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Challenges and Opportunities in A Fit - For Purpose Cadastre

The FFP Approach in Land Governance Shaping our contribution to society

Session 2
Kano, Nigeria 1st - 3rd July 2019

The Future We want to shape

Sustainable and holistic development:

- **People:** Responsible government of tenure
- **Partnership:** Rapid urbanisation, managing land use
- **Peace:** Human rights and equality
- **Planet:** Climate change and natural disasters
- **Prosperity:** Economic livelihoods, land and property

A Purposeful and **Continuing Shift in how we operate**

Transforming Our World

It is all about People!

- **The 2030 Agenda:** agreed and united global policy to transform t**he** social, economic and environmental **dimensions of humanity and our planet**

- It is clear that our world is at the apex of an enormously creative and innovative shift that will result in profound changes to the everyday lives of people across the world.

Overview

Two Parts:

1. Fit for Purpose Approach:
Why, What and How

2. You!
A catalyst in
SDG 2030 Agenda

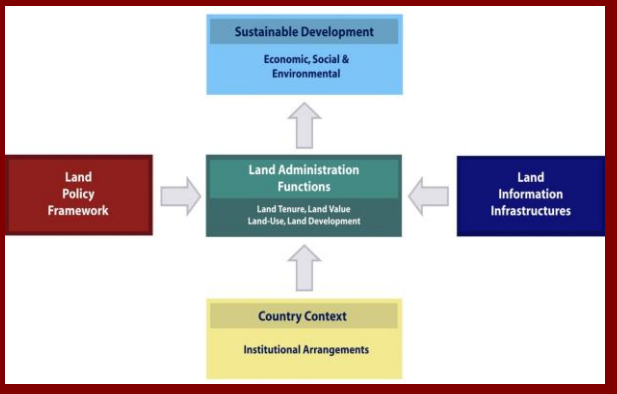
Overview

A Fit for Purpose Approach:

1. Why – Land Governace
2. What – the FFP Guide
3. How- The FFP frameworks

Material drawn from Dumashie/ Enemark, Rwanda 2017

1. Why: Land Governance



The land management paradigm- Prof Enemark, et al

Land governance is about the policies, processes and institutions by which land, property and natural resources are managed.

This includes decisions on access to land; land rights; land use; land development.

Land governance is about determining & implementing sustainable land policies.

Land Governance, Supporting the 2030 Global Agenda

Meeting the Sustainable Development Goals

Land governance to underpin the core components of the global agenda

Trustable land information and good land administration is fundamental for:

- Responsible governance of tenure
- Managing the use of land
- Coping with climate change
- Enforcing equity and human rights
- Achieving sustainable development

The Global Agenda

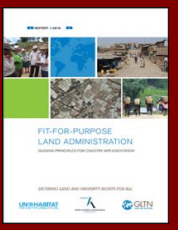
Promoting human rights and gender equity

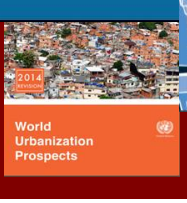
Applying responsible governance of tenure

Climate change mitigation and adaption

Rapid urbanisation and slum upgrading

Applying the social tenure domain model





Building Fit-For-Purpose LA systems - fast, affordable and upgradeable.

Benefits to Society

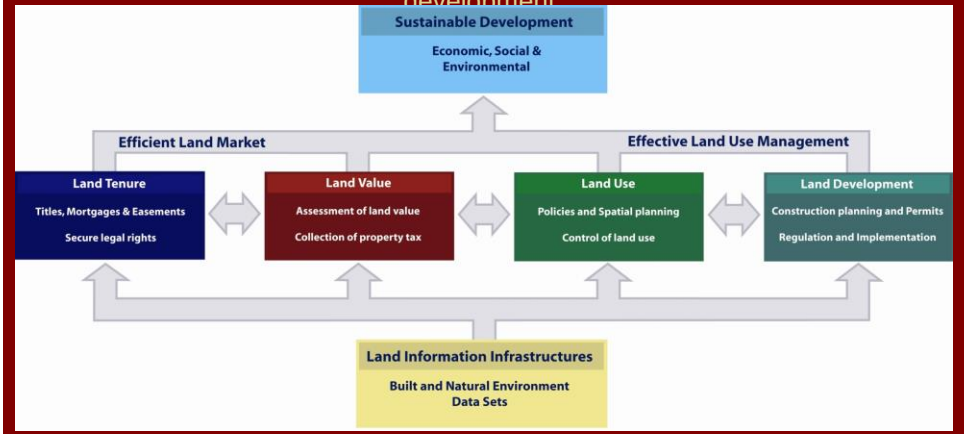
• Support for governance and the rule of law		• Protection of state lands
• Alleviation of poverty		• Management of land disputes
• Security of tenure		• Improvement of land use planning
• Support for formal land markets		• Development of infrastructure
• Security of credit		• Management of resources and environment
• Support for land and property taxation		• Management of information and statistical data

