The state of digitisation of the land registry operations in Uganda

David Luyombya
Makerere University, Department of Records and Archives Management, Uganda
dluyombya@easlis.mak.ac.ug

Dennis Fred Obbo
Makerere University, Department of Library and Information Science, Uganda
dennisfo@mlhud.go.ug

Abstract
This article reports the findings of the study on the digitisation of the land registry in the Ugandan Ministry of Lands, Housing and Urban Development (MoLHUD), which is being done to improve access to land records. The aim of this study was to ascertain the extent to which the land registry, especially the Kampala mailo land registry, had adopted digitisation. The case study assessed the ministry's readiness to manage electronic land records, establish the challenges and chart strategies to overcome the challenges faced by stakeholders. The study adopted a mixed research approach and used both qualitative and quantitative techniques to examine how digitisation of the land records is achieved. The quantitative methods enabled the researchers to collect data from 207 clients who visited the Kampala mailo land registry between May and December 2011. The qualitative methods were applied in interviewing MoLHUD staff (systems administrators, registrars of titles, and Senior Assistant Records Officers) regarding an interpretation and description of how digitised records are established and managed in the registry. The findings suggest that, though efforts are in place to digitise the land registry in Uganda, the bulk of the records still exist in paper format. The authors recommend strengthening the management of both paper and digital records as a matter of urgency if the land registry is to continue protecting the vital evidence that the land records contain.
Keywords: Digitisation, land management, land information system, records and archives management, land registry operations, Uganda.

1. Introduction and background

The aim of this study was to determine the state of digitisation of the land registry in Uganda. Digitisation refers to the conversion of an item – printed text, a manuscript, an image, or sound, film and video recording – from one format (usually print or analogue) to digital (Pakesh, 2002). The process basically involves taking a physical object and essentially making an 'electronic photograph' of it. An image of the physical object is captured – using a scanner or digital camera – and converted to digital format that can be stored electronically and accessed via a computer (Lee, 2001). Digitising a document allows the access needs of the majority of users to be met by use of the digitised access copy (Hirtle, 2002). This paper seeks to look at the issues involved in the digitisation process from the perspective of a land registry. As such, there is greater focus on the digitisation of printed materials than on objects, or sound, film and video recordings.

The Government of Uganda (GoU), through the Department of Land Registration, has the mandate to register land ownership and transactions as guided by the Registration of Titles Act (Cap 230) and the Land Act (Cap 227) (NPA, 2009). According to the Uganda Land Sector Strategic Plan (LSSP) 2001-2011, the underlying purpose of digitisation is generally to improve access to materials and to ensure that transactions relating to land are authentic and reliable.

The Department of Land Registration is responsible for keeping custody of the national land register in Uganda. It also provides knowledge and information on land-related matters to the

clients of the department, which serves as the supervising office for *mailo* land registries in Kampala, Mukono, Mityana, Masaka, Bukalasa and Fort Portal (MoLHUD, 2000). *Mailo* land refers to the holding of registered land in perpetuity evidenced by a certificate of title.

A study conducted in 1989 by the Makerere Institute of Social Research (MISR) and the Land Tenure Centre (LTC) of Wisconsin, USA, on the Ugandan land tenure system revealed that the land registry relied on manual processes, which affects the quality of the services delivered. The processing time for any required information was long as one had to access multiple systems or wade through paper records to retrieve the required information. Land fraudsters, land agents and speculators, together with the department staff, were taking advantage of the poorly managed system to delay and frustrate services. The MISR and LTC study recommended immediate digitisation of all the land records to avoid any further delay in service delivery.

