TERMS OF REFERENCE FOR A CONSULTANT TEAM TO LEAD HACKATHONS ON THE DEVELOPMENT OF TECHNICAL GUIDES IN LAND ADMINISTRATION

Background

Land governance across borders or transnational land governance looks at rule making, standard setting and institution building across borders. Empirically, one can see a variety of patterns of regulatory governance emerging. The studies commissioned by IGAD in 2016 reviewing the of land governance systems in the IGAD Member States identified four transnational elements:

- state sovereignty over land.
- legal pluralism (customary and statutory).
- gender biases in access to land.
- land tenure insecurity and land conflicts.

In the IGAD Region, national organisation as a structuring principle of societal and political action can no longer serve as the orienting reference point. This creates the need for increased cooperation among nations. The IGAD region finds itself in a time where economic, social, and political developments in one country are increasingly affected by developments in others; and where opportunities and threats to people are no longer exclusively the responsibility of individual governments; The transnational sphere of land governance in the IGAD region is built neither upon nor beyond national institutional frameworks (full integration). Rather, the transnational sphere of land governance in the IGAD region transcends national borders while at the same time being entangled in historically contingent institutions and shaped by actors rooted in locally and nationally diverse contexts (Convergence). In dealing with cross border contexts in land governance, it is important to understand how transnational rules are implemented on the ground, how they are monitored by civil and public actors, and whether there is any learning from local experiences going on, or not.

IGAD through this project with the Swedish Embassy seeks to improve the performance of the land administration function in the IGAD region moving these closer to convergence and enabling the implementation of cross border initiatives that have a bearing on land. This project intends to deliver the following four result:

1) Enhanced Capacity Development of IGAD Region on gender responsive land administration.
2) Strengthened gender mainstreaming in land administration for the IGAD Region.
3) Strengthened Capacity of the IGAD Region to implement land monitoring.
4) Strengthened IGAD Land Governance project coordination and Implementation.

This project focuses on documenting best practices and generating mode or prototypes on land administration and management that can be replicated or scaled up. The model/prototype generated are mainstreamed by gender and will be used as learning ground and adaptation for use by the IGAD Member States with the expectation that there will be increased systemic change in how land governance functions at Member States level.

With the support of the Embassy of Sweden in Addis Ababa, IGAD Land Governance Unit is desirous of developing a manual for mainstreaming gender in the implementation of land governance reforms and practices.

Despite land reforms, conflicts between customary resource users, concessionaires (such palm oil and pulp and paper industries) and government agencies, as well as between central, provincial and district level governments have proceeded apace with negative consequences for the tenure security of local communities. Thus, a broad range of issues including overlapping rights regimes, conflicting claims, inconsistencies of legal mandates and practices among government agencies at different governance levels, capacities and motivations of reform implementing agencies and a lack of responsiveness to gender inequality continue to undermine tenure security.

In this regard, IGAD is desirous of developing technical guides to support land administration processes at country level using the Hackathon approach. Hackathon is an approach where a team or teams are put together to proffer solutions to a problem or an issue through generation of ideas aimed at building on or putting flesh around a particular solution to a problem. The approach is to be applied to activities at Initial framework level regarding the design of the geodetic reference framework and application of open-source tools in land administration and at strategic activity level regarding computerization of records and system, service provision including access to records.

There has been a challenge in maintaining and modernizing the geodetic reference frameworks or survey frameworks which form the foundation for creation of geospatial information and associated systems in the IGAD region. The geodetic reference frameworks which were established during the colonial times were heavily affected by loss of too many old stations. There have been efforts by countries like Ethiopia, Kenya, and Uganda, working independently to upgrade and modernize their geodetic reference frameworks using Global Navigation Satellite System techniques. Moreover, at the regional level no advantage is being taken to adopt a regional approach driven by the African Reference Framework that is promoted at the African Union level.

It has been observed that innovations in land reform and land administration adapted to current conditions are being attempted in some countries in sub-Saharan Africa. However, insufficient innovative tools exist to deliver affordable security of tenure and property rights at scale for most of Africa's populations. It was proposed that new tools need to be developed, but these are not simple and easy to produce, or easily adapted to the diverse needs of various countries including those in the IGAD Region.