http://www.esri.com/landing-pages/industries/land-administration/e-book#sthash.0LYolX4m.dpbs

Williamson, Enemark, Wallace, Rajabifard, ESRI Press, 2010, 500 pages.

Land Administration Systems

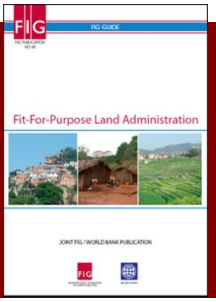
Land Administration Systems provide the infrastructure for implementation of land polices and land management strategies in support of sustainable development



Land Tenure: Allocation and security of rights in lands; legal surveys of boundaries; transfer of property;
Land Value: Assessment of the value of land and properties; gathering of revenues through taxation;
Land-Use: Control of land-use through adoption of planning policies and land-use regulations at various levels;
Land Develop: Building of new infrastructure; implementation of construction works and the change of land-use

Meeting the Global Agenda

- **"**There is an urgent need to build systems which can identify the way land is occupied and used and provide security of tenure and control of the use of land**"**.
- **"**When building such systems the focus should be on a **"fit-for-purpose approach"** that will meet the needs of society today and can be incrementally improved over time**"**.



http://www.fig.net/pub/figpub/pub60/figpub60.htm

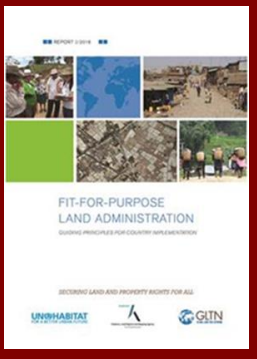
FIG /WB Declaration

A **fit-for-purpose** approach includes the following elements:

- **Flexible** in the spatial data capture approaches to provide for varying use and occupation.
- **Inclusive** in scope to cover all tenure and all land.
- **Participatory** in approach to data capture and use to ensure community support.
- **Affordable** for the government to establish and operate, and for society to use.
- **Reliable** in terms of information that is authoritative and up-to-date.
- **Attainable** to establish the system within a short timeframe and within available resources.
- **Upgradeable** with regard to incremental improvement over time in response to social and legal needs and emerging economic opportunities.

FIG/WB, 2014

2. What: Fit For Purpose – A Guide

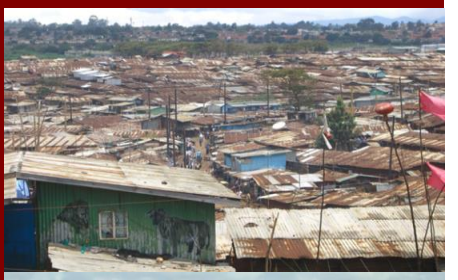


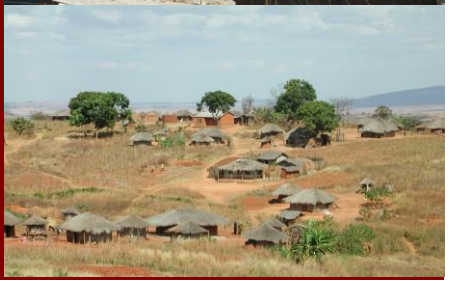
In the context of this guide, the term FFP' means:

- Applying the spatial, legal and institutional methodologies that are most fit for the purpose of providing secure tenure for all.
- This approach will enable the building of national land administration systems within a reasonable time and at affordable costs.
- The system can then be incrementally improved over time.