The GoU has been working strategically to overcome many of the obstacles constraining the land sector by implementing a digitised land registry system through the introduction of an electronic and networked land information system (MoLHUD, 2010). The development of the digitised system flows from the country's National Development Plan, which seeks to increase the availability, accessibility, affordability and use of land information for planning and implementing development programmes (NPA, 2009). The decision to digitise also partly flows from the National Information and Communications Technology (ICT) Policy, which provides a roadmap for the country's progress towards e-governance through the adoption of ICT strategies (MoICT, 2010). Despite the digitisation initiative, the processes are still manual, with many derivative records (Denninger & Ayalew, 2006). Land information cannot be accessed via the Internet, the technology does not enable sharing and collaborating on files with clients, and many MoLHUD personnel are calling for interventions to address these constraints, which ultimately impact on the efficiency and effectiveness of the land registry (Office of the Auditor General, 2013).

2. Statement of the problem

Inefficiencies which arise from using a manual-based system for land records management exist in the land registry. The land registry has not met its mandate to provide accurate and timely information on land ownership and usage (NPA, 2009). The registry continues to report delays in processing land titles, difficulty in accessing land information, and the falsification of survey information on land titles (Office of the Auditor General, 2013). The GoU undertook the digitisation of the land registry as an intervention to provide reliable and quality services through an efficient and effective service mechanism. Despite efforts towards the digitisation of the land registry in Uganda, success that is visible to the users of the registry has not yet been achieved (Rutasikwa, 2012) and hence the need to establish the underlying factors favouring full digitisation of the land registry operations.

3. Objectives of the study

The objectives of this study were to:

i. Identify the current state of digitisation of the land registry
ii. Review the challenges faced in the digitisation of the land registry operations
iii. Propose strategies for improving the implementation of the digital system in the land registry

4. Literature review

The need for thoughtful and careful stewardship of land, alongside the more intensive use and management of its resources, has emerged as a matter of major global concern (Saxena, 2005). This has led to a re-evaluation of both the need for information about land and the strategies and programmes that may provide for it (IRMT, 2008). Consequently, digitisation of land registries resulting from the application of information and communication technologies (ICTs) has emerged as a new pattern to ensure that accurate land information is available on land sizes, location and proprietary characteristics, substantive and anticipated values, and land use quality (UNECE, 2006).

According to the International Records Management Trust (IRMT, 2008), ICT utilisation in land administration contributes to improving land information management. However, most digitising initiatives fail because of ignoring the need to specify the technical and organisational steps involved in periodical migration, which should be constantly refined as part of system design (Creuzer & Kjellson, 2005). Countries, therefore, face two challenges: first, the strategic challenge of e-readiness, i.e. preparing six identified preconditions for digitisation, namely data systems infrastructure, institutional infrastructure, human infrastructure, technological infrastructure, leadership and strategic thinking; second, adopting best practices in land digitisation projects in order to avoid failure (IRMT, 2008).

Sebina (2004) argues that using ICTs in land administration would only be achieved if two things were in place: first, the strategic e-readiness infrastructure, especially the required hardware and software on which digitised systems depend; and second, the tactical best practices that are needed to close up design-reality gaps and to steer land information management projects from failure to success. Ahene (2000) suggests that e-land initiatives sometimes fail totally because of disregarding the need to adhere to the scheduling and sequencing of project activities to enable smooth integration of the new system with the existing systems as the latter are slowly phased out.

In his study on the institutional framework for land administration in India, Saxena (2005) emphasises that most digitisation projects in developing countries employ high-technology intervention whereas the major issue is not information technology but an understanding of the users' needs**,** which act as the critical factor for triumph in the digitisation of land systems. Quan & Toulmin (2000) state that land digitisation initiatives can only succeed when they promise a more client-centric approach since the clients are the only reason why they exist. Unfortunately, most of the land digitisation initiatives have not been able to achieve the intended benefits in the developing countries because of a techno-centric, rather than a client-centric, focus (McKinnon & Reinnika, 2000).

A World Bank report (2006) recommends that governments should emphasise the need for their e-government programmes to establish and maintain reliable, technology-driven and user-friendly land information systems (LIS) as a public good for national development. However, there are continuing problems, such as lack of well-defined structures/systems and processes in the area of land records management, which should be addressed.

