INNOVATIVE APPROACHES TO LAND TENURE DOCUMENTATION IN GHANA: AN INSTITUTIONAL PERSPECTIVE

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ABSTRACT

Land tenure documentation is very significant for every country especially the developing world. Having land rights documented or registered has many benefits, the most important one being the provision of people's tenure security, from which other benefits are derived. Despite the relevance of land tenure documentation, documenting land rights is a complicated process and as such less than 30% of land in the world has full cadastral coverage as indicated in the literature. This situation is partly due to the problems with conventional methods of tenure documentation, which are costly, time consuming and inflexible. To address the problem, innovative approaches to land tenure documentation have been conceived of at global level and are being promoted in many countries of the global south to offset the inefficiencies and the loopholes of the conventional methods of land administration. However, little is known about how they work during implementation as well as how different actors view them, because they are relatively new. In the case of countries like Ghana, the institutional complexity deriving from formal statutory rules and laws alongside other multiple normative frameworks governing land, poses an additional challenge to implementing new approaches to land documentation.

In response, this study explores, how innovation in land tenure documentation takes place within the institutional land context of Ghana. The study can be described as descriptive qualitative in nature. It employed semi-structured interviews, and focus group discussions to obtain primary data from statutory institutional actors, customary institutional actors and the intended beneficiaries (community actors) and secondary data in the form of published and unpublished works.

Throughout the thematic analysis, the results revealed institutional challenges impeding the successful implementation of innovative land tenure documentation in Ghana and respective solutions to address or ways to accept and adapt to those existing institutional challenges. The main institutional challenges were addressed through technical, and financial ways, but also relate to the dynamics between land, landholders and customary authorities. Concerning the non registration of customary land freehold interest in the study area as well as regid observation time for mapping, these instititional challenges could not be solved but the promoters of innovative land tools have to accept and adapt to the situation. The insitutional context, however, also enables and serves as basis for the promoters of innovative land tools to foster their innovation through providing flexibility in terms of actor involvement, fees and payment options, and through the vibrancy of the land tenure documentation communities.

Concerning the outcome of the land tenure documentation on the intended beneficiaries, the study explored the uses of the generated certificate, perceptions of the mapping process as well as the degree of perceived tenure security through land tenure documentation according to the beneficiaries. The uses of the generated certificates could only be speculated by respondents at this point in time, because the issuance of certificates has taken place only recently. Concerning the tenure security of the beneficiaries, they indicate that validation of the land documents by the appropriate authorities increases their sense of security.

Keywords: land documentation, innovation, customary institutions, statutory institutions, Ghana

ACKNOWLEDGEMENTS

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LIST OF ACRONYMS

CLS	Customary Land Secretariat
CSAU	Client Service and Access Unit
ED	Electronic Distance Measurement Instrument
FAO	Food and Agriculture Organization
GPS	Global Positioning System
LAP	Land Administration project
GLTN	Global Land Tool Network
LC	Lands Commission
LVD	Land Valuation Division
LTRD	Land Title Registration Division
MAST	Mobile Application to Secure Tenure (MAST)
NGOs	Non-Governmental Organizations
OASL	Office of the Administrator of stool Lands
SMD	Survey and Mapping Division
STDM	Social Tenure Domain Model
TCPD	Town and country Planning Department
UML	Unified modelling language
USAID	United State Agency for International Development

1. INTRODUCTION

1.1. Background and justification

Tenure documentation is significant for every country, especially in the developing world. Land tenure documentation essentially entails the writing of the name of the person and the right held by the person or legal entity concerning the land in some form of register. Land registration more specifically is *"a process of official recording of rights in land through deeds or title (on properties)"*(Zevenbergen, 2004). Land registration is also defined as an official and systematic process of managing information regarding land tenure (Nichols, 1993). In most instances, the outcome of land registration is accompanied with the issuance of title certificate by the government through statutory laws, which purport to guarantee land rights.

Having land rights documented or registered has many benefits, the most important one being the provision of people's tenure security, from which other benefits are derived. One of the most promoted means of providing and ensuring tenure security is through state-led land registration, which connotes the registering of legally recognised land rights in a central system to create a multi-purpose property ownership database controlled by the state (Abdulai, 2010). This process entails land documentation through individual land titling based on the argument that this leads to better accessibility of formal credit facilities, higher land values, higher investment in land and higher income or financial returns (Feder & Nishio, 1998; De Soto, 2000). Similarly, (van Gelder, 2010) argues that security of tenure has the additional benefits of stimulating investment among households and communities, encouraging economic initiatives, alleviating poverty, making credit accessible and enabling land markets. Also, according to (Holden & Ghebru, 2016), formal recognition of land rights may strengthen tenure security where such land rights are threatened for various reasons and as such reduces the chances of being evicted. This argument in favour of tenure documentation and formalization is also put forth by UN-Habitat (UN-HABITAT, IIRR, GLTN, 2012).

However, tenure documentation is a complex and challenging process. According to (Lemmen, 2013), many developing countries have less than 30 percent cadastral coverage which implies that higher than 70 percent of land in most countries is outside the formal land registers. Also, similar studies carried out by (Diop, 2013) pointed out that only 10 percent of rural lands in Africa is registered and the remaining 90 percent remains undocumented, which makes it vulnerable to land grabbing, expropriation without adequate compensation and corruption.

This situation is *"strongly related to the data collection process, where the use of highly accurate, expensive and time-consuming spatial data colection methods such as field surveying, is overemphasised"*(Rahmatizadeh, Rajabifard, Kalantari, & Ho, 2017).The data collection process mentioned above are mostly embedded in conventional methods of tenure documentation. Conventional methods of tenure documentation include the various processes and procedures involved in formal land registration systems accompanied by the issue of titles, which purports to guarantee land rights, and which are mainly carried out by the government with reference to statutory laws. Securing tenure through conventional land documentation systems in developing countries is very cumbersome because the application of these systems is usually expensive, inaccessible, complicated, slow and tends to exclude marginalised groups from either getting titles to their farmlands or residential plots (Toulmin, 2005). For example, after approximately three decades of the implementation of land title registration in Ghana, the coverage has only extended to the Greater Accra Region and some areas in the Ashanti region (Tutu, Asante, Appiah, Bendzko, Chigbu, 2015). Therefore, many people living in other parts of the administrative regions are yet not given a chance to take part in land title registration since the land title program is rolled out according to regions. At the current pace of land documentation through individual land titling in Ghana, it will take the country numerous years to attain full coverage *"Ceteris paribus"*. For example, according to (World Bank, 2005) only 8 percent of properties are registered in Ghana.

In addition to conventional methods of tenure documentation being slow, expensive and technically difficult to implement there is another difficulty that relates to the idea of documentation of land tenure through

state-led efforts more broadly. Often the conventional methods of tenure documentation do not fit the customary systems operating in an area. For example, (Meinzen, & Mwangi, 2009) have established in a case study conducted in some parts of rural Kenya that documentation of property rights through individual land titling has created social inequalities or classes along the social ladder with problematic effects especially for the marginalised groups such as women and the youth as well as conflicts, elite capture, disruption of management of collective resources that spans over more extensive area, erosion of secondary rights and extinction of social institutions. In contrast to the accolades earned by the documentation of property rights through individual land titling, some researchers contend that same evidence has been lacking in some parts of Africa after three decades of implementing land registration systems (Payne, Durand, & Rakodi, 2009). Empirical studies conducted over the past years have questioned the performance of documentation of property rights through individual land titling as a sole solution for ensuring economic growth and promoting investment in developing countries. For example, (Geoffrey Payne, Payne, Rakodi, Marx, & Rubin, 2008) established in both Senegal and South Africa that formal title does not ensure access to credit and does not affect land transferability, government revenue, and investment in land. Also, a study conducted in Ghana found that land documentation through individual land titling is not a pre-requisite in mortgage transactions, but rather a post requirement (Abdulai & Hammond, 2010).

Given the expensive, slow, inaccessible and complex nature of conventional methods of land documentation (Toulmin, 2005) advocacy for a paradigm shift away from conventional methods of land documentation to the adoption of alternative tenure documentation options to suit various circumstances in any area has become inevitable (UN-HABITAT, 2008). The argument is that documentation of land rights through individual land titling as a single solution cannot provide the tenure security needed for the teeming majority of people in the developing countries since it is slower than required (Jacoby & Minten, 2007).

Innovative approaches to land tenure documentation seek to address both concerns with conventional documentation methods: technical complexity through fit-for-purpose land administration as well as the need to recognise land rights beyond formal individual title based on the continuum of land rights.

Fit-for-purpose is a complementary approach for tenure documentation. Fit-for-purpose denotes that the land administration systems especially the underlying spatial framework for large-scale mapping should be developed for managing current land issues in country context rather than merely following more advanced technical standards (Enemark, Clifford, Lemmen, & McLaren, 2014). Innnovative land tools seek to implement fit for purpose principles, which have three fundamental characteristics: focus on purpose; flexibility; and incremental improvement (Enemark, Bell, Lemmen, & McLaren, 2014). The fit for purpose land administration promises to have various benefits. According to (Enemark, Bell et al., 2014), the Fit for purpose approaches seek to be participatory; involve flexible processes and procedures; are inexpensive; support incremental improvements in future, and cover all people and tenure types within the shortest possible time.

Continuum of land rights refers to the diverse land tenures ranging from formal to informal along the continuum. It has also been well established by (Payne, 2002) that in practice a continuum of land tenure rights can be observed, particularly in developing countries, where different sources of law and different ownership patterns coexist. With this, there is the security of tenure and implementation gap in the conventional methods of tenure documentation, which emphasize formal land rights at the expense of so called customary land rights. Therefore, there is the urgent need for complementary approaches for land documentation. Based on the inability of land documentation through the individual land titling to ensure tenure security promptly for the teeming majority, it is proposed that methods based on the continuum of land rights need to be adopted (Zevenbergen, Augustinus, Antonio, & Bennett, 2013).

The purpose of the use of emerging innovative approaches based on fit-for-purpose principles and in recognition of the continuum of land rights for tenure documentation is to ensure poverty alleviation, food security, and good governance thereby contributing to Sustainable Development Goals (Bennett & Alemie, 2016). In implementing innovative approaches for land tenure documentation, spatial accuracy should not be a requirement but rather contextually based. This opinion has been buttressed by (FAO, 2012) that spatial accuracy for parcels, as well as other spatial units, should be sufficient enough for identification to meet local needs, with incremental accuracy provided in future if required over time. Based on the benefits of the

innovative land tools, it is important to adopt them in tenure documentation, especially in the developing countries.

However, despite these calls for the use of innovative approaches for tenure documentation, existing institutions in African nations, not only customary, but also including the surveying standards that are part of conventional methods of tenure documentation, are likely to influence with the implementation of these methods in different ways. In African countries, land rights documentation takes place through interactions between customary and informal norms for land documentation as well as existing regulations based on conventional tenure documentation methods as described above even though the demands for high spatial accuracy and technologies of the latter make the entire procedures very expensive and out of reach of the poor.

The land laws of Ghana, for example, mandate that survey maps and plans should conform to certain survey standards before the state land agencies can accept them. For example, Section 7 (1-2) of the Land Title Regulation 1986 (LI 1341) requires that a permanent beacon should separate boundaries between two parcels and be maintained in a manner determined by the director of the surveys. A lot of technical specifications are embedded in the laws that make it tough, if not impossible, to adopt innovative approaches for tenure documentation. According to (Görgens & Denoon, 2013), a genuinely pro-poor approach requires regulation that can directly challenge and transform the embedded socio-spatial inequalities. There are some innovative approaches for tenure documentation currently being implemented in Ghana by different organisations collaborating with other actors, such as the statutory actors, customary actors as well as the community actors working on the implementation of these innovative tools.

This study seeks to describe how innovation in land tenure documentation takes place within the land institution context of Ghana. This research aim will be further justified and specified in the following sections.

1.2. Research Problem

Literature indicates that innovative land tools (new approaches for tenure documentation) have been conceived and are being promoted at a global scale, but their application is, of course, based on various country contexts. Innovative land tools are meant to offset the inefficiencies and the loopholes of the conventional methods of land administration, but little is known concerning how they work during implementation as well as how different actors view them because they are relatively new.

The effectiveness of the innovative land tools depends not only on how well they are tailored to meet local needs, but also how they interact with the institutional context, including regulations regarding the existing documentation procedures.

However, such regulations in Ghana are not only formal statutory rules and laws, but there are multiple normative frameworks to govern land.

This poses additional challenges to implementing new approaches (innovative land tools) to land tenure documentation. There is the formal system governed by written rules and regulations and the customary systems which are governed by customary laws and practices handed down from generation to generation and different from region to region. The customary system dominates the landscape of Ghana and regulates according to customary norms. It is unclear how the existing innovative approaches for tenure documentation (innovative land tools) negotiate the legal web of formal and customary institutions

1.3. Research Objective

To describe how innovation in land tenure documentation takes place within the land institution context of Ghana.

1.3.1. Sub-Objectives
1. To identify nature and types of innovative approaches to land tenure documentation in Ghana.

2. To identify institutional challenges to innovative land tenure documentation in Ghana and means to address the challenges.
3. To explore the current outcomes of innovative land tenure documentation on the intended beneficiaries: the landholders in a case study community

1.3.2. Research Questions

1. To identify nature and types of innovative approaches to land tenure documentation in Ghana.
   a. What innovative land tools are currently being implemented in Ghana and by whom?
   b. What are the main characteristics of innovative land tools according to the actors implementing them?
   c. What are the priority mapping areas for land documentation using innovative land tools and who prioritises these areas and how?
   d. Who are the actors involved in the implementation of innovative land tools besides the promoters of the tool and what are their relations?

2. To identify institutional challenges to innovative land tenure documentation in Ghana and means to address the institutional challenges.
   a. What are the tenure documentation processes within Ghanaian institutional context?
   b. What are the current institutional challenges in relation to tenure documentation using innovative land tools?
   c. How do the actors deal with the institutional challenges in implementing innovative land tools in Ghana?
   d. What changes are needed to accommodate the application of innovative land tools in Ghana from an institutional context?

3. To explore the current outcomes of innovative land tenure documentation on the intended beneficiaries: the landholders in a case study community
   a. How participatory is the use of these innovative land tools for data collection?
   b. How do landholders perceive their tenure security after documenting their land rights?
   c. What are the different uses of the documents/the certificate being generated?
   d. What are the most critical challenges in relation to tenure documentation using innovative land tools?

1.4. Conceptual framework

The conceptual framework in figure 1 below shows a simplified institutions in African contex in relation to tenure documentation. The institutional environment broadly categorised as statutory and customary institutional domains in African context either enable or constrain innovation in land tenure documentation. In the process of documenting land tenure, actors from both realms work together in various ways; with the support of communities of landholders and various other institutional actors, such as legal professionals. The participation of the actors from both statutory and the customary domain in the use of conventional methods for tenure documentation is unknown while the relationship between the conventional methods of tenure documentation and innovations in land documentation is also unknown.
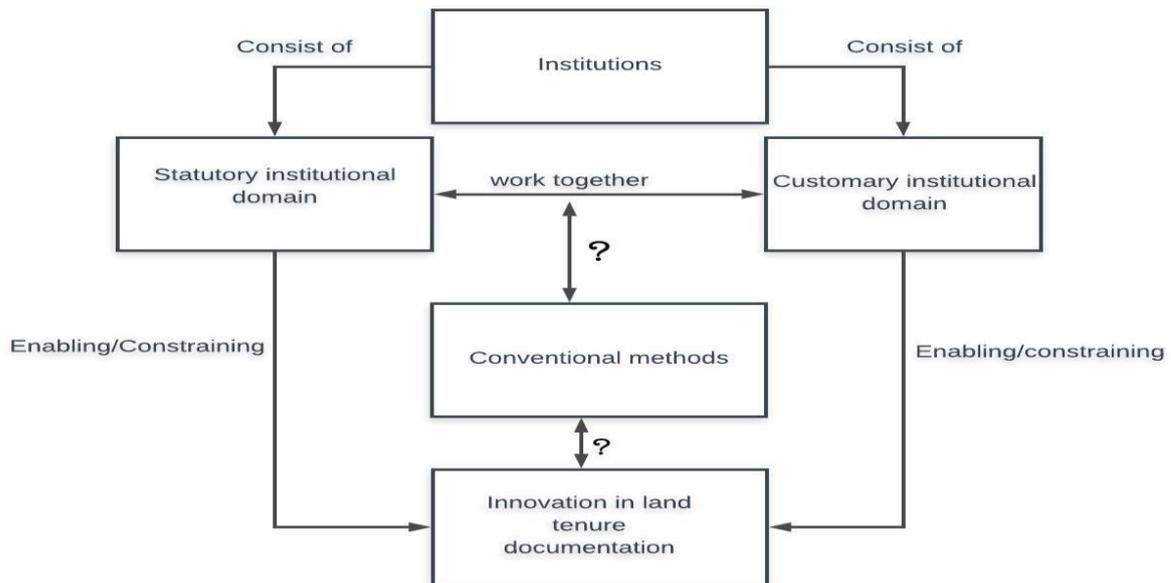
Figure 1 shows the conceptual framework and will be further explained in chapter 2 of this thesis

1.5.   Thesis structure

Chapter 1: Introduction

This chapter gives an overview of the study and entails the: background and justification of the study, research problem, objectives and research questions of the study and conceptual framework.

Chapter 2 Literature Review

This chapter entails the review of the existing literature pertaining to concepts such as conventional methods and the need for innovative approaches to land tenure documentation, innovative approaches to land documentation, innovation in organisational perspective, institutions, and institutional constraints in land administration in Africa.

Chapter 3 Land administration: Institutional Framework in Ghana

This chapter gives an overview of the existing institutional framework for land administration in Ghana as well as how they interact with one another and the outside environment.

Chapter 4 Methodology and data collection

This chapter entails the study area description, the research design and methods, research matrix, sources of data, and sampling techniques.

Chapter 5 Findings from analysis

This chapter entails findings from the data collected from the field concerning the innovative approaches to land tenure documentation in Ghana, institutional challenges to innovative land tenure documentation in Ghana and the outcomes of innovative land tenure documentation on the intended beneficiaries.

Chapter 6 Discussion of results

This chapter contains the discussion of the findings with respect to the existing literature.

Chapter 7 Conclusion and Recommendations

This chapter entails the summary of the answers to the research objectives.

2. LITERATURE REVIEW

2.1. Conventional methods and the need for innovative approaches to land tenure documentation

There has not been a universal definition of what conventional methods of land documentation are in a global context, although the term is widely used in land administration discourse (including some references of reports or academic articles), especially in juxtaposition to new, so-called innovative approaches.

In this context, conventional methods of land documentation denote the various processes and procedures involved in formal land registration systems accompanied by the issue of titles which purports to guarantee tenure security for landholders. In the developing world, providing secure land tenure for the marginalised groups has become a primary tool for promoting economic growth, social development, poverty reduction and encourage better natural resource management (Toulmin, 2005). The conventional methods which are processes and procedures are mostly carried out by Governments with intentions of ensuring land tenure security. Land tenure security has, therefore, formed an indispensable part of Government development interventions in the developing world. According to (van Gelder, 2010), tenure security can be based on one's perception; protection and enforcement of rights by the law (legal security) and actual circumstances on the ground (de facto). On the legal security upon breach, the state normally invocates its coercive powers to protect the rightful owner. De facto tenure security is defined by both intrinsic (i.e., length of time of settlement, Community solidarity, the size of the settlement, etc) and extrinsic (i.e., political acceptability, mobilization of media, etc) characteristics (van Gelder, 2010). Perception of tenure security is when land dweller refers to the degree of fear of being evicted in future.

These conventional methods (are procedures and processes) mainly carried out by the government through statutory laws with the aim of achieving tenure security. The data acquisition methods for conventional land documentation for cadaster are mostly conventional land surveying, aerial photogrammetry and terrestrial laser scanning (Jamali, Boguslawski, Gold, & Rahman, 2014). According to (Zevenbergen, 2002), in some countries, traditional survey apparatuses such as tapes, compasses or simple theodolites as well as paper (books and files) are used; in other places, more advanced survey apparatuses such as Electronic Distance Measurement Instrument (EDM), aerial photogrammetry, Global Positioning Systems (GPS) as well as computer-based storage and manipulation databases and Geographic Information Systems (GIS) are used. The conventional methods for data acquisition are used to provide the legally and procedurally required spatial accuracy. Spatial accuracy is a closeness of a location to its true location (Heuvelink & Lemmens, 2000).

