations are emerging towards flexible land information system that are less technical, fast, and affordable.

Key Words: Land information, fit for purpose, cadastre, post conflict, land reform.

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List of Acronyms

CCO	Certificate of Customary Ownership
DRC	Democratic Republic of Congo
FFPLA	Fit-For-Purpose Land Administration
GIS	Geographic Information System
GLTN	Global Land Tool Network
GPS	Global Position System
LADM	Land Administration Domain Model
LAN	Local Area Network
LIS	Land Information System
STDM	Social Tenure Domain Model
UCBC	Christian Bilingual University of Congo

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1. Introduction

The current global challenges related to climate change, food security and drought cannot be addressed without reforming the traditional approaches in land administration (Orking, and Clima,2008). Essentially, we need a shift towards flexible cadastral systems that are feasible and attainable in both urban and rural context and less complex in the procedures and technical standards ((Enemark.et.al, 2014). Such system will increase access to land for the majority of people and unlock the ability to invest on land. For the past decade. we have seen emerging innovations towards flexible land information system that are less technical, fast and affordable. These systems are providing low-cost solutions for setting up cadastre that is functional to the context and embraces participatory approaches in data generation and management. These approaches are focussing on developing system based on the local knowledge of the people, addressing key needs and priorities within a given local community area or region.

It is recognized that people to land relationship (rights, responsibilities, and restrictions) can take a variety of forms which may or may not be documented. According to the continuum of land rights concept, the concerns should be how to improve recordation and recognition of a diversity of land rights (UN-Habitat, 2008; Augustinus et.al, 2015). Many land tenure systems are outside the legal framework because they do not conform to the defined rights and restrictions in a particular jurisdiction. In many communities especially in the African context, customary and informal land tenure dominate in this category and have been considered outside the formal land administration system. In other countries like Nepal, the formal cadastre does not fully cover all land tenure typologies and the unregistered land turn out to be dead capital (Joshi et. al, 2019).

However, it is the mandate of the government to close this gaps, For example by introducing progressive land policies and laws that make explicit efforts to capture all land rights in records, even where land remains state-owned or vested with the state in trust for the nation, including protecting customary and other informal land rights and providing for their registration. Innovative approaches and tools that includes development of flexible land information systems are already mature and available for rollout in different contexts. These are driven by the recent trends in Information and Technology (IT), Mobile Computing and they operate within a broad framework that recognizes the increasing diverse role of cadastral systems (Danilo 2010; Lemmen, 2012; FIG, 2014; UN-Habitat, 2016)

In the international context land information systems (LIS) are seen as a new way of establishing cadastral system to support the evolving role of functioning land markets, land use planning, environmental protection and sustainable development (Enemark, 1999; Enemark, 2005). Similarly, land information systems are also viewed as enablers of good land governance through public access to information, improved service delivery and coordination, mostly implemented as e-government solutions (Van der Molen, 2007), one-stop- shop (Akingbade et.al, 2012; Jing, Bennet, Zevenbergen, 2014), multipurpose cadastral systems (Stuedler, 2014) and web-GIS system (Kuria, et. Al, 2016). These developments are championed by emergence of standards in information modelling and inclusion of geographic information and spatial capabilities in system design as well as standardization efforts such as the ISO T211 Geographic Information/Geomatics (Van Oosterom, et.al 2002; Lemmen 2012).

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Unfortunately, many governments have tended to go the proprietary way to build high technology systems with the aim of collecting revenue mainly driven by large corporations requiring large investments and long term visions towards full realization (Williamson, et.al, 1999; Dale & McLaughlin 2000; Onwumere, 2014). The challenge has been that these projects have not impacted the local people; the approach has been too ambitious and not tailored to local demands. Also, the initial investment is too high, requiring sophisticated equipment and the software packages that are not adopted to the local needs (UN-GGIM, 2018). In addition, the political interest, corruption, and kickbacks usually slows down the take off for these projects. In many cases, the capacity of the local institutions is limited to manage these technologies and usually rely on external support to make them functional. Therefore, implementing LIS in developing countries has been a challenge mainly because the approach has not been practical and not user driven.

This paper tries to document the experiences of implementing flexible land information system in three countries of Uganda, Nepal and Democratic Republic of Congo. The reflections will try to demonstrate how the land information system has impacted business processes and changes in mindset among the land administrators. The discussion will also highlight changes in the implementation of laws and regulations that have facilitated improvement of land tenure security.