Fit-For-Purpose – why it is needed

- **The cadastral gap:** Only about 40 countries in the world have well functioning land administration systems In most developing countries less then 10 per cent of the land is included in formal systems.
- **Limitations:** Western style systems are too costly and too time consuming and capacity demanding – and they do not serve the millions of people whose tenure are predominantly social rather than legal.
- **Benefits:** A Fit-For-Purpose approach will ensure that basic and appropriate land administration systems are built within a relatively short time frame and at affordable costs … they can then be incrementally improved over time.





"From 30% of the world covered by secure tenure in 2015 to 80% in 2030"

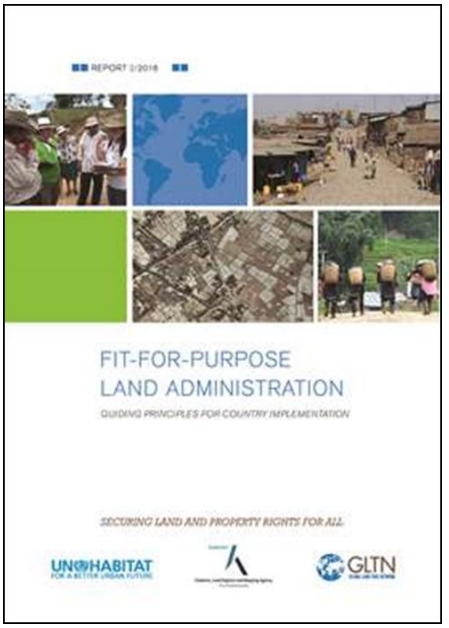
Fit-For-Purpose – what is it ?

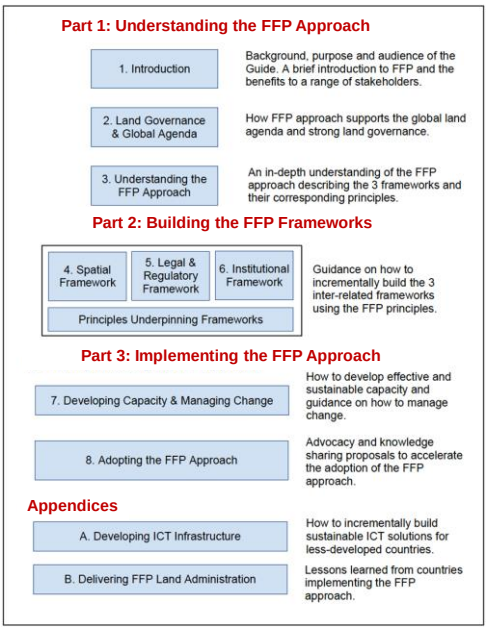
- **Fit-for-purpose:** The systems should be designed for managing current land issues – and not guided by high tech solutions and costly / time consuming field survey procedures.
- **Basic purposes:** Include all land; provide secure tenure for all; and control the use of land.
- **Flexibility:** Scale and accuracy relate to geography, density of development, and budgetary capacity
- **Incremental improvement:** Advanced Western style concepts may well be seen as the end target but not as the point of entry.
- **Good practice:** Rwanda leads the way with about 10 million parcels demarcated and registered in about five years - unit costs of 6 USD per parcel

Denmark

"As little as possible – as much as necessary"

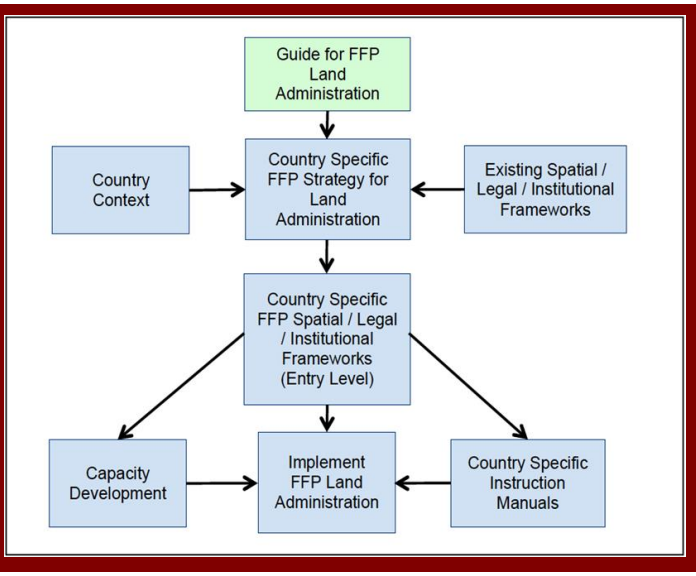
Fit-For-Purpose Land Administration –Guiding Principles





Guiding Principles

for Building Country Specific Land Administration Solutions.