Conventional land documentation is usually the initiative of the Government and implemented through its bureaucratic agencies or organisations. The number of agencies involved and the exact division of tasks between them differs from country to country (Zevenbergen, 2002). According to (Abdulai, 2010), the registration of the land rights is usually driven by the state and the records obtained are legally recognized land rights and are kept in a central system or database to create a multi-purpose property ownership database controlled by the state. Meaning that the land tenure records are managed, monitored and protected by the Government agencies responsible. According to (Monica & Mathilde, 2015), the stakeholders involved in conventional land documentation are mostly municipalities, surveyors, conveyors, financial institutions, registrars, lawyers, Non-Governmental Organizations (NGOs), ministries, utility companies, taxation department, planners as well as other formal institutions.

The outcomes of the conventional methods of land documentation have been well established in the literature. In the global north, the outcomes of the implementation of the conventional land registration systems are highly centralised, accurate, accessible digital land records (Zevenbergen et al., 2013). According to (Henssen, as cited by (Zevenbergen et al., 2013), conventional land registration systems have been primarily established in developed countries of Western Europe over many centuries and their development was promoted beyond Western Europe during colonisation and globalisation. These conventional land documentation systems are premised on state legislation, European concepts of ownership and land titling, and registration (Tutu, Asante, Appiah, Bendzeko, Chigbu, 2015). In order to define and ensure the enforceability of land rights, many states have introduced formalization of property rights.

Formalization of property rights is a process of identifying interests, adjudicating them and registering them (Meinzen & Mwangi, 2009) in government-held databases. Most often, land title registration is the lawfully recognized medium of formalizing land ownership rights (Tutu, Asante, Appiah, Bendzeko, Chigbu, 2015). According to (Bogaerts & Zevenbergen, 2001), the land registry is a public register in which the documentation effecting interests in land are kept, maintained on the grounds of legal documents and procedures.

In the less developed world, customary as well as communal areas have made many attempts to copy these conventional land documentation systems but met with mixed results due to the absence of the required institutional underpinnings (De Soto, 2000). There are several arguments in the literature indicating the reasons why the conventional methods of land documentation could not be replicated in some parts of developing countries. These reasons can be grouped into four:

First, most sub-Saharan countries lack the capacity to implement a high-standard land administration system (Augustinus, 2003). To implement the conventional methods for doccumenting land tenures, there is the need for appropriate land policy, clear administrative procedures for specific needs and presence of efficient institutions. The conventional methods require high technology for data acquisition. In addition to the lack of high technology in data collection, there is also storage, management, and dissemination of land information challenges as well as capacity and workforce challenges (Williamson, Enemark,Wallace, Rajabifard, 2010).

Secondly, such approach is considered slow and complex (Tuladhar, 2004), expensive and bureaucratic (Hanstad, 1998) and there no significant evidence that poverty levels are reduced through formal land titling (Payne et al., 2009). According to (Van Asperen, 2014) *"Such systems could even fail to deliver tenure security to the poor; they tend to push poor people off their land rather than strengthen their rights."*. The conventional methods for data acquisition are usually expensive. For example, a cost-benefit analysis carried out in Madagascar suggests that the current system of formal land titling should not be extended to rural areas in Madagascar and that any new system of land registration would have to be less inexpensive or affordable to be worthwhile (Jacoby & Minten, 2007).

Thirdly, conventional land documentation systems are not always appropriate for the range of tenure types and land rights found in real-life situations, such as the rights commonly found in informal settlements and customary areas (Augustinus, 2003). Similarly, documentation of property rights that focus on individualized land titling can create uncertainties for people who rely on the native system to protect their land claims (Awuah & Hammond, 2013). Formalization of property rights as in some rural parts of Kenya established that individual land tiling has the risk of excluding legitimate claimants in the formalization process even though these rights were formally guaranteed under the customary system (Meinzen & Mwangi, 2009). Also, the land titling programs failed to incorporate different tenure arrangements especially customary and secondary land rights (Asiama, Bennett, & Zevenbergen, 2017). Finally, as noted by (Bromley, 2009) documentation of property rights through individual land titling erodes and dislocate existing social networks and arrangements that do offer tenure security.

Fourth, the reason why conventional methods of tenure documentation could not be replicated in Africa is that local institutions were not taken into account when developing land administration systems (Delville, 2002). According to the author, social mechanisms cannot be supported by a standard model alone; it is better to use a gradual crafting process of rules and procedures.

The problems that characterized applying conventional methods of tenure documentation in a global context also manifest in Ghana. Over the past years, many types of research have been conducted in the country to find out the challenges of the statutory land registration system in the country. Many findings were ascertained including weak public land sector institutions; duplication of institutional functions, inadequate logistics; and high transaction cost in registration concerning legal fees, delays, travel time and cost (Awuah & Hammond, 2013). According to (World Bank, 2005), it takes an average of 382 days for registration to be completed in Ghana with a cost of 4.1 percent of the value of the property. A more current study by (Hammomd, Antwi, 2010) also shows that the social cost of land title regulative policies on a 0.23-acre residential plot of land in Ghana is $US 5,320. These problems that characterise land registration process in Ghana may make it very difficult for many of the poor landholders to document their land rights.

Based on the reasons given above concerning the deficiencies and loopholes of conventional methods of land documentation, the adoption of innovative approaches for tenure documentation has been promoted in the past ten years.

2.2. Innovative approaches to land documentation

According to (Van Asperen, 2014), innovative land tools are a conceptual answer to the difficulties or challenges created by the failure of conventional land administration systems. The subsections below describe the characteristics of innovative land tools and the lessons learned from the implementation of innovative land tools.

2.2.1. Characteristics and definitions of innovative land tools

Innovative land tools exhibit certain characteristics when applied in tenure documentation. Global Network for Pro-Poor land tools has categorized four essential characteristics that are noticeably when innovative land tools are used for tenure documentation (Augustinus, 2005).The four characteristics are: (1) Cheap, no rigid boundaries in Customary areas, (2) minimise land disputes since it is participatory, (3)the design of the tool have nationwide application, and (4) minimise gender bias. Prominent aims of innovative land tools are: increase the cost-effectiveness of the use of the tools, speed or fastness in documenting land rights, easy to use, inclusiveness, flexibility to mention a few.

Although there are different for-profit and not-for-profit initiatives and technologies being implemented with the characteristics listed above, the idea of innovative approaches to land documentation has been promoted especially by the Global Land Tool Network through its land tools and toolbox approach with tremendous support as well as coordination from UN-HABITAT. As indicated by (Williamson, Enemark, Wallace, & Rajabifard, 2010), the toolbox approach involves identifying and implementing appropriate tools given a country context to meet immediate and future needs. According to (UN-Habitat, IIRR, GLTN, 2012), a land tool is a practical means to resolve a problem concerning land administration as well as land management. It serves as a means to put principles, policies, and legislation into effect. According to (UN_HABITAT, 2012), many benefits can be derived from documenting through pro-poor land tools. Some of the advantages include improved access to consumer loans; make huge investments on the land; being the first step on the land tenure rights ladder or continuum, be the foundation for capital formation, notice to the world or government and proof of ownership.

Innovative land tools for this research is defined as a low cost, flexible tools with a mobile application for documenting land rights through community-generated data. They seek to be bottom-up approach where the mapping of the land rights start with the communities and involve the community members taking an active part in mapping their land rights. Examples of some of these innovative tools for tenure documentation are the Social Tenure Domain Model (STDM) of UN-Habitat, Open Title by Thompson Reuters; Open Tenure by FAO; Cadasta application, Landmapp initiative by Landmapp to just mention a few.

2.2.2. Lessons learnt from implementation

Two cases (STDM & MAST projects) of implementation of innovative land tools were reviewed to identify the lessons learned from implementation. The general features of STDM and the MAST project are described as flexible (incorporate different land rights and claims), participatory and low cost.

The STDM tool was piloted in Uganda, and the project aims to solve the land information needs of women and men living in slum areas. The report indicated that the STDM promotes the continuum of land rights principle and it is flexible (incorporate different land rights and claims), participatory (participatory enumeration by people being surveyed), low cost and user-friendly. According to the report, many lessons were learned from the implementation of the project. The lessons are grouped into five (5) main points such as partnerships, technical aspects of the STDM tool, ownership of the process at community levels, capacity building and the impacts of the tool on livelihoods. These lessons enumerated above are further explained below:

Firstly, the partnership with local authorities, community actors, national institutions and international organizations prove to be critical for the successful implementation of the STDM in Uganda. All the stakeholders embraced the project since they were all part of the implementation of the project.

Secondly, concerning the technical abilities of the STDM tool, the Stakeholders appreciated its ability to capture information regarding the informal settlement with the use of simple technology in a participatory manner. The implementation of the STDM application makes use of community members with their existing capacities.

Thirdly, Ownership of the process at community levels was vital during the implementation phase. According to the report, the community members are pivotal in the mapping as well as the enumeration process starting from the planning stage to implementation stage and the post-implementation phase. Based on the participation of the community members, they easily accepted the outcomes as their own.

Also, capacity building is one of the lessons learned from the implementation of the STDM tool in Uganda. The capacity building is an ingredient for the future sustainability of the project. The project provided enough capacity building programs to the stakeholders involved.

Finally, the impacts of the STDM tool on livelihoods of the pro-poor is another lesson learned from the implementation of the tool. The outcomes of the engagement of the stakeholders in the project and the information generated from the tool have strengthened the dialogue and partnership between the Government authorities, Slum dwellers, and the community members.

Tanzania was selected as the site to test MAST pilot project. The project aims to secure land rights of rural communities. The MAST pilot project was conducted in two phases: one is the initial phase and the second one was scaling up phase. There were many lessons learned from the project. The lessons learned from the project are grouped into five(5) categories including those at the National level, District level, village level, mapping/technology used and sustainability concerns (USAID, 2016b). The observations and the lessons learned from the implementation of MAST Pilot are described below.

Firstly, lessons learned at the National level. Many stakeholders were identified at the National level that helps to execute the project. According to the report, the project had broader stakeholders outreach to collect adequate information from Government agencies, NGO's and Donors concerning the land administration framework in Tanzania.

Secondly, lessons learned at the districts. There were also many stakeholders engaged in the districts which contributed to the successful execution of the project. For example, the staffs at the districts brought much expertise in surveying as well as mapping to helped implement the project.

Thirdly, lessons learned at the community level. Several stakeholders were also identified at the community levels, and they contributed immensely towards the implementation of the MAST pilot project. The active engagement with the leaders and elders of the communities helped to shape and improve the project planning as well as creating a realistic time frame.

Also, lessons learned concerning mapping/technology used was also very critical. The cost of the internet can be a potential barrier to the implementing, utilizing ITC based project. During the implementation phase of the projects, many options were explored to reduce the cost of the internet

The final part of the MAST report dealt with sustainability issues. There were many sustainability issues enumerated which include some of the following: Financial sustainability, staffing, and capacity building of staff and community members. Land regularization needs both financial and political commitment for its implementation to be successful.

In sum, the lessons learnt from the STDM, as well the MAST project in Uganda and Tanzania respectively, have commonalities. The challenges of implementation of the two projects described above are of organizational and institutional and therefore is imperative look into innovation in organisational perspective in the following section

2.3.   Innovation in organisational perspective

Innovation has a positive impact on the performance of an organization and many studies conducted in the past affirmed this viewpoint (Hult, Hurley, Knight, 2004; Verhees & Meulenberg, 2004)

In general, the term "innovation" is complex and multifaceted; and as such a universally accepted definition of the term innovation in science does not exist (Antanas & Timur, 2017). Since there is no worldwide accepted definition of innovation and its empirical classifications, the concept is defined differently depending on the context. For example, the word innovation is used in many fields such as biology, health, economics, sociology, anthropology to mention a few and the definitions varies even though they are intertwined. According to (Godin, 2011), innovation is defined in three broad ways. The three main types of innovation are: substantive, action and process (innovation as commercialisation). Innovation as an action means novelties such as new ideas, behaviours and objects. Innovation as substantive means introducing something that is new. Lastly, innovation as a process (commercialization) means the introduction of a technological invention into the market. Based on the three broad definitions of innovation above, most scholar's definition of the concept cut across at least one of the definitions mentioned above. For example, innovation is the successful application of new ways of doing things or new techniques of doing things to improve the effectiveness of an organisation or an individual (Archibugi, 1994). Also, innovation is defined as a process whereby new ideas, objects and procedures are created, developed or reinvented (Slappendel, 1996). Finding a universally accepted definition of innovation as well as its classification is a daunting task in the arena of research as indicated earlier:

"A plethora of definitions for innovation types has resulted in an ambiguity in the way the terms 'innovation' and 'innovativeness' are operationalized and utilized in the new product development literature" (Garcia & Calantone, 2002). Based on the numerous classifications of innovation by different scholars, a universally accepted classification of innovation types is not in existence. The table below shows different classification of the concept of innovation in literature according to scholars and corresponding definitions.

Author	Classification of innovation	Definition of the innovations
(OECD, 2005)	Oslo Manual mentions four types of innovation	
	▪ Product	*"A product innovation is the introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses"* (OECD, 2005,p 48)
	▪ Process	*''A process innovation is the implementation of a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/ or software"* (OECD, 2005 p 49)
	▪ Organizational	*"An organisational innovation is the implementation of a new organisational method in the firm's business practices, workplace organisation or external relations"* (OECD, 2005 p 51)
	▪ Marketing	*"A marketing innovation is the implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing"* (OECD, 2005 p 49)
(Daft, 1978)	Daft classified product innovation into two categories	
	▪ Technological	Technological innovations are the various ways products are created and rendered (Zapfl, 2016)

Author	Classification of innovation	Definition of the innovations
		Technological innovation consists of the various activities which are scientific, commercial, technological and financial with the aim of implementing technologically new or improved products and processes (OECD, 2002)
	▪ Administrative	It involves new practices and approaches to encourage as well as reward employees, devise administrative strategy, structure of the task and modify organisations management system or process (Daft, 1978)
(Bessant & Tidd, 2007)	Bessant & Tidd classified innovation according to four dimensions of change	
	▪ Product innovation	*"changes in the things (products/services) which an organisation offers" (*Bessant & Tidd, 2007 p 13)
	▪ Process innovation	*"changes in the way in which things (products/services) are created and delivered" (*Bessant & Tidd, 2007 P 13)
	▪ Position innovation	*"changes in the context in which products / services are introduced" (*Bessant & Tidd, 2007 p 13) . Thus, new ways of introducing innovation to potential customers
	▪ Paradigm innovation	*"Changes in the underlying models which frames what the organization does (Bessant & Tidd, 2007 p 13)"*
(Toivonen, 2015)	Toivonen distinguishes innovation in three interrelated forms	
	▪ Service innovation	Service is final benefits (user benefits), technical features(production system), competence features and therefore change in any of these features is called service innovation (Gallouj & Weinstein, 1997)
	▪ Social innovation	In social innovation, solutions are sought for addressing complex economic and social problems (Toivonen, 2015) social innovation is when new ideas are created which have positive impacts on quality as well as the quantity of life (Pol & Ville, 2009)
	▪ System innovation	It is based on the new operational model of an organisation which is simultaneously based on the development of the organization, technology, products as well as multiple network relationships (Toivonen, 2015)

Table 1 Different classification of innovation according to literature

Table 1 above shows the classification of innovation by different scholars in literature. The classifications of innovation by different scholars on the table above largely depends on the words used to describe the concept, and most of the classifications are intertwined. For example, social innovation is manifested in products, services and system (Toivonen, 2015) while product innovation can further be broken down into technological innovation and administrative innovation (Daft, 1978).

"Culture that has the ambition of helping develop innovative ideas have features of dynamism, flexibility, quick adaptation to existing and changing conditions as well as non-stereotypical solutions" (Woszczyna, 2014). Organizational innovation has become more complex even though there is an increasing demand for more flexible organizational forms (Sydow, Schreyögg, & Koch, 2009). This has become more complex especially in developing countries land administration organizations and this is partly due to the culture of the organizations to embrace organizational innovation. But it is also related to the broader institutional context.

In sum, there is an underlying differentiation between product vs. process innovation; and technological vs. social innovation. Also, many of the definitions and classifications, but not all, refer to the marketing domain and business processes; and need to be adapted to the context of governance beyond private sector and – in this study specifically, the institutions involved in the governance of land. The following section will therefore discuss innovation in its relationship to organizational culture specifically in land administration

2.4.   Institutions: enabling and constraining innovation

The study of institutions is essential to the discipline of sociology and related fields of knowledge, because institutions always refer to aspect of human behaviour (Davis, 2009). According to (Douglass, 1994,p 360) institutions are defined as *"the humanly devised constraints that structure human interaction. They are made up of formal constraints (rules, laws, constitutions), informal constraints (norms of behavior, conventions, and self-imposed codes of conduct), and their enforcement characteristics".* Similarly,(Greif, 2006, p 30) indicated that *"an institution is a system of social factors that conjointly generate a regularity of behaviour. Each component of this system is social in being a man-made, nonphysical factor that is exogenous to each individual whose behaviour it influences".* Also, (Glaeser, Porta, Silanes & Shleifer, 2004) talks about institutions in the direction of *"constraints"* that are *"reasonably permanent or durable".* *"Institutions both constrain and enable behavior. The existence of rules implies constraints. However, such a constraint can open up possibilities: it may enable choices and actions that otherwise would not exist"* (Hodgson, 2006) The two basic characteristics of institutions are that they are social and as such influencing behaviour following the scholars (Douglass and Greif) above, and are durable, if not permanent, following the scholars Glaeser, Porta, Lopez, Silanes & Shleifer .

Depending on theoretical view, institutions can refer to an activity or an association. As association, for example, institutions are large organizations like the World Health Organization, United Nations etc., but also more general forms of association like the motel, the army, or the corporation refer to institutions, but also broader activities (Jepperson,1991). Hatch's (2011, p.4) definition of institutions includes both characteristics of institutions as activity and an organization: an institution is a *"time-honoured activity or organisation that addresses what would otherwise be a persistent social problem by encouraging behaviour that stabilises society" (Hatch, 2011,p 4).* These definitions are similar to the above by Glaeser, Porta, Silanes & Shleifer, because they also talk about permanency and durability of institutions. For example, if viewed as repeated activity institutions still carry durability, because they refer to organised procedures that have been established such as voting, handshake, attending college (Jepperson,1991). Across different definitions and dimensions institutions commonly serve as production systems, enabling structures, programs and performance scripts (Jepperson,1991).

In sum, institutions are organizations and associations between individuals, but also activities that are repeated and serve to structure human interaction. The concept of institutions in this study, therefore, encompasses the larger context of societal norms and structures, including customary as well as statutory laws and actors. An essential characteristic of institutions is that they are durable and structure human conduct. This means that institutions are always enabling change to some degree, but also constrain it, including the implementation of new technologies.

Conventional land administration systems are based on a rigid institutional framework that goes beyond individual organizational units and which requires several approval steps based on the statutory law (Arko-

Adjei, 2011). Applying these non-flexible institutional arrangements especially in the customary tenure setup would be problematic since accessibility to land and management of it is based on negotiations as well as local knowledge (Amanor, 2008); and this is an issue that goes beyond the respective customary or statutory organizations, such as the Customary Land Secretariat or the Lands Commission and their respective regional or local offices and organizational cultures. In such dynamic as well as the complex environment, a non-rigid institutional framework is required to allow innovation in land administration processes (Arko-Adjei, 2011). Institutional flexibility denotes the various flexible processes and procedures adopted for land administration as well as allowing non-conflicting institutions such as formal and informal land administration systems to perform their respective roles in land administration process and allowing their roles to be incorporated when the need arises (Arko-Adjei, 2011). Institutional flexibility can allow the adoption of innovation in land administration to enhance the effectiveness of the land administration. Rigid institutions with rigid procedures inhibit innovation

The most prominent limitation to capitalize on the innovative tools that have been offered by the modern land administration system to support sustainable development is the presence of the historical institutional framework established with separate silos (Williamson, Enemark, Wallace, Rajabifard, 2010). For example, in both the developing and developed countries the '*historic cadastral and LAS silos, and topographic and geographic information silos, continue to compete and stall innovation and development''* (Williamson, Enemark, Wallace, & Rajabifard, 2010). These old institutional arrangements in many developing countries are many and rigid and cannot readily support innovation to support sustainable development. For organizations to catch up with the innovation in land administration, it means that these historical institutional arrangements should be redesigned and amalgamated into single silos (Williamson, Enemark, Wallace, Rajabifard, 2010). Meaning that many separate silos need to be amalgamated into one silo. The redesigning of the institutions should also take cognizance of the flexibility of processes and procedures as well as innovations embedded in the culture of the organization

In the African land administration context, the institutional environment can be broadly differentiated into the formal institutional and the customary institutional domains. Therefore, the following section will discuss each of these with focus on statutory laws and procedures customary institutions, and rules and norms in customary institutions.

