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Deliverable 7.3

Initial Governance and Capacity Development Model

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Abstract:
This is a consolidated report on the initial proposal to create a governance and capacity development model as part of WP7 'Govern and Grow: Sustainable governance and capacity buildings models'

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Executive Summary

its4land is a European Commission Horizon 2020 project funded under its Industrial Leadership program, under an ICT call (H2020-ICT-2015) with the topic of 'International partnership building in low and middle income countries'. its4land combines an innovation process with emerging geospatial technologies, including smart sketchmaps (Smart SkeMa), unmanned aerial vehicles (UAVs), automated feature extraction (AFE), and geocloud services (GS), to deliver land recording services that are end-user responsive, market driven, and fit-for-purpose. The transdisciplinary work develops supportive models for governance, capacity development, and business capitalisation.

This Deliverable 7.3 is directly linked to 'Work Package 7 (WP7) – 'Govern and Grow: Sustainable governance and capacity building' of the its4land project. WP7 deals specifically with the development of a governance and capacity development model to support the implementation and evaluation of innovative technologies and their use in order to meet stakeholders' needs so that the innovation process can have sustainable effects.

This report presents the deliverable entitled "Initial Governance and Capacity Development Model" (IGCDM). This initial model, is the first step to construct a refined "Governance and Capacity Development Model". Therefore, this first attempt presents a general approach, that will be refined through its application. The application of the IGCDM will allow an understanding of the issues that the adoption of the its4land tools face. The application of the model will be presented in Deliverable 7.4. The resulted understanding will permit the refinement of the model. This refinement will take place in Deliverable 7.5.

This Deliverable 7.3 is divided into five sections.

The first section introduces the initial version of the its4land governance and capacity development model.

The second section explains the Fit-For-Purpose Land Administration (FFPLA) approach as a basis for the model and its relation with the geospatial technologies that are considered in the its4land project. FFPLA contains four principles, three components and seven elements. The four key principles support the creation of an affordable and sustainable land administration system. The components are related with the concept of "incremental improvement". This means that the land system should aim to meet the basic current needs of the users and at the same time it should provide the possibility of being improved over time. The seven elements emphasize that a spatial framework should be designed within a specific country rather than only aiming for the most advanced technical standards. The seven elements require that the legal and institutional framework be revised before being applied.

The four principles of FFPLA are: 1) General boundaries rather than fixed boundaries, 2) Aerial imaginaries rather than field surveys, 3) Accuracy relates to

the purpose rather than technical standards, and 4) Opportunities for updating, upgrading and improvement. The FFPLA components are: 1) The use of affordable modern technologies, 2) The use of participatory approach based on a spatial framework, and 3) The adoption of a legal framework with enough flexibility to implement the FFPLA approach. The FFPLA elements are: 1) Flexibility, 2) Inclusiveness, 3) Participatory, 4) Affordability, 5) Reliability, 6) Attainability, and 7) Upgradability. These seven elements of FFP are being adapted to become an assessment criteria.

These criteria will be employed to assess the applicability of the four geospatial technologies that are also briefly introduced in section two. These technologies are: 1) Smart Sketchmaps, 2) Unmanned Aerial Vehicles, 3) Automated Feature Extraction, and 4) Geocloud Services.

The third section explains the sources for creating the IGCDM. The three main input sources considered and accepted are: 1) The users' needs in the African countries as presented in Deliverable 2.5, 2) The Governance and Capacity Development definitions as presented in Deliverable 7.1, and 3) The models presented in Deliverable 7.2. These three sources will support the coherent development of the initial model.

Section four presents the IGCDM, which consist of three building blocks: 1) Tools, 2) Governance context, and 3) Actor's capacity development. These three building blocks are aligned with the seven elements of the FFP approach to set an assessment criteria. This assessment aims to identify where the main governance and capacity development bottlenecks are to facilitate the adoption of the tools.

Section five, presents the main conclusions. In this section we highlight that the initial model, through the application of three building blocks, sets the objectives that the its4land tools, the governance context and capacity development should consider.

In Deliverable 7.4 we will apply this initial model in the selected cases in East Africa. This application will allow us to refine the IGCDM.

Keywords: fit-for-purpose approach, governance models, capacity development, initial model

List of acronyms

AFE	Automated Feature Extraction
EU	European Union
FFP	Fit-for-purpose
FFPLA	Fit-for-purpose for Land Administration
GS	Geocloud Services
GAT	Governance Assessment Tool
GNSS	Global Navigation Satellite System
H2020	Horizon 2020
ICT	Information and Communications Technology
IGCDM	Initial Governance and Capacity Development Model
OECD	Organization for Economic Co-operation and Development
R&D	Research & Development
Smart SkeMa	Smart Sketchmaps
UAVs	Unmanned Aerial Vehicles
UNCTAD	United Nations Conference on Trade and Development
WP	Work Package

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1 Introduction

its4land is a European Commission Horizon 2020 project funded under its Industrial Leadership program, specifically the 'Leadership in enabling and industrial technologies – Information and Communication Technologies ICT (H2020-EU.2.1.1.)', under the call H2020-ICT-2015 – and the specific topic – 'International partnership building in low and middle income countries' ICT-39-2015.

its4land aims to deliver an innovative suite of land tenure recording tools that respond to sub Saharan Africa's immense challenge to rapidly and cheaply map millions of unrecognized land rights in the region. ICT innovation is intended to play here a key role. Many existing ICT-based approaches to land tenure recording in the region have not been successful: disputes abound, investment is impeded, and the community's poorest lose out. its4land seeks to reinforce strategic collaboration between the European Union (EU) and East Africa via a scalable and transferrable ICT solutions. Established local, national, and international partnerships seek to drive the project results beyond R&D into the commercial realm. its4land combines an innovation process with emerging geospatial technologies, including smart sketchmaps (Smart SkeMa), unmanned aerial vehicles (UAVs), automated feature extraction (AFE), and geocloud services (GS), to deliver land recording services that are end-user responsive, market driven, and fit-for-purpose. In this context, fit-for-purpose seeks to be an answer to the deficiencies that conventional land recording methods find in African countries (Enemark, et al., 2014).

The transdisciplinary work in its4land also develops supportive models for governance, capacity development, and business capitalization. Set in the East African development hotbeds of Rwanda, Kenya, and Ethiopia, its4land is divided into three major phases, hosting eight work packages that enable contextualization, design, and eventual land sector transformation. In line with Living Labs thinking, localized pilots and demonstrations are embedded in the design process. The experienced consortium is multi-sectorial, multi-national, and multidisciplinary. It includes Small and Medium Enterprises and researchers from 3 European Union countries (Belgium, Germany, The Netherlands) and 3 East African countries (Rwanda, Kenya and Ethiopia): the necessary complementary skills and expertise are delivered. Responses to the range of barriers are prepared: strong networks across East Africa are key in mitigation. The tailored project management plan ensures clear milestones and deliverables, and supports result dissemination and exploitation: specific work packages and roles focus on the latter.

This document is directly linked to 'Work Package 7 (WP7) – 'Sustainable governance and capacity building' of the its4land project. In Deliverable 7.1 we presented definitions for governance and capacity development. We defined governance as a process of interactively steering the land tenure society to sustain the use of the its4land tools. In addition, capacity development was defined as the development of knowledge, skills and attitudes in individuals and networks of people that are relevant for the sustained use of the its4land tools.

In Deliverable 7.2 we presented a selection of six governance and capacity development models. The selection had three main steps. First, these models were selected as a result of extensive literature review of contemporary publications on governance and capacity development models. The analysis included the revision of the top 50 cited governance related publications on the "Web of Science" platform. Second, we narrowed our selection by preselecting those models that were meeting the governance and contextual needs described in Deliverable 2.5. Third, we established a selection criteria that derived in the final selection of the six models.