1.1 Purpose of Flexible land information system

The land recording gap has been difficult to close, and it is acclaimed that only about 30% of registrable land is recorded in the existing cadastral system (World Bank, 2017). It has been shown that developing cadastral system does not need to be very ambitious and could start with simple procedures of recognizing the priorities for a country and incrementally working towards a robust and more inclusive system (Enemark, 2014). Such systems are said to implement the Fit-Purpose-Approach in Land Administration (FFP-LA) that emphasizes on utilizing local technology and knowledge of the local people as the first step in building a cadastral system (UN-Habitat, 2016). FFP-LA approach has been applied in many contexts by the UN-Habitat and the Global Land Tool Network (GLTN) in Nepal, Namibia, Uganda and Democratic Republic of Congo to reform the current land administration system (UN-Habitat, 2018). In these contexts, the focus has been towards application of participatory mapping and enumeration approaches in eliciting the desires and vision of the people towards recording land in post-conflict disaster, resettlement efforts, informal settlements, and customary lands.

The flexible land information is based on the FFP-LA approach in that it embraces incremental, low cost and participatory approaches in setting up local cadastre. The low-cost facilitates easy and quick recording of community land rights and perceived tenure options. It is shown that good land administration systems should consider equitable, just and transparent mechanism for ownership, transfer, control and land use (LGAF, 2012; FAO 2012). Incorporating participatory approaches enables transparency, open access to information and inclusion of local knowledge and identification of priorities that are deemed relevant in the customization and adaptation of the tool to suit the context (Antonio, et al., 2015). The flexibility aspect is important in adapting local business processes of land transfer so that they can interface with existing practices and system. (Njogu et al, 2018). Hence, the all-inclusive aspect of cultural,

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spatial and social-economic are accommodated in one system that we refer in this study as flexible land information system.

1.2 Drivers for these innovations and the link with cadastre

Cadastre is central to LIS in that it forms the basis for assessing legal and fiscal characteristics of the land in land management and administration. FIG defines a cadastre as a parcel based and up-to-date land information system containing a record of interests in land for example, rights, restrictions and responsibilities (FIG,1995). The vision of cadastre as presented in the UN Bogor Declaration 1996, is to: “develop modern cadastral infrastructures that facilitate efficient land and property markets, protect the land rights of all, and support long term sustainable development and land management”. Essentially, the role of cadastre is thus broadened to include wide functions towards promoting inclusive economic development of land. Equally, application of technology has been mentioned as a catalyst that will effectively enable achievement of its goal.

Innovative tool like Social Tenure Domain Model (STDM), a specialization of the ISO certified Land Administration Domain Model (LADM) and the FFP LA principles are based on the underlying framework of appropriate technology for land administration. The technology role facilitates revision of standards, metadata and data formats to make the system interoperable and relevant. At the institutional level, land information systems are required to transform business processes and support automation of workflow systems within an integrated environment. Use of Information Communication and Technology (ICT) has facilitated intra-office communication, revision of roles, conversion to digital archives and exchange of information over the World Wide Web. More so, data requirements are changing in both technical and social with the growing repository of open data concepts, Voluntary Geographic Information (VGI) and crowd sourcing requiring big databases for storage and integration of tools for data mining in large environments. These are concerns that modern land information system needs to address in both local and national system.

Coupled with the recent trends in technology, the power of mobile computing is reaching new level in influencing our interaction with mobile devices. Their application potential has tremendously improved. The hardware in these devices has integrated with many powerful sensing technologies that can monitor environmental conditions, body temperature, navigation, proximity services and potential for positioning and location mapping. For instance, the GPS sensors in the smartphones is capable of providing up to 3 meters’ accuracy comparable to cheapest recreational handheld GPS device (Brunette et. al, 2013).

These tools combined with the use of high- resolution Imagery and handheld GPS can provide a fast and effective way to collect data on land use and facilitate first registration on land. Additional data such as fingerprints of the owner, boundary marking of the parcel, signature and picture of all the family members in the presence of neighbours can be collected by taking photos using smartphones and linking them to the map/spatial data. This is useful information in providing transparent land information and improving tenure security in rural areas where formal cadastre is lacking. Therefore, flexible LIS become relevant in supporting recording of wide data sets such as gender dimension in land, youth, conflicts, social economic and

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recording of diverse range of documentation such as audio-visual, fingerprints and bills as supporting documentation for social tenure relationship.