2.5. Institutional constraints in land administration in Africa (and Ghana specifically)

Ghana practices two systems of land administration. There is the formal system governed by written rules and regulations and the customary systems which are governed by customary laws and practices handed down from generation to generation. These two systems operate side by side and also together. Two types of land tenure exist in Ghana. These are customary and public lands (Kasanga & Kotey, 2001). Therefore, broadly speaking, two regulatory systems work side by side: the statutory and the customary. Each poses different challenges to innovation. These will be discussed in turn in the following sections

2.5.1. Challenges to innovation in statutory institutional domain

Regulations are essential for the benefit of every society. Regulations can be a powerful tool for addressing issues concerning poverty alleviation as well as the overall development of the country. Proper regulations create a supportive environment that provides opportunities for people to improve their livelihoods, reduce land conflicts and stimulate economic growth (Nielsen, Tanner, & Knox, 2011). *"Good regulation is effective in terms of realizing social values and objectives and is efficient in promoting economic activities by minimizing direct and indirect costs"* (Hiroko & Nakamura, 2017). Regulations governing land administration promotes and at the same time suppress innovative ideas (Hiroko & Nakamura, 2017). Regulations in the formal land administration domain, that potentially stifle innovation in land administration organizations in Africa, and in Ghana specifically, pertain to four elements in statutory laws: elements pertaining to the qualifications to carry out land surveys, elements pertaining to comprehensiveness of land information, elements related to survey procedures as well as ambiguities of land administration laws.

Firstly, the qualification to carry out land surveys is a challenge in relation to statutory institutional domain. Some African countries have some provisions entrenched in the laws that firmly block the use of innovative land tools. For example, according to the Deed Registries Act of 1937 of Namibia which is still operational stipulates that all lands in Namibia must be surveyed before registration can take place. The same law

indicated that a professional surveyor must survey any transaction on the land leading to the change of ownership and approved by Surveyor General. Some of the provisions entrenched in some of the African countries legal framework such as Namibia concerning the qualification needed to conduct survey work also manifest in Ghana. For example, according to the survey Act of 1962, Act (127) stipulates that the authority to conduct survey work is vested in the Director of the survey. The oversight of land surveying practice in Ghana by the director of the Surveying and Mapping Division stifle innovation.

Secondly, regulations concerning comprehensiveness of land information is another challenge in relation to statutory institutional domains. The regulations concerning the comprehensive land information system is missing in Ghana land tenure regulatory laws such as Act 122, 1962; Act 127, 1962 and PNDCL 152, 1986 as well as the current land bill which is reminiscent of the old land laws and the constitution of Ghana. Comprehensive land information system mainly talks about nationwide, surveying and land adjudication process with simple, pro-poor and innovative techniques, not meeting the criteria for cadastral surveys.

Studies in some parts of Africa indicated that there had been significant changes in legal and policy frameworks to accommodate innovative land tools. For example, in the year 2000, there were massive legal and policy reforms in Rwanda concerning land and the large part of the reforms involved the nationwide surveying, adjudication as well as recording programmes (Koeva et al., 2017). During the regularization of lands in Rwanda, accuracy was sacrificed in the name of speed and cost: parcel boundaries were digitized within 1-5m of the 'true' position (De Vries, Bennett, & Zevenbergen, 2015).

Lastly, ambiguities of land administration laws constitute another challenge. Land administration laws in many African countries are not clear as such may carry different interpretations resulting in different meanings (Burns, Grant, Nettle, Brits, & Dalrymple, 2006, p 20).The authors indicate that *" a central issue in Africa is the proliferation of conflicting and overlapping laws. Many countries have begun legal reform to address the issues and to introduce new approaches, including, among other things, new forms of evidence".* Unclarity of laws in some African countries is also present in Ghana. According to (Mensah, 1999), the land administration in Ghana can well be described as ambiguous: a *"practice whereby two or more persons can advance different, though apparently legitimate interpretations and symbols to validate their claims to the same piece of land".* Also, (Fynn, 2016) has pointed out the ambiguities associated with the interpretation of the article 267(5) of the constitution of the Republic of Ghana. The author indicated that the earlier position held by esteem scholars in Ghana that indicated that not even members of a stool or skin could register freehold interest in land in Ghana is misleading and ought to be rejected as the rightful interpretation of article 267(5) the constitution of Ghana. 'Stool" is a symbol of authority for chiefs in the southern part of Ghana as such the lands are called ''stool lands". ''skin" is a symbol of authority for chiefs in most and as such the lands are called ''skin" lands

2.5.2. Challenges to innovation in customary institutional domain

Regulations in the customary land administration sphere, that potentially constrain innovation in land administration institutions in Africa, and in Ghana specifically, pertain to three elements such as ambiguities of the customary laws, lack of legal backing of customary laws, and weakness of customary land management institutions.

Firstly, ambiguities of the customary laws constitute a challenge in customary institutional domain. There are different opinions as to how customary land administration systems should be analyzed. One school of thought is against the analyzing of customary land administration system from the perspective of rules as well as social hierarchies (Barry & Danso, 2014). This school of thought indicates that sub-Saharan African land tenure systems, as well as institutions, have always been fluid, unclear, always subject to different interpretations, repeatedly disputed and often redefined (Comaroff, 1982). The uncertainty of the customary laws and practices can have potential impact on innovation, albeit both positive and negative. The ambiguities of the customary laws in Ghana was noted by (Mensah, 1999). The author indicates that in the case of Ghana, it is a common practice in the traditional levels to see different people exercising the same right on the same piece of land; that the ambiguities become more complicated especially in rural cocoa growing areas, due to the scarcity of land.

Secondly, lack of legal backing of the customary laws. Customary regulations have formed an essential part of the land administration in some African countries because formal land administrations system

implemented in the past did not recognise the strength, as well as the validity of the customary rights, various tenure insecurity issues emerged in Africa (Knight, 2010). According to (Knight, 2010), some of reseasons why the formal legal system should recognise and back customary laws are: filling the gap in state administration, growing socio-economic factors (land grabbing for biofuel, climate change) and prevent state sanctions against the users of customary lands. Increase in the demand for land may encourage the manipulation and advancement of personal interest (Ubink & Quan, 2008).Such increase in the demand and the commercialisation of land may also push the custodians of the customary lands to charge higher fees on the land users and even evict them to look for alternative lands (Cotula, 2013). The fees charged can be very high (Delville; Toulmin, Colin, & Chauveau, 2002).

In some African countries, institutions established by the state to help the traditional authorities to manage the customary lands better lack legal backing. For example, the Customary Land Secretariat was established in Ghana to help the traditional authorities to manage their lands better. The CLS was established with specific mandates such as the establishment of a simple register for recording land transactions, systematically categorise, adjudicate, demarcate and register holdings in the traditional areas; identify and resolve overlapping claims among landowners; develop effective and efficient dispute resolution mechanism in the traditional areas of operation (Bugri, 2012). Despite the above responsibilities and potential benefits, CLSs owe their existence and activities to only policy actions since there is no statutory basis for their existence and operations currently (Bugri, 2012). The absence of laws backing the establishment of the CLS makes their operation difficult.Even though there is no law backing the customary land secretariat, there has been an improvement in the preparation of land documentation and records keeping and improvement in the land right documentation at the CLSs from as low as 1000 as at 2011 to 30, 811 in June 2016 (Antwi-Boasiako, 2017). However, the land tenure documents prepared by the CLS have legitimacy problems, because no law backs its activities.

In summary of the chapter 2, the conventional methods of tenure documentation were explained with their associated loopholes. The chapter also looks at implementation of STDM and MAST project in Uganda and Tanzania respectively. The two projects are of institutional and organizational dimension and it was imperative to review innovation in organizations. Lastly, the chapter concluded with institutional constrains in land tenure administration in Africa. The following chapter 3 specifically looks into the institutional framework for land administration in Ghana and how these statutory and customary institutions interact with each other and the outside environment

3.   LAND ADMINISTRATION: INSTITUTIONAL FRAMEWORK IN GHANA

3.1.   Institutional framework for land administration in Ghana

Figure 2 below shows an overview of the existing institutional framework for land administration in Ghana and how the institutions interact with one another and the outside environment. The bold lines with arrows show strong existing links in the institutional arrangements in regards of information sharing and collaboration. Also, the broken lines with arrows show weak existing links regarding information sharing and collaboration. If there is an strong link among all the land management institutions, it can enhance effective coordination and information sharing leading to an effective land administration system in Ghana
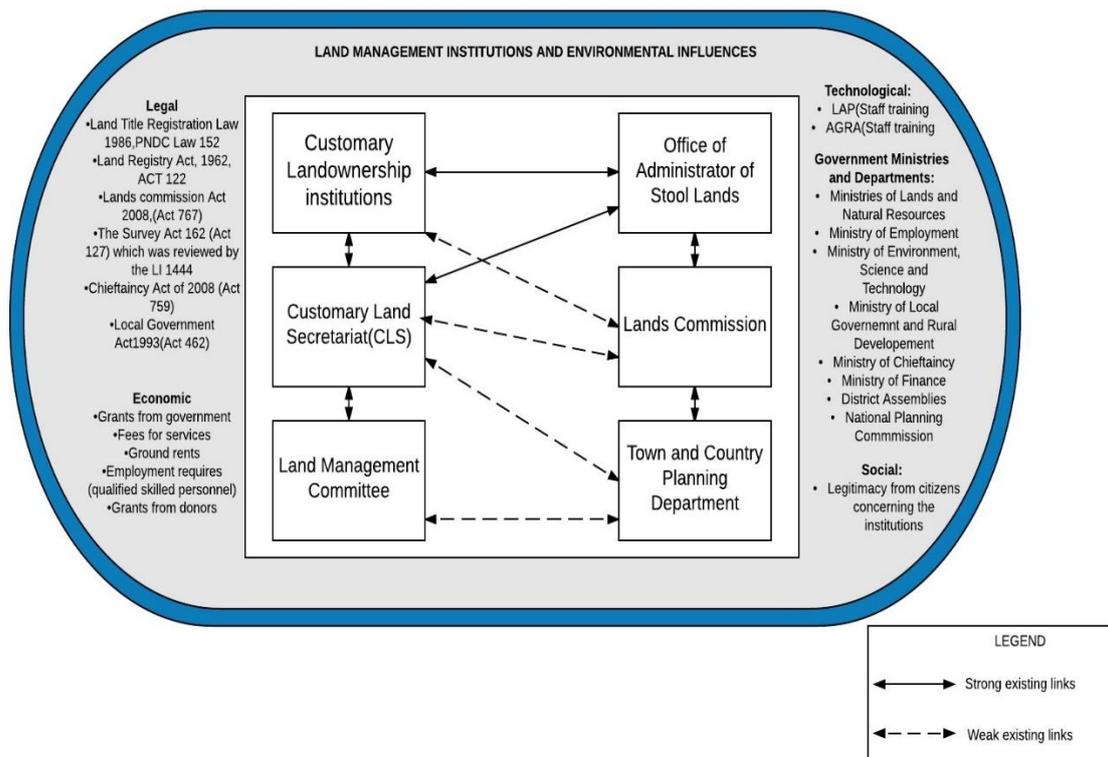
Figure 2 shows the institutional framework for LA in Ghana

3.1.1.   Customary institutional framework for land administration in Ghana

Article 267 (1) of Ghana's Constitution of 1992 states that: All stool lands in Ghana shall vest in the rightful stool on behalf of, and in trust for the subjects of the stool by customary law and usage. Section 139 of the Land Title Registration Law, 1985, interprets"Stool" to include ''skin" and any person or people having control over skin or community land including family land, as a representative of the particular community.' ''Stool" is a symbol of authority for chiefs in the southern part of Ghana as such the lands are called ''stool lands". ''skin" is a symbol of authority for chiefs in most Northern part of Ghana as such the lands are called ''skin lands". What differentiates stool/skin from the family is the size of the community as well as the size of land under control (Gyapong, 2009).The former is bigger than the later.

 The customary institutions have cordial and strong links with the Customary Land Secretariats set up to help and strengthen the customary institutions (chiefs, family heads, Clan heads, etc.) to bring about efficiency and effectiveness in land administration and service delivering within the communities.The Customary institutions also have strong links with the Office of Administrator of Stool Lands who is in

charge of collecting and disbursing stool and skin lands revenues.The Customary institutions mostly have weak links with the Lands Commission which is responsible for formal land registration, valuation, and cadastral services in the country. The Lands Commission and the Customary institutions occasionally collaborate with each other, especially during appropriation and expropriation issues.

The customary institutions interact with the outside environment in respect of customary land administration, and the relevant bodies and laws regulate them. For example, the Customary institutions are governed by the Constitution of the Republic of Ghana as well as the Chieftaincy ACT and other legal laws of the land (state Land Act, Land title registry Law, etc.)

3.1.1.1.   Customary Land secretariat

The Land Administration Project was initiated to provide a platform for the implementation of the policy actions enumerated in the Ghana National Land Policy document promulgated in the year 1999. Since most landholdings in Ghana is under the customary system, the land administration project deems it imperative to formulate plans to ensure effective and efficient customary land management and delivery system in the country. This policy action was achieved under component 2 of the LAP where 37 Customary Land Secretariats (CLS) was established between 2003 to 2010 (Issifu, 2015) to coordinate with traditional authorities in providing an efficient and effective land delivery system within the communities of the establishment. From the inception of the customary secretariats till date; the institution has established cordial and strong links with the customary institutions in achieving its set goals and objectives. They also have established strong links with the land Management Committees which have been created under them. The CLS also have strong links with the Office of Administrator of Stool Lands in respect of payment of ground rent and other royalties. The CLS has weak links with the Town and Country Planning Unit even though they sometimes liaise with them in the preparation of land allocation plot and schemes and for the approval of building permits of their client. Most of the CLS has established weak links with the lands commission. See figure 2 above.

3.1.1.2.   Land Management Committee

The Land Management Committee was established under CLS to assist them in the management of the customary lands at the areas of jurisdictions. The Land management Committee performs various functions such as helping in alternative dispute resolutions (ADR). They corporate and have a strong bond with the CLS. However, they have weak links with Town and Country Planning Department. See figure 2 above

3.1.2.   State institutional framework for Land Administration in Ghana

The state management of land is principally carried out using legislation and instruments for the administration of lands at varying levels and functions. Currently, the statutoryl land administrative framework in Ghana consists of three (3) key land sector agencies, to facilitate effective and efficient land administration system. The main institutions involved in land administration are the Lands Commission, the Office of Administrator of Stool Lands (OASL) as well as Town and Country Planning Department (TCPD). These institutions work under two key ministries such as Lands and Natural Resources, and Local Government and Rural Development. The Ministry in charge of Lands and Natural Resources oversees the Lands Commission and the Office of the Administration of Stool Lands while the Local Government, and Rural Development Ministry oversees the Town and Country Planning Department.

3.1.2.1.   Lands Commission

To streamline land administration in Ghana, the government of Ghana has made concerted efforts under the new Lands Commission Act, 2008 (Act 767) to consolidate all land sector agencies into a single entity. Th new Lands Commission Act Sec. 19 of Act 767 amalgamated four main land agencies namely, Land Registration Department, Survey, and Mapping Division, Public and Vested Land Management Division and Valuation Division. All these Departments and Divisions report to the Ministry of Lands, Forestry, and Mines and finally any other Division the commission may determine. The lands Commission has strong existing links with the formal land sector agencies namely; Town and Country planning department and the Office of Administrator of Stool Lands. However, the Lands Commission have weak links with the Customary land management institutions explained above. See figure 2 above for more details.

3.1.2.2.   Office of Administrator of stool lands

The Office of the Administration of Stool Lands Act, 1994 (Act 481), was established to perform the following functions among others: Create accounts for all stools, Collect stool lands revenue and Disburse the said revenue to its beneficiaries, i.e. Stools, Traditional Councils and District Assemblies. The Office of Administrator of Stool Lands have strong links with the Lands Commission as well as the Customary Land ownership institutions. They also have strong links with Customary Land Secretariat. See figure 2 above

3.1.2.3.   Town and Country Planning Department

The Town and Country Planning Department derived its mandate from several laws and statute including Local Government Act 1993 (Act 462), National Development Planning Commission Act 1994(Act 479) National Building Regulations 1996 (L. I 1630) and Town and Country Planning Ordinance of 1945 (CAP 84). The Department operates under Ministry of Local Government and Rural Development. The Department performs functions such as layout and planning. The Town and Country Planning Department has strong links with the Lands Commission but weak links with CLS and the Land Management Committee See figure 2 above for more details.

4.   METHODOLOGY AND DATA COLLECTION

4.1.   Introduction

This chapter entails a description of the study area, research design and methods adopted to carry out data collection in Ghana. The chapter equally contained the sources of data as well as how the data was analyzed. It also contained the flow chart of the thesis that describes how the research was carried out from the start to the end

4.2.   Study area

The study area for this thesis is Ghana and the research was conducted in three major regions.These three regions are namely: Greater Accra Region with Accra as its capital and seat of Government, Ashanti Region with its capital as Kumasi and Western region of Ghana with Wassa Akropong as the chosen community. Accra was chosen because, it is the city of Government and is where most of the national offices are located (e.g national head office of Lands Commission).The Kumasi city was chosen because that is where the head office of Land Resource Management Center is located and the organisation was responsible for the implementation of Community-based Land Survey Tool in the area. The respondents from Accra (Lands Commission and Landmapp) and Kumasi (Land Resource Management Center) were used to address sub-objective 1 and 2 which mainly deals with innovative approaches for tenure documentation as well institutional challenges and means of addressing those institutional challenges. The respondents from Western Region (Wassa Akropong farming community both male and female Landmapp certificate holders) were also used to address sub-objective 3 which deals with outcomes of innovative land tenure documentation on the intended beneficiaries. The profile of the Wassa Akropong is briefly described below:

Wassa Akropong is a town located in the Western region of Ghana, and it is the capital town of Wassa Amenfi East District. The town has a current population of 7,094 and agriculture is the most dominant economic activity in the area accounting for about 66 percent of the total population. The Wassa Amenfi East District where Wassa Akropong is the capital town is engaged predominantly in cocoa farming and contributes significantly to the overall cocoa production in the country. In respect of religious affinities, Christianity commands about 82.8 percent of the total population in the district followed by Islam with 7 percent. The traditional religion and those people without religion account for 0.6 and 8.6 percent respectively. The Wassa Akropong farming Community was selected because is the community that Landmapp has implemented their land tool for documentation of land rights in the area. So, in getting insight into the experiences of these communities concerning the implementation of innovative land tools, it is ideal to consider the locality.
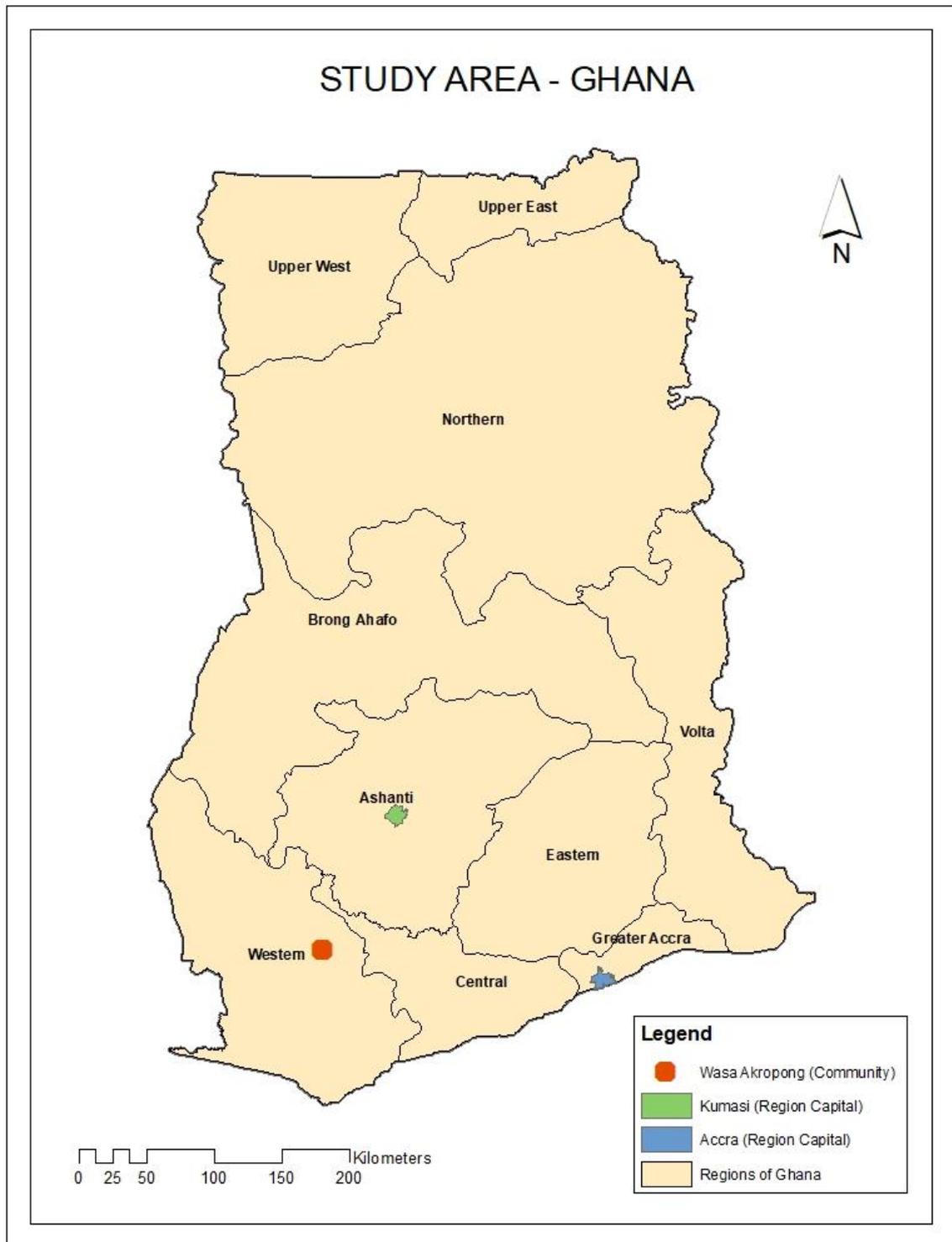
Figure 3 Map of Ghana showing the study area