This Deliverable 7.3 presents the initial version of the IGCDM. This model aims to support the adoption of the its4land tools (Smart SkeMa, UAVs, FE and GS) in Kenya, Rwanda and Ethiopia* from a governance and capacity development perspective. It is aligned with the FFPLA approach (Enemark et al., 2014) in order to respond to the needs of the adoption context. The IGCDM is the first step to construct a refined "Governance and Capacity Development Model". Therefore, this first attempt presents a general approach, that will be refined through its application. The application of the IGCDM will allow an understanding of the issues that the adoption of the its4land tools face. This understanding will permit the refinement of the model. The application of the model will be presented in Deliverable 7.4 and its refinement will take place in Deliverable 7.5.

In order to present the IGCDM, this document has been divided in five sections, this introduction is the first section. The second section will explain the FFPLA approach and its relation with the tools that are taking part in the its4land project. Section two also briefly presents the four tools and the seven elements of the FFPLA approach.

The third section is focused on the main sources and how they are used for the creation of the IGCDM. The main input sources are: 1) The needs of the three East African countries as presented in Deliverable 2.5, 2) The Governance and Capacity Development definitions as presented in Deliverable 7.1, and 3) The models presented in Deliverable 7.2.

Section four presents the IGCDM alignment with the seven elements of the FFPLA approach. These are: 1) Flexibility, 2) Inclusive, 3) Participatory, 4) Affordability, 5) Reliability, 6) Attainability, and 7) Upgradability. The initial model is constructed upon three building blocks: 1) Tools, 2) Governance context, and 3) Capacity development of the actors as a foundation for facilitating the adoption of the its4land tools.

Section five, the conclusion states that the initial model, through the application of three building blocks, sets the criteria that the its4land tools, the governance context and capacity development should consider. The application of the model will be presented in Deliverable 7.4 and its subsequent refinement will take place in Deliverable 7.5.

*At the moment of this deliverable, the case study of Ethiopia is under evaluation and its participation might be cancelled in the its4land project.

2 Fit-for-purpose approach in its4land

The Initial Governance and Capacity Development Model (IGCDM) is the first step to construct the refined governance and capacity development model. Therefore, this first attempt presents a generic approach, that will be refined through its application. The IGCDM presented here aims to support the adoption of the innovative technologies of the its4land project: smart sketchmaps (Smart SkeMa), unmanned aerial vehicles (UAVs), automated feature extraction (AFE), and geocloud services (GS). This model is intended to be aligned with the Fit-For-Purpose for Land Administration (FFPLA) approach to "enable and accelerate the implementation of sustainable land administration systems in developing countries" (McLaren et al., 2016, p. 1). This approach requires innovative tools.

Conventional land recording depends upon tools such as theodolites, total stations, and Global Navigation Satellite System (GNSS) for position measurements and mapping purposes. These methods have proven to be very useful in developed countries as they deliver precise and accurate geospatial data. For developing countries however, they have been found to be of limited value as area coverage is more important than accuracy (Bennett et al., 2008a; Williamson et al., 2010; Zevenbergen et al. 2013). Additionally, conventional approaches are not always able to accommodate existing contextual conditions due to the diversity of informal, social or customary land tenure types (Enemark et al., 2014). Conventional tools represent complex, time-consuming and expensive processes, which are mostly government driven. In addition, developing countries often have insufficient resources in financial and professional terms to conduct such methods of cadastral data capture. The continued use of such methods would mean taking centuries to deliver adequate coverage (Zevenbergen et al., 2013).

Around the 2000s, given the failures of several projects to deliver appropriate and adequate land recording data in developing countries, the FFPLA approach was introduced (Enemark et al., 2014). This sought to provide an answer to the inability of conventional methods to fully accommodate existing conditions (e.g. the diversity of informal, social or customary land tenure types), and to be sensitive to the limited resources in developing countries. FFPLA argues that the development of a land administration system in developing countries should be flexible and should be focused on serving the purpose of the system instead of focusing on top-end technical solutions with high accuracy (Enemark et al., 2014, p. 10). It is also participatory driven and strives towards including non-governmental actors in the process of decision making and delivering services. However, there is an acknowledgment that the role of the government remains crucial for accomplishing real change (Enemark et al., 2014).

FFPLA tools are therefore designed to fulfill country specific land issues, needs and capacities (Enemark et al., 2014). These tools need to be flexible in use, accurate according to the purpose and affordable in price. This moves away from the conventional top-down approach and is more focused on a bottom-up approach aimed at better meeting the needs of users and associated policies. These tools can

then be subsequently upgraded by conventional tools as soon as high precision data is a priority (UNCTAD, 2012).

There is a growing interest in using innovative geospatial tools that are more readily accessible, including examples like crowdsourcing (Goodchild & Glennon, 2010; Laarakker et al., 2015) or mobile mapping (Enemark et al., 2014; Hay, 2016). The use of such technologies is reflected in the its4land project, where the land tenure recording technologies are: smart sketchmaps, unmanned aerial vehicles, automated feature extraction and geocloud services. Each technology will be briefly introduced:

- *Smart Sketchmaps* (Smart SkeMa) enable hand drawn non-metric spatial representations collected in a participatory manner to be converted into topologically and spatially corrected maps (Bennett et al., 2008b). This tool is a community mapping system using sketch maps as input. It is being specifically developed to support a bottom-up approach to land tenure, land rights, and land resource mapping that uses freehand maps. Smart SkeMa is innovative, because it uses hand-drawn sketches to collect information and integrates this information into existing land tenure systems.

- *Unmanned Aerial Vehicles* (UAV) are remotely piloted fixed-wing or rotary vehicles, integrated with positioning system onboard and imagery sensors for data collection of smaller areas of up to a few hundred hectares (Stöcker, et al., 2017). The main advantages over conventional (manned) airborne-based mapping are threefold: i) UAVs are easily deployable; ii) UAVs are able to achieve a ground pixel size of 5 cm, which can be captured for a relatively large area in a relatively short time; iii) UAVs are easy in use - with a small training effort, state-of-the-art devices can be easily operated, even by laymen.

- *Automated Feature Extraction* (AFE) algorithms support image-based identification and vectorization of real-world phenomena of interest for visible cadastral boundary detection (Crommelinck et al., 2016). The approach is most suitable for areas in which a large portion of boundaries are visible. Visible boundaries are demarcated through objects like fences, roads or field outlines. By avoiding the need to do in-field measurements and providing an automated, transparent, scalable and flexible approach, the automatic boundary identification and extraction can save money and time (Crommelinck et al., 2018).

- *Geocloud Services* (GS) are information infrastructures that enable remote storage, analysis, and presentation of geo-information (Zhang et al., 2015). This technology differs from conventional storage since the acquired data can easily be accessed and adapted through one overarching storage. Geocloud services are designed to improve the flexibility, cost-efficiency and speed of data exchange and use between different sectors and for different contexts. In its4land project, the geocloud platform is intended to host the

technical results of the UAV imagery, sketchmaps and the automated feature extraction algorithm. Given the actual contextual situation of the East-African countries, where internet access rate and related infrastructural developments are lacking compared to the rest of the world, the its4land geocloud service will use cloud techniques, which integrates the data information of the aforementioned tools. It is important to highlight that lack of internet and its related infraestructure is still one of the main challenges.

The FFPLA proposition provides an ideological framework for the adoption and implementation of the its4land tools mentioned above. FFPLA contains four principles, three components and seven elements. The four key principles support the creation of an affordable and sustainable land administration system. The components are related with the concept of "incremental improvement". This means that the land system should aim to meet the basic current needs of the users and at the same time it should provide the possibility of being improved over time. The seven elements emphasize that a spatial framework should be designed within a specific country rather than only aiming for the most advanced technical standards. The seven elements require that the legal and institutional framework be revised before being applied. In particular, the seven elements should be considered in the adoption and implementation of technical solutions (Enemark et al., 2014).