The basic process of digitisation of land records requires that the advantages of digital storage and processing not be gained at the cost of reproduction quality, low durability, or lack of compatibility or future proofing of the information medium or of the hardware (UNECE, 2006). A special hardware and software platform should be provided to capture, send and receive digital documents across various networks (Creuzer & Kjellson, 2005). Since digitisation encompasses a range of procedures and technologies with widely varying implications, it is, therefore, necessary to have pre-set procedures to guide the users of the system. According to the World Bank (2006), inadequate supply of skilled and experienced professionals in the sector

would also lead to the failure of such a project. Without trained human resources, digitised land information systems would not deliver effective services to the public (World Bank, 2006).

Much has been written on the introduction of digitised land information systems but the literature is silent on the challenges of and solutions to digitisation of the land registry operations in Uganda. This paper addresses this gap.

5. Methodology

Both qualitative and quantitative methods were applied to elicit data for this study. The study employed the quantitative approach to determine the categories of clients and their ability to utilise ICTs, and to explore and describe the nature, range and types of services they seek from the land registry. A questionnaire with both structured and non-structured questions was used. Questionnaires were manually administered to 463 clients but responses were received from only 207, hence a 45 % overall response rate comprising different levels of clients who visited the Kampala *mailo* land registry between May and December 2011. The qualitative methods were applied using open-ended interviews in order to elicit the experiences and perspectives of the MoLHUD staff on the digitised land information system.

5.1 Choice of population of study

The study focused on *mailo* land registry personnel and the clients seeking the services of the registry. The clients were chosen because they used the registry and the state of the registry affected access and obtaining the required information. The land registry personnel were chosen because they were responsible for the registry collection and its management. The total population of the registry personnel was 22 staff and 463 clients who used the registry between May and December 2011, the study period.

5.2 Sampling method

Purposive sampling was used to decide on the sample size that participated in the study. The researchers purposively selected 10 land registry technical staff as key respondents because of their day-to-day involvement in the services of the digitised land information system. These were interviewed to allow participants to speak freely and comment on their procedures concerning the utilisation of the land information system. The questionnaire was administered to 207 land registry clients selected basing on their willingness to participate in this study. Table 1 shows the sampled respondents.

Table 1: Respondents

Category of respondent	Sampling method	Sample selected	Total population
Systems administrators	Purposive	2	03
Registrars of titles	Purposive	6	15
Senior Assistant Records Officer	Purposive	2	04
Clients to the registry	Random	207	463
Total		**217**	**485**

6. Findings and Discussion

The findings are presented according to the research objectives of the study.

6.1 Profile of the clients

Section I of the questionnaire aimed at finding out the categories of the land registry clients and their access and ability to use ICT facilities. Table 2 shows the different categories of land registry clients.

Table 2: Categories of clients who responded

Clients of land registry	Responses received	% of responses
Land agents	51	25
Private professional practitioners	25	12
Lawful and bona fide occupants	23	11
Registered landowners	22	11
Financial institutions	21	10
Law enforcement agencies	19	09
Office of the Administrator General	17	08
Uganda Land Commission clients	16	08
Line ministries	13	06
TOTAL	**207**	**100**

A breakdown of 207 responses revealed that the majority of the clients (25%) were land agents, comprising land developers, real estate agents and land dealers. The private professional practitioners, who included lawyers/advocates and surveyors, were 12%. Although 11% of the clients were lawful and bona fide occupants of land, more could have participated in the study but many refused to answer the questionnaire. This could have been due to their low level of education, as many of them were unwilling to participate in the study claiming that they were not comfortable reading and writing in English, which was the language used for the study. While there were different categories of clients in need of the land registry services, they all wanted easy access to land information.

6.2 Clients' access to and utilisation of ICT facilities

The study investigated the clients' access to ICT facilities such as mobile phones, computers and the Internet, and their ability to utilise them to access information from the land registry. The data collected is summarised in Table 3.

Table 3: Clients' access to ICT

ICT facility	Frequency
Mobile phones	197
Computer	131
Internet	96
Non-response	10

As indicated above, some clients had access to more than one ICT facility, hence the frequency in Table 3. One hundred ninety-seven respondents revealed that they had at least one mobile phone, 131 that they had access to a computer and 96 that they had access to the Internet. The findings revealed that many of the clients were using ICTs to communicate, deliver information and send queries electronically. Only ten clients did not respond to this question, which implies that they had no experience in ICT use.