Fit-For-Purpose Approach

3 Fundamental Characteristics
- Focus on Purpose
- Flexibility
- Incremental Improvement

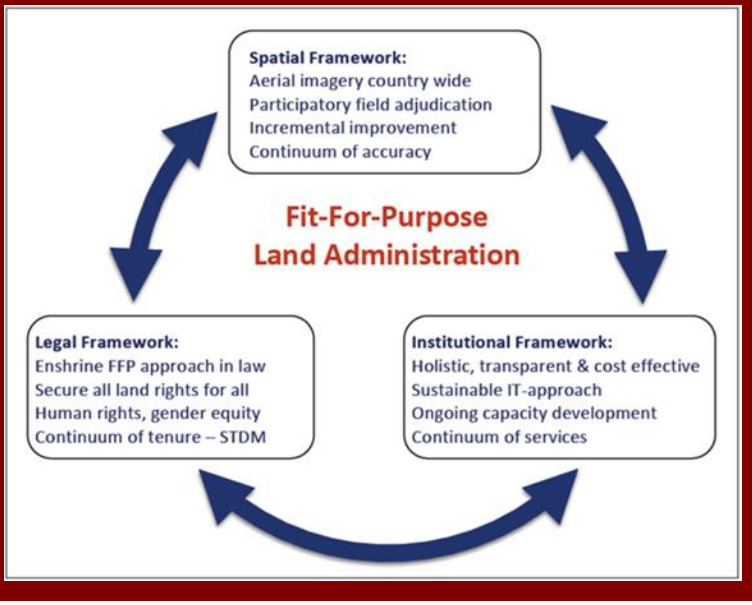
Fit-For-Purpose Concept
3 Core Components
- Spatial Framework
- Legal Framework
- Institutional Framework

Each Framework has
4 Key Principles

- **Focus on Purpose:** Focusing firstly on the "what" in terms of the end outcome and then designing the "how" to be the most "fit" for achieving the purpose.
- **Flexibility:** It is about flexibility in terms of demands for accuracy; for recording of a range of different tenure types, and for shaping the legal and institutional framework to best accommodate societal needs.
- **Incremental improvement:** A Fit-For-Purpose approach will ensure that basic and appropriate land administration systems are built within a relatively short time frame and at affordable costs … and the systems can then be incrementally improved over time..

Fit-For-Purpose Land Administration

Guiding Principles for Country Implementation



KEY PRINCIPLES		
Spatial Framework	**Legal Framework**	**Institutional Framework**
▪ Visible (physical) boundaries rather than fixed boundaries ▪ Aerial / satellite imagery rather than field surveys ▪ Accuracy relates to the purpose rather than technical standards ▪ Demands for updating and opportunities for upgrading and ongoing improvement	▪ A flexible framework designed along administrative rather than judicial lines. ▪ A continuum of tenure rather than just individual ownership ▪ Flexible recordation rather than only one register ▪ Ensuring gender equity for land and property rights.	▪ Good land governance rather than bureaucratic barriers ▪ Holistic institutional framework rather than sectorial siloes ▪ Flexible IT approach rather than high-end technology solutions ▪ Transparent land information with easy and affordable access for all

Fit-For-Purpose Land Administration
Spatial
From: Sporadic field surveys
To: Visible boundaries on aerial imagery covering all land
Legal
From: Focus on land titling
To: Recording legal as well as legitimate land rights for all
Institutional
From: Serving mainly the elite
To: Responsible land governance with equal access for all