4.3.   Research Design

According to (Bryman, 2012), a research design provides a framework for the data collection as well as the analysis of data. The effectiveness of the innovative Land tools depends not only on how well they are tailored to meet local needs but also how they fit into the existing institutional context as well as the existing documentation procedures. The objective of this study is to describe how innovation in land tenure documentation takes place within the land institution context of Ghana. To carry out the study of this nature, a case study approach was adopted. One case of innovative land tools implementation in Ghana by Landmapp was studied. According to (Gerring, 2004), a methodological case study approach is to provide a comprehensive study of a single unit with the ultimate aim of elucidating features of a more extensive class of similar phenomena. The case study approach is fundamental and handy in describing how innovation in land tenure documentation takes place within the land institution context of Ghana. Table 2 shows the overview of research design matrix

4.4.   Research Approach

The research approach adopted for this research is qualitative research approach. The qualitative research approach was used to obtain information from the actors concerning how innovation in land tenure documentation takes place within the land institution context of Ghana. The qualitative data approach is not based on numeric values. This particular idea has been buttressed by (Bryman, 2012) that qualitative research approach is emphasized on words rather than quantification in respect of data collection and analysis. The qualitative research approach can provide the necessary information about human behaviour, emotion, and personality features that the quantitative research approach would not be able to provide and the information is useful in designing a product that will thoroughly fit into user life (Madrigal & McClain, 2013). The qualitative research approach is relevant for this study because it helps to reduce prejudices, creates openness by allowing expansions on responses which were never anticipated and also it provides detailed information concerning a particular phenomenon. For this research, this study was conducted in three stages which included pre-fieldwork, fieldwork, and post-fieldwork which are presented in a flowchart in figure 4. The flow chart has further been summarized into the research design matrix in table 2 which gives an overview of research objectives and questions, data collection methods, respondents, processing of data and the results.
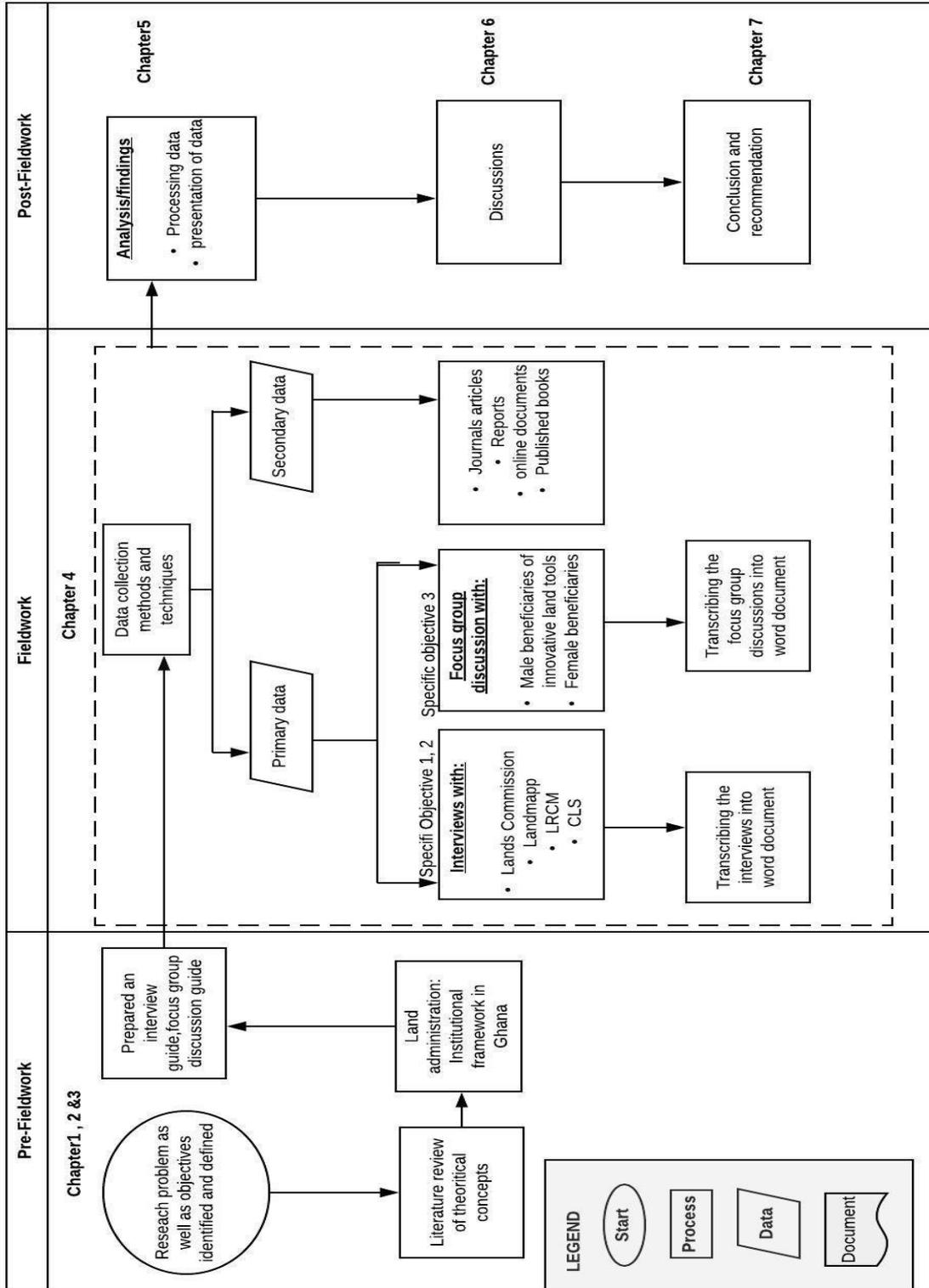
Figure 4 shows the thesis structure and workflow

4.4.1. Pre-fieldwork

During the preparatory stage, the following concepts from the research questions were operationalized. Main characteristics of the tools (Sub-objective 1b) based on lessons learned from section 2.2.2. Types of mapping areas based on factors influencing mapping (Sub-objective 1c), actors involved in mapping process (Sub-objective 1d) based on lessons learned from section 2.2.2, institutional challenges (sub-objective 2b), Participatory (sub-objective 3a), tenure security (sub-objective 3b) and different uses of the certificate (sub-objective 3c). These concepts were operationalised mainly to develop a focus group discussion topic guide as well as an interview guide that were used to gather information from respondents.

4.4.2. Field work-Data collection methods

The fieldwork adopted both primary and secondary data collection methods to generate the necessary data for the whole thesis. See the thesis workflow in figure 4 as well as research design matrix in figure 5

4.4.2.1. Primary Data

With regards to the primary source of data, it was obtained from the field through the conduction of semi-structured interviews (one-to-one) with the statutory actors (Lands Commission), customary actors (Customary Land Secretariats, chiefs) and promoters of the innovative land tools (Landmapp, Land Resource Management Centre). Another source of the primary data was a focus group discussion with community actors (Wassa Akropong farming community) to get their experiences concerning the implementation of innovative land tools in the area. For more details see the research design matrix in figure 5 below.

a. Interviews

Semi-structured interviews, an interactive data collection technique, was adopted to address sub-objectives 1 and 2 which are mainly dealing with promoters of innovative land tools, statutory actors and customary actors. The semi-structured interviews were used to obtained information from statutory actors (Lands Commission), customary actors (Customary Land secretariat, traditional authorities) and promoters of the innovative land tools (Landmapp, Land Resource Management Centre) at their various offices (see research design matrix in figure 5). Interviews were used to get information concerning how promoters of innovative land tools, negotiate the institutional context when implementing these tools as well as the priority mapping areas for these tools. According to (Bryman, 2012), semi-structured interviews provide some level of flexibility, and the interviewer has the latitude to ask additional questions based on significant replies by the interviewee. The semi-structured interviews also enhance the richness of the information collected since it allows further probing. To have detail information , it was appropriate and ideal to adopt semi-structured interview. The technique that was used to select the actors for the interviews was purposive sampling. Purposive sampling technique is typically used when one wants to gather information that is not general as such but privileged information.

b. Focus group Discussion

A focus group method was used to address sub-objective 3 which deals with mainly the experiences of community actors (Wassa Akropong farming community) in implementing innovative land tools. Focus group discussion method is a form of an interview with a group of people of which there are many individuals (at least four) in addition to a facilitator, and there is an emphasis on the questioning on a particular defined topic (Bryman, 2012). Focus group discussion was used to gather information from Wassa Akropong farming community concerning their experiences in respects of the implementation of innovative land tools in the area. Landmapp which is a promoter of innovative land tools has already issued about 2000 land certificate to the cocoa farmers and some of these beneficiaries were part of the focus group discussion. Focus group discussion provides an opportunity to get detailed information concerning a research problem. It also acts as an avenue for understanding complex social issues facing local communities as well as providing solutions through participatory discussions. The sampling technique used to select Landmapp certificate holders for the focus group discussion was the Snowballing sampling technique. One farmer who acquired Landmapp certificate as well as Landmapp field staffs were contacted, and they recommended Landmapp certificate holders. Figure 4 shows focus group discussion held with Landmapp certificate holders in a village within Wassa Akropong.

Figure 5 shows focus group discussion held with Landmapp certificate holders in a village within Wassa Akropong

4.4.2.2. Secondary data

Secondary data was used to address sub-objective 1, 2 and 3. With the secondary source, a desk research methodology was adopted. Desk research is typically used to find out the so-called 'hard facts' about countries (UNDP, 2007). The secondary data was obtained from reviewing relevant literature involving textbooks, articles from the internet, published reports, Land laws of Ghana and journals articles. The technical instruction of surveyors which was a source of secondary data was collected from the Survey and Mapping Division of the Lands Commission. The technical instruction of surveyors is comprehensive instructions that guide how survey work should be carried out in Ghana. The report was used to cross verify the interviews held with the statutory actors as well as the implementers of innovative land tools.

4.4.3. Post fieldwork and methods of data analysis

Data gathered from the field were processed (transcribed) and analyzed by adopting thematic data analysis method which means categorizing the data collected into themes (Bryman, 2012). Data collected from semi-structured interviews, focus group discussion were analyzed using thematic data analysis method. Column 1,2,3, and 4 in the research design matrix in table 2 were pre-fieldwork operationalisation while column 5 and 6 are the summaries of the themes identified through thematic data analysis obtained from the findings of the data collected from the field. For more details see the research design matrix under data analysis section in table 2. The information on how the documentation is done in both challenging and less challenging areas was modelled using Enterprise architecture software

Research Sub-objectives	Research Questions	Data Collection Methods	Data sources/Respondents	Themes identified through thematic analysis (across data collection questions)	Analysis findings
1.To identify nature and types of innovative approaches to land tenure documentation in Ghana .	a. What innovative land tools are currently being implemented in Ghana and by whom	Semi-structured interview	Landmapp LAP Lands Commission	Perspectives on what innovation means according to different actors in land documentation process	4 basic meanings of innovation by actors
	b. What are the main characteristics of innovative land tools according to the actors implementing them?	Semi-structured interview	Land Resource Management Centre (LRMC)	Identification of types of mapping areas based on factors that influence mapping	Challenging (urban) and less challenging (rural) areas
	c. what are the priority mapping areas for land documentation using innovative land tools and who prioritise these areas and how?	Semi-structured interview		Mapping areas based on challenging(urban) and less challenging (rural) areas	
	d. Who are the actors involved in the implementation of innovative land tools besides the promoters of the tool and what are their relations?	Semi-structured interview	Customary Land secretariat(CLS)	Actors involved in the mapping process by type of tenure documentation package and area	Customary institutional actors, statutory institutional actors, Landholders/community actors, promoters/ field professionals of Landmapp tool

Research Sub-objectives	Research Questions	Data Collection Methods	Data sources/Respondents	Themes identified through thematic analysis (across data collection questions)	Analysis findings
2. To identify institutional challenges to innovative land tenure documentation in Ghana and means to address the challenges	a. What are the tenure documentation processes within Ghanaian institutional context?	Semi-structured interview	Lands Commission Landmapp Land Resource Management Centre (LRMC) Customary Land secretariat(CLS)	Description of documentation process in less challenging and challenging areas respectively Types of land tenure documentation packages being implemented in challenging and less challenging areas	UML diagram with texts that shows and explain the documentation process in challenging and less challenging areas Cropseal,Farmseal, Orgseal and Homeseal
	b.What are the current institutional challenges in relation to tenure documentation using innovative land tools?	Semi-structured interview		Specific challenges in challenging and less challenging areas	Technical, financial, legal environmental and awareness issues
	c. How do the actors deal with the institutional challenges in implementing innovative land tools in Ghana?	Semi-structured interview		Specific solutions or means to address the challenges in less challenging and	Technical solution (PVC pipes vs concrete monuments, digital signatures etc), social solutions and sensitization programs

Research Sub-objectives	Research Questions	Data Collection Methods	Data sources/Respondents	Themes identified through thematic analysis (across data collection questions)	Analysis findings
	d. What changes are needed to accommodate the application of innovative land tools in Ghana from an institutional context?	Semi-structured interview		challenging areas respectively	
3. To explore the current outcomes of innovative land tenure documentation on the intended beneficiaries: the land holders in a case study community	a. How participatory is the use of these innovative land tools for data collection?	Focus group discussions	Wassa Akropong Farming Community	Perception of mapping process	Ease of use, in how far documentation process is participatory
	b. How do landholders perceive their tenure security after documenting their land rights?	Focus group discussions		Degree and types of tenure security obtained through documents as perceived by land holders	Legal tenure security, expansion of farms and motivation to work hard on the farms
	c. what are the different uses of the document/ the certificate being generated?	Focus group discussions		Types of uses of generated certificates	Access to finance, increase legal security & motivation to work hard on the farm
	d. What are the most critical challenges in relation to tenure documentation using innovative land tools?	Focus group discussions		Challenges in relation to participation during mapping and sensitisation	Financial challenges, occupational hazards, tiredness in walking and clearing farm boundaries

Table 2 shows research design matrix

5.   FINDINGS FROM ANALYSIS

5.1.   Introduction

This chapter describes findings obtained from the field through the semi-structured interviews and the focus group discussion with the respondents (Lands Commission, LAP, Customary leaders, Landmapp, LRMC, Wassa akropong Community) and subsequent analyse according to the themes identified in table 2 in section 4.3.3 above. As such the chapter describes the meaning of innovation and innovative land tools specifically, the actors, processes and documentation packages involved in land tenure documentation; as well as the perception of landholders towards the process and the uses of issued certificates.

5.2.   Different meaning of innovative land tools according to actors in land documentation process

The table below depicts different meanings of innovative land tools according to promoters of the tools as well as statutory actors (Lands Commission)

Respondents	Meaning of innovative land tools
Lands Commission(CSAU)	Technological injection into already existing system
Landmapp	Solution-driven
LAP	Going beyond orthodox methods
LRMC	Alternative approaches

Table 3 shows meaning of innovative land tools by respondents

Table 3 shows the meaning of innovative land tools according to the various respondents interviewed. The meaning given by the respondents varies depending on their background as well as the angle from which they view it. The Lands Commission which is the formal land administration organisation in Ghana view innovative land tools as an introduction of new technologies into land administration systems (i.e. registration, surveying), more straightforward and practical ways of surveying and making the registration process quicker, faster and more transparent. The definition given by the Lands Commission (CSAU) shows their professional backgrounds since the definition emphasized more on using new technologies to enhance land surveying and registration. Landmapp, which is a promoter of innovative land tools, defines innovative land tools as a means of improvising solutions to solve real problems that the world is currently facing in a more effective and efficient manner. The meaning of innovative land tools given by Landmapp is probably based on the land tenure documentation services they are providing to the rural communities since they have witnessed how farmers lose their lands because of the lack of land documents to back their ownership. Land administration project (LAP), which is also a promoter of innovative land tools, defines innovative land tools as something that is new and out of the norm to move things to make progress in societies. For example, in the land sector, there are orthodox ways of doing things like surveying, valuation, registration, but innovative land tools seek to make a shift away from such kind processes. Land Resource Management Center, which is also a promoter of innovative land tools, indicated that innovative land tools are alternative approaches that are easy and fit for purpose for application in an environment.

In summary, similarities in the meaning of innovative land tools can be drawn from the above. For example, the novelty of an idea is a distinguishing feature of the above meanings, capturing both the need for solutions to tackle societal problems, but also drawing on available resources. The meaning of innovative land tools given by the four respondents differs in respect of their professional grounds. Lands Commission and the LAP emphasized more on registration and surveying domain of land administration while the Landmapp is looking at improvisation of solutions to solve societal needs. Landmapp is viewing innovative land tools from the angle of social innovation. The following section below describes the identification of land documentation areas based on the factors influencing land documentation

5.3.   Identification of land documentation areas based on factors influencing land documentation

Rather than discussing priority areas, the respondents discussed various challenges in documenting land rights. A primary differentiation emerged from these discussions into urban and rural areas with the former

being more challenging. There are also different factors that explain why an area is more or less challenging to document. The relationship between factors and challenging/less challenging areas is shown in table 4 below according to different respondents.

Factor influencing mapping process	Challenging areas (Urban areas)	Less challenging areas (Rural areas)	Respondents who referred to the factor
Land litigations	More	Less	Land Administration Project
Required surveying accuracies	More accuracy required	Less accuracy required	
Monetary land values	Higher	Lower	
Required use of standardize surveying equipment	More standardised equipment	Less standardised equipment	
Land use intensity	Higher	Lower	Client Service and Access Unit of the Lands Commission
Extent of land encroachments	Higher	Lower	
Number of conflicts over land rights	Higher	Lower	
Demand for tenure documentation services	(diverse or less perceived)	High	Landmapp
Community cohesion	Less, more diverse communities	Present	
Extent of conversion of farmland to residential land uses	High	Low or none	Survey and Mapping Division of the Lands Commission
Existence of slums	Yes	No	

Table 4 Factors influencing the choice of mapping areas

Table 4 above shows factors influencing the choice of land documentation areas in Ghana. The areas are classified according to challenging areas which are mostly the urban and peri-urban areas. The other areas are therefore less challenging, and these are mostly the rural areas. The respondents from Land Administration Project (LAP), the Client Service and Access Unit of the Lands Commission, Landmapp and Survey and Mapping Division of the Lands Commission, have enumerated different factors influencing land tenure documentation as indicated in table 4 with various degrees of impacts (high, low, less, diverse etc.). Land litigations are more noticeable per LAP in challenging areas since there is high demand for land that brings competition for land resulting in multiple sales of land. Therefore, higher accuracies in challenging areas may be needed for surveying to precisely delineate parcel boundaries. In delineating parcel boundaries with the required accuracies, standardized surveying apparatus are required in challenging areas, unlike the less challenging areas, which required less standardised surveying equipment.

Per the Client Service and Access Unit of the Lands Commission, competition for land in challenging areas is intense and higher as compared to the less challenging areas. The intense competition results in higher land encroachment issues resulting in higher land conflicts in the challenging areas and lesser encroachment issues and conflicts in less challenging areas.