2. Application in the country context

Experiences on country applications has shown that development of flexible land information system is inevitable. Impact is largely dependent on particular data collection methodology that enables customization of tools to suit local context and needs. The Global Land Tool Network in partnership with country implementing partners has been able to leverage interest of government through tailoring the tools and methodologies to work within the framework of national and local governments thus promoting faster adoption of the flexible LIS. As such, it is agreed that hardly can have one size fit for all solutions. Usually, the tools and methodologies are dependent on the expectation of the people, application contexts and alignment to the ongoing programs by the government. Hence, these interventions are seen as complementing the broader national vision which really improves the outcome and impact at the national level. Essentially, in each country, the flexible land information system use-cases have necessitated adoption of new methodologies, review of semantics and tweaking of language for easier applications.

2.1. Democratic Republic of Congo

Democratic Republic of Congo (DRC) is the second largest country in Africa. For the last three decades, the country and particularly the eastern region has continued to experience conflicts over land resources and minerals. According to the UNCHR report, the country records the highest number of displaced population with over 700, 000 people said to have fled due to escalating conflicts while half a million others are inside DRC as internally displaced persons (UNHCR, 2018). By 2017, USAID estimates about 7.7 Million people who are facing acute food shortage of which 4.6 million accounts for the children. Continuous political instability and decade long conflicts have affected many sectors and crippled country development.

The existing land administration system remains largely undeveloped. Access to land and related services especially for the poor, youth, women and vulnerable groups remain a challenge (Leeuwen & van der Haar, 2014). In North Kivu alone, it is estimated that only about 2% of the rural land is registered (UCBC, 2017). This is a critical gap that has contributed to the conflicts in the region resulting to loss of life and crippling the development in the region. Capacity of the staff and the level of infrastructure is quite low to attract investment. All the benefits accrued from agricultural and mining sector has been squandered in the hands of few politicians and rebels who continue to destabilize the region to sustain their business activities.

For past decade, the government has made little progress on land reform. The current land administration is guided by the 1973 land law (Njogu et al., 2018). The law fails to recognize the customary tenure system which is practiced in at least 70% of the country. It is also silent on land ownership by women, inheritance, and transfer of land in customary tenure system. This loophole has been exploited by the wealthy and the political class through corruption, land grabbing and forced acquisition. The traditional authorities in charge of customary land have not been left behind; anecdotal evidence indicates that they are usually bribed by the rich to

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sell community land for a token. These transactions have been rampant to cause conflicts experienced from overlapping claims and double selling of land.

2.1.1. Methodology for LIS implementation

In 2012, the draft land policy was proposed but lacked institutional support due to lack of human, financial and technical capacity from the government. In 2016, UN- Habitat through funding support from Department for International Development (DFID) engaged on a project aimed at improving community land use planning and documentation of land tenure towards social economic development. The project covered three provinces in the eastern region with the GLTN providing technical support in the establishment of land information system and digital archiving. By the end of 2018, through the project, a functional land information system was operational at land administration system at the provincial level supporting digital capture of land survey procedure, verification, and production of land certificate.

Several awareness raising meeting with women groups, men, youth and local leaders were conducted in the initial phases of the project. The awareness was critical to the success of the project because its targeted demarcation within traditionally managed land. This meant the system would collect both customary land and formally registrable land into one system. The trainings on land governance and transparency were done by the implementing partners in the region targeting local leaders, provincial administration, surveyors, and land administrators. This influenced change of mind-set and building consensus on the requirements for LIS to both customary and statutory land. Technical trainings followed focussing on the technical staff in the land offices as well as selected community representatives that would lead in field demarcation processes. High resolution Orthorectified Satellite Imagery of 50cm was procured including tablets and handheld GPS. Local committees were also established that would follow up on mobilizing communities, awareness raising as well as data validation campaigns for local ownership of processes.

After data collection, the flexible system was tested within the land office to assess performance and data management. A server was installed that hosted all the collected data and deployment of client computers in each office. The surveyors were trained on how to access the server, load map and manage transactions electronically. The processed data was then pushed back to the server for others to access. Due to many procedures involved in the manual processes, some actions and transactions could not be performed in the digital environment. Also, the existing practices could not be replaced by digital transaction without legal backing and therefore, the experiences were shared with land minister and capitalized in the land policy discussion for debate.

2.1.2. Impacts

The surveyors trained under the project have shifted from the use of tapes to use of Satellite Imagery, GPS and smartphones for land demarcation including household surveys (Njogu e al, 2018). Also, digitization of business processes especially cadastral workflows and electronic document management was done by local implementing partners. A local area network was installed to enable sharing and retrieval of information across different offices. Land information system was customized using the STDM model and a geo-database setup to record parcel map and property ownership information. This approach has raised attention at the

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national level with clear evidence that the government intended to promote development of a national land information system following the project outcome.