The FFPLA principles (Enemark et al., 2014, pp. 20–21) are:

1. General boundaries rather than fixed boundaries. The use of general boundaries to delineate land areas is sufficient for most land administration purposes in rural and semi-rural areas.
2. Aerial imaginaries rather than field surveys. The use of aerial imaginary is sufficient for most land administration purposes.
3. Accuracy relates to the purpose rather than technical standards. Accuracy of land information is relative and is related with the use of the information.
4. Opportunities for updating, upgrading and improvement. Building a spatial framework should consider opportunities for upgrading whenever necessary.

The FFPLA three basic components (Enemark et al., 2014, p. 10) are:

1. The use of affordable modern technologies. This means that the adopted technology should not be expensive for the different users.
2. The use of a participatory approach based on a spatial framework. Participation of the different stakeholders can allow the identification and recording of various legal and social rights.
3. The adoption of a legal framework with enough flexibility to implement the fit-for-purpose approach. The flexibility should allow a continuous development, according to the adoption needs.

The FFPLA seven elements (Enemark et al., 2014) are:

1. **Flexibility** in the spatial data capture process in order to provide information about the different uses and occupations of the land. This means that the tool aligned with the FFPLA approach should be able to provide information for varying uses and occupations.

2. **Inclusive** in the extension to cover all types of tenure and all types of land. This means that the tool aligned with the FFPLA approach should cover different types of tenure and different types of land.
3. **Participatory** in the manner to capture and use data, ensuring community support. This means that the data capture process and use of the tool aligned with the FFPLA approach should be supported by the community.
4. **Affordable** operation for the government and for society to use it. This means that the tool aligned with the FFPLA approach should be affordable for both the government and the users.
5. **Reliable** regarding the information. It should be authoritative and updated. This means that the tool aligned with the FFPLA approach should provide authoritative and updated information.
6. **Attainable** to create a system within a short timeframe and with the resources that are available. This means that the tool aligned with the FFPLA approach is capable of creating a system in a short time frame and with the available resources.
7. **Upgradable** regarding improvement over time in order to respond to social and legal needs as well as economic opportunities. This means that the tool aligned with the FFPLA approach can be updated over time, in order to respond to the emerging needs of social, legal and economic character.

These elements also have implications for the governance and capacity development models. For example: flexibility and affordability for land administration purposes are key to build a sustainable system when considering limitations in resources and capacities (Enemark et al., 2014). Flexibility as well as participatory conditions are also important in governance terms. Flexibility in the spatial data capture process also requires flexibility in regulations regarding implementation of the tools as the data (and data capture process) will be upgraded over time. A participatory process which is important to help to identify the different legal and social land tenure rights in turn requires both capacity considerations as well as an inclusive governance arrangement. Combining both flexibility and participation, we can find that "a flexible approach and the various legal and social tenure rights can be recorded in a participatory way" (Enemark et al., 2014, p. 11). Finally, there are also governance and capacity implications if captured data is to be reliable and attainable to be accepted by different stakeholders and used to respond to social needs.

There are already positive examples of the FFPLA approach application in Rwanda and Ethiopia. Land tenure regularisation in Rwanda was achieved within five years with an affordable cost of 6 USD per parcel (Enemark et al., 2014). In Ethiopia, participatory approaches supported a process to interpret imageries obtained from UAVs. Both countries' process of comprehensive land reform projects are currently being followed by other African countries (Enemark et al., 2014). This description of FFPLA elements and their impact in the aforementioned cases, states the relevance of considering them as key criteria for creating an IGCDM . This will be explained in Section 4. Before this explanation, Section 3 will present a summarized version of the three main sources that seed the creation of the IGCDM.

3 Sources for Creating the Initial Governance and Capacity Development Models

In this section we will present a brief description of the main sources used for the creation of the IGCDM. These sources are:

1) The needs of the African countries as presented in Deliverable 2.5,
2) The governance and capacity definitions presented in Deliverable 7.1, and
3) The selected models presented in Deliverable 7.2.

We will start with the recommendations from Deliverable 2.5 that are relevant for the creation of the IGCDM.

3.1 Needs from Deliverable D2.5

Deliverable 2.5 presented particular governance and capacity development issues related with the challenges that land recording tools are facing in Ethiopia, Kenya and Rwanda. Among the three countries Rwanda is the most advanced regarding the adoption and implementation of land recording tools. However, legal and policy frameworks still need to be developed for the use of UAV's, as well as regulations regarding data access, data sharing, privacy and security conditions for geocloud services. It is relevant to develop a governance and a capacity development model that promotes the collaboration between governmental and non-governmental users as well as capacity development strategies.

In the case of Kenya, the decentralization of land policy at the local level presents vertical coordination challenges, which also affect data flows. This situation creates direct implications for the use of geocloud services. There is also distrust from the community about government handling of land data, as seen in multiple reports about high levels of data fraud, misuse of the data itself and corruption in data processes (Ho et al., 2017).

In the case of Ethiopia, technology owners and resource streams are still yet to be identified and justified. A structure that facilities the coordination of stakeholders in data collection, use and management is also required. In this context, it is necessary to identify bottlenecks, to favor the use of the land recording tools and to propose recommendations to overcome these challenges.

In the three countries there are important requirements about the development and acquisition of skills by the actors involved in the creation and use of land recording data. Training appears to be important to sustain the use of the tools in the long-term.

The diversity of contextual needs for each country as well as their commonly shared challenges points in the direction of a model that is capable of assessing governance and capacity development in a contextual manner for each its4land tool. In this

sense, a diagnosis is required to present proposals of what types of reforms and changes for the adoption of the tools are required.
Based on the findings from Deliverable 2.5, we can assert that the IGCDM should pay attention to the following aspects:

- Coordination of actors: the coordination between social, economic and governmental actors that participate in the adoption of the tools;
- Multi-level coordination: coordination among the different governmental levels that participate in the adoption of the tools;
- Legal framework: the development or adaptation of the legal framework where needed to support the adoption of the tools;
- Resources: the availability or consideration of resources to support the adoption of the tools; and
- Capacity aspects such as the acquisition of knowledge regarding the tools as well as a better understanding of social and political factors.

These governance and capacity development aspects will be taken into account in the creation of the IGCDM.

3.2 Governance and Capacity Development Definitions

The second relevant source used for the creation of the initial model is derived from our understandings of governance and capacity development as explained in Deliverable 7.1. In this deliverable, the terms governance and capacity development were defined for the its4land project. These two definitions are:

Governance: "*The process of interactively steering the land tenure society to sustain the use of the its4land tools"*.

Capacity development: "*The development of knowledge, skills and attitudes in individuals and networks of people that are relevant for the sustained use of the its4land tools"*.

From the definitions of governance, steering is a relevant concept. Steering comes from a policy understanding of governance and points out the relevance of governance instruments such as hierarchical regulation, market-based instruments or voluntary agreements (Pahl-Wostl, 2015). In the case of governance, it was found that the application of governance is context specific and "governance is mainly about '*structures and processes'*, '*decision-making, organising, managing and controlling'* and *'actors'*" (Buntinx et al., 2018, p. 13). These characteristics were considered for the creation of the definition presented just above. It was also found that most of the definitions and approaches used are mainly from western perspectives (Buntinx et al., 2018). This situation highlights the relevance of understanding governance from a contextual perspective when creating our initial model.

In the case of capacity development, the research conducted in Deliverable 7.1 found that the following competencies are required:

- Knowledge of land regulations in the area of land administration;
- Knowledge about political systems on the ground where the land tenure recording is supposed to take place;
- Knowledge of the operational (organisational) unit;
- Knowledge about relevant social norms/values/(actual) practices regarding the management of land;
- Basic knowledge about relevant land recording techniques including surveying techniques and coordinating systems;
- Software knowledge and skills such as GIS, Matlab, QGIS, Python as well as database knowledge such as SQL;
- Basic knowledge and skills in photogrammetry, UAV technology, meteorology, and aviation regulations;
- Applied knowledge and skills for using the its4land tools in order to better understand what they do, how they need to be applied and maintained; and
- Ability to understand and interpret geospatial information.