Also, per Landmapp, one of the critical factors influencing the choice of mapping areas in relatively less challenging areas also coincide with high demand for land tenure documentation services. This factor is apparent in the operational zone of Landmapp, where the migrant farmers experience a high level of land tenure insecurity. The migrant farmers who are popularly called in local Ghanaian language as **'Atukotina Akuafoɔ'** which is literally translated as *''move, go and settled farmers''*. The migrant farmers ('**Atukotina**

Akuafoɔ') are people who left areas they have originated from, but who settled in the Wasa Amenfiman due to certain circumstances such as less fertile lands and conflicts in their areas of origin. They are called migrant farmers because their ancestors did not come from the Wasa Amenfiman. On the other hand, the demand for land tenure documentation services in the challenging, predominantly urban areas, is more diverse or less perceived.

Also per Landmapp, community cohesion characterizes less challenging areas which makes land tenure documentation in the less challenging areas relatively easy since the community members are bound together in love and solidarity, shared norms, shared values and shared goals. Therefore mapping in these areas is quite easier. However, community cohesion is less present in challenging areas due to diversities in regards to norms, values and goals.

Finally, the Survey and Mapping Division of the Lands Commission indicated that there is the higher conversion of farmlands to residential because of the higher demand of land whiles less conversion of farmlands occur in less challenging areas.

In summary, the identification of land documentation areas based on the factors influencing the choice of documenting in those areas have different degree of impacts (high, low, diverse) as indicated in the table above. The factors listed on documenting land in the challenging areas has higher degree of impact as compare to less challenging areas. Considering the factors influencing the choice of land documentation areas, the factors mentioned in the table above are not exhaustive.

5.4. Types of land tenure documentation packages being implemented by Landmapp

This section depicts the land tenure documentation packages that are being implemented by Landmapp in their operational areas.

Land documentation packages	
Less challenging (rural) areas	**Challenging (urban) areas**
FarmSeal	Home seal (Residential and commercial)
Cropseal	Organizational seal

Table 5 Land tenure documentation packages of Landmapp

Table 5 above shows the land documentation packages Landmapp has designed purposely for tenure documentation in Ghana. All these products were designed to meet specific challenges on the ground. These products are not specifically designed for less challenging areas (rural) or challenging areas (urban) but they overlap during implementation depending on the attraction of these packages by the customers as well as customer location. Based on where the customers are located, their attraction to documentation packages and the complexities associated with the areas, these products can therefore be classified according to less challenging areas and challenging areas.

Farmseal, which captures customary arrangements, consists of an indenture and farm plan, which provides farmers with long-term lease in the traditional areas and validation is done by the appropriate stakeholders. The Farmseal product meets the Lands Commission requirements such as accuracy issues, monuments (using PVC pipes as monuments with agreement from Lands Commission), certification of the plan by licensed Surveyor and approval of the certified plan by Regional land Surveyor, who represent the Director of surveys. The Director of surveys and the Regional land Surveyor are both within the Survey and Mapping Division of the Lands Commission. The product also meets the customary requirements since it is witnessed by the paramount chief of the area

The Cropseal is a leasehold interest agreement between the landholder and the sharecropper (caretaker farmer), that allows clarity of the traditional *'Abunu'* and *'Abusa'* agreements. This aims at providing the landholder and the caretaker farmer with some degree of tenure and financial security. Caretaker farmer is a person who takes care of the farm, which the landholder cultivates. Landholder is a person who is in possession of the land and can be an indigene or migrant farmer. *'Abunu'* is a local Twi word which means that a farmer collects land from the landholder without payment of anything and cultivates land with their

own resources. When the produce is matured (e.g. cocoa) then they divide the land and the produce into two equal parts, one for the farmer and another one for the landholder. On the other hand, *'Abusa'* is also a local Twi word in Ghana which is a sharecropping arrangement whereby the landholder cultivates the land and gives it to a 'caretaker' farmer for maintaining the farm. The caretaker maintains the farm by means of weeding, applying fertilizer etc. The produce from the farm is divided into a ratio of 3:1 where the landholder takes two-thirds, and the caretaker farmer takes the remaining one-third. However, the landholder is responsible for buying the farming inputs. The Cropseal has no indenture and farm plan since it is a formalization of an existing agreement on the ground using a Landmapp agreement template. The agreement between the two parties (landholder and caretaker farmer) is witnessed by the divisional chief and some other community members. The package only meets the customary requirements since only the divisional chief witnesses the agreement.

Concerning the challenging areas, two products, namely Homeseal and Organisational seal were designed by Landmapp to penetrate more challenging areas. The two packages are briefly described below.

The Homeseal, which in turn consists of the residential and commercial seals, is designed to meet the specific conditions of challenging urban areas. The product is designed to give homeowners as well as commercial property owners in both towns and cities a peace of mind by offering them a land document with the site plan and indenture. The Homeseal is more expensive as compared to the Farmseal and the Cropseal, because it requires more signatures, regional numbers, and monuments as per the requirement of the Lands Commission, who is more involved in the process of documentation in urban areas. Also, because of the factors explained in the previous section (See table 4) such as higher land values and land contestations, the Lands Commission pays special attention to accuracy and the following of existing survey requirements. At the same time, the Homeseal meets customary requirements in so far as it is signed by the paramount chief of the area. The Homeseal product is less patronized in less challenging areas due to its costly nature, but people in rural areas do also acquire it, if they can afford the cost of the service.

Another product attracted by people in the challenging areas is the Organizational seal (Orgseal). The package is for Organizations that have large parcels of land, and it also depends on the location of the organization, but mostly they are in towns and cities. The Organizational seal is also expensive just like the Homeseal, because it requires more signatures, planting monuments and Regional numbers. The Organizational seals comes with the site plan and indenture. Organizations such as churches especially in the communities that Landmapp is working on patronize this product. The product also meets the customary requirements since the document is signed by the paramount chief of the area.

In summary, the design packages for tenure documentation in less challenging rural areas and more challenging urban areas mainly differs regarding costs, type of tenure being documented and related aims of documentation, degree to which a document is recognized by customary only or both customary and statutory actors, and regarding the terms of the lease. The latter is in turn related to the necessities of adhering to existing surveying standards and requirements. Landmapp tenure registration packages such as Homseal, Orgseal and Farmseal are pre-registration packages. Accordingly, the preparation of each type of documentation package requires the involvement of different actors. These will be described in the next section.

5.5. Actors involved in land documentation process by type of tenure documentation package and area

The table below shows actors involved in the preparation of Landmapp tenure documentation packages and the roles of the actors are explained below.

Actors and their roles for land tenure packages			
Challenging (urban) areas	**Less challenging (rural) areas**		**Categorized actors in tenure documentation packages**
Actors in Homeseal and Organization seal preparation	**Actors Farmseal preparation**	**Actors Cropseal preparation**	
Licensed land Surveyor	Licensed land surveyor	-	Statutory institutional actors
Regional land Surveyor	Regional land surveyor	-	
Lands Surveyors Association	-	-	
Lands Commission (Survey and mapping Division of Lands Commission, Land Valuation Division and Land Title Registration Division, Client Service and Access Unit)	-	-	
Town and Country Planning Department	-	-	
Solicitor (private legal person)	Court (Commissioner of oath)	-	
Traditional authorities (paramount chief, elders)	Traditional Authorities (paramount chief, elders)	Divisional chief of the area	Customary institutional actors
National House of Chiefs	National House of Chief	-	
Customary Land secretariat	Customary Land secretariat	Customary Land secretariat	
Homeowners &Neighbor	Farm owners & neighbour	Landholder & witnesses	Landholders /Community actors
Landmapp Mappers	Landmapp Mappers	-	
Landmapp Interviewers	Landmapp Interviewers	Landmapp interviewers	Promoters of Landmapp tool

Table 6 Actors and their roles in the type of tenue documentation packages

Table 6 above shows actors and the respective roles they play in the various types of Landmapp tenure documentation packages. There are four types of actors: statutory institutional actors, customary institutional actors, the landholders and members of the communities whose tenures are being documented, and the promoters and associated field professionals of Landmapp. Their respective roles in the preparation of each documentation packages are described in the following.

Firstly, the statutory institutional actors who are involved in the Landmapp tenure documentation packages are licensed land Surveyors, Regional land Surveyor, Lands Commission, Town and Country Planning Department, Solicitor as well as the court (Commissioner of the oath). The licensed Surveyor and the Regional land Surveyor are statutory actors involved in the preparation of all Landmapp's documentation packages apart from Cropseal. The licensed Surveyor certifies the survey plans before they are sent to the

Regional lands Surveyor for approval. The Regional lands Surveyor approves the site or farm plan for all Landmapp's products (Homeseal, Farmseal, and Organisational seal).

The Home and Organizational Seal processing also involves the Land Surveyor's Association and the Lands Commission. The former is responsible for stipulating processing fees of Landmapp tenure documents packages (Homeseal and Orgseal) from the statutory perspective.

The Lands Commission involvement can be broken down further based on the role in the documentation process by various sub-divisions of the commission. (Survey and Mapping Division, Land Valuation Division and Land Registration Division). The Survey and Mapping Division of the Lands Commission has the responsibility devising the policy and survey guidelines to guide the survey process. The Land Valuation Division of the Lands Commission is responsible for the assessment of the stamp duty, which is not fixed but based on the value of the property or land. Also, the Land Registration Division of the Lands Commission is responsible for the registration of deeds and other instruments affecting land outside the areas of compulsory land title registration districts. The Client Service and Access Unit of the Lands Commission is responsible for the receiving and initial verification of submitted documents for land registration with the Lands Commission.

Another statutory actor involved in the production of Homeseal and Organization seal, namely the Town and Country Planning Department within the District Assembly, dealing with residential properties as well as organisational properties. For residential properties, Landmapp can only prepare documents for areas which have been planned through proper layouts. The Town and Country Planning Department oversees preparation of planning schemes and layouts. The solicitor who has legal knowledge is involved in the preparation of the Homeseal and the Organizational seal. The solicitor is a private legal person, who is responsible for the preparation and signing of the deed especially for the Homeseal and Organisational seal. The solicitor performs responsibility similar to the commissioner of the oath since both aim at given the endorsed land documents some legal backing. Lastly, one statutory actor that is involved in the Farmseal is the court (Commissioner of oath). The commissioner of the oath is responsible for the legalisation of the indentures (agreement between the chief and the farmers).

The second type of actors involved in the process of preparing the various documentation packages by Landmapp are customary institutional actors. The customary institutional actors include, traditional Authorities (chiefs and elders), National House of Chiefs and the Customary Land Secretariats. The Traditional Authorities (paramount Chief and elders) are involved in three of Landmapp's tenure documentation packages mentioned above in table 5, namely Homeseal,Organisational seal and Farmseal. The paramount chiefs are usually the grantor of the land in the study area, and for the land to be registered with the Lands Commission, the latter needs confirmation from the traditional authority represented by the paramount Chief and elders. The chief together with his council of elders is responsible for designing and signing of the indentures. They also sign the land documents as well as stipulating signing fees for Landmapp tenure documentation packages. The Divisional chiefs are responsible for witnessing the Cropseal document. Also, the National House of Chiefs do not sign any document, but the outfit is used to advocate for land tenure documentation in the traditional areas since it is the highest Traditional Authority in Ghana. Lastly, the Customary Land Secretariat facilitates the whole documentation processes especially during the sensitisation aspects to create the client base for Landmapp. The CLS also serves as a mouthpiece between the Traditional Authorities (**Nananom**) and Landmapp.

The third main group of actors are the landholders and community, whose tenure is being documented. The landholders and community actors involved in Landmapp tenure documentation packages are homeowners, farm owners and neighbours who serve as witnesses. The homeowners and the farmers in the rural communities lead the mappers in defining the boundaries of their farms or homes during the mapping for all the tenure documentation packages mentioned. The homeowners, as well as the farmers, clear their respective boundaries of their lands for easy movement of the mappers. The boundary neighbours of the land to be surveyed are usually present to serve as witnesses. If there are no neighbours present, then the homeowners or farmers are required to bring one person, who is not a family member, but knows the boundaries of the land.

Finally, the promoters of the Landmapp tool and affiliated field professionals are a relevant group of actors. The promoters of Landmapp tool are the Landmapp mappers and the Landmapp interviewers. Landmapp Mappers are employees of Landmapp and majority of them are university graduates with surveying background. The responsibility of the mappers is to carry out the mapping of land for the tenure documentation packages (Farmseal, Orgseal and Homeseal). Interviewers are also employees of the Landmap, who are indigenes of Wassa Amenfiman. Their responsibility is to conduct one on one interviews with the landowners, who is leasing the land as well as the one who is currently on the land to ascertain the root of ownership of the land.

In summary, Homeseal and Organizational seal in urban areas involve the largest number of actors; and especially statutory actors. Less statutory institutional actors are involved in farm and crop seal processes. The customary institutional actors are more involved in the Farmseal production in rural, less challenging areas. This is not surprising given that in urban areas requirements for standardized surveys according to statutory procedures are required as described in the previous section. Landholders/ community actors take part in the process at the point of surveying and preparing the land boundaries for surveying. They also influence the processes indirectly, because the needs of customers determine the number of actors, who become involved.The landmapp tenure documentation is based on levels (pre-registration package by Landmapp, registration with Lands Commission). If the customer wants to travel through the whole level to obtain a deed with the Lands Commission, then the number of stakeholders will increase, and Landmapp will do the facilitation to get the deed for the customer. The processes of preparing the different packages will be described in the following sections.

5.6. Description of documentation process in less challenging areas and challenging areas respectively

In this section the land tenure documentation process for the Farmseal in less challenging areas and for the Homeseal and Orgseal in challenging areas are described.

5.6.1. Farmseal: How is the documentation of the less challenging areas done?

Figure 6 below shows how the documentation is done in less challenging areas to produce a Farmseal documentation package. The figure also indicates the actors involved in the preparation of the farmseal as well as their roles. The data used to construct the figure below is obtained from conducting interviews with Landmapp representatives
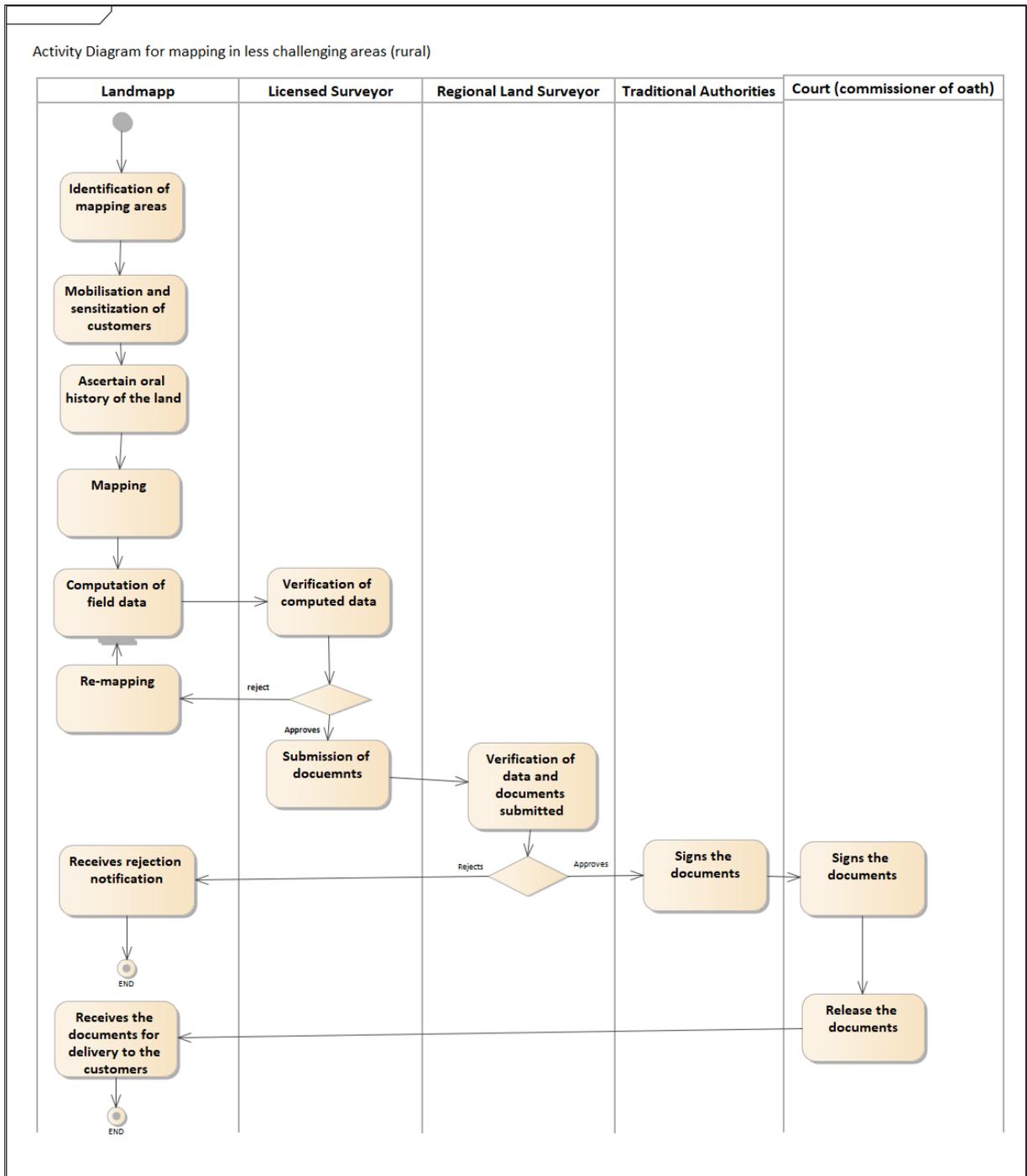
Figure 6 shows documentation of less challenging areas for Farmseal by activity and by actors involved through interviews with Landmapp

The steps of the documentation process are described next in more detail. .

Firstly, Landmapp identifieds areas they want to document, and they are not selective in their approach, but instead follow demand pulls rather than supply push. Even though Landmapp is not selective in their approach in getting areas to document, their concept of tenure documentation was first proven in areas where there was some level of commercial farming because the farmers can pay for the services.

Secondly, after identifying areas to document, Landmapp conducts sensitisation activities with the communities. Landmapp informs the local people through local **gong-gong beater** (community member in charge of making announcements), who informed the farmers concerning a date and time Landmapp will

come to meet them. The sensitisation team goes to the community at least for one week to sensitise the people and educate them about the importance of tenure documentation before the actual mapping. The head of the sensitization team of Landmapp is the CLS coordinator of Wassa Akropong

After the sensitization is conducted, Landmapp interviewers go to farmers' houses to interview them as well as the neighbours to ascertain the oral history of their lands. The initial interview is held with the owner of the land and the one who is leasing the land and sometimes people from the community. The interviewers obtain some background information concerning how the farmer acquired the land, witnesses that were present during the time of acquisition of the land and the number of years the farmer had to stay on the land. The mappers also ask the farmers the same questions concerning how their lands were acquired even though the interviewers usually ask the same questions in the house during the interrogation process that has taken place. The mappers also ask all these questions as a means of cross-validation of the information already collected.

Thirdly, After the ascertainment of the oral history of the land, the mappers go to the field with their equipment to carry out the surveying. During the surveying, the farmers together with a neighbour lead the whole process of defining the boundaries of the farm. They walk around the boundary whiles the mapper picks the boundary points with either Bad Elf GPS or Emlid Reach GPS. The neighbours are involved in the surveying to testify that boundaries which have been surveyed are correct and belonged to the said owner. The farmers also help in putting the PVC plastic pipes at the place where the coordinates were picked, and concrete is poured into the hole of the PVC pipe to serve as a monument. The farmers also helped in the clearing of the boundaries of the farmlands to make it easier for movement during mapping.

After the mappers have conducted their mapping, they upload the data into the Landmapp integrated end to end system. The GIS team in Accra have access to the data to do computations to eliminate errors and anomalies to produce a farm plan. After the computation is done, the GIS team submit the farm plan and the data to the licensed surveyor for verification and validation. The certified plan is submitted to Regional lands Surveyor of the Lands Commission for approval. The documents are signed by the appropriate authorities such as traditional authorities (paramount chiefs) for the indentures and farm plan and also legalization of the indenture by the court (commissioner of oath) at the high court.

Finally, after the relevant authorities (chiefs and court) have signed the documents, Landmapp set a date to go to the community to deliver the documents.

In summary, concerning the preparation of the Farmseal, both customary and statutory actors are involved. The chiefs and the commissioner of the oath endorse the documents to give it legal backing as well as satisfying land registration requirements set forth by the Lands Commission. Other actors such as the Regional Land Surveyor and the Licensed Land Surveyor certifies the documents as a statutory requirement for further registration with the Lands Commission which is the statutory land administration organization in the country. The next section deals with how the documentation is conducted in the challenging areas(urban).