The evidence of cadastral improvement and data management procedures has shed light to the local staff and provincial leaders on the potential to implement change. This has enabled quick development of draft land policy which is currently awaiting national validation. The application of FFP-LA approaches in the flexible LIS enables low-cost deployment of systems, tool and capacity building at the local level. The impact has been improved relationship between traditional authorities and land administration, and easy access to information. About 500 parcels were demarcated and digitized into LIS database in the pilot area.

2.2. Nepal

Studies show complexity of land tenure system in Nepal inherited from the feudal history mainly categorized now into formal (having registered Title), non-formal (Socially and legally accepted but having no Title) and informal (Socially accepted by not legally recognized) tenure typologies (Chhatkuli et.al, 2019). Nepalese land administration system mainly deals with the formally registered land as such informal tenure holders are prevented from accessing full recognition to ownership of land including grants and compensation from government whenever disaster strikes, or the land is expropriated for public goods. Lack of documentation for the unregistered land means one cannot prove ownership of land denying them right to just compensation to rebuild their lives and livelihood and the local governments would be deprived from revenue from land and property taxation important for local development.

Addressing land tenure issues have been agenda of successive governments after the restoration of democracy in 1989. The massive earthquake of 2015 resurfaced the urgency to look into this matter, and the Nepalese government renewed its commitment towards ratifying the national land policy, a process that had stalled for several years in the past. The national land policy was passed in 2019. It was estimated that about 25% of the cultivated land comprising some 10 million parcels on the ground operated by 1.3 Million families were outside the formal cadastral system and could not be registered without reform in land administration. Therefore, innovative approach that resonated with the Fit- for-Purpose (FFP) approach to land administration was seen as an entry point towards integrating informal land tenure to the formal cadastre, thereby implement the provisions of the national land policy in line with the newly proclaimed Constitution of Nepal of 2015 (MOLMCPA, 2018).

The Constitution of 2015 has provided for state restructuring into a federal republic with land administration and land management authority distributed among the central, provincial and local governments. The local governments have a dual function to protect public and government land and, in the meantime, look into the resolving issues related to informal land tenure. A greater political will to resolve these issues has emerged. Winning public trust with innovative solutions must be viewed through different lens since government land projects have mostly been slow, ineffective and sometimes unreliable especially on service delivery lacking transparency and this was no different in Nepal. Building the trust and improving land tenure for the poor needed a quick and scalable solution that represented the aspirations of the people.

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2.2.1. Impacts

Appropriate land legislation has been enacted with the 8th Amendment to Land Act and the 18th Amendment to Land Rules both in 2020. Similarly, the land commission, called the Land Issues Resolving Commission, was institutionalised with a three-tier mechanism coordinating all the seven provinces, 77 districts and the 753 rural/urban municipalities in the country. The commission has taken lessons from the pilots' sites and developed guidelines and Standard Operating Procedures. The resultant system envisaged was a land information system customized to the local system that had capacity to interface with the formal land administration system. As matter of fact, these interfaces were explored and demonstrated with confidence that the low-cost solutions provided an alternative and rapid approach to addressing the land tenure gap in Nepal. The experiences informed the land policy process, which was later ratified, and necessary legal, institutional framework put in place. As a result, the LIS facilitated an alternative and low cost solution for recording land in informal areas, providing land titles to the landless and regularization of informal land holdings.

2.3. Uganda

In Uganda, a significant proportion of the population access land through customary land tenure system governed by the customs and norms of the respective area. Normally, these customs do not align with the formal land registration system and therefore, customary land tenure has remained outside the legal system for a long time. Notably, customary land tenure system is the dominant tenure system covering over 70% of the country that relies on agriculture (Becker, 2019). With the rising population, pressure to access land is leading to conflicts, land grabbing and fragmentation of land rendering it unproductive to sustain many family livelihoods. Informal land transactions within customary land have also resulted to disputes due to lack of proper documentations and disinheritance of women land rights.