These competencies play a role in the adoption and use of the tools. The third and last source is the selected models presented in Deliverable 7.2. The next section will present them briefly.

3.3 The Selected Governance Models

The selection process for the models can be described in three different steps.

First, we conducted an extensive literature review of contemporary publications on governance and capacity development models. The analysis included the revision of the top 50 cited governance related publications in Web of Science platform.

Second, we narrowed our selection by preselecting those models that were meeting the governance and the needs of the users as described in Deliverable 2.5. This deliverable provided an analysis of relevant land issues, land tenure information needs and the readiness of the selected cases for using the its4land technologies.

Third, this process led us to establish a selection criteria for the models. As presented in Deliverable 7.2, the selection criteria included two key aspects: sustainability of the policy and capacity development. The sustainability of the policy is highly important, since many projects in African countries are funded by donors with a short-term impact. In the sense, capacity development plays a relevant role to support this process with a long-term perspective. The development of capacities can increase the possibilities of both adoption of the technology and a successful implementation.

Sustainability and capacity development are key to overcome current challenges in African countries, such as lack of capacity and short-term impacts when

implementing policies (Casiano Flores et al., 2018). Besides these key aspects we set the following conditions:

1) The models should be adaptable to the East-African context or should have been already applied in African countries. Although, we understand the diversity of the region, we consider that narrowing this aspect, would help us to align our project better with the norms, values and governance structures of the three selected countries.
2) The models should consider topics related to land management and/or technology since the project is about land tenure recording tools and/or
3) The models should be applicable to analyse the hierarchy-market-network relationship. The analysis of hierarchy-market-network, allows an understanding of both the multi-level governance aspects and the different forms of collaboration among citizens, government and private companies.

Our final selection resulted in six models. Considering Osborne's classification, three models can are categorised as "Public governance" and the other three as "Good governance". According to Osborne (2010, p. 6) these two categories can be defined as:

- Good governance: includes normative models regarding social, political and administrative governance; promoted by international organisations such as the World Bank.

- Public governance: is divided in five sub-categories; 1) Socio-political governance (concerned with over-arching institutional relationships); 2) public policy governance (focused on how policy elites and networks create, interact and govern public policy process); 3) administrative governance (focused on the effective application of public administration); 4) contract governance (focused on the governance of contractual relationships in public service delivery), and 5) network governance (focused on networks capable of self-organization with or without the government).

The selected models take into account both categories. Therefore, this selection permits to consider elements from academic literature as well as from international organisations.

As explained in Deliverable 7.2, the three "Public governance" models are:
1) Framework for Understanding Policy Competences and Capabilities (Wu et al., 2015),
2) Conceptual Framework for the Shifts in Modes of Environmental Governance (Driessen, et al., 2012), and
3) The Governance Assessment Tool (Bressers, et al., 2016).

The three "Good governance" models are:
1) Multi-level Governance Assessment of OECD (OECD, 2011),

2) Framework and Guidelines in Land Policy Africa (African Union, African Development Bank, & Economic Commission for Africa, 2010), and
3) Land Governance Assessment Framework (World Bank, 2015).

For more information about the description of each model, see Deliverable 7.2.

The Framework for Understanding Policy Competences and Capabilities, allows us a better understanding of both the relation between hierarchy-market-network mechanisms and the relevance of capacity development (Wu et al., 2015). This framework also takes into consideration the relevant issues related to policy sustainability, capacity development, and information sharing. The Conceptual Framework for the Shifts in Modes of Environmental Governance supports the understanding of the hierarchy-market-network approach. This is important, in order to increase our understanding on the new forms of citizen-government, citizen-private companies and government-private companies collaboration. This environmental model also provides insights in the evolution of the governance model through time (Driessen et al., 2012). The Governance Assessment Tool evaluates the governance arrangements through semi-normative qualities. This assessment tool is capable of identifying the governance factors that can hinder or limit the implementation or adoption of technologies (Bressers et al., 2016).

The Multi-level Governance Assessment - OECD is one of the most influential models worldwide. It has influenced the international agenda regarding specific governance principles such as transparency (Akhmouch & Correia, 2016). The Framework and Guidelines in Land Policy Africa is a governance model that has been derived from an important social agreement regarding normative expectations of Land Governance (African Union et al., 2010). Finally, the Land Governance Assessment Framework model is one of the most developed models applied in Africa and provides a deep understanding of land issues in Rwanda, Kenya and Ethiopia (World Bank, 2015).

This selection of models regarding governance and capacity development has helped us to highlight elements that are common when modelling governance and capacity development for using the its4land tools. The different dimensions and competences have been taken into account in the construction of the initial model. These dimensions will be explained in section 4. In general terms, this selection process formed the foundation for the construction of the IGCDM.

4 its4land Initial Governance and Capacity Development Model

The IGCDM is aligned with the FFPLA approach, through this alignment the IGCDM considers as normative criteria the seven FFPLA elements presented in section 2. This criteria will be used to assess the three building blocks that constitute our initial governance model, which will be explained below. Figure 1 shows the overarching model construction and application process.

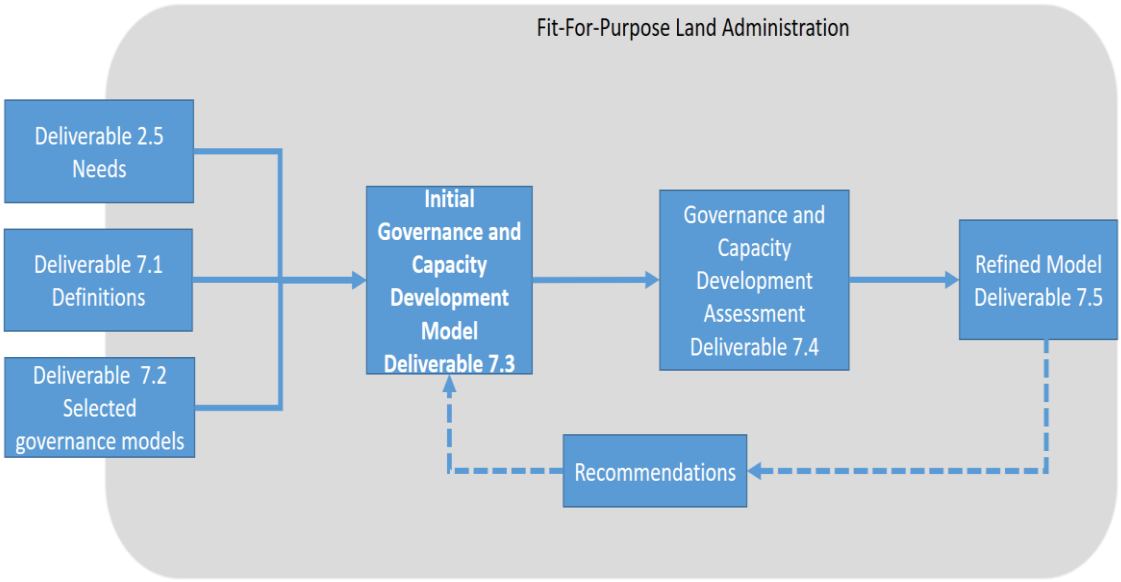

Figure 1. Construction of Governance and Capacity Development Model

As presented in Figure 1 above, the FFPLA approach embraces the process around the IGCDM from its construction to its refinement. This emphasises the relevance that the FFPLA concept has in this process. The first part of the figure shows the three sources introduced in the previous section 3:

1) The needs presented in Deliverable 2.5,
2) Governance and capacity definitions presented in Deliverable 7.1 and
3) Selected models presented in Deliverable 7.2.