5.6.2. How is the documentation done in challenging areas?

Figure 7 below shows how the documentation is done in challenging areas. The figure also depicts the various functions of the actors involved in the preparation of both Organisational seal as well as the Homeseal, but the whole process is very dependent on the needs of the customer. The data use to construct the UML diagram below is gathered from interviews conducted with Landmapp and the Lands Commission.
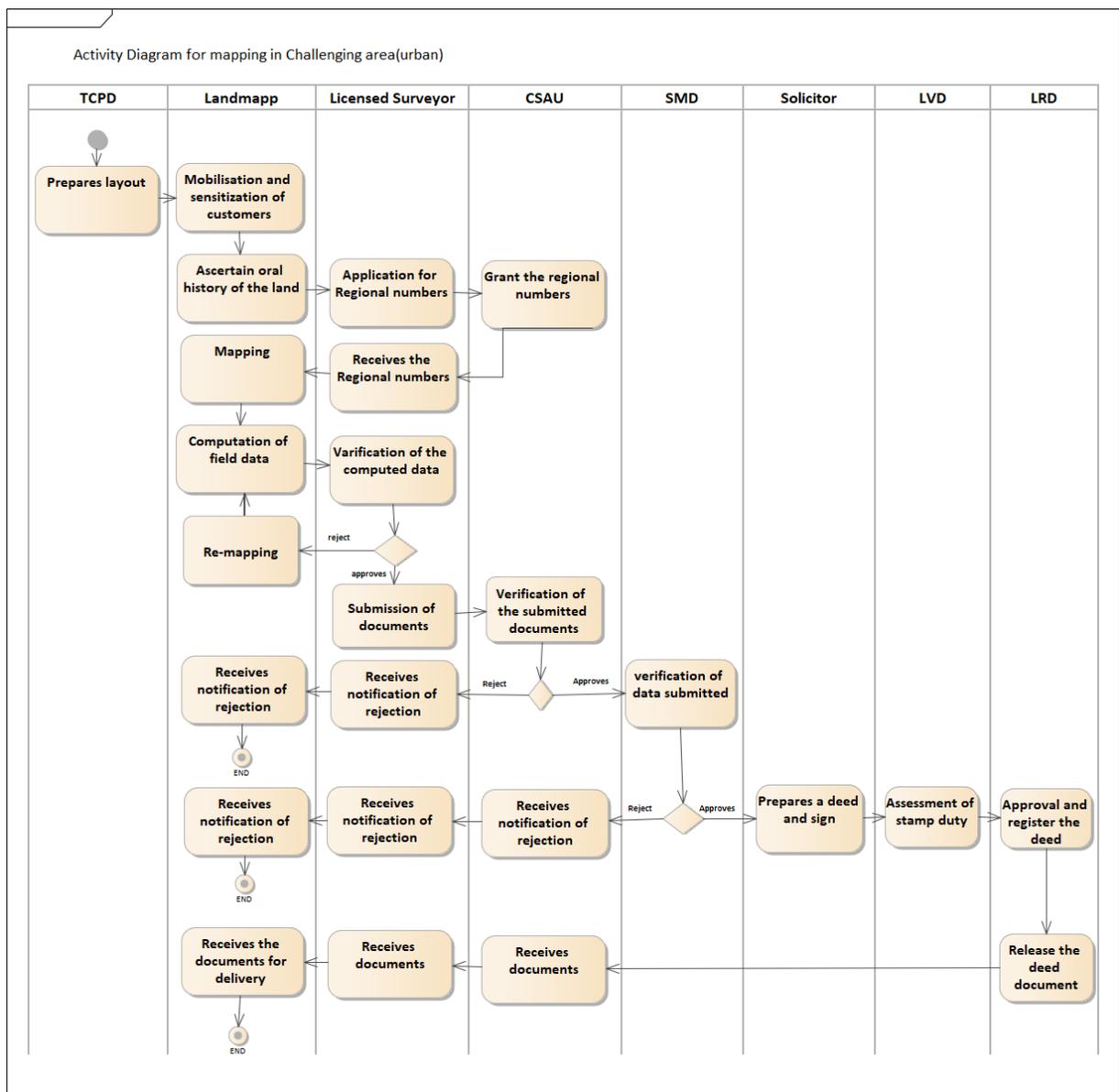
Figure 7shows how documentation is done in challenging areas for Homeseal and Organisational seal by activity and by actors through interviews with Lands Commssion and Landmapp

Figure 7 above shows how the documentation of the challenging areas is done for Homeseal and Organisational Seal. In comparison to the process described for the Farmseal, the figure illustrates that in terms of steps and actors involved urban and peri-urban areas are more challenging, because of greater complexity.

In the more challenging areas firstly, Town and Country Planning Department is responsible for the preparation of layouts. Landmapp can only prepare documents for areas that have been properly planned through layouts (or more detail see table 6).

After the preparation of layouts for the mapping areas, the Landmapp conducts mobilisation and sensitization of customers, and ascertains the oral history of the lands in the same way as described for the Farmseal (or more see figure 6 above)

After the ascertainment of the oral history of the land, the licensed Surveyor applies to the Client Service and Access Unit (CSAU) of the Lands Commission for the issuance of Regional numbers. After the generation of the Regional numbers, the officer in charge gives the client a bill to go and pay at a bank. After

the payment of the bill, the Regional number will be given to the licensed Surveyor. The necessity of that number is to identify the survey work carried out in that year.

After obtaining the Regional numbers from the CSAU and related datasets by the licensed Surveyor, the mappers will go to the ground to carry out the survey work according to the technical instructions of the surveyors and other relevant laws of the country. The Regional numbers are planted on the ground to be able to generate monument numbers for each corner. There are different types of monuments: type A, B, C depending the kind of survey to be conducted. The Landmapp mappers usually carry out the mapping using emlid reach GPS device together with the landowners and neighbours, who helped to define the boundaries of the land. After the survey work, the mappers send the data through the Landmapp end to end integrated system (database linked to mobile application), which can be accessed at the head office of Landmapp in Accra. The data is processed in Accra, and a plan of the parcel is then prepared. The plan of the parcel, as well as other required data, are cross-checked by a licensed Surveyor, who then approves it.

After the certification of the documents by the licensed surveyor, the documents are submitted to the Client Service and Access Unit of the Lands Commission by the Licensed surveyor. The submitted file contains the following: field report or history of the survey, letter of submission, Ex Data (the control points the Licensed Surveyors took from survey and mapping Division), raw field data (rinex format), and point list.The submitted file should also contain the beacon index, computation of bearing and distance, plan data, area computation, a diagram of the survey, total survey record on CD, eight copies of the certified plan and a copy of LRD request letter.The Client Service and Access Unit of the Lands Commission verify the documents against a checklist and either approve or reject it.

After the examination of the content of the file submitted to CSAU and if everything is right then the file is submitted to the examination section within the survey and Mapping Division of the Lands Commission. The examination section will also carry out data processing since they have the raw data of the survey work carried out and then compare it with the results of the survey work submitted for quality control checks. After examination of the plan and the documents by the examination section and if everything is all right then the examiner will append his signature and send the plan for cartographic checks by a department within the survey and Mapping Division. When they are satisfied with the cartographic aspect of the plan, then the Regional land Surveyor will append his signature. The plan will come back to the examination section where a barcode will be placed at the back of the plan indicating that it has been approved. After the plan has been approved, then a Solicitor prepared a deed of assignment and sign it. The Deed of assignment is submitted to Land Valuation Division(LVD) to assess the value of the property based on open market value. The rate is not fixed but based on the value of the property or land. The necessary documents such as the approved registration form, copy of deed of assignment are submitted and verified by the registration department. The signed documents are sent to the Client Service and Access unit of the Lands Commission for the licensed surveyor to pick them up. The licensed surveyor sends the documents to the Landmapp who deliver the documents to the customers.

In summary, concerning how the documentation is carried out in the challenging areas, both customary and statutory actors are involved. However, there are more statutory actors involved in more challenging areas as compare to less challenging areas probably due to the complexities (e.g. contestations, encroachment) associated with the urban areas. The documentation process in the challenging areas is also cumbersome since one need to contact many stakeholders with higher hierarchies as compare to documentation in less challenging areas. Maintaining relationship with all these numerous statutory actors is time-consuming and financially costly.

5.7. How Landmapp addresses challenges during implementation and its strategies of scaling up

The documentation packages designed by Landmapp and the processes involved in producing these as describe in previous sections already show how Landmapp introduces new tenure documentation approaches to the existing institutional context of Ghana; involving both customary and statutory actors as described in previous sections, at a more countrywide scale. In the following section, the strategies of scaling up and tackling specific challenges during implementation will be described in more detail.

Landmapp has encountered specific challenges related to the institutional context in the case of implementation in rural areas; and Landmapp has addressed these challenges as they emerged through improvisation and negotiation. However, some of the challenges identified could not be address by Landmapp through improvisation and negotiation. In this situation, Landmapp accept and adapt. These challenges and ways of addressing them as well as how Landmapp adapt to the situations are described in section 5.7.1 below.

In the case of challenging areas, the documentation packages are themselves a means to scale up Landmapp's initiatives into urban and institutionally more complex areas of Ghana. These scaling strategies are summarized in the section 5.7.2.

5.7.1. How Landmapp addresses specific challenges encountered during documentation in less challenging areas

Table 7 below lists the institutional challenges Landmapp encountered during the implementation of their land tenure documentation project in Wasa Amenfiman (Wasa Akropong) traditional areas of the western Region. Despite these challenges, there are also some enabling factors which are already present in the current land administration system and which can served as foundation for innovative land tools promoters to build their innovation. Some of these enabling factors include: Flexibility of the customary arrangement, flexibility in the use of mobile mappers instead of licensed Surveyors, flexibility in the use of PVC pipes as monuments instead of concrete cement, active local governance structure and vibrant communities. For more details concerning enabling factors that aid innovation as well as the land governance system in Ghana (see section 6.5). Based on these enabling factors, Landmapp has develop means to address these challenges (see table 7 below). This information is based on interviews with Landmapp representatives.

Challenges	How the challenge is addressed by Landmapp	Categorized challenges
High volumes of documents submitted to the chiefs to sign	Digital signature	Technical challenges
Rigid monuments requirements by Lands Commission	Use PVC pipes for only Farmseal	
Rigid observation time for mapping based on Lands Commission requirements	Accept and adapt to the situation	
Capturing customary tenancies (Abunu and Abusa)	Landmap sharecropping agreement template	
High surveyor's fees	Use of mobile mappers	Financial challenges
Refusal of some of the chiefs to sign the documents	Engagement with the traditional authorities by Landmapp (Not complete compromise reached yet)	
Collecting renewal fees from the farmers by the grantors of the land (chiefs)	Engagement with the traditional authorities	

Challenges	How the challenge is addressed by Landmapp	Categorized challenges
Farmers lacking money to pay for Landmapp tenure documentation services before harvesting of cocoa	installment payments by the farmers (part payment before harvest and the rest after harvest)	Financial challenges
Lack of registration of customary freehold by Lands Commission due to different interpretations of the law	Accept and adapt to the situation	Legal challenges
Competition with illegal miners("Galamsey")	Sensitization and outreaches for the farmers and the chiefs not to sell their lands to illegal miners	Environmental challenges (pollution of rivers, air)
Inadequate knowledge of farmers on the sizes of their farms	Explain to the farmers the sizes of their lands in acreages after mapping the boundaries of their lands	Awareness issues
Tuning the mindset of both the migrant and the indigenous farmers concerning the whole documentation process	Sensitization and making agreements (terms, conditions) with chiefs and farmers	

Table 7 challenges and solutions in less challenging areas for farmseal

Table 7 above shows institutional challenges Landmapp encountered during the implementation of their project as well as how they dealt with such challenges in rural areas. The institutional challenges enumerated by Landmapp representatives includes: technical, financial, legal, environmental and awareness issues as contained in the table above. Notwithstanding the institutional challenges enumerated by the representatives of the Landmapp, they equally mentioned some non-institutional challenges such as topography of the land and occupational hazards which were not discussed since they were outside the jurisdiction of this section. The main institutional challenges, solutions as well as how Landmapp accept and adapt to the various situations are explain below

Firstly, there are technical challenges, which found various solutions. Concerning high volumes of documents submitted to the chiefs, Landmapp has created a digital signature of the respective chiefs to aid the signing of the documents. Considering the high volumes of the documents submitted to the chiefs and coupled with numerous responsibilities of chiefs make it extremely difficult to sign the documents quickly. Also, when Landmapp submitted the huge documents to the chiefs for signing; the chiefs see them as a mammoth task and wants to charge extra money even though they had already agreed on the fees. Based on this, Landmapp collected the chiefs' signatures and printed them on the documents, and the chief's assistant checked to confirm whether the chief signature is well embossed.This takes Landmapp shorter time to have their documents signed and it saved the chiefs some time to concentrate on their customary responsibilities.There is also some level of flexiblity with respect to signing land tenure documents since

there is no existing laws that dictate whether documents should be sign manually or digitally. Landmapp use this avenue to improvise digital signatures to aid the chiefs to sign the documents.

Concerning the rigid requirements for official surveying set forth by the Lands Commission for placing monuments during surveying, Landmapp came up with an improvised solution to overcome this challenge. Landmapp uses monuments during mapping of Farmseal packages but not the one stipulated in the technical instructions for the surveyors. Landmapp with agreement from the Lands Commission uses smaller PVC pipes for the construction of the monuments for the Farmseal. The PVC pipes are planted into the ground and concrete is poured into the holes of the pipe, and the pillar numbers and other details are inscribed on them. It would be impossible to construct the standard monuments (solid cement concrete of 15cm high above ground and with a 30cm concrete foundation in the ground) stipulated in the technical instructions for the surveyors because some farms have about 70 or 80 boundary points. Due to this one cannot use the required monuments for these points since they are bulky and excruciating to carry. The monuments are also very expensive to construct and can add additional cost to the tenure documentation that would make it impossible for the local farmers to participate and pose additional financial problems to Landmapp. Notwithstanding the use of PVC pipes for the construction of monuments for Farmseal, when it comes to the Homeseal and Orgseal, Landmapp uses the required monuments stipulated in the technical instructions of Surveyors.The flexibility in respect of placing monuments in rural Ghana enables Landmapp to improvise the use of PVC pipes as monuments instead of the concrete cement which were bulky to carry

Concerning the rigid observation time for mapping, the Lands commission has an observation time for farmlands, residential and base stations. After getting a vantage point to pick the coordinates of a boundary, one still has to wait for three minutes, ten minutes and 15 minutes for farmlands, base station and residential respectively. According to Landmapp mappers,*'even if you get a good reception unless the observation time is exhausted, you cannot take a point".* So, if Landmapp has procured a new machine which can pick a point in five seconds, they cannot still use it. The observation times has already been set automatically during the calibration of the instruments based on Lands Commission requirements. Capturing customary tenancy arrangement in the area is also challenging for Landmapp. The tenancy arrangements such as 'Abunu' and 'Abusa' are complex. Here Landmapp seeks to make adjustments to the templates used for tenure documentation templates according to existing customary land rights.

Secondly, there are financial challenges and respective ways of addressing them. By law Licensed Surveyors and Official Surveyors are mandated to carry out land surveys in Ghana. Based on their professional training, the fees they charge are very high and beyond the reach of local farmers. To hire surveyor by these local farmers to carry out survey work, the farmers have to go to the city to look for the surveyor and pay them a daily rate to go to the field to do the work. After the completion of the work, the local farmer will go to the city to collect the documents. From the point of hiring a Surveyor to the collection of certified survey plan, the farmers incur substantial cost. Landmapp is able to cut down the cost of hiring a surveyor drastically by engaging mobile mappers and interviewers who go to the field to capture the information and have it cross-verified by the licensed surveyors stationed in the city through their end to end integrated system (database liked with the mobile application). The duty of the land Surveyor in the Landmapp setup is to verify the information collected from the field by doing the necessary computations and certifications of the plans as mandated by law.

Moreover, some of the chiefs have refused to sign the documents submitted to them, because they believed that the signing fees they had earlier on agreed with Landmapp, are inadequate. The chiefs indicated that they support the land tenure documentation in the area and they appreciate the good work Landmapp is doing but will only continue the signing of the documents if the signing fees are increased. To address this issue Landmapp continues to negotiate with the chiefs to find a compromise point since the increase of the signing fees will eventually increase the cost of the tenure documentation in the area, which would have a significant bearing on the local farmers. Currently, no compromise has being reach concerning the new signing fees, but negotiations are still ongoing. The flexibility of the customary arrangements with respect to signing fees allows the Lanmapp to negotiate with the chiefs to charge lower signing fees thereby reducing the total cost of land tenure documentation

Furthermore, collecting renewal fees from the farmers by the grantors (chiefs) of the land to signify that allodial interest of the land belongs to them constitute a financial challenge in the part of the farmers. The

lands in the Wasa Amenfiman were granted to the migrant farmers ('Atukotina Akuafɔɔ') by the forefathers of the current chiefs with no payment of anything apart from schnapps and the performance of other customary rituals to symbolise the authority of the allodial landowner. The chiefs now want the migrant farmers ('Atukotina Akuafɔɔ') to pay some money to the chiefs to offset the fees they were supposed to be paid since time immemorial. The chiefs believe that some of the farmers have settled on the land for more than thirty years without payment of anything to them or their forefathers. These fees are a huge sum of money and will certainly have significant bearings on the success of the entire Landmapp tenure documentation project in the area. Landmapp has discussions with the Traditional Authorities indicating that if these renewal fees are supposed to be paid now, then it will make it extremely difficult for the farmers to pay. Landmapp proposed to the chiefs that they will document the land rights of these migrant farmers ('Atukotina Akuafɔɔ') and other indigenous farmers ('Omanni Akuafɔɔ') in an affordable manner to get the base records of all these farmers into a database. After Landmapp has completed the work, they will give the data to the CLS (chiefs), and OASL to use the data for the collection of ground and farm rents which is a statutory requirement. Ground rents are payable by holders of leasehold grants annually in respect of habitation and commercial uses. The farm rents are payable by migrant farmers on annual basis for occupying stool lands for agricultural purposes which is a normal practice in Ghana. These revenues are collected by OASL which a statutory body is mandated to carry out this responsibility on behalf of the Government and the traditional authorities. The revenue collected by the OASL are disburse according to percentages between the Government and the Traditional Authorities. The collection of ground and farm rents over the years in the area has been hampered by lack of database concerning the farmers in the area and according to Landmapp, documenting the lands of these farmers to produce a comprehensive database for the CLS and the OASL will certainly improve revenue collection in the area. The Traditional Authorities agreed to suggestion offered by Landmapp and asked them to carry on the documentation.

Lastly, inadequate money for the farmers to pay for documentation services during the light cropping constitute a financial challenge. The wasa Amenfiman traditional area is a cocoa growing zone where the income of the people is dependent on the season. The main harvesting period for cocoa in Ghana is from October to February and from May to August for the light crop. During the main haversting period, the farmers have the money to pay for the tenure documentation fees. During the light cropping, the farmers do not have enough money to pay Landmapp for their services, but Landmapp collects part payment from the farmers, who could not afford payment during hard times. The farmers are therefore obliged to pay the money during the major cocoa harvesting periods.

Thirdly, ambiguities of the statutory and customary laws constitute a challenge. The Lands Commission in the Western region does not accept to register customary land freehold. According to the CLS coordinator, who is the sales lead for Landmapp, the Lands Commission only registers leases and not customary freehold. This assertion may be due to different interpretations of the constitution of Ghana. When you are an indigene of Wassa Amanfi you are entitled to a customary freehold and they are believed to hold it through inheritance. The lands which are locally called "Abusua Asaase" (family lands) is customarily under the care of the family head ("Abusuapanin") who holds it in trust for family members. However, the stool lands ("Ahenfo Nnsaase") are under the care of the paramount chief in the area for the general benefit of the entire community. There is less motivation for the indigenes to register their lands since they will be getting a lesser interest and this was evident in Landmapp tenure documentation in the area where only 20% of indigenous families documented their lands. Concerning the non registration of customary land freehold in the study, Landmapp could not solve this challenge but only have to accept and adapt to the situation

Also, the illegal mining in the study area constitute an environmental challenge. Wasa Amenfiman is a rich land with abundant natural resources, including gold. Based on this, there are many illegal mining activities famously called in the Ghanaian language as 'Galamsey'. There is increasing pressure on the farmers as well as the traditional authorities to sell farmland for mining activities. The miners use money to entice the farmers and the traditional authorities to sell the lands to them. There is pollution of water bodies in the area due to the activities of the local mining which has tremendous bearings on the people, who depends on those water bodies as a source of drinking water and livelihood. The current Government of Ghana is fighting the "Galamsey" menace in the country through the arrest of culprits and confiscation of equipment. Landmapp has found themselves in competition with people doing local mining in the area, where it is not supposed to be taking place. Landmapp had to embark on sensitization programs with the chiefs as well as the farmers to explain to them why they should not release their lands for illegal mining activities. Landmapp

educates the chiefs and the farmers concerning the need for tenure documentation and why land documentation is a necessary ingredient to protect their lands from illegal mining activities. Landmapp also highlighted the environmental consequences of releasing lands for illegal mining activities by chiefs and the farmers. After successful sensitisation of the farmers and the traditional authorities, both parties came to a common ground concerning the need to protect lands from illegal mining activities. To cement this consensus, a provision was kept in the indenture that indicated that the farmlands should not be sold to illegal miners and when it is done is tantamount to the farmer losing the land to the chiefs.