The 1995 Constitution of Uganda and the Land Act (CAP 227) provides that land in Uganda can only be held in only four tenure categories namely: customary, freehold, *mailo* and leasehold. The Land Act of 1998 stipulated the various ways land can be held under customary tenure that included individual, family, and common. The Uganda National Land Policy (NLP) of 2013 commits itself to “redress historical injustices to protect the land rights of groups and communities marginalized by history or on the basis of gender, religion, ethnicity and other forms of vulnerability to achieve balanced growth and social equity”. Under Policy Statement 39 (a), the NLP stresses that “The State shall recognize customary tenure in its own form to be at par (same level) with other tenure systems”. The policy also makes provision for the issuance of certificates of title of customary ownership based on a customary land registry that confers rights equivalent to freehold title. Enabling registration and policies have also followed to be enacted to promote official recognition of Certificates of Customary Ownership (CCOs) land titles such as the Gender Strategy for National Land Policy Implementation of 2019, spearheaded by the Ministry of Lands, Housing and Urban Development (MLHUD) with technical support from GLTN/UN-Habitat. However, there are significant gap that have led to slow implementation of the law including lack of financial support, technical innovations, and solutions, to register customary land (Musinguzi, Enemark & Mwesigye 2018).

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2.3.1. Methodology

A Fit for Purpose country strategy was developed in 2018 that laid down the procedure and recommendations for implementing land policy and the land law of 1988. UN-Habitat through the Global Land Tool Network in partnership with the Government of Uganda came together to implement a project to improve land tenure security for rural households - particularly women, youth and vulnerable groups - in select areas in Uganda. The project was funded by Embassy of the Netherlands to Uganda and envisioned to reduce land conflicts through issuance of Certificate of Customary Land Ownership (UN- Habitat, 2018).

The participatory approaches of mobilizing and sensitizing the communities were considered in the initial activities. High resolution orthorectified Satellite Imagery from the Ministry was acquired for the project. In order to setup the flexible LIS, computers and other equipment were sourced. The customization of the STDM to suit the local needs enabled the design of the customary certificate that was later approved by the Ministry to be considered as the official document for registering customary land rights. Data from the field was fed into the database by trained local community members with GLTN and Ministry of Lands, Housing and Urban development providing technical support and quality control. Several training exercises were conducted to raise awareness including technical capacity of key stakeholders to support in the running of the customized land information system.

After data validation by the community, it was necessary to issue certificate of customary ownership. By end of 2019, 3000 CCOs had been issued with support from the Office of the President and the President participated in the ceremony for issuance of those documents in several districts. In the past, it cost an upwards of USD \$600 to have one plot accurately mapped and land rights registered. The flexible solution enabled reduction in the cost down to between USD \$20 to \$40. This is a significant drop in a country where so little of the land has been formally mapped and registered (UN-Habitat, 2019). The provided system will greatly impact on the improvement of land administration services and improved transparency.

2.3.2. Impacts

The use of flexible land information system restored/renewed confidence of the people in the ability to secure and protect their land rights in an affordable and easy solution. The unit cost of the issuance of CCO land documents was much lower than for other land documents in Uganda because the overall legal requirements for CCO are more relaxed than for freehold and leasehold land documents. Different stakeholders in Uganda i.e. the CSOs engaged in the project, the government and even the communities have demonstrated willingness to adopt the flexible systems to reduce the cost, the complexity and the time taken to acquire the land tenure documents. There is a huge opportunity to upscale this practice to cover much of the country where land is governed under customary tenure.

The transparent process facilitated resolution of land disputes through Alternative Dispute Resolution mechanisms and mediation, as well as enhancing voicing of women land issues. By the end of the project in June 2020, approximately 1,377 CCOs were issued benefiting approximately 10,462 households, of which 6,139 were women. Further, about 58 land disputes ranging from parcel boundaries, counter ownership claims to inheritance and succession were resolved successfully out of about 85 cases identified. Further, three wetlands facing increasing

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pressure from the population growth, unreliable rainfall patterns and degraded upland soils were mapped and use rights adjudicated representing 918 smallholder farmers. Further, 367 smallholder rice farmers were supported to apply for a Wetland Resource Use Permit from the National Environment Management Authority. The support of the government provided official recognition of the certificates generated through the customized land information system.

3. Lesson and Experiences

Changing the land tenure dialog in the land sector

Political will cannot be underestimated in implementing cadastral reforms. It is essential to have buy-in from the government and their commitment to support the use of flexible information system to ensure they are effective and sustainable. Since the development of these systems, we have seen increased accountability and efficiency in land administration systems, capacity improvement and changes in the laws and regulations. The three country experiences benefitted from strong leadership within the ministries concerned, i.e. Ministry of Lands and Urban Development in Uganda, Ministry of Land Management, Cooperatives and Poverty Alleviation in Nepal and the Ministry for Land Affairs in the DRC. There are several emerging requests to continue with the projects which indicates interest from the government.