The impact of each source for the construction of the initial model will be explained at the next subsection.

The IGCDM is aligned with the FFPLA approach. The description of each building and its alignment with the seven FFPLA elements will be presented in the following subsections. Tables 1, 2 and 3 (see below) will present the FFPLA alignment with the three building blocks that conform our model. These three building blocks are:

1) The tools,
2) The governance context and
3) Capacity development of the actors.

In order to reach the criteria set by the alignment, an assessment is proposed. The assessment will allow an understanding of the current challenges that the adoption process of the tools can face. This assessment implies shifting the FFPLA elements to an evaluation criteria. The assessment will be applied for each building block individually. The assessment for each selected case will be presented in Deliverable 7.4. This assessment will support the development of contextualized recommendations that can help both to overcome the challenges of the adoption process and the refinement of the initial model.

The assessment will include a systematic analysis of the different factors that can affect the adoption of the tools in a specific context. This contextual assessment will take place in Deliverable 7.4. Based on these results, modifications will be made to the initial model in order to refine it for the East African conditions. The refined model will be presented in Deliverable 7.5. The refined model will include recommendations, which implementation will aim to reach the dimensions and competences of the building blocks that are present in the IGCDM. The initial model will be explained further in the following subsections.

4.1 Framework of the Initial Governance and Capacity Development Model

In this Deliverable 7.3, we focus on the left part of Figure 1. Figure 2 shows the three sources that form the foundation of the initial model being 1) The needs from Deliverable 2.5, 2) The definitions of Deliverable 7.1, and 3) The selected models presented in Deliverable 7.2.

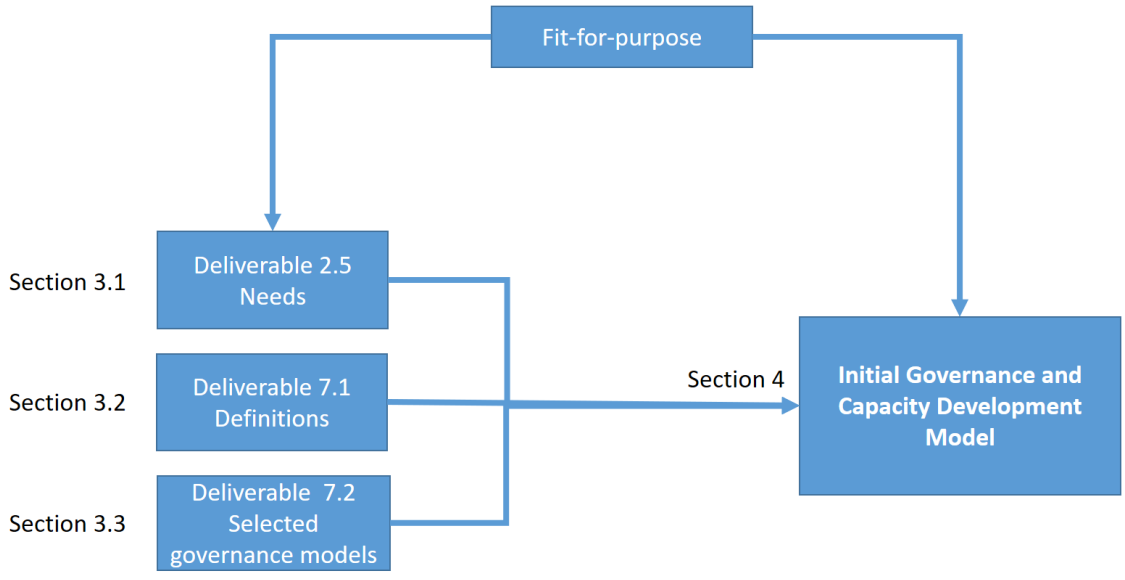

Figure 2. Sources of the Initial Governance and Capacity Development Model

Figure 3 below, presents the building blocks of the IGCDM and their characteristics: 1) Tools, 2) Governance context, and 3) Capacity development at the actors' level. Deliverable 2.5 provided an understanding of the governance and capacity

development needs that require attention in the selected countries when constructing the initial model. This understanding has also permitted a first contextualization of the governance and capacity development issues. The governance and capacity definitions presented in Deliverable 7.1 produced a conceptualization of both terms and in the case of capacity development, it has also supported the operationalization of the concept. The selected models presented in Deliverable 7.2 fed in different degrees the development of the initial model as it will be explained in section 4.2.2.

Figure 3 below also shows the relationship between the three building blocks and the central role of FFPLA. By surrounding the three building blocks around the FFPLA approach, we aim to create an initial model that sets the criteria to assess the three building blocks through the FFPLA lens.

Due to the relevance of the seven FFPLA elements and the aim of its4land, the importance of these elements are at the centre of the model and they form the assessment criteria of each building block. Figure 3 shows the five dimensions that form the governance context, the seven competences that can be employed to understand the challenges of capacity development and the four tools that are included in this project. These five dimensions and the seven competences will be explained in section 4.2. It is important to highlight that each of the three blocks impact each other. For example, the adopted tool is affected by the governance context and the capacity of the actors. An appropriate tool, within a supportive governance context and with capacitated actors is more likely to have a successful adoption.

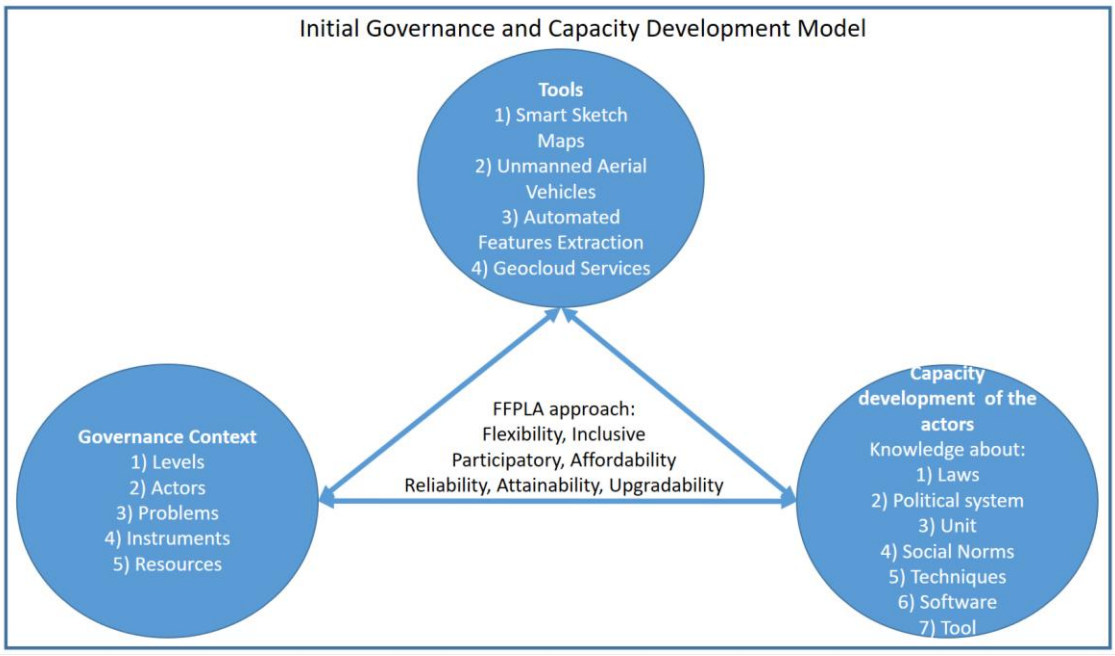

Figure 3. Building blocks of the initial model aligned with the FFPLA approach

4.2 Building Blocks of the Initial Governance and Capacity Development Model

This subsection presents how the seven elements of the FFPLA approach are being aligned with the four its4land tools, the five dimensions of the governance context and the seven competences of capacity development. The five governance dimensions and the seven competences will be explained below.