Given that not any one of the IGAD Member States has fully completed its computerization processes, with best practice being Uganda, which has a fully functional land administration system, Ethiopia following suite with a national rural land information system almost rolled out, and Kenya in the process of computerizing, it is important that the region develops model/prototypical guidelines that can aid in these processes, considering lessons learnt and best practices.

These Terms of Reference provide an approach that will be followed in the process of a Hackathon on the development of a Technical Guide for the design of the Geodetic Reference Framework, Technical Guide on the application of open-source tools in land administration, Practice manual on computerization of Records and System and Regional Guidelines on access to land information and records. It helps in providing a general overview on how the process will move, what to expect per stage and probably how to go about it in different areas.

The Problem
Generally, for all the all the Countries in the IGAD region, the geodetic reference frameworks or survey frameworks were established during the colonial times. Overall, there were apparent challenges in maintaining those geodetic reference frameworks. There is a real concern that too many of the old stations of the survey framework have been lost. In recent years survey parties engaged on mapping and related

projects have encountered evidence of increasing damage and destruction of both pillars and ground stations. However, the advent of modern GNSS techniques has opened up opportunities for the upgrade and modernization of the geodetic reference frameworks at both National and Regional levels. However, Countries in the IGAD region may differ a little in terms of their level of adoption and implementation of modern techniques in upgrade and modernisation of geodetic reference frameworks and need for the associated expertise. This is further complicated by lack of the appropriate tools and support at both technical, administrative, and political levels in most Member States. To make progress, there is need to increase inter-state collaboration to promote the long-term vision of implementation of the African Geodetic Reference Frame, which was conceived **to** unify the geodetic reference frames of the countries in Africa.

Lack of reliable geodetic reference frameworks and the inability to take advantage of their full potential when upgraded and modernized has been a challenge faced in the IGAD Member States. It is a well-known fact that poorly managed geodetic reference frameworks lead to poor quality of survey and mapping activities that inevitably lead to disputes, sometimes quite serious, at individual ownership level, to inter District or even between Member States. These disputes are not only time consuming, but retard development at individual citizen level, within the Member States and at regional level as well.

There has been motivation to promote use of open-source software and related tools for cadastre and land registration basing on the observation that many systems and projects in developing countries struggle to provide appropriate and affordable services for tenure security. Reasons are related to governance but also to technological and financial shortcomings. Information technology plays a crucial role in operating cadastres and land registration systems. In developing countries, the on-going license costs of proprietary software often created serious constraints and have even stopped programs.

To improve the situation innovative approaches and development of new affordable and efficient tools should adapted to the African conditions. But practice shows that development of such tools is not a simple or easy task as in some cases ad-hoc approaches based on the desire for immediate results prevails and the system development will be supplier driven rather than needs driven.

Many studies and research carried out in land administration and management since the 1990s up to about mid 2000s revealed that the land administration systems in Sub-Saharan Africa were shrouded with functional obsolescence and were based on laws and regulations created many years ago to meet different social, political, and economic conditions then. The condition of physical records both in the cadastral sections and land registries were appalling, with documents deteriorating and going missing.

The manual systems gave way to fraudulent actions and were riddled with corrupt tendencies. The duration of transactions was also too long and the cost of doing business was unacceptably high.

With the Support of the Swedish Embassy in Addis Ababa, the IGAD Land Governance Unit wants to develop a Technical Guide for the design of the Geodetic Reference Framework, Technical Guide on the application of open-source tools in land administration, Practice manual on computerization of Records and System and Regional Guidelines on access to land information and records that can be used across the IGAD Member States.