Building FFP Land Adm. Systems: Before and After

Before	After
Limited range of tenure types supported.	Rather than exclusively focusing on individual land titling process, a continuum of land rights approach is supported.
Specification for high accuracy surveys mandated in regulations.	Flexible regulations accommodating a range of methods to measure and record special unit boundaries, including visual boundaries.
Licenses restricting operations in the land sector.	A range of stakeholders can legally operate in the land sector, including locally trained land officers acting as trusted intermediaries.
Predominantly judicial only processes.	The majority of land transaction processes are administrative.
Gender inequity.	The legal framework and associated processes are gender sensitive.
Fragmented land institutions.	Land administration institutions are integrated and coordinated.
Lack of information in the delivery of land administration services.	All stakeholders have access to reliable land information within the constraints of privacy.
Insufficient capacity to sustain land administration solutions.	Capacity of stakeholders is enhanced.
Private sector excluded from participation in the land sector.	Public-Private partnerships are improved.

Rwanda – leads the way

10 million parcels demarcated, adjudicated and registered in about five years
Unit costs were about 6 USD per parcel

Fit-for-purpose land administration:

- Flexible
- Inclusive
- Participatory
- Affordable
- Reliable
- Attainable
- Upgradeable

FAQs

for adopting and understanding the Fit-For-Purpose Approach

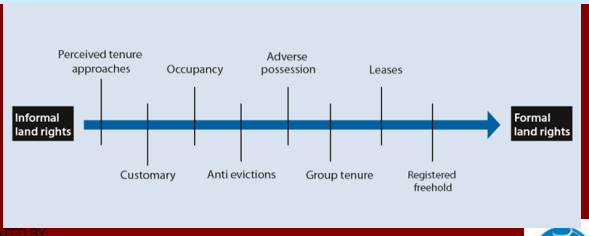
1. Why would politicians be attracted to adopting the FFP approach?
2. Why should developing countries not use state of the art technology to build highly accurate land administration solutions as in developed countries?
3. What are the biggest challenges in adopting the FFP approach?
4. What is the difference between conventional cadastral systems and the FFP land administration solution – and what are the benefits?

3. How : The Frameworks

What is the continuum of land rights

•"embracing the complexity of a diversity of appropriate tenure rights"

- **An alternative to just focusing on land titling**
- **Rights to land are regarded as lying on a continuum between informal and formal**
- **In between these lie a wide and complex range of rights**
- **Tenure can take a variety of forms along this continuum**
- **The rights do not lie on a single line, and they may overlap with one another**
- **Registered freehold should not be seen as the preferred or ultimate form – it is one of a number of appropriate and legitimate forms (customary, leasehold, group tenure, others)**
- **The most appropriate form depends on *context***



FACILITATED BY:

UN-HABITAT FOR A BETTER URBAN FUTURE

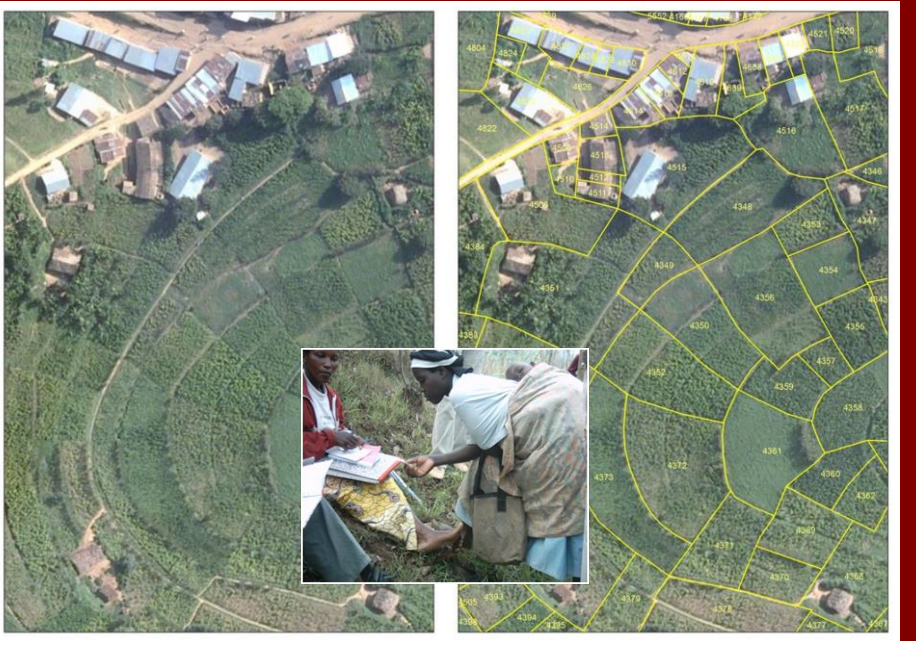
GLTN GLOBAL LAND TOOL NETWORK

Building the Spatial Framework
- a continuum of accuracy

- Visual boundaries rather than fixed boundaries
  - Visual (General) boundaries will be sufficient for most land administration purposes..
- Aerial/ satellite imageries rather than field surveys.
  - Aerial imageries are 3-5 times cheaper and less capacity demanding than field surveys.
  - Aerial imageries provide not only the framework of the parcels but also the general topography to be used for a range of land administration functions

- Accuracy relates to the purpose rather than technical standards
  - Accuracy should be seen as a relative term related to the use of the information
- Opportunities for updating, upgrading and improvement
  - Building the spatial framework is **not** a one stop process
  - In turn, incremental improvement will establish a fully integrated land administration system.
    - This could be named as a **"Continuum of Accuracy"**

Building the Spatial Framework



Building the Legal Framework
- a continuum of tenure

- A flexible framework designed along administrative rather than judicial lines
  - The legal framework needs to be flexible and managed through administration rather than court decisions..
- A continuum of tenure rather than just freehold.
  - The **STDM** concept should be applied to ensure that legal as well as social tenure be secured independent of formality and technical accuracy.

- Flexible recordation rather than only one register
  - The FFP approach will require a flexible recordation system.
  - Applying the continuum of land rights will require innovative pro-poor recordation systems
- Ensuring gender equity for rights in land
  - Women make two thirds of the worlds poor.
  - Women's access to land must be seen as a universal human right.

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Gender equity

Building the Institutional Framework
- a continuum of services

- Good land governance rather than bureaucratic barriers.
  - The term “good governance” includes for government to be legitimate, transparent, accountable, and dedicated to integrity
  - Applying the FAO Guidelines on Responsible Governance of Tenure.
- Integrated institutional framework rather than sectorial siloes
  - Focusing on treating land and natural resources as a coherent whole
- Flexible IT-approach rather than high–end technology solutions
  - Clear description of mandates, work processes and responsibilities
  - Alternatives such as open source solutions should be considered.
- Transparent land information with easy and affordable access for all
  - Applying an open data policy – subject to the protection of privacy.

Building the spatial framework

A three step process:

I. Producing the aerial imagery at scales according to topography, use, and building density.

Ii The aerial imagery will be used in the field to identify, delineate and adjudicate parcel boundaries (general boundaries), which can be drawn directly on the imagery and the parcels be numbered for reference to the connected land rights

Iii The resulting boundary framework can be digitised from the imagery to create a digital cadastral map to be used as a basic layer in the land information system or in combination with the satellite imagery.

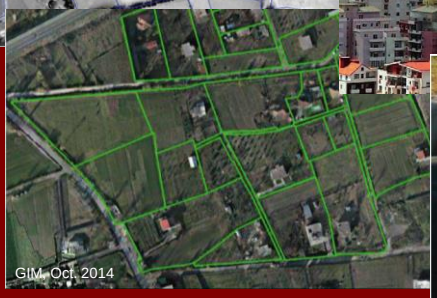
Using aerial imageries for participatory field adjudication

Orthophoto used as a field work map sheet with a georeferenced grid. The map shows the delineated parcel boundaries and parcel identification numbers.

Vectorised field map showing the resulting cadastral map with parcel boundaries and cadastral numbers.