One cannot access a digitised system without adequate ICT utilisation skills (IRMT, 2008). It was important to establish the ICT utilisation skills of the respondents in order to determine whether they could access the digitised land information system online. To establish

the computer utilisation skills of the clients, a selected number of ICT skills were presented to the respondents to choose from. Table 4 shows that clients totalling 143 had skills in using the telephone, 79 clients in utilising the Internet and email, and 64 in database management. Ten clients did not respond to this question, implying that they had no ICT utilisation skills. The respondents therefore had knowledge of more than one form of ICT application.

Table 4: ICT utilisation skills of the clients

ICT Utilisation skills	Frequency
Phoning and accessing SMS	143
Internet and email use	79
Database access and use	64
Non-response	10

6.3 Some of the services required by the clients

Before identifying the challenges faced in using the land registry, the researchers wanted to find out what services the respondents required from the registry. The findings are summarised in Table 5. A '✓' means that the service is digital and '✗' that it is manual. Table 5 indicates some services are offered by consulting the digitised system. However, ICT application to the land registry services is very limited as many of the processes are still manual. One of the clients indicated that requesting a digitised records file took more than a month and cost over 100,000 Uganda shillings (equivalent to £40). This frustrates the clients, who keep asking whether the digitised system is operational.

Table 5: Sample of services required from the land registry by the clients

Responses	No. of respondents	%	Status of the service	
			Manual	digital
Conduct a physical/ personal search on the registered piece of land	91	44	✓	✓
Process of transfer of title	61	29	✓	✗
Register court orders/ decrees	55	27	✓	✗
Total	**207**	**100**		

6.4 Challenges faced by the clients

One of the objectives of the study was to find out the challenges faced by the clients while accessing the land registry. As Table 6 shows, 111 (54%) respondents registered missing records as the major challenge they faced with the digitised system. The clients reported that the block numbers of land were mixed up, instruments were scattered and fixed on wrong digitised files and the files were misplaced. This implies that the conversion process was handled haphazardly. Thirty-two (15%) of the clients reported delayed feedback and 23 (11%) mentioned difficulty in understanding the language used with the digitised system. Twenty (10%) of the clients reported they had to travel long distances to get to the land registry when they wanted to check any land-related information, which implies that the digitised system did not provide the capability for data-sharing over a wide area network (WAN). As Creuzer & Kjellson (2005) argue, without the required software platform for data sharing, the digitisation effort is not worth the investment. Regarding the distance to the registry, 12 (6%) of the clients complained that the service points were very few. This wasted time because lining up to be served took up a lot of

time. Although some clients wanted to use the digitised system, they lacked the relevant guidelines, as indicated by nine (4%) of the respondents. This restricted the use of the digitised land records and made it difficult to take advantage of ICT facilities. All these findings manifest a larger problem of inadequacy of facilities to manage the digitised records.

Table 6: Challenges faced by the clients in accessing the land registry

Responses	No. of respondents	%
Missing records	111	54
Delayed feedback	32	15
Language barrier	23	11
Distance to access the land registry	20	10
Limited service points	12	06
Lack of guidelines	09	04
Total	**207**	**100**

6.5 Clients' preference for improved land registry services

The study was interested in establishing the clients' preference regarding improving the services offered by the registry. As shown in Table 7, 124 (60%) respondents wanted the MoLHUD to provide translators. The language problem was raised because the digitised records were in English, which most clients were not very comfortable using, hence they preferred information to be made available in their local language. Thirty-two clients (15%) wanted several service points located in various parts of the registry because only one such service point was available. Access points to the land registry were limited by barriers such as the shortage of required facilities, for instance computers. The low utilisation of the digitised registry was also attributed to the distance one had to travel to consult the registry. This explains why 27 (13%) of the clients wanted the services decentralised to regional or branch land registration offices. This was intended to address the physical distance between the registry and the clients' residences. Eighteen (9%) of the clients desired the procedures for accessing the digitised system while only six (3%) wanted to get feedback from the registry through SMS and email. The results show that the clients were not actually using the digitised system. Without a proper conversion process the MoLHUD risked establishing a digitised system that was not functional (UNECE, 2006).