Justification
A geodetic reference framework forms the spatial foundation for the creation of any Land-Information System (LIS). Consisting of monumented points whose locations have been accurately determined with respect to a mathematical framework, this system permits the spatial referencing of all land data to identifiable positions on the Earth's surface. A geodetic reference framework provides not only an accurate and efficient means for positioning data, but it also provides a uniform, effective language for interpreting and disseminating land information. Responsibility for the coordination of geodetic control activity at the state level varies from essentially no organization or coordination in some states to the existence in other states of strong state geodetic survey agencies. Any Land-Information System requires some method of spatial reference for the data. An adequate geometric framework for such reference must, if it is to serve

even the narrowest of purposes of a cadastre, permit identification of land areas by coordinates down to the individual parcel level.

Because of the importance of the geometric framework for the spatial reference of data to the long-term success of any multipurpose land-data bank, and because that importance is apt to be overlooked by planners and decision makers in their deliberations of other important issues involved in the creation of land-data systems, this project will develop and validate an illustrated technical guide for the design of the geodetic reference framework for any land-data information system that integrates gender parameters.

A good geodetic reference framework, among other benefits, provides a foundation for all geo-referencing activities; It is the base for coherent multipurpose Land Information System (cadastre) and its subsequent maintenance; positioning services; surveying and mapping; Community-Boundary mapping; food security, disaster management; air, land and sea navigation; Effective land administration, registration and taxation; emergency response, management of resources; promotion of Good Governance; revenue planning and collection.

The costs of proprietary software licenses and related tools have proved to be a constraint, but even more, the lack of capacity, models, and support to develop software and related tools have frustrated or completely stopped initiatives. Open-source software with related tools, which have become a credible alternative to proprietary software and related tools, provide a way forward. Open-source solutions and related tools have proved to be more flexible and adaptable to local conditions and languages than proprietary software with the associated tools. By using and improving open-source software and tools, cadastres can build local knowledge and contribute to the development of open-source projects that can in turn benefit other cadastres in the IGAD Region.

To improve efficiency and effectiveness of land administration systems, some of the actions which need to be carried out include computerisation of land administration records and system accompanied by simplification of the registration procedures, involvement of CSOs and private sector, capacity building for sustainability of land administration, acceptance of various degrees of accuracy for land surveying to make affordable and economically viable use of the opportunities of satellite imagery for land and natural resources management.

There are various benefits of computerization of land administration records and system, which include the fact that the system will be more responsive to the needs and demands of the citizens and business clients; will prevent, reduce or eliminate backdoor transactions, forgeries and graft; there will be more efficient and speedy registration of transactions; the problems of missing land records will be eliminated; there will be a decrease in the cost and space required for storing land records; it will be possible to prepare backups and disaster copies; and there will be faster resolution of land disputes

Objective of Developing Technical Guides, Practice Manual and Regional Guidelines
The main goal of the Technical Guides is to provide practical steps and approaches for establishment of geodetic reference frameworks and application of open-source tools in land administration. Geodetic reference frameworks form the spatial foundation for the creation of Geospatial Information in support of land administration and management including any Land-Information System (LIS). It is also hoped that with the use and improvement of open-source software and tools, cadastres can build local knowledge and contribute to the development of open-source projects.

The Technical Guides should further provide an overview of good practices that exist in the IGAD Region on establishment and maintenance of geodetic reference frameworks and application of open-source tools in land administration. The Technical Guides will seek to facilitate a more informed approach to the design, development, implementation, maintenance and monitoring of geodetic reference frameworks for the land sector and application of open-source tools in land administration that can be used by Governments at various levels, the Private Sector, and Non-Governmental Organizations (NGOs).

Reliable, effective, and appropriate geodetic reference frameworks must be established, and must also be sustainable over a long period of time. Similarly, appropriate open-source tools in land administration should be developed and adopted for use in the IGAD Region. With the Technical Guides, IGAD envisages building capacities of local stakeholders to support establishment of geodetic reference frameworks and application of open-source tools in land administration that can be sustained over a long period of time at country level.

The main goal of the Practice Manual and Regional Guidelines is to provide practical steps and approaches for computerization of records and system and access to land information and records. It is hoped that computerization of records and system and improved access to land information and records will contribute to development of efficient and effective land administration systems.