4.2.1 its4land tools

The IGCDM considers the four tools that are taken into account in the its4land project. Each tool has different governance and capacity development demands. Therefore, Table 1 shows the alignment between the tools and the FFPLA elements. The tools and the FFPLA elements were already introduced in section 2. This table presents the alignment of the seven elements of FFPLA with the four tools. The criteria stablished by the alignment can help to assess the tools from a FFPLA approach perspective.

The first column presents the seven FFPLA elements and the other columns show how each element could be aligned with each tool. In order to complete Table 1, four key researchers/partners who are directly involved in the design and development of the its4land tools. The four researchers were consulted via email. These four researchers can be considered as specialist regarding their tools. They are very familiar with the project since they have been involved in the its4land project from the beginning. In order to receive their input, first we contacted them and shared with them the general characteristics that each tool should have according to the FFPLA literature. These characteristics were based on the seven elements of FFPLA. Based on this information and their experience with the development of the tools, they suggested how their tool should be aligned with the FFPLA elements. We reviewed their suggestions by comparing their answers among each other and with the general characteristics that each tool should have. In some cases we made small modifications in order to present a standardised matrix.

Table 1. Alignment of the its4land tools with the FFPLA elements

FFP conditions	Smart Sketchmaps	Unmanned Aerial Vehicles	Automated Feature Extraction	Geocloud Services
Flexibility	The tool can provide information according to the users' needs	The tool can provide information according to the users' needs. It is flexible in spatial resolution and spectral information	The tool can be applied to delineate different types of boundaries, according to the user needs	The tool can be adapted for different usages and scenarios, according to the user needs
Inclusive	The tool has the capacity to capture the different land tenure practices	The tool has the capacity to cover the different types of land (spatial) information.	The tool supports image based identification and vectorization of visible cadastral boundaries	The tool provides information for registration in land administration systems
Participatory	The community is engaged in the adoption of the tool	The community is engaged in the adoption of the tool	The tool is intuitive and open to be used by different stakeholders	There is participation of the users
Affordability	The adoption of the tool is affordable in cost	The adoption of the tool is affordable	The adoption of the tool is affordable	The adoption of the tool is affordable
Reliability	The collected information could be updated and is recognized by the government	The collected information could be updated and officially recognized by the government	The created information can be updated and is recognized as reliable by the government	The collected information is recognized reliable by the government
Attainability	The SSM adoption can be made with the available resources in an efficient manner	The UAV adoption can be made with the available resources in an efficient manner. Cloud services can support its adoption	The AFE adoption can be made with the available resources in an efficient manner	The geocloud adoption can be made with the available resources in an efficient manner
Upgradability	The SSM could be upgraded by the users according to their needs. They can extend the domain of the models	The UAV's information could be upgraded according to the users' needs by flying again over the same area	The tool is developed in a modular fashion allowing partial adaptation and improvements	The geocloud service could be upgraded by the users according to their needs

From Table 1 we can see that there are differences in the expectations of the four tools. In the case of flexibility, the emphasis has been placed on the capacity that the tools have to be adjusted to the users' needs. The needs of the users should be aligned with the type of information that is expected to be obtained by the tool.

Regarding inclusiveness, some variations can be found since the degree or type of inclusiveness varies according to the technical capabilities of each tool. In this sense, each tool has its own scope. For example, while Smart SkeMa can capture different types of land and tenure practices, UAVs are focused on covering different types of land.

In terms of participation, variations can also be found, while Smart Sketchmaps and Unmanned Aerial Vehicles focus on the participation of the community, meanwhile Automated Features Extraction and Geocloud services are more directly focused on the users' participation.

In the case of affordability and attainability, there is a clear expectation that the tools' adoption can be affordable and efficient.

Regarding reliability, the its4land partners are doing important efforts to provide information that is updated according to the country requirements. However, there are some concerns about the recognition of the information by the government. For example, in Kenya, the information generated by the Smart SkeMa is still not recognized. However, according to the Smart SkeMa expert from our project, it is expected that the information is recognized through the implementation of the Community Land Act.

In terms of upgradability there is also a variation related with the capabilities of the tool, this is similar to the one found in inclusive.

The alignment of the tools with the seven FFPLA elements and their establishment as assessment criteria, is part of our initial efforts to create a Governance and Capacity Development Model. Through the assessment, we will be able to explore the associated limitations of both the elements and the tools. For example: Do the four tools need to cover the seven elements to be FFP? This question exemplifies an aspect that we will have to analyse when applying the initial model in Deliverable 7.4 and when we will refine it in Deliverable 7.5.

After presenting the seven elements aligned with each tool, the next subsection will present the governance context and its alignment with the seven elements of FFPLA.

4.2.2 The governance context

In the case of the governance elements, six models from Deliverable 7.2 were considered as examples for the development of the governance part of the model. From those six models, three were mainly considered for the governance block, since they were the most developed in operational terms. They are: The Governance

Assessment Tool (GAT), The Multi-Level Governance and the Land Governance Assessment Framework. However, the methodological requirements to apply the Land Governance Assessment Framework are challenging. The application of this model requires the leadership of a locally recognized and independent land expert with a large network of governmental and non-governmental actors as well as the creation of teams with technical experts for each of the nine topics of the framework (World Bank, 2015). Despite this, publications based on this model will be taken into consideration as part of the relevant literature, when applying the initial model. In the case of the Multi-level Governance and the Governance Assessment Framework, both share important similarities regarding the governance elements that require attention. Considering these similarities as well as the governance challenges derived from the needs presented in Deliverable 2.5 and summarised in section 3.1 of this document, the GAT dimensions were selected as the main source for the governance block of the initial model. These dimensions include characteristics of modern governance systems (Kuks, 2004). By selecting the GAT dimensions under the FFPLA approach, we are aiming for a model that considers a "Public governance" approach and a "Good governance" approach (See Deliverable D7.2).

The GAT sees governance as 'a context for decision-making and implementation; and it can be both supportive and restrictive for those processes'. The governance context here, assumes the existence of various actors, levels, goals, instruments and different means that can be applied (Bressers et al., 2016). The governance dimensions of the GAT have been applied to compare and to understand governance structures in developed countries such as Belgium, France, Spain, Italy, Spain, Switzerland, Finland, the Netherlands and the United States, (Bressers & Kuks, 2004; Owens & Bressers, 2013) and in developing countries such as Indonesia, Vietnam, South Africa and Mexico (Mohlakoana 2014; Gunawan et al., 2017; Casiano Flores et al., 2017).

Five governance dimensions can be distinguished. The dimensions are multilevel, multi-actor, multifaceted nature of the problems, multi-instrumental, and multi-resources-based. These dimensions are derived from questions that respond to characteristics that feature modern governance systems: Where?, Who?, What?, How and With what? (Kuks, 2004). Adapting the dimensions of governance defined by Bressers and Kuks (2003) for this project result in the following:

- **Levels:** governance assumes a multi-level character of the land recording tool's adoption. This characteristic will allow us to understand the involvement and impact of the different governance levels in the tools' adoption process. The governance levels could be national, provincial and local level.
- **Actors:** governance assumes an involvement of multiple actors in the land recording tools' adoption process. This involvement will allow an understanding of the different actors and the networks involved in the adoption of the tool. They might be not only governmental actors but private companies, non-governmental organizations, universities, and citizens as well.