In DRC, flexible land information system is being setup in four provinces to support the land registration and cadastre. The systems have incorporated the workflows in land administration office including the field data generation activities. This has enabled digitization of processes and electronic management of records. Another element of the flexible land information system in DRC is inclusion of customary land register. The traditional system of land management has been incorporated in the formal land registration system. These experiences are feeding into the land policy process to guide how to improve land governance aspects. Similarly, In Uganda, the use of flexible system based on STDM is being roll out to other customary areas to support land participatory land registration.

Participatory approaches contributed to shaping of the dialog around sensitive land issues such as access to land for women, inheritance and transfer, land conflicts and land grabbing. These issues were captured during awareness campaigns and formed a basis for building consensus for better and transparent systems where all people participated in the process. Eventually, all the data was accepted by the community enabling resolution of disputes in the field during the data collection phase. Most notable was the recognition of the rights of each person (people-to-land relationships) and appreciation of the provision of the laws in protection and management of land tenure rights. Hence, the land governance aspects were shaped during forums, and trainings impacting on the future management of land and natural resources, appreciation of gender issues in land, as well as sharing available mechanisms for conflict resolutions. The participatory enumeration processes contributed in building women champions in terms of articulation of land issues in national and local processes. Gender issues were promoted through existing platforms to contribute towards policy discussion to voice challenges of land access and share their experiences regarding flexible land information system that have facilitated their inclusion.

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Triggering institutional change through business process reengineering

It is possible for low cost systems to provide fast and efficient service delivery where review of existing processes is done. Business process are mainly manual in these countries and what was evident is the willingness of government and local offices to incrementally digitize and conduct transaction electronically for security, efficiency and innovations. A good example is Uganda where GLTN country partners in collaboration with the MLHUD have developed an electronically generated CCO. Previously, the certificates were created manually, and the Ministry would provide hard copies of certificates of the information of the beneficiaries and parcels entered using a typewriter. This process was seen to be time consuming, expensive, and prone to errors.

The digital CCO template was approved by the Government and gazetted by Uganda Printing and Publishing Corporation (UPPC) in the Uganda Gazette in October 2020. The document is a replica of the manual CCO originally issued by the government, but with some improved features such as: a unique Quick Response (QR) code that strengthens the security of the document; a map of the parcel; provision for signature of the Area Land Committee members, the stamp of the Area Land Committee chairperson and a watermark of the Uganda Coat of Arms. Additionally, lessons from FFP-LA application in Uganda are informing the government to develop Standard Operating Procedures (SOP) for customary land registration in Uganda. It is recommended that future projects should be designed to be more systematic covering substantially (above 75 percent) all land rights within the project sites. This approach will not only improve cost effectiveness but also ensure maximum impact.

Accelerating evidence- based land policy reform.

The key success for these experiences is seen in the engagement with communities to elicit dialogue and to capture aspirations of the poor and the most vulnerable such as the case of the landless *Dalits*¹. This way, the final system is shown to be user driven responding to the issues identified and setting the agenda for land reform. However, it is notable that land is a very sensitive subject in many cases and technology can have both positive and negative impacts based on the approach. The experiences from these countries have shown that success was possible because the projects were tailored around ongoing national or regional initiatives, thus the processes were seen complementing the bigger picture. For instance, in DRC, land use planning was at the top of the agenda for peaceful development in the region. The flexible LIS was necessary in that it provided an integrated solution for harmonizing traditional tenure system with the formal system and improve both land use and land tenure through integrated solutions. Generally, flexible land information provided a platform for reforming cadastre and service delivery and good land management.

4. Conclusion

The positive outcomes from the flexible land information systems provided an opportunity for accelerating land reform in the three countries where conventional systems have been slow. It facilitated closing the land recording gap and enabled access to land documentation that will

¹ In the Hindu caste system, Dalits are the 'untouchables', the lowest caste and they have 'nothing' in the world. They are excluded from interaction and denied access to resources.

most likely spur economic development for the local communities. The use of LIS has a broad data framework and facilitates inclusion of women, youth and the marginalized issues and concern relating to inheritance, transfer in both formal and social context towards mitigating future conflicts. It is therefore a recommendation to governments to embrace the flexible cadastral approach as intermediate system that can be incrementally improved. Application of the Social Tenure Domain Model as a framework for flexible land information system has the potential for promoting the continuum of land right approach by enabling recording of different forms of land rights and claims. This is applicable in many contexts such as informal settlements, customary, pastoralism and squatter settlements and so on.

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