The Practice Manual and Regional Guidelines should further provide an overview of good practices that exist in the IGAD Region on computerization of records and system and access to land information and records. The Practice Manual and Regional Guidelines will seek to facilitate a more informed approach to computerization of records and system and access to land information and records that can be used by Governments at various levels, the Private Sector, and Non-Governmental Organizations (NGOs).

Reliable, effective, and appropriate approaches for computerization of records and system and access to land information and records must be developed and must also be sustainable over a long period of time. With the Practice Manual and Regional Guidelines. IGAD envisages building capacities of local stakeholders to support computerization of records and system and access to land information and records that can be sustained over a long period of time at country level.

Scope of work

From a historical perspective, geodetic reference frameworks that were established had limited but important applications restricted to provision of the necessary survey and mapping infrastructure, their densification, and the associated limited high-cost surveying activities. The advent of new GNSS positioning techniques has revolutionized implementation of Geospatial applications including those in land administration and management. There are enormous opportunities which have been made available by modernization of establishment of geodetic reference frameworks, with the potential to reduce the cost of geospatial products including survey and mapping activities involved in land administration and management. But care must be taken to ensure that establishment of modern geodetic reference frameworks driven by implementation of modern GNSS applications are cost effective, will be sustainable by ensuring good maintenance programs are put in place backed up by capacity building programs taking advantage of existing arrangements in the region like Eastern African Land Administration Network (EALAN) and training centers like the Regional Centre for Mapping of Resources for Development (RCMRD). While a broad range of standard geodetic reference framework activities will be considered when developing the technical guidelines, due cognizance of an ever-increasing modern GNSS positioning techniques and their associated applications should be catered for. Practical scientific applications of the geodetic reference framework should also be taken care of, mainly because the IGAD Region is astride the East African Rift Valley, prone to seismic activity and sometimes volcanic eruptions as was observed recently, with a view to mitigating the associated risks. This kind of work is best handled at regional level. In designing geodetic reference frameworks and associated interventions, practitioners should consider both the procedures to be adopted and the legal, institutional, and administrative arrangements to be put in place in driving the interventions.

Land administration and cadastral systems are playing a crucial macro-economic role in the collection, management, and dissemination of information about land ownership, use and value. Cadastral systems are documenting land tenure rights and are thus providing crucial economic, social and environmental benefits. Modern cadastral systems make extensive use of information technology (IT) supported by software systems. In developed countries, such systems were established over the last 20-30 years and became powerful tools in operating cadastral systems. In developing and transitional countries, as in the

IGAD Region, the need for efficient cadastral systems and the use of IT is as much a necessity as it is in developed countries, although there are substantial financial and operational constraints.

It is important to explore open-source software and related tools in general and in the fields of cadastre and land registration and to come up with recommendations on use of open-source products. There is need to explore and to develop an understanding of open-source software and related tools in as much a balanced and unbiased way as possible, give recommendations and reflect on lessons learnt with long-term validity on a conceptual and strategic level.

It is necessary to have a balance between the different technological approaches for the innovative approaches to the system design. The use of different technologies such as GPS or approach to the system design (such as free open source software (FLOSS) or customer of the shelf software (COTS) etc.) should be carefully considered from the maintenance, license payment, system security and local capacity points of view to ensure the systems are operational. The information system maintenance for some period after the project end should ideally be part of any system design.

Computerisation and the associated design and implementation of the LIS should be oriented to cost effectiveness of the system, based on modern technology. The system should be open for future changes and able to adopt them without major redesign or need to rework. The implementation of LIS requires considerable efforts but as practice in the last decades shows, it is a possible way towards good land administration system that should substitute archaic and inefficient structures and contribute to improvement of land tenure security and economic development of the countries in the IGAD Region.

Computerization efforts should cover the full spectrum of land administration and management services including physical planning, valuation, inspectorate, surveys and mapping and land registration, but also consider the design and develop data security procedures and access control land records, including those that are archived and recommend appropriate technology solutions to be adopted at various levels for provision of electronic and various other backup options.