- **Problems:** governance assumes a multi-faceted character of the problems in the processes of adaptation and use of the land recording tools. This dimension will allow an understanding of the problems that the actors are facing when adopting the tools. The problems' analysis embrace both governmental and non-governmental actors.
- **Instruments (legal):** governance assumes the nature of multiple legal instruments that affect the adoption of the tools. This dimension will allow the identification of legal issues related with the adoption of the tool. The legal instruments are analyzed considering the legal framework composed by national, provincial and local regulations.
- **Resources:** governance assumes the existence of multiple resources to support the adoption of the tools. This dimension will allow an understanding of the different resources that are involved or that are lacking to support the adoption of the tool. This can include financial resources coming from donors or governmental agencies (Bressers & Kuks, 2003).

These five dimensions are being aligned with the FFPLA elements. One of the most important modifications on the governance dimensions corresponds to the instruments. We decided to focus on the instruments from the legal perspective, since as mentioned on Deliverable D2.5, the development or adoptation of a legal framework is one of the most important challenges that the adoptation of the tools are facing. The seven FFPLA elements were adapted in order to be compatible with the five governance dimensions presented above. This adaptation process took into consideration the similarities between the FFPLA elements and the assessment elements of the Governance Assessment Tool. The assessment criteria of the GAT can be found in Deliverable 7.2. This governance block also took into consideration the assessment criteria of the selected governance models (See Deliverable 7.2). Table 2 presents the alignment of the five governance dimensions with FFPLA elements.

Table 2. Governance dimensions aligned with the FFPLA elements

Governance Dimension	Flexibility	Inclusive	Participatory	Affordability	Reliability	Attainability	Upgradability
Levels	Different governance levels, according to the situation, can take a different/changing role to support the adoption of the tool	All the governance levels should be involved to support the tool adoption	All the required governance levels are participating in the adoption process of the tool	The adoption of the tool is affordable for the relevant governance levels involved	All relevant Governance levels support the data authority and the updating processes that could result from the adoption of the tool	The required governance levels can adopt the tool within a short time frame	The required governance levels will support the upgrading and improvement of the tool over time after its adoption
Actors (governmental and non-governmental)	Different actors, according to the situation, can take a different/changing role to support the adoption of the tool	All the relevant actors should be able to support the tool adoption	All the required actors are participating in the adoption process of the tool	The tool is affordable for the relevant actors involved in the adoption of the tool	All relevant actors support the data authority and the updating processes that could result from the adoption of the tool	The required actors can adopt the tool within a short time frame	The required actors will support the upgrading and improvement of the tool over time after its adoption
Problems	There are opportunities to reassess the adoption process, depending on the nature of the problems	All problems' perspectives are being considered regarding the adoption of the tool	There is a participation process to solve the problems related with the adoption of the tool	Different problems regarding the affordability of the tool are taken into consideration for the adoption process	Different problems regarding the authority and updates of the data are taken into consideration for the adoption process	Different problems regarding the adoption of the tool in a short time frame are considered	Different problems regarding the upgradability and improvement of the tool are being considered during the adoption process
Instruments	It is possible to combine different type of governance instruments to adopt the tool	There are all the required governance instruments to support the adoption of the tool	There is a participation process to apply different instruments to support the adoption of the tool	The required instruments are affordable to support the adoption process	The instruments support the authority of the data and its updating processes	The available instruments provide the support to adopt the tool in a short time	Different instruments are available to support the tool's upgrade and improvement after its adoption
Resources	Different types of resources and in sizes can be used to support the adoption of the tools	There are all the required resources to support the adoption of the tool	There is a participation process to exploit different type of resources to support the adoption of the tool	The required resources are affordable to support the adoption process	The resources to support the authority of the data and its updating processes are available	The available resources provide the support to adopt the tool in a short time	Different resources are available to support the tool's upgrade and improvement after its adoption

From Table 2, it can be seen that the governance dimensions present a governance context that allows flexibility from the different dimensions. This includes flexibility from governance levels, actors, the governance instruments (including a legal framework) and the resources required.

Inclusive means the involvement of the actors is required to support the adoption of the tool. This also means that all the problems that the actors face should be included when proposing solutions. The governance instruments should include the most relevant aspects that are required for the adoption of the tools and all the possibilities of resources should be considered.

Participatory at the governance level means that participation should be open to all the actors that can support the tools' adoption. This includes their participation to strengthen the application of the governance instruments, solving adoption problems and to improve financial resources.

Affordability from a governance perspective means that the different actors that are participating in the adoption process can afford the tool's adoption. The relevant actors will also be aware of the problems that different actors can have to afford the adoption of the tools and they can propose changes in the instruments or resources in order to support the tools' adoption.

Reliability means that the actors support the authority of the data produced by the adopted tools as well as the updating processes. The application of the governance instruments as well as resources guarantees the quality of tools' adoption as well.

Attainability from a governance perspective means that actors involved support the adoption of the tool within a short time frame. There are relevant instruments as well as resources that can back up a quick adoption.

Finally, **upgradability** from a governance perspective means that the different actors are taking into consideration the (changing) needs, that tools have to be upgraded and improved over time. Relevant instruments, as well as the resources are being considered during the adoption process in order to support upgrading.

The alignment of the governance dimensions with the seven FFPLA elements, is part of our initial efforts to create a Governance and Capacity Development Model. Through the assessment, we will be able to explore the governance dimensions from a FFPLA perspective. This process will allow us to understand in a systematic way the governance context and to explore the limits that the FFPLA approach might have to understand key governance issues. For example: Do the seven FFPLA elements provide a clear understanding of governance issues when adopting the tools? Do they overlap? Is there a key criteria being missed? These are the type of questions that we will have to consider when applying the initial model in Deliverable 7.4 and when we will refine it in Deliverable 7.5.

After, presenting the building block governance context, the capacity development block will be presented in the next subsection. Capacity development is the third building block of the initial model.

4.2.3 Capacity development of the actors

Actors and their capacity play a relevant role when adopting a new tool. According to our finding in Deliverable D7.1: "The actors involved in capacity development to support the use of the its4land tools are the same actors that are involved in governance of the its4land tools" (Buntinx et al., 2018, p. 18). The analysis of capacities at the actor level can help us to capture adoption challenges at the different levels. The key model of the Capacity Development building block is based on the "Framework for understanding policy competences and capabilities" (Wu et al., 2015). Among the six models introduced in Deliverable 7.2, this model appears to be the most explicit in capacity development aspects. It considers that public managers and policy analysts have a determinant role on the activities they carry out (Wu et al., 2018). This model considers that there are three levels of resources and capabilities: 1) Individual, 2) Organizational and 3) Systemic.

As commented in section 3, competences of the different actors or users will be studied at the actor level. Therefore we have considered that our approach could be benefited if we focus on the individual level of the framework. At this individual level, there are three skills or competences: analytical, operational and political. The analytical capacity of the actor is to diagnose problems and to develop strategies. Operational capacity focuses on the competences and abilities of the actors to perform managerial functions, as well as knowledge about the policy processes. From a political capacity perspective, it involves the ability to take into consideration political aspects (Wu et al., 2018). These three qualities are very relevant and complex to evaluate. Therefore, we decided to operationalise them by considering the competences that correspond to the capacity development competences as presented in section 3.2. These elements are the result of an online survey undertaken to formulate the capacity development definition for the its4land tools. This survey was presented in Deliverable 7.1. We have adapted them for this model to be the competences that will be aligned with the seven elements of FFPLA. The competences are:

- Knowledge about the regulations
- Knowledge about the political systems
- Knowledge about the unit
- Knowledge about social norms
- Knowledge about basic land recording techniques
- Knowledge and skills about the relevant software
- Knowledge about the adopted tool

Considering the "Framework for understanding policy competences and capabilities", the competences above can be categorised as analytical, operational

and political. The analytical category can actually be related with the seven competences. Actors can diagnose problems and to develop strategies for each of them. This means, for example, that the actor can diagnose regulation problems and provide proposals to overcome them. However, when considering operational and political competences as categories, the seven competences that will be used to operationalize capacity development can be segmented as follows:

Operational capacity:

- Knowledge about the regulations
- Knowledge about the unit
- Knowledge about basic land recording techniques
- Knowledge and skills about the relevant software
- Knowledge about the adopted tools

Political capacity:

- Knowledge about the political system
- Knowledge about social norms

Table 3 presents how these seven capacity development competences at the actor level can be aligned with the seven elements of the FFPLA approach. Table 3, in the first column shows the seven competences that resulted from the online survey and which were categorized under the "Framework for understanding policy competences and capabilities" above (Wu et al., 2015).