Table 7: Clients' priorities regarding improving services through land registry digitisation

Responses	No. of respondents	%
Providing digital land information services in local languages	124	60
Increasing service points	32	15
Decentralising services to regional offices	27	13
Procedures for accessing digitised land information	18	09
Providing feedback via SMS and email	06	03
TOTAL	**207**	**100**

6.6 Challenges Faced by the Registry Staff while Serving their Clients

The challenges faced by the registry staff in executing their duties varied from one category of respondent to another, which are discussed below:

a. Challenges faced by the systems administrators

The systems administrators raised the issues of inadequate ICT facilities and power supply.

i. ICT facilities

The systems administrators noted that the computers introduced in the registry were still limited in number. During the study only 10 computers were available yet the MoLHUD personnel working at the land registry numbered over 22. In most of the registry, typewriters manufactured in the 1950s were still being used. The systems administrators believed that the digitised land register was not meeting client expectations owing to the limited ICT infrastructure. They cited lack of software to allow the sharing of information between the land registry and its clients. Running parallel systems that favoured the manual system was still preferred. Each client request necessitated a significant manual effort to search, locate and retrieve the information from the physical records storage areas. Where computers were available, there was neither any connectivity between the various departments and the land registry, nor much interface within each department.

ii. Intermittent electricity supply

The systems administrators complained about the erratic electricity supply, which disrupted the use of the digitised land information system. One systems administrator reported:

> Under the present circumstances, continued access to land records in the digital system cannot be guaranteed since electricity supply is sometimes for only half of the daytime or sometimes only for a few hours a day. While the MoLHUD has a generator, it cannot be used regularly because of lack of fuel and maintenance funds.

There was thus high demand for a constant and reliable supply of electricity for the digitised system at the land registry to be reliable. This demand was prompted by the unreliability of power supply in Uganda. Without a constant supply of electricity, digitised systems would be difficult to depend on since services would be disrupted.

b. Challenges faced by the registrars of titles

While the registrars believed that there were benefits to be enjoyed after full digitisation, such as spending less time tracing files, they complained of lack of ICT training and of a plan to manage the digitisation process.

i. Technical training

The registrars were not ICT-literate and found the system difficult to use. One registrar reported that 'few colleagues consulted the digitised system because they lacktechnical expertise to use the system.' The registrars depended heavily on ICT staff in using the system. However, in-house ICT expertise was generally inadequate. Only three people provided ICT support in the whole ministry, with only one supporting the land registry full-time. This implies that the registrars preferred the manual system to serve the clients. Training of the registrars in ICT skills remained an ongoing requirement. Another registrar lamented:

> While we are expected to serve the clients expeditiously, we have limited training in ICT use. Registrars lack training and mentorship in using the digitised system with ease. We also lack the computers to use. This explains why we cannot use the digitised system to deliver better services.

In general, the registrars noted an acute shortage of the ICT skills required to effectively use the digitised registry.

ii. Lack of a plan for managing the transition from paper to electronic records

The registrars reported the lack of a comprehensive plan for managing the conversion of the paper records into digital format, which provided a very weak context for the effective management of the digitised registry. There were no clear laid-down procedures for managing the digitising process. Diverse approaches to the indexing and classification of digitised records existed. As one of the registrars reported:

> One of the principal challenges is to organise our materials for digitisation. We need to determine what information is essential in describing the digitised land records which is not the case.