At the country level a holistic approach and long-term strategy shall be developed supported by short term actions. Computerization and the associated LIS implementation may require significant institutional changes and civil services restructuring in the land administration area and adjustment of the institutional structure to gain the full benefits of LIS. The LIS due to its technological complexity and interagency nature requires centralized management and network of regional offices that will be able to bring the land administration services closer to Clients. Possible resistance to changes of different agencies is likely and expectations must be properly managed to ensure smooth implementation of the projects.

The technical Guides to be developed are:

- **Illustrated Technical Guide for The Design of The Geodetic Reference Framework**

- **Illustrated Technical Guide Development and Application of Open-Source Tools in Land Administration**

- **Practice Manual on Computerization of Records and System as Well As Archival Mainstreamed by Gender**

- **Regional Guidelines on Access to Land Information and Records**

APPROACH

To run a successful hackathon on the development of the Technical Guides for Geodetic Reference Framework and Application of Open-Source Tools in Land Administration, Practice Manual and Regional Guidelines on Computerization of Records and System and on Access to Land Information and Records the following steps will be followed:

1. **Step 1: Defining the Issue**. For the hackathon to work, there must be a clear definition of the issue or the problem and agreement on the most appropriate solutions. This first step must be done by a small number of people who take the initiative to think it through. The problem and its solution in the case of the Technical Guides, Practice Manual and Regional Guidelines is already defined in the detailed terms of reference.

   The definition of the issue therefore gives the scope and guides the minds of towards the probable solutions to the problem. If the issue is not properly defined, it leaves the hackathoners scattered in the thinking and may not effectively lead to the expected outputs. Also, when the issue is clear, it sets the right framework for forging common understanding of the problem and proposed solutions.

2. **Step 2: Constituting Advancers' Team**
   The Advancers' team is the first takers that provides initial ideas in terms of the solutions to the problem/issue. They can be internal or external teams or mix of two with experience and expertise in the relevant area/issue.

   To do a proper hackathon, there is need to have a small team to go on an expedition thinking, put together the skeleton and develop key elements or components of an issue. The document developed can act as the "Hackers trigger" providing a roadmap for the hackathoners to build on. For the development of this Technical Guides, Practice Manual and Regional Guidelines, a team of two, for each technical area, will be put together to produce the initial document (a framework) which will form the foundation for the work by the Hackathoners. The task for the Advancers is to:

   - Provide key principles for establishment of reliable geodetic reference frameworks and associated interventions; development and application of open-source tools in land administration; computerization of Records and System and on access to land information and records.
   - Provide a wide range of technical and organizational options for establishment of reliable geodetic reference frameworks and associated interventions; development and application of open-source tools in land administration; computerization of Records and System and on access to land information and records.
   - Offer a series of diagnostic tools that could be used by the IGAD Member States.
   - Share out some lessons learned in establishment of geodetic reference frameworks, development and application of open-source tools in land administration; computerization of Records and System and on access to land information and records for the land sector in the IGAD Member States, and consequent good practice.
   - Share case studies that provide practical examples if any.

3. **Step 3. Constituting the Hackathons Team**
   The selection of the hackathoners is a critical step for the success of any hackathon. It is Important to get a team that will be committed and stay focused on the agenda. It is also important to have a good blend to factor in diversity, member state representations, professional and stakeholders' diversity. A team that blend the experts in the respective field, the thinkers and people with general knowledge reinforces and builds each other.

   For the hackathon on the technical guides for the design of the geodetic reference framework for any land-data information system that integrates gender parameters and development and application of open-source tools in land administration; Practice Manual and Regional Guidelines on Computerization of Records and System and on Access to Land Information and Records, a team of six experts per technical area with a healthy mix from the IGAD Member States will be identified with the support of the IGAD Land Governance Unit in consultation with the Member States: The technical areas

   - Technical Guide for the design of the geodetic reference framework

- Technical Guide development and application of open-source tools in land administration
- Practice Manual on computerization of Records and System as well as archival mainstreamed by gender
- Regional Guidelines on access to land information and records

4. **Step 4. Planning the Hackathon Meeting**

   The following items should be giving due consideration when planning to host a hackathon meeting:

   i. Duration. How long will the meeting be? The agenda and the amount of work will determine the duration. However, it imperative to consider the people participating in the hackathon in terms of their availability. For this Technical Guide, it will not take more than five days. Develop a programme guide and share before the meeting. The team should feel free to review the same.

   ii. Venue: Choose appropriate place that will enhance concentrate. A venue that is open to all manner of distractions will be a de-service to the team. The team should feel comfortable and secure in the place.