Source: Zerfu Hailu, Ethiopia

From aerial images to cadastral index maps



Cadastral Index Mapping - Cambodia

Pilot Project, Gresik District, East Java, Indonesia

- Land parcels boundaries delineated at high resolution imagery
- 3000 parcels mapped and tenure evidence collected by three teams over 12 days using locally trained land officers
- Political will from the government - but the debate is ongoing

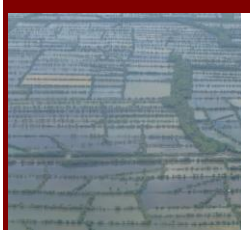
Indonesia

Current key issues:

- Sporadic registration with measurement and boundary marking of individual parcels
- Demands for accuracy of measurement and area
- Fragmented sectors for land tenure, land value and land use
- Lack of capacity and land professionals

FFP solutions:

- Systematic registration with aerial mapping and participatory land adjudication.
- Visual boundaries and areas calculated on the map
- Integrated land management based on a one map policy.
- Use of locally trained land officers acting as trusted intermediaries.



- **Area:** 1.9 mill km2 ; Population: 255 mill;
- **Administration:** 36 districts - divided into regencies, districts and villages,
- **Land parcels:** 120 mill of which 40 mill are registered and only 20 mill are mapped.
- **The President:** Registration of 5 mill in 2017, 7 mill 2018 and 9 mill 2019.

TABLE 4.1: MAPPING APPLICATIONS FOR URBAN AND RURAL LAND (ADAPTED FROM BYAMUGISHA ET AL., 2012).

Area	Mapping applications
Urban central High density, high value	Dense development and very high land values require large-scale mapping to be performed by conventional terrestrial surveys or large-scale image maps with a preferred scale of 1:500 – 1:2,000.
Residential urban Medium density, high value	In residential areas, the dwellings and parcels are normally easily identified in image maps imagery to a scale of 1:1,000 – 1:2,000.
Peri-urban Mixed density, good value	Peri-urban areas include a mix of land uses that will require image maps to a scale of 1:2000 – 1:5000 depending on the density and complexity of developments.
Informal/slum Very high density	Slum areas can be mapped for many purposes. An option is use UAVs for mapping to a preferred scale of say 1:500 – 1:2,000. Individual housing structures can then be identified for administration and service delivery.
Small towns, villages High density, low value	Rural villages may be mapped separately e.g. using UAV to a scales of 1:2,000, or they may be mapped as part of a major rural area
Rural agricultural Medium density, good agricultural value	In rural agricultural areas, the individual parcels will normally be visible on satellite image maps to a scale of 1:2,000 – 1:5,000.
Rural remote, forest Low density, low value	Mapping more remote rural areas may serve various purposes, such as land rights, natural resource management, water catchment, etc. Satellite image maps to a scale of 1:5,000 – 1:10,000 will normally be sufficient.
Rural mountainous	Mountainous areas can be covered by satellite image maps to a scale of 1:5,000 – 1:50,000 depending on the topography and settlement activity.

Updating and Upgrading

- The requirement for on-going, **updating** procedures is essential in order to ensure that all data are complete and reliable. The maintenance processes must start from day one.
  - **Subdivision** and alteration of boundaries must be recorded either through simple measurements related to the existing boundaries, or through provision of new imagery, e.g. by using UAVs once the boundaries are established in the field.
- The opportunity for **upgrading** should be adopted wherever relevant or needed e.g. by providing an improved map-base for planning and implementation of land development activities such as major construction works and implementation of major infrastructure
  - **Upgrading** activities may also be adopted as part of a strategy for a more general improvement of the base of information with regard to land and the natural environment

The Spatial Framework:

- Principles
- Actions
- Outcome

(p.37)