Finally, some of the farmers do not know the sizes and boundaries of their lands in acreages, because in the past and until recently the acquisition of land was based on one's ability to farm the land. In other words, however much land one farmed and put to productive uses came to constitute one's land size and boundaries. It is the work that makes the boundaries, not the boundaries that allow a certain kind of work. When Landmapp carried out the mapping, some of the farms were either too big or too small as stated by the farmers previously during the interview session. Fees usually charged are based on what the farmer provided earlier on during interview. This makes Landmapp work very difficult, especially when they overcharge due to the land having been reported as too big after mapping. They must convince the farmer that his land is big and inconsistent with what the farmer mentioned earlier which is a daunting task. So, the way Landmapp measures and delineates land using GPS differs from the logic by which the farmers themselves delineate and measure land.

Moreover, the farmers were initially sceptical concerning whether they want to partake in Landmapp's tenure documentation program in the area, because of the involvement of the traditional authorities. When the farmers were informed that the Chiefs would be signatories to the documents they thought that after signing the documents by the chief they would be kicked out of the land. The Farmers were assured that signing of the documents by the Chiefs would ensure that the farmers legitimately own the land and no one can evict them from the land before the expiration of the leasehold interest of 40 years provided he or she honours the land tenure documentation agreement (indenture). Similar agreements has also being made with the chiefs that, they cannot kick any farmer away from any land unless the expiration of the term of the lease or when the farmer renege in honoring of the documentation agreement (indenture). The chiefs agreed to this by appending their signatures on the indentures.

In summary, the main challenges and the ways in which Landmapp addresses these are technical, and financial in nature, but also relate to the dynamics between land, landholders and customary authorities. An additional challenge in many areas are illegal mining activities, which add another group of actors and interests to the already complex scene of statutory and customary institutions. Landmapp addresses these challenges through technical solutions, e.g. PVC pipes instead of cement monuments, step-by-step negotiations over feeds, and various so-called sensitization and awareness initiatives to negotiate especially with customary authorities and landholders. Landmapp also seems to make future commitments to some actors (CLS & OASL) to reach compromises and move forward with the present documentation, such as in the case of promising customary authorities and the OASL to give them the data to be use later for the identification of the landholders for the purpose of the payment of the ground rent and farm rent

5.7.2. Scaling up strategies: how Landmapp moves into challenging areas

The strategies employed by Landmapp to scale up activities into more challenging areas are grouped into four main types, namely:
- Designing new products
- Engaging higher-level stakeholders
- Introducing new surveying equipment,
- Retaining flexibility of the landmapp system
- Showcasing track record of Landmapp's successes in tenure documentation in operational areas.

Firstly, designing new products, such as Home and Organisational seal, allows Landmapp's initiatives to penetrate the urban land market for tenure documentation. The Homeseal and Organisational seal which are mostly attracted in Towns and Cities has been designed to meet all the conditions on the ground and strictly complies with what is stipulated in the Lands Commission technical instructions for surveyors, which is a standard guideline for surveying in Ghana, but more strictly implemented in urban areas. The Homeseal and Organisational seal have the tendency to overcome the most critical challenges in the urban and peri-

urban areas of Ghana in respect of tenure documentation, since they were carefully designed to accommodate those challenges as described in previous sections.

The design of these packages also addresses the need to include a larger number of actors to be engaged in the documentation process, including statutory institutional actors. Concerning the institutional actors, a higher hierarchy of actors were involved like the ,Land Valuation Department, Land Title Registration Department etc which are sub-division within the Lands Commission. As such the process by which the package is produced gives room for engagement of the necessary actors and therefore constitutes another strategy to penetrate the urban land market regarding tenure documentation. There is a higher level of stakeholder's engagement in Homeseal as well as Orgseal, because they require more signatures to provide for legal validity as described in sections 5.5

The procurement of new surveying equipment constitutes another strategy employed by Landmapp. To improve the accuracies in surveying as required in urban areas, Landmapp has procured new Surveying equipment. Initially, landmapp was using Bad Elf hand-held GPS, which is fast, flexible and easy to use, but has limited accuracy. The Landmapp uses the Bad Elf handheld GPS specifically for carrying out mapping for the Farmseal packages. The hand-held GPS has an accuracy of 1.5 meters which is sufficient for documenting rural parcels but fell below the Lands Commission's accuracy standards of 0 to 0.9144m for surveying. To improve the accuracy of the mapping, Emlid reach GPS device was procured upon advice from the Lands Commission. The new equipment which has sub-meter accuracy is used in most urban areas (The new device is also now used in less challenging areas.)

What also supports efforts to scale up documentation efforts into different and more challenging areas is the flexibility in system design (documentation templates in the mobile application for data capture) pursued by Landmapp. According to Landmapp it has created a system, which is flexible to meet whatever conditions on the ground. For example, the documentation templates that have been created for Landmapp land tenure documentation packages (Orgseal, Farmseal, Homeseal and the Cropseal), and the content of indenture forms used for different land documents are based on the specific conditions on the ground. By including or excluding various elements on the forms they can be used to collect information from specific localities or areas.

Lastly, the track record of Landmapp in tenure documentation has also played a role in penetrating the challenging areas. Landmapp emphasizes that it has successfully documented more than 2000 parcels of land in Wasa Amanfiman covering more than 300 communities. The success achieved in that regard has served as a showcase to move to more challenging areas like urban and peri-urban settings, since most people living in the urban settings has heard of their success story, which makes them readier to partake. While quantity of the documents having been issued in areas of operation is one dimension of success, the final results section below will briefly summarize the perspective of landholders on the documentation process and the uses of issued documents, specifically the issued land tenure packages(certificates)

5.8. Perceptions of documentation process

The perceptions of the farmers during the documentation process are categorized with respect to how easy is the documentation process as well as how participatory is the process.

Landmapp, like many of the initiatives to innovate land tenure documentation, seek to make the documentation process easier, this study also sought to gain insights into the landholders' views regarding the ease of the documentation process. In conducting the mapping, the farmers do not hold the GPS for mapping, but they perform certain responsibilities which are very critical for the success of the mapping exercise. The owner of the farm t ogether with a neighbour lead the whole process of defining the boundaries of the farm. They walk around the boundary while the mapper picks the boundary points with GPS. The farmers complained that, they sometimes walk through the hilly areas with Landmapp mappers to pick boundary points, which is tiresome. It is also extremely difficult to walk through the thick canopies of the cocoa farms and the farmers are able to do that since they are familiar with the terrain. The farmers also help in putting up the PVC plastic pipes at the place where the coordinates were picked, and concrete

is poured into the hole of the PVC pipe to serve as a monument. The farmers indicated that, fetching water to mix the concrete makes the mapping process difficult. The farmers also helped in the clearing of the boundaries of the farmlands to make the identification of boundaries easier and they considered it as a difficult task to the extent that some neglected this important responsibility.

Because Landmapp, like many of the initiatives to innovate land tenure documentation, seek to make the documentation process more participatory for landholders, this study also sought to gain insights into the landholders' views regarding the participatory aspects of the documentation process. Participation of landholders and their neighbours in the documentation process takes place mainly during the sensitization week, during the GPS mapping of boundaries and related preparation work, including interviews and boundary clearing. Before conducting the sensitization program in the area, Landmapp also informed the farmers that the CLS and the chiefs want to document their lands and therefore ask for their presence at a community meeting. The landholders, who are now Landmapp certificate holders, indicated that they have attended all Landmapp sensitization meetings and that they have learnt a lot, especially concerning the importance of land tenure documentation. After sensitization, the farmers, who decided that they want to take part in documenting their lands write down their names with their community leaders and the location of the farms. The landowners and their neighbours then participate during the mapping itself as briefly described above.

In summary, the perception of the mapping process for land tenure documentation in the study area is participatory since the farmers were involved from the inception phase of the project until land documents were delivered to the customers. Concerning how easy is the mapping process, it is evidently clear that the mapping process is difficult.

5.9. Landholders perspective on the potential uses and benefits from Landmapp Certificates

The landholders enumerated several uses of the generated documents even though none of the landholders has so far tried to use the generated certificate to obtain any benefits or services, because they only recently obtained the certificates from Landmapp. Some of the perceived uses of Landmapp certificates enumerated by the farmers are categorized into three broad themes such as access to finance, increase legal security, and lastly as a source of motivation to work hard on the farms.

Concerning the access to finance through the use of Landmapp certificates, the Landmapp certificate holders have high hopes of using the certificate to obtain loans from cocoa purchasing companies, using the certificate to obtain fertilizers and weedicides from the cocoa purchasing companies as well as from friends.The Landmapp certificate holders indicated that, the land certificates will be given to the cocoa purchasing companies and friends as a guarantee to obtain financial benefits and after payment they will collect them back. The farmers indicated that, the money they will receive from these cocoas purchasing companies can be used to expand their farmlands as well as buying cocoa seedlings for planting. This is what one Landmapp certificate holder has to say: '*We can use the document to get money and other incentives that will help us to expand and improve upon our farmlands. some of our cocoa trees are dying, and we need to plant new ones, and we cannot do that without money".*

Also, the Landmapp certificate holders indicated that, the land certificates provided by Landmapp increases their legal security. The Landmapp cetificate holders indicated that, the cerficates helps to protect them against forceful eviction since it serves as evidence that the land belongs to them. During the focus group discussions, the certificate holders were positive regarding the potential impacts of the land certificates on their own tenure security . For example, one farmer indicates that '*'Now we the farmers in Wassa Akropong have land documents provided by Landmapp and it serves as a protector which can protect us against forced eviction and also offer us a platform to transfer our interest to our children".* The endorsement of the land certificates by all the relevant authorities such as the court (commissioner of oath) and the chiefs give the land certificates legal status. It is evidently clear that, chiefs cannot collect the land from the farmers because the chief has committed themselves by signing the documents and the terms and conditions under which a chief can collect the land

from them are spelled out such as using it for Galamsey (local mining) etc. The Landmapp certificate holders indicated how the landmapp certificates has promoted them to obtain landownership status in the eyes of the chiefs. The farmers indicated that, their landownership status have now been recognized and elevated by the chiefs as the rightful owners of the lands during the terms of the lease as such they can construct permanent structures such as farm huts on their lands. The farmers show how they were afraid before the intervention of the Landmapp certificates to construct permanent and comfortable structures to live in. The Landmapp certificate holders also believe that the certificate they received would help them to transfer their interest in land and its attachments to their families

Finally, motivation to work hard on the farms was also identified by the Landmapp certificate holders as one important use of the Landmapp certificates. The Landmapp certificate holders indicated that, the day they received the land tenure documentation packages (certificates, site plan, indenture), it drastically bolsters their moral to work hard on their farms since they are assured that the farm and its attachment is their bona fide property. This what one certificate holder has to say: *"without the land document when going to the farm, there was always a general weakness in the body because of lack of motivation to work on the farms"*. As migrant farmers they are always conscious that the land may be collected from them by the grantor(chiefs). So, *''we always live in fear of insecurity, but now we are motivated to work hard on our farms''*.

6. DISCUSSION OF RESULTS

6.1. Introduction

This chapter discusses the results presented in the earlier chapter concerning the innovative approaches to land tenure documentation in the study area. Sub-section 6.1. addresses sub-objective 1 of the study and discusses the meaning of innovation and the various innovative approaches by Landmapp in comparison with the literature. Table 8 below contains different manifestations of innovation as a summary. The subsection 6.2. addresses the central sub-objective of the study, namely sub-objective 2 by discussing institutional challenges. Sub-section 6.3 discusses perceptions of landholders regarding the documentation process addressing sub-objective 3 of the study. Additional section 6.4 discusses the ways in which the institutional context enables innovation, an issue not directly asked at the beginning of this study, but which became relevant during analysis.

6.2. Nature and types of innovative approaches to land tenure documentation in Ghana

Innovation has broad meaning depending on the context. Innovation, as indicated in the previous chapter, is defined differently by different actors with due regards to their professional background as well as the angle at which they view it. As put forth by (Archibugi, 1994), innovation is the successful application of new ways of doing things or new techniques of doing things to improve the effectiveness of an organisation or an individual. The definition above concerns the enhancing the effectiveness and efficiency of the organization through the introduction of new ways of doing things. Also, (Slappendel, 1996), broadly defines innovation as a process whereby new ideas, objects and procedures are created, developed or reinvented.

The definition of innovation found in the study area is similar to the definitions given by (Archibugi, 1994; Slappendel, 1996). A consummated definition of innovation by different actors in the study area include-using the resources available to easily create solutions to solve problems in a way it has not been done thereby making progress in society. To sum the e definitions given by LAP, Lands Commission, Landmapp, and Land Resource management indicate the social dimension of innovation. This study identified four types of innovation: technological, social, product and process innovation. These innovations are discussed below based on existing literature from chapter 2.

6.2.1. Technological innovation

OECD and Zapfl (2006) have defined technological innovation. According to (OECD, 2002), technological innovation consists of the various activities which are scientific, commercial, technological and financial with the aim of implementing technological new or improve products and processes (OECD, 2002). Meaning that the ultimate aim of technological innovation is to make new or improved products. According to (Zapfl, 2016), technological innovation are the various methods through which products are created and rendered

The Landmapp integrated end-to-end system (database liked to the mobile application, indentures forms, documentation templates) and digital signatures are considered as technological innovation per the definition given by OECD and Zapfl. The Landmapp integrated end-to-end system is used to create Landmapp tenure documentation packages (Homeseal, Orgseal, Farmseal and Cropseal). The Land tenure packages mentioned above are rendered to customers. The Landmapp system is paperless, and it functions with the resources available. For example, data is captured from the field without internet but able to pass the information through the system when there is internet. The landmapp tool is a mobile base solution where they collect the data from the field and bring it to the office for processing via the system. The documents are then sent to the customers as finished products. The integrated end to end system also aims at making general improvement to data capture and processing by preventing delays as well ensuring the security of the data captured.

Also, landmapp has developed a digital signature to aid the chiefs in signing the land tenure documents. The digital signature helps the chiefs to solve a social problem thereby freeing the chiefs to concentrate on their numerous responsibilities to ensure the overall development of their traditional areas

6.2.2.   Social innovation

According to (Pol & Ville, 2009), social innovation is the creation of new ideas having positive impacts in quality as well as the quantity of life. Also, according to (Toivonen, 2015), solutions are sought for addressing complex economic and social problems in social innovation. Based on the two definitions above, an idea, service, product etc capable of satisfying a social need can be called social innovation

The Landmapp tenure documentation project in the study area can be broadly seen as social innovation since they are providing a service for the more significant benefit of the migrant farmers per the definition of social innovation by Pol & Ville, and Toivonen. Landmapp is providing land tenure documentation service to these migrant farmers to protect them against forced evictions as well as give them the impetus to make investments on their lands since they are secured. Social innovation was manifested especially during the implementation of the Landmapp tool in Wassa Akropong. Landmapp has an agenda of solving societal issues in their operational areas through the implementation of their land tool. For example, Landmapp has an agenda of fighting the menace of illegal mining prevalent in the study area. Illegal mining has been a problem in Ghana since time immemorial and many governments in the past have drafted policies to help restraint these activities but to no avail. The smart method adopted by Landmapp in entrenching provisions in the indentures with active collaboration with chiefs and the migrant farmers has helped to minimise the speed at which viable farms lands were being converted to *''Galamsey''* sites by these illegal miners.

Landmapp has also respected and collaborated with the Ghanaian land administration institutional setup which in itself is a social innovation. Landmapp negotiated both the formal and customary institutional context in the preparation of tenure documentation packages as discussed in the previous chapters to conform to the standards specified by those institutions. There were instances in Ghana where land tenure documentation projects backed by statutory institutions (Lands Commission) collided with customary sensitivity due lack of recognition of where they were working.

6.2.3.   Product innovation

OECD, Bessant & Tidd provided a vivid definition of product innovation. For example, an introduction of a good or service that is new or meaningfully enhanced concerning its features or intended uses is called product innovation (OECD, 2005). Product innovation is also defined as *''changes in the things (products/services) which an organisation offers''* (Bessant & Tidd, 2007 p 13). Based on the definitions of product innovation above, Landmapp tenure documentation packages can best be describe as product innovation since the packages are the introduction of improved features for the intended uses. Landmapp has developed various kinds of land tenure documentation packages to satisfy the needs of their customers as explained in previous chapter. The solutions for tenure documentation in challenging and less challenging areas differs with respect to costs, number of stakeholders involved, the terms of the lease which in turn relates to the necessities of adhering to existing surveying standards and requirements.

6.2.4.   Process innovation

Basssant & Tidd provided definition of what constitute process innovation in the book entitled *'' innovation and entrepreneurship''*. According to (Bessant & Tidd, 2007 P 13), process innovation can be defined as *''changes in the way in which things (products/services) are created and delivered''*. OECD also provided a more detailed definition of process innovation. According to (OECD, 2005), process innovation can be defined as *'' implementation of a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software'' (*OECD, 2005 p 49). Based on the two definitions of process innovation above, the common and main distinguishing feature of process innovation is a production and delivery method. Thus, through which products/ services are created and delivered.

Based on the definitions above concerning process innovation, the improvisation of the PVC pipes for construction of monuments, fixing signing fees, step by step payment of renewal fees with aim to create products or services are considered to be process innovation. Table 8 below shows the different manifestations of innovation in comparison with the literature.

Constrains to innovation within the existing institutional context	Solutions for the constraints	Classification of innovation based on literature
Lands Commission non-integrated end to end system	Landmapp integrated end to end system	Technological innovation
Manual signing of land documents by the customary authorities (chiefs) which takes more time	Digital signatures to aid the chiefs to sign documents faster to fulfil the Lands Commission requirements	
Rampant illegal mining in the study area (polluting water bodies and air)	Solving the social problem of illegal mining(Galamsey) in the area through entrenched provisions in indentures	Social innovation
Some land tenure documentation projects (parcel cert project) projects backed by statutory institutions (Lands Commission) collides with customary sensitivity.	Respecting and collaborating with both the statutory and customary institutional domains	
Non-flexible land tenure documentation products by lands commission to meet customers' needs	Developing varieties of products to meet customers' demands (Homeseal and Orgseal)	Product innovation
Using bulky concrete monuments for surveying which are excruciating to carry	Using PVC pipes to construct monuments	Process innovation
flexible signing fees based on the sizes of the land thereby increasing it's costly	Fixing signing fees (Gh40)	
payment of renewal fees at once which makes it difficult for farmers to pay	Step by step payment of renewal fees by the migrant farmers	
Using official and licensed surveyors which is costly	Using mobile mappers to cut down mapping cost	Sustaining activities
No incentives for tenure documentation	Incentives for tenure documentation (part payment	
No attraction of Lands Commission activities by impact investor	The attraction of Landmapp activities by impact investors(Omidyar).	
Many land tenure documentations undertaken in Ghana were pre-registration packages	Alignment of the documentation processes with the Lands Commission requirements.	Upscaling

Table 8 shows different manifestations of innovation

6.3. Main Institutional challenges to land tenure documentation

There were many challenges identified in table 8 above that constrain innovation within existing institutional context and solutions discussed in section 6.2. Among the challenges identified, the ambiguities of tenure documentation laws, qualifications to carry out land survey resulting in complex survey processes and the difficulty in getting the chiefs to sign the documents were found to be the most significant challenge in the implementation of innovative land tools in Ghana. The three main challenges identified cut across both statutory and customary institutional domains and they area are discussed below based on literature review.