Table 3. Capacity development competences aligned with the FFPLA elements

Competences	Flexibility	Inclusiveness	Participatory	Affordability	Reliability	Attainability	Upgradability
Knowledge regulations	The actor has the knowledge to steer the adoption process within the current regulations	The actor collaborates with all the other actors that are specified in the regulations for the adoption of the tool	There are participatory mechanisms that allow the actor to obtain new knowledge about the regulations that affect the adoption of the tool and to expose related challenges	The actor has the resources to afford the acquisition of regulation knowledge	The actor has reliable knowledge about the regulations to support the adoption process	The actor has the required regulations knowledge to adopt the tool In a short time frame	The actor will be able to increase her/his knowledge about regulations to meet emerging social needs derived from the adoption
Knowledge of the political system	The actor has the knowledge to steer the adoption process within the current political system	The actor collaborates with political actors that are relevant for the adoption of the tool	There are participatory mechanisms that allow the actor to obtain new knowledge and about political systems that affect the adoption of the tool and to expose related challenges	The actor has the resources to afford the acquisition of knowledge regarding the political system	The actor has reliable knowledge about the political system to support the adoption process	The actor has the required political system knowledge to adopt the tool In a short time frame	The actor will be able to increase her/his knowledge about the political system to meet emerging social needs derived from the adoption
Knowledge of the (operational) unit	The actor has the knowledge of steer the adoption process within the unit she/he works	The actor collaborates with other relevant actors operating in the same unit	There are participatory mechanisms at the relevant unit where the actor can learn and present issues about the adoption of the tool	The actor has the resources to afford the acquisition of knowledge about the unit	The actor has reliable knowledge about the unit to support the adoption process	The actor has the required unit knowledge to adopt the tool In a short time frame	The actor will be able to increase her/his knowledge about the unit to meet emerging social needs derived from the adoption
Knowledge of the social norms	The actor understands the social norms and can use that knowledge to favor of the adoption of the tool	The actor takes into account the different social norms that could affect the adoption of the tool	The actor is involved in participatory mechanisms to be aware of the social norms that could affect the adoption of the tool	The actor has the resources to afford the acquisition of knowledge regarding social norms	The actor has reliable knowledge about the social norms to support the adoption process	The actor has the required social norms knowledge to adopt the tool In a short time frame	The actor will be able to increase her/his knowledge about social norms to meet emerging social needs derived from the adoption
Knowledge about basic land recording techniques (LRT)	The actor shows flexibility to learn about new LRT related with the adoption of the tool	The actor acknowledges all the relevant LRT information to adopt the tool	There are participatory mechanisms where the actor can learn about LRT that facilitate the adoption of the tool	The actor has the resources to afford the acquisition of knowledge about the required LRT	The actor has reliable knowledge about LRT related to the tool and its adoption process	The actor has the possibility of acquiring new knowledge about new LRT within a short time frame to support the adoption of the tool	The actor will be able to increase her/his LRT knowledge to meet emerging social needs derived from the adoption
Knowledge and skills about relevant software	The actor shows flexibility to learn about the use of new software related with the adoption of the tool	The actor has a comprehensive competences regarding the use software that can support the adoption of the tool	There are participatory mechanisms where the actor can learn about the use of software that can facilitate the adoption of the tool	The actor has the resources to afford the acquisition of competences about the use of the software	The actor has reliable competences about the use of software related to the tool and its adoption process	The actor has the required software competences to adopt the tool In a short time frame	The actor will be able to increase her/his competences about software to meet emerging social needs derived from the adoption
Knowledge and skills about the tool	The actor shows flexibility to learn about the use of new tool	The actor shows a comprehensive competences that can support the adoption of the tools	There are participatory mechanisms where the actor can learn about the use of the tool to facilitate its adoption	The actor has the resources to afford the acquisition of competences about the use of the tool	The actor has reliable competences about the use of the tool and its related adoption process	The actor has the required tool competences to adopt the tool In a short time frame	The actor will be able to increase her/his competences about the tool to meet emerging social needs derived from the adoption

Table 3 presents the capacity development competences aligned with the FFPLA elements. Based on Table 3, we can state that **flexibility** is related with the capacity of the actors to apply their knowledge about the regulations, political system, operational work units, social norms, basic land recording techniques, software and the tools to steer the adoption process of the its4land tools.

Inclusive focuses on the actors' capacity to involve and consider other relevant actors' problems in legal, political and social terms. The actors also should have a comprehensive competence about software that are relevant for the tool and about the tool itself.

Participatory relates with the existence of participation mechanisms where the actors can learn and be aware of issues regarding the regulations, political system, social norms, basic land recording technique, software and the its4land tool.

Affordability means that the actor has the resources to afford the acquisition of new knowledge (and skills) in terms of the regulations, political system, social norms, basic land recording techniques, software and the its4land tools.

Reliability is related with the trustworthiness of the quality of knowledge that the actors has or can receive about the seven conditions.

Attainability means that the actor has the required competences about the regulations, political system, social norms, basic land recording techniques, software and hardware, to support the adoption of the tool within a short time frame.

Finally, **upgradability** in terms of capacity development means that the actors have the capacity to increase or to update their knowledge on the seven conditions that conform the capacity development part of this model.

This section of Deliverable 7.3 provided detailed information about the three building blocks of the IGCDM. Now, the final remarks are presented in the next conclusion section.

5 Conclusion

The objective of this Deliverable 7.3 is to create an initial version of the its4land Governance and Capacity Development Model. The three building blocks presented here will allow an assessment of the its4land tools, the governance context and capacity development at the actor level.

Setting the criteria to assess the its4land tools will provide us the opportunity to understand the governance and capacity development limitations of the tools when attempting their adoption. In this sense the assessment of the tools based on the FFPLA approach can play a key role to understand both the potential of adoption of the tool and which characteristics of the tools from a governance and capacity development perspective are more adequate when those new tools are being adopted. The understanding of the governance context can facilitate the adoption process of the tools. It will facilitate the provision of the recommendations at different levels. In this regard, we are proposing an initial model where different governmental levels and actors can be integrated to its full potential. From a capacity development perspective, the FFPLA elements can support an assessment of the unit regarding tasks, units involved, decision-making processes, and roles that can support the end-user needs. Capacity deficits at the actor level may influence capacity development at another level. A diagnose of the available capacity by distinguishing between the types of governance arrangements and the available capacity will facilitate the adoption of the tools. In order to provide a clear understanding of the challenges and opportunities of the tools' adoption process, it is important to set the assessment criteria for the three building blocks of this initial model.

The assessment process will be presented in the Deliverable 7.4. called "Review and apply the governance and capacity development models in Ethiopia, Kenya, and Rwanda". In Deliverable 7.4 we will apply the criteria of Tables 1, 2 and 3 to assess the three building blocks for the different cases. The assessment will consider the contextual factors of each selected case (country). Therefore, it is expected that the its4land tools' requirements, the governance context arrangement and the capacity development needs have variations across the cases. These variations will allow the identification of local opportunities in order to support an adoption process that really considers the local needs. By identifying local opportunities, we will be able to refine our governance model. The refinement of the model will be presented in Deliverable 7.5; the final deliverable of this WP. The refined model will include proposals which implementation will aim to reach the set criteria aligned with the dimensions and competences of the building blocks that are present in the Initial Governance and Capacity Development Model.

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