5. **Step 5. Facilitation**

   The hackathon meeting should have a facilitator who will guide the meeting. Given that the hackathons help in building stuff; it is important to develop the facilitation notes or questions before hand based on the key areas /components required to have full draft document.

6. **Step 6. Output**

   Every hackathon must end with a delivery of a clear output. It could be an improved draft document that may require little work to finalize. In that case, the ways of finalizing the output should be discussed and agreed upon before the meeting is concluded.

   The output in this case will be a draft technical guide for the design of the geodetic reference framework for any land-data information system that integrates gender parameters in land administration in the IGAD Region.

7. **Step 7. Validation**

   The refined draft developed by the hackathoners will be subjected to validation through appropriate channels. This can be done through the community of practice discussions, in country meetings (physical and online), strategic member state members, the IGAD CSOs Forum and other appropriate avenues.

   Expected timeline:

   The Consultancy is for a total of 75 days spread over four months. The final products should be delivered to IGAD no later **than 15th May 2022.**

   Location:

   The Consultancy is home based with one travel for the validation meeting

   Deliverables & payment distribution:

   Payments of total budget will be processed upon delivery of the following product along with invoice:

   1. Annotated outline of the contents of the technical guides comprising a detailed description of each section that indicates the focus of the section, its purpose, and the main lessons/messages in that section. Note that the first/introductory section will need to have a background and rationale for the work, including the review of what has been done by other relevant actors. (20%)

   2. Submission of draft technical guides 40%:
      - **Illustrated Technical Guide for The Design of The Geodetic Reference Framework**

- **Illustrated Technical Guide Development and Application of Open-Source Tools in Land Administration**
- **Practice Manual on Computerization of Records and System as Well As Archival Mainstreamed by Gender**
- **Regional Guidelines on Access to Land Information and Records**

3. Reports of the Hackathons and final draft technical guides (30%)
4. Final Technical Guides (10%)

Report
A detailed report on the process of developing the practice manual including the validation meeting.
Copyright and Intellectual Property Rights
In consideration of the fees paid, the Consultant expressly assigns to IGAD any copyright arising from the works the consultant produces while executing this contract.
The consultant may not use, reproduce, or otherwise disseminate or authorize others to use, reproduce or disseminate such works without prior consent from IGAD.

Qualifications:
The Consultant team of 2 is expected to have the following qualifications:
- The Lead Consultant should have expertise in Surveying, Geomatics and Land Information Systems.
- **The Lead Consultant** should have led the process of developing and documenting land information development processes in country. A minimum bachelor's degree (or equivalent) in relevant area (surveying with 20 years relevant professional experience working in a government institution in the IGAD Region. A Master's Degree or PhD in Geomatics, Land Administration, Land Surveying or GIS will be considered an asset.
- Minimum 10 years of relevant professional experience in developing land information systems; Record of participation in at least 2 assignments of similar nature.

- **The second consultant** should have a PhD in land management, gender studies, anthropology, development communication or law with 5 years of professional experience, or a master's degree in a field relevant to the assignment, such as GIS, land management, development communication, Gender studies, anthropology, combined with at least 8 years professional experience; or A Bachelor's degree in land management, land economics, law, gender studies, population studies with 10 years of professional experience.
- Knowledge of developing technical guides and manuals.
- Sound understanding of mainstreaming gender in land administration systems is an asset.
- Excellent communication, presentation, report writing and analytical skills.
- Mastery of oral and written English
- Very strong writing and analytical skills