All the registrars decried the lack of a standardised naming convention for the digitised files and the time spent harmonising data entries hampered by inconsistencies and inaccuracies.

c. Challenges faced by the Senior Assistant Records Officers

The records officers expressed concern that many records had not been processed yet and the records management skills were inadequate.

i. Backlog of undigitised records

The records managers reported that the slow pace of digitisation created a big backlog of unprocessed records. Major records, such as land titles, were still maintained in hard copy and managed in a strong room under a manual system. In many cases, the requested information either remained unprocessed or was unavailable. A records officer reported:

> Due to incomplete separation of land records under the former system and the new system, there are significant difficulties surrounding retrieving and accessing information form the digitised system.

A Senior Records Officer reported that 'storage for the non-digitised records was inadequate and retrieval of required information from the piles of records is highly time-consuming'.

ii. Inadequate records management training

The records officers mainly reported that they lacked adequate training in using the digitised system. The findings revealed that the records officers were not specifically trained to use the digitised land system. For instance, a Senior Assistant Records Officer reported:

> I have not attained any refresher training in records management practices, ICT and not familiar with the digitised record-keeping processes required to use a digital land registry.

This corroborates the authors' observation that the records officers would only consult the digitised system in pairs so that one officer could guide the other on how to search for data in the system. All the records officers were concerned that without adequate technical knowledge regarding use of the digitised system, confidentiality and accuracy of land records could be compromised. Records staff had training in general records management but none in managing digitised land records specifically.

7. Conclusions and recommendations

Digitising a land registry is an area of serious concern throughout the world. In Uganda the challenges are varied. Effective digitisation of the land registry could result in the efficient delivery of land registry services. The government of Uganda has an interest in implementing new and innovative electronic services designed to extend the range of services offered by the land registry to its clients. However, the digitisation process is not comprehensive. Explicit planning is required to develop effective services and this requires careful analysis of the needs of the clients and the staff of the registry. There is need to design the appropriate means of meeting the requirements. The MoLHUD has to provide strategic and technical leadership, overall

coordination and support on all matters related to digitising the land registry and the utilisation of ICT. The MoLHUD should be ready to adopt ICT initiatives and develop strategies for increased management and access to land information by focusing on the following areas:

i. Improving ICT infrastructure

This will entail the acquisition by the MoLHUD of more ICT facilities, such as those for storage and communication, and having all departments linked to the digitised land system. The focus should be on rolling out infrastructure that will ensure that the MoLHUD promotes the creation and sharing of digital land records. The MoLHUD should have integrated configuration of hardware and software that are networked with operational local and wide area networks (LANs and WANs) allowing more access to land information. This would promote a more networked business environment. The MoLHUD has to procure the software that will enable the clients to interact with the digitised system.

ii. Providing alternative sources of electricity

There is need to address the inadequate electricity supply as part of the initiative to improve the land registry services. To overcome electricity interruptions, the MoLHUD should acquire alternative energy sources, such as solar technology, to enable the digitised collection to be accessible as and when required.

iii. Recruiting and training land registry staff

The land registry should employ more staff with adequate technical knowledge of management of digital systems. It should attract, recruit and retain records management staff with ICT skills. The ICT managers should also be trained in records management practices so that they are familiar with record-keeping processes.

The land registry can play a big role in terms of training its staff in the use of the digitised land registry system. There is need to train and retrain more systems administrators, and registrars of all cadres in the use of ICT facilities and services. The expansion of the information technology team into a distinct department within the land registry needs to be prioritised. The records staff should be trained in ICT skills too. Sensitising all *mailo* land registry staff in order to enable them to use the new land registry system can be one of the options. The land registry should initiate training seminars aimed at improving access to the digitised land information system for its entire staff. This will enable the staff to make use of the technology as well as the information it provides. The MoLHUD should find resources to initiate a records management training programme targeted at registrars to promote the creation and maintenance of digital records.

iv. Sensitising clients to the land registry procedures in a digitised environment

There is need to sensitise all clients regarding the services of the digital land registry. Procedures to use the digitised records system should be documented and followed. This will enable the clients to benefit from the vast amounts of information that is provided by the digitised land information management system. It will also reduce the time needed to get feedback from the registry.

v. Plan for the management of transition from paper to electronic records

Paper records need to be streamlined because digital systems cannot simply be superimposed on dysfunctional or chaotic paper systems, as this would be a recipe for failure. Phases of converting the paper records to digitised format must be adhered to through the

scheduling and sequencing of activities to enable smooth integration of the new system as the old system is slowly phased out. Attention should be paid to improving the management of both paper and electronic records during the transition. This should entail the appointment of more land registry staff by the MoLHUD to process the backlog of unprocessed records and to ensure safe storage of these records. A systematic approach is needed to ensure that what is digitised today does not slide into obsolescence tomorrow.