6.3.1. Ambiguities of statutory and customary land documentation laws

Ambiguities of statutory and customary land documentation laws and the potential impacts in land documentation has been in discourse over the years especially in the African context. A study conducted by (Burns et al., 2006) concerning land administration reform focusing on indicators of success and future challenges pointed out the unclarity of land tenure documentation laws in Africa. According to (Burns et al., 2006), land administration laws in many African countries are not clear as such may carry different interpretations resulting in different meanings. The discourse concerning the ambiguity of land tenure documentation laws was also noted by (Mensah, 1999) in the context of Ghana. The author indicated that land administration in Ghana can be described as ambiguous: a *"practice whereby two or more persons can advance different, though apparently legitimate interpretations and symbols to validate their claims".* The assertion by the author above applies to both customary and statutory laws. The ambiguities associated with the land tenure documentation laws in Ghana was also noted by (Fynn, 2016). The author pointed out ambiguities associated with the interpretation of the article 267(5) of the constitution of the Republic of Ghana in respect of the registration of customary freehold interest. According to (Fynn, 2016), the point of ambiguity concerning the registration of freehold interest in Ghana lies in the interpretation of article 267(5) of the constitution of the Republic of Ghana.The article said that *''subject to the provisions of this Constitution, no interest in, or right over, any stool land in Ghana should be created which vests in any person or body of persons a freehold interest howsoever described'.* The author indicated that the article 267(5) is interpreted not considering article 267(1), article 11 as well as the intention of the constitution. The author further indicated that stool is made of families and members and if the stool is granting the family or the member's such freehold right, it is not to the detriment of the future generation since the families will bring forth the future generation.

Similar issues concerning unclarity of land documentation laws in Ghana especially concerning the registration of freehold interest was encountered by Landmapp in Wassa akropong during the implementation of their land tenure documentation project. The indigenous people were believed to hold customary freehold interest from the time of immemorial and will not like to sacrifice that interest for a lease. Based on this, there is less motivation for the indigenes to register their lands since they will be getting a lesser interest and this was evident in Landmapp tenure documentation in the area where only 20% of indigenous families documented their lands. Concerning the non-registration of customary land freehold in the study area, Landmapp could not solve this challenge but only have to accept and adapt to the situation.

Th misinterpretation of this Act sometimes goes negatively towards the beneficiary land rights holders that has in a way promotes vulnerability. Example, the interpretation of the Act 267(5) has affected usufructuary land rights holders in Ghana which rights are bigger than that of a lease but in an actual sense are truncated to leases.The possible implications are that the security of the customary usufructuary right has eroded resulting in an insecure position for the vast majority of people who holds it in Ghana. The customary usufructuary right holders are also prone to vulnerability (risk of losing the land) due to misinterpretation of the Act

Juxtaposing the conundrum of non-registration of a freehold interest in the study area against realities, it can be said that, the inability of the lands commission to register freehold interest in the area cannot be blamed entirely. Most of the deeds that have been submitted to the Lands Commission for registration are normally leasehold interest, and this has been the normal practice over the years. The lands commission in the study area has now become used to the registration of leases, so when higher interest is submitted to them for the registration, it becomes something new.

6.3.2. Qualification to carry out land survey

Some African countries have some provisions entrenched in their laws that firmly block the use of innovative land tools. Looking at the Deed Registries Act of 1937 of Namibia which is still operational indicated that a professional surveyor must survey any transaction on the land leading to the change of ownership and approved by Surveyor General. The provision entrenched in land laws of Namibia concerning the qualification to conduct land surveys also manifest in Ghana land laws. For example, according to the survey Act of 1962, Act (127), the authority to conduct land survey work is vested in the licensed Surveyor and official surveyor and the general supervision is done by the Director of Surveys.

Despite the above strict position taken by the Deed Registries Act and Survey Act of Namibia and Ghana respectively, it is true that, some level of standardization and checks is needed in professional practice for conducting survey.However, some sufficient allowance should be made for adaptation to local situation.

Landmapp encountered similar challenge concerning who qualifies to conduct land surveys in Ghana during the implementation of their land tenure documentation project in Wassa Akropong which is not surprising since Landmapp needed to follow what is enshrined in the land laws. Based on the magnitude of the legal requirements concerning the qualification to conduct land surveys in Ghana with its potential impacts (increase in additional survey cost, delays leading to frustrations), Landmapp improvised a cheaper, quicker and faster solution but sufficient to meet the requirements set in the land laws. Landmapp recruited local people (as mobile mappers & interviewers) with the least qualification being the high school certificate and trained them on how to use the Landmapp tool for tenure documentation.The mobile mappers and interviewers are stationed on the field. They interview the landholders, capture the information and have it cross-verified by the licensed Surveyors stationed in the city through their end to end integrated system (database linked with the mobile application). The duty of the licensed Surveyor in the Landmapp setup is to verify the information collected from the field by doing the necessary computations and certifications of the plans as mandated by law.The certification of the plans by the licenced surveyors shows that they have vowed with their professional integrity that, the mapping is done correctly and in case of anything wrong the surveyor will be responsible.The responsibilities of conducting land surveys in Ghana by the Licensed and Official surveyors only with direct supervision from the Director of Surveys stifle innovation.

6.3.3. Difficulty in getting chiefs to endorse Land documents

Increase in the demand for land may encourage the manipulation and advancement of personal interest (Ubink & Quan, 2008). Such increase in the demand and the commercialization of land may also push the custodians of the customary lands to charge higher fees on the land users and even evict them to look for alternative lands (Cotula, 2013). The fees charged can be very high (Delville; Toulmin, Colin, & Chauveau, 2002).

Concerning Landmapp tenure documentation project, the two important institutional actors that give the legitimacy to the documentation packages are mostly the chiefs (customary) and the courts (statutory). Getting the chiefs to sign the Landmapp tenure documentation packages is a difficult task. The chiefs indicated that the signing fees were small, and they will only sign if Landmapp increases the amount. This finding is similar to the findings of Cotula as well as Delville, Toulmin, Colin & Chauveau who indicated that the custodians of the customary lands usually charge higher fees. The chiefs charge higher fees because of the competition for land in area by the illegal miners who are prepared to offer higher money. However, getting the courts to sign the documents is easier provided the documents are free from errors as well as the appropriate signing fees are paid. The signing fees from the courts are fixed and not based on negotiations

6.4. Perception of mapping process

The literature review conducted in chapter 2 pointed out some lessons learned from the implementation of STDM and MAST projects in Uganda and Tanzania respectively (see details in section 2.2.2). The data gathering process for both projects was described as participatory (taking part by people being surveyed), low cost (e.g. the cost of adjudication was paid by MAST) and user friendly (people with less technical background can use the tool) (Antonio, D; Gitau, Njogu, 2014; USAID, 2016a).The MAST and the STDM tool were also described as comprehensive (incorporate different land rights and claims) and as flexible. Also, the implementation of the two projects required active stakeholders' engagement (i.e. sensitisation),

political as well as financial commitment. The three factors enumerated above ensures the successful implementation of the two projects (STDM and MAST) in Uganda and Tanzania respectively.

Similar lessons learned from the implementation of the STDM and MAST project also manifest in the Landmapp tenure documentation in Wassa Akropong traditional area. Concerning the mapping process, it was established that it is participatory since the farmers were involved from the inception phase of the project until land documents were delivered to the customers. Unlike the cost of the adjudication of the land been paid by the MAST, in the case of Landmapp is paid by the farmers, home and commercial owners. The cost of the mapping in the incase of Landmapp is determined by the type of land package (Homeseal, Farmseal, Cropseal and Orgseal) as well as actors involved. Involving more actors means that, the cost of documentation will eventually increase. The Farmseal and the Cropseal which are mostly in the rural areas are less expensive as compare to Homeseal and Orgseal which are mostly found in urban areas. Unlike the case of MAST project whereby local intermediaries were used to conduct the mapping, Lanmapp uses people who are from their operational areas but with higher level of education (e.g. university education). The Landmapp tool required people with more skills to operate it especially the Emlid GPS device. Despite the uneasiness of the use of Landmapp tool, the tool is very comprehensive and flexible capable of capturing all tenures and claims (e.g Abunu and Abusa). Landmapp also engage many stakeholders from national level (statutory actors) to local level (customary actors, landholders etc). Three major factors that made Landmapp tenure documentation in the study area successful is the general need for tenure documentation by migrant farmers, financial commitment from venture capitalist like Omidyar, owners of the Landmapp and active engagement of both statutory and customary actors.

6.4.1. Landholders perspective on the potential uses and benefits from Landmapp Certificates

For this study, no much can be said about the uses and benefits of the Landmapp tenure documentation certificates, since the documentation is still in the early days. The focus group discussion held with Landmapp certificate holders, no one was able to mention the benefits they have derived from the documentation certificates received from Landmapp. However, the Landmapp certificate holders have high hopes of using the certificate to protect themselves against forceful evictions (legal security) as well as to access finance from cocoa purchasing companies to help them invest on their lands thereby reducing poverty levels. These two broad potential uses of the Landmapp certificates are discussed below with reference to established literature in Chapter 2.

Studies conducted by (Toulmin, 2005) concerning securing land and property rights in sub-Sahara- Africa, focusing on the role of institutions found out that providing land tenure security for marginalised groups in the developing world is a primary tool for promoting economic development, reduction in poverty levels and encourages better management of natural resources. The author further indicated that simpler, cheaper as well as locally grounded land registration systems could well meets the needs of the people in respect of their tenure security. More insight concerning the distinctions of the various types of tenure security was established by (van Gelder, 2010) in the study of ''*What tenure security? The case for a tripartite view"*. In the research, a clear-cut distinction between tenure security as a legal construct, tenure security as perceived by dwellers and de facto tenure security were established. According to (van Gelder, 2010), tenure security can be based on one's perception (perceived by dweller); protection and enforcement of rights by the law (legal security) and actual circumstances on the ground (de facto). On the legal security upon breach, the state invocates its coercive powers typically to protect the rightful owner. De facto tenure Security is defined by both intrinsic characteristics (i.e., length of time of settlement, Community solidarity, the size of the settlement, etc) and extrinsic characteristics (i.e., political acceptability, mobilisation of media, etc). Perception of tenure security refers to the degree of fear of being evicted in future.

Similar to the position of Toulmin concerning the relevant of tenure security, Landmapp has also identified secure tenures as the primary tool for promoting economic development and reduction in poverty levels. This is one main reason for embarking on land tenure documentation by Landmapp to help secure lands so that landholders can concentrate on working on their lands without fear of eviction and make investments

on it. This will undoubtedly accelerate the economic development as well as reducing poverty levels which is prevalent in the study area. However, the study was not able to establish how the tenure security can promote economic development as well as a reduction in poverty levels since the Landmapp tenure documentation is still in its embryonic stage.

The migrant farmers in the wassa Akropong have settled on the lands for more extended period, and they are supposed to enjoy de facto tenure security which increases with respect to the passage of time per the distinction made by Van Gelder. Some migrant farmers have stayed on the land as long as 40 years but sometimes receives threats of evictions by Traditional Authorities especially when migrant farmers refuse to honour a request made by the chief when bereaved. The distinction made by Van Gelder concerning the de facto tenure security indicated that the older the settlement, the higher its legitimacy and protection. This means that these migrant farmers are supposed to be safe and secured even before the intervention of Landmapp tenure documentation project in the area. On the contrary, the farmers in Wassa Akropong even though they have settled on the lands for such a long time, they still fear that they may be evicted by the chiefs since the farmers did not purchase the lands but rather obtained at the mercies of the chiefs. Although the migrant farmers have settled on the lands for more extended periods, the perceived tenure security becomes more pervasive as compare to the de facto tenure security. The Landmapp certificate holders categorical indicated that the Landmapp documents increase their legal security and they can freely work on their lands without fear of eviction. Meaning, in the eyes of the farmers, they recognised legal tenure security far better since it ensures certainty backed by coercive powers of Government. The high court has endorsed the Landmapp documents, and the court can invoke its coercive powers in case of breach to protect the migrant farmers

A report concerning the designing a land record system for the poor put forth by UN-HABITAT highlighted some benefits that can be derived from documenting land rights through pro-poor land tools. According to (UN_HABITAT, 2012), some of the benefits that can be derived from documenting land rights through pro-poor land tools are: improved access to consumer loans; making substantial investments on the land, being the first step on the land tenure rights ladder or continuum. The documentation also serve as a proof of ownership and notice to the world or the government that someone is in possession of that particular property.

Similar findings were also encountered from the implementation of Landmapp project in Wassa akropong where the certificate holders enumerated potential uses of the land certificate. Some of the potential benefits of the Landmapp certificates are access to finance, weedicides, fertilizers from the cocoa purchasing companies, making massive investments on the land because they are free from forceful eviction, as well as using the certificate as a proof of ownership.

6.5. Existing institutions: Enabling innovation

As discussed in the literature section, institutions evoke in the first instance the image of permanence and rigidity, because they structure social relations. But they may also enable change and innovation. There are some enabling factors which are present in the current statutory and customary institutional setup which serve as basis for the promoters of innovative land tools to foster their innovation as mentioned in section 5.7.1. Some of these enabling factors include: flexibility of the customary arrangement in relation to signing fees, flexibility in the use of mobile mappers instead of licensed surveyors, flexibility in the use of PVC pipes as monuments instead of concrete cement ,the presence of an active land governance structure in the study area as well as the vibrancy of the land tenure documentation communities.

Research carried out by Arko Adjei concerning adapting land administration to the institutional framework of the customary tenure in peri-urban Ghana highlights the dynamism of the land tenure institutions in Ghana especially the customary land tenure institutions. According to (Arko-Adjei, 2011) in such a dynamic

as well as the complex environment, a non-rigid institutional framework is required to allow innovation in land administration processes to take place (Arko-Adjei, 2011). As such Arko Adjei argues for institutional flexibility in the context of both statutory and customary domains to allow innovation to take place. Institutional flexibility denotes the various flexible processes and procedures adopted for land administration (Arko-Adjei, 2011). According to (Amanor, 2008), accessibility to land and management of land in customary land tenure setup is based on negotiations as well as local knowledge, both of which require institutional flexibility. The negotiations also relate to signing fees, the price for purchase of lands to mention a few. The two authors (Arko-Adjei & Amanor) position indicates that institutional flexibility is one of the panaceas to champion innovation in an institutional perspective.

This study found that a certain degree of institutional flexibility cutting across both statutory and customary institutional domains enables the implementation of the Landmapp tenure documentation project,

The flexibility of the customary arrangement in relation to signing fees provides an opportunity for negotiations, which Landmapp uses to reduce signing fee cost. The signing fees are normally charged by chiefs and are not regulated by any law but rather based on negotiations skills. Landmapp is exploring this element of flexibility woven in the customary institutional domain to reduce land tenure documentation costs thereby persuading the chiefs to charge lower signing fees.

The flexibility concerning who should carry out actual survey on the ground provided an opportunity for Landmapp to use mobile mappers to do the survey work with cross-verification by licensed Surveyors. The law mandates the licensed Surveyors to certify plans before they can be submitted for registration with Lands Commission. The law does not care, who carries out the land survey but only cares about the final survey outputs, which must meet the standards set forth by the Lands Commission (certification of the final output by Licensed Surveyor). Landmapp uses this opportunity to negotiate with the Licensed Surveyors to use the mobile mappers to carry out the survey, but the outputs were certified by the Licensed Surveyors at low cost. The licensed Surveyors vowed with their professional signatures that the work is done by them and in case of any problems, they would be held responsible. Due to the flexibility of the use of mobile mappers instead of the licensed surveyors for mapping on the ground, Landmapp was able to reduce costs significantly.

Monuments are generally used to carry out Survey work in Ghana to mark boundary points, but difficult to carry as well as to set up. They are, in this sense, a quite literal and tangible symbol of the rigidity of statutory survey norms. At the same time, the institutional setting provided some flexibility here regarding the monumentation of farmlands by allowing Landmapp to improvise through the use of PVC pipes as monuments, which are handier, but also do not deviate from the normal concrete cement monuments in terms of function. In summary, these institutional flexibilities in both statutory and customary domains enable Landmapp to build their innovation around the existing land governance structures.

Also, the presence of an active local governance structure, especially in the form of Customary Land Secretariat (CLS), which initially provides land tenure documentation services in study area provides an opportunity for Landmapp to function. Before the advent of Landmapp tenure documentation project in the study area, the CLS was already conducting land tenure documentation in the area and carried out so-called sensitisation programs with the aim of creating awareness among migrant farmers concerning the need to protect their lands through land tenure documentation. These so-called sensitisation programs carried out by the CLS evoked the interest among migrant farmers in wanting to document their lands. Based on this, when Landmapp came with their tenure documentation program, there was already a need-based market for tenure documentation services created by CLS, and it was used as stepping stone for Landmapp to implement their project

The vibrancy of the land tenure documentation communities, as well as their cohesiveness, makes land tenure documentation in those communities easier for Landmapp. The communities, where Landmapp carries out their tenure documentation project are united communities bound together in love and solidarity, common norms, common values and common goals. Landmapp can build on this existing cordiality and cohesiveness of the communities to do their project. If Landmapp had met a diverse and a conflict-prone areas, it is likely that they could not have achieved the success with respect of land tenure documentation in such areas (see also factors influencing challening/less challenging areas in findings section 5.3).

7.   CONCLUSION AND RECOMMENDATIONS

The study was based on how innovation in land tenure documentation takes place within the land institution context of Ghana. In doing so, the study looked at innovative approaches to land tenure documentation in Ghana, challenges to innovative land tenure documentation with social and technical means of addressing the challenges and the outcomes of innovative land tenure documentation on the intended beneficiaries, Throughout the analysis, various institutional challenges were identified influencing the implementation of innovative land tenure documentation in the study area as summarised in table 8 and the solutions or means to surmount those constraints.

Landmapp has to negotiate both customary and statutory institutional domains in order to prepare their tenure documentation packages. The negotiations between the multiple actors in preparing Landmapp tenure documentation packages is time-consuming, but the technology (e.g. Mobile application) itself is more quickly "innovated" as compared to the other elements of land tenure documentation, which stretch across different institutional domains. Elements other than technology itself involve both procedures and practices that have long been in place.

Landmapp found various ingenious ways of addressing the institutional challenges and constraints. What these context specific solutions have in common is that they allow Landmapp to distill important elements of the registration processes of the Lands Commission's bureaucratic structure and simplify them. In the normal operations of the Lands Commission and other offices that regulate land administration in Ghana, the administrative processes are designed according to certain procedures and different people play different roles along these procedural lines (superiors down to the implementing officers). What many of Landmapp's solutions do is to short-circuit and simplify these chains. So, in conclusion the innovation in the case of the Landmapp case studied here lies in an overall simplification of bureaucratic processes and as such reducing bureaucratic inertia.

Concerning the outcome of the land tenure documentation on the intended beneficiaries, the study explored the perception of the mapping process and land holders' perspective on the potential uses of the Landmapp Certificates. Regarding the mapping process, the beneficiaries indicated that participation took place especially during the inception phase of the Landmapp tenure documentation project and the mapping of boundaries in the study area. Concerning the uses of the land certificates(package), the beneficiaries have not transacted any business with the certificates but have high hopes of using them to secure loans form cocoa purchasing companies, obtain weedicides, fertilisers and to transfer ownership to their next in kin. Concerning the tenure security of the beneficiaries, they indicated that validation by the appropriate authorities (chiefs and courts) increases their sense of security based on the certificates. Innovative land tools until now are not woven in the larger economic system. Thus, they are not synchronized with the formal financial sector. If and how this takes place is a point for future research.

Based on the findings of this study the recommendations relate to future research and the way forward for the adoption of innovative land tools in Ghana for nationwide adjudication of land.

In terms of future research, more in-depth studies should be conducted on the application of innovative land tools and its relationship to the institutional context similar to this research approach but *giving more time and depth* to the study of implementation in practice. Future studies could include various innovative land tenure documentation initiatives implemented in Ghana by World Bank, Land resource management centre, and Landmapp to provide a *comparative perspective*. In making the comparative study of the various innovative land tools initiatives implemented in Ghana, the following questions can be asked regarding longer term sustainability and upscaling: What happens to the generated data of those initiatives in the long run? Who is currently in possession of and responsible for the generated data of those initiatives and what are the various uses? What are the security issues in relation to data capture and storage? Furthermore, future research needs to investigate in how far these initiatives have *really benefited the beneficiaries*. The studies should also find out whether those initiatives have been *upscaled from initial pilot projects*.

Concerning the way forward for the adoption of innovative land tools in Ghana for nationwide land adjudication, a lot of innovative land tools have been piloted in Ghana in this regard. However, no single decision has ever been taken either by the government or land administration institutions in Ghana (statutory and customary) to use these innovative approaches for land tenure documentation to develop large-scale databases concerning human relationships to land. For the successful application of these tools in Ghana, it is imperative to think about changes in the land laws, actively engage the land professionals, including statutory institutional actors and how to inspire political commitment from the government. Also the success of the implementation of innovative land tools in Ghana relies on the benefits that will be derived from those initiatives by the intended beneficiaries'. Evidence suggests that registration systems work when there are apparent benefits for the intended beneficiaries (Szreter & Breckenridge, 2012).The intended beneficiaries of innovation in land documentation need to see and experience benefits of documenting their lands in the longer run.

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