The factors that influence the digitisation of the land registry in Uganda have been discussed and solutions provided. It would be interesting to conduct further research to discover what metadata was captured in order to improve the location and retrieval of the digital land records. That information would provide users of the digitised system with a standardised means for intellectual access to digitised land records.

References

Ahene, H. 2000. Measures to improve access to land resources and related benefits to Uganda. http://www.fig.net/pub/fig_wb_2009/papers/mkt/mkt_2_ahene.pdf (Accessed 17 February 2012).

Creuzer, P & Kjellson, B. 2005. *Public-private partnership in land administration for the fourth session of the working party on land administration*. Geneva: United Nations Economic Commission for Europe (UNECE).

Denninger, K & Ayalew, D. 2006. Do overlapping land rights constrain agricultural investment? Paper read at workshop on Land Reforms and Regional Initiatives in Eastern Africa, 13-14 November, Kampala (Uganda).

Hirtle, PB. 2002. The impact of digitisation on special collections in libraries. *Libraries and Culture: A Journal of Library History* 37(1): 42-52.

International Records Management Trust (IRMT). 2008. *Fostering trust and transparency in governance: Investigating and addressing the requirements for building integrity in public sector information systems in the ICT environment: Botswana Case Study*. London: IRMT.

Lee, S. 2001. *Digital imaging: A practical handbook*. New York: Neal-Schuman.

Mayer, P & Pemberton, A. 2000. *A short history of land registration in England and Wales*. London: HM Land Registry.

McKinnon, J & Reinnika, R. 2000. Lessons from Uganda on strategies to fight poverty (World Bank Development Research Group). http://ideas.repec.org/p/wbk/wbrwps/2440.html (Accessed 12 June 2012).

Pakesh, H. 2002. Digitisation: An overview of issues. http://ir.inflibnet.ac.in/dxml/bitstream/handle/1944/79/cali_1.pdf?sequence=1 (Accessed 12 June 2012).

Quan, J & Toulmin, C. 2000. *Evolving land rights, policy and tenure in Africa*. London: DFID, National Resource Institute and IIED.

Rutasikwa, G. 2012. Lands computerization project hurting economic activities. *The Monitor* 14 July. Kampala: Monitor Publications.

Saxena, N. 2005. *Land administration in India and its institutional framework*. London: PASS, Department for International Development.

Sebina, P. 2004. Poor records management exposed! *ESARBICA Newsletter* 4:11-12, http://www.geocities.com/esarbica/esarnews4.pdf (Accessed 05 September 2010).

Ministry of Information and Communications Technology (MoICT). 2010. *Information technology policy for Uganda (final draft)*. Kampala: MoICT.

Ministry of Lands, Housing and Urban Development (MoLHUD). 2010. *The national land policy:*

Revised draft four. Kampala: MoLHUD.
MoLHUD. 2000. *Land sector strategic plan (LSSP) 2001-2011: Utilising Uganda's land resources for sustainable development*. Kampala: MoLHUD.
National Planning Authority (NPA). 2009. *National development plan (2010/11–2014/15)*. Kampala: NPA.
Office of the Auditor General. 2013. *Value for money audit report on the functionality of land management institutions in Uganda*. Kampala: Office of the Auditor General.
United Nations Economic Commission for Europe (UNECE). 2006. *Land administration in the UNECE region: Development trends and main principles*. Geneva: United Nations.
World Bank Report. 2006. *Land administration and policy in India*. New Delhi: World Bank.