Building the Spatial Framework

Principles	Action	Outcome
1. Visible boundaries rather than fixed boundaries	1.1 Adopt a visible boundary approach to determining the land parcels/spatial units as demarcated by physical features in the field that can be identified on aerial/satellite imagery.	Agreed field procedures for building the spatial framework showing the individual spatial units.
	1.2 Allow for non-visible boundaries to be captured by simple field surveys	Agreed field procedures for when and how to use simple field surveys.
	1.3 Allow for boundaries to be recorded as fixed when relevant and paid for by the parties.	Regulations to create fixed boundaries.
2. Aerial /satellite imagery rather than field surveys	2.1 Use aerial/satellite imagery to produce the mapping of the land parcels/spatial units	A nationwide imagery coverage at various scales.
	2.2 Use a community participatory process to identify the physical parcel boundaries on the on a print of the imagery.	Field procedures for adjudication to determine land rights connected to the individual spatial units.
	2.3 Digitize the identified boundaries from the field map to produce a vectorised cadastral map.	Digitized spatial units managed in a land information infrastructure.
	2.4 Store the original field map to be used as evidence in case of future land conflicts.	Archive containing the original field maps.
3. Accuracy relates to the purpose rather than technical standards	3.1 Adopt adequate level of accuracy for variations in density of settlements and topography.	Appropriate scale of imagery for regions of the country.
	3.2 Adopt adequate levels of accuracy for the functions of land tenure, land value, land use and land development.	Appropriate scales of imagery for managing the land administration functions.
4. Demands for updating and opportunities for upgrading and ongoing improvement	4.1 Adopt a capacity development strategy upfront to ensure that the necessary capacity is available for maintaining the system.	National capacity development strategy for land administration
	4.2 Adopt measures for updating and maintenance of the system related to transfer, inheritance, etc.	Set of regulations to ensure and support maintenance of the system.
	4.3 Adopt procedures for upgrading and on-going improvement of the spatial framework.	Set of regulations for upgrading the spatial framework.

Facilitating Change

- Challenges and opportunities
- Best Practice: An implementation history is evolving (Uganda, Indonesia, Rwanda etc)
- Above all, practitioners and educators to lead the way

- The FFP guide addresses FAQ's in each section

FAQs for building the Spatial Framework (p. 38)

1. Will citizens accept visible boundaries identified on an aerial/satellite imagery as a definition of their land unit boundaries rather than a surveyed boundary?

What is important is the physical appearance of the parcel as it is represented by its natural features. Evidence shows that the incidents of boundary and ownership conflicts relate mainly to inheritance, fraud and eviction rather than boundary issues (Zevenbergen and Bennett 2015). In terms of registration, enquiries could determine dimensions and boundaries of the parcel, but in general, these are not necessary for providing security of tenure. What is necessary is that each parcel is identifiable in relation to neighbouring parcels and preferably also geo-referenced.

2. Is a geodetic framework provided by a network of Continuously Operating Reference Stations (CORS) not a prerequisite for FFP?

National geodetic reference frames are the prerequisite for positioning, geo-referencing, and application of geo-spatial technologies, which are essential for supporting the land-based production of goods and services as well as the planning and development of physical infrastructures. They are also the foundation on which a national spatial data infrastructure is built. However, a network of CORS is not a direct prerequisite for applying a FFP approach to building a national land administration system. In the FFP approach, the spatial framework is built by using aerial/satellite imagery for identifying the individual spatial units, and the production of such a spatial framework does not require a network of CORS as a prerequisite. High geodetic accuracy may well be seen as the end target – but not as the point of entry.

3. Can the FFP spatial framework be used for other land administration functions apart from the recordation of land rights?

The FFP spatial framework is built using aerial/satellite imagery rather than field surveys. The spatial framework shows the way land is divided into spatial units for specific use and occupancy and thereby combines the legal rights to lands with the general topography. This provides the basis for dealing with not only recordation and management of legal and social tenure, but also: valuation and taxation of land and properties; planning and control of current and future use of land, implementation of development schemes; delivery of utility services; and administration and protection of natural resources. The FFP spatial framework therefore provides the basis for management of the four land administration functions: land tenure, land value, land use, and land development.

FAQs for building the Spatial Framework

1. Will citizens accept visible boundaries identified on an aerial / satellite imagery as a definition of their land unit boundaries rather than a surveyed boundary?
2. Is a geodetic framework provided by a network of Continuously Operating Reference Stations (CORS) not a prerequisite for FFP?
3. Can the FFP spatial framework be used for other land administration functions apart from the recordation of land rights?

FAQs
for adopting the Fit-For-Purpose Approach
(p. 8)

FREQUENTLY ASKED QUESTIONS

1. Why would politicians be attracted to adopting the FFP approach?

Security of tenure should be a key component of national reform programmes but current land administration systems have not delivered. Politicians are wary about integrating security of tenure components into their political programmes and subsequently not delivering the benefits to their electorate. This is compounded by national tenure security projects that take decades to deliver national solutions outside the election cycle.

The FFP approach to land administration provides politicians with affordable and inclusive solutions that are attainable within a relatively short time. The approach is highly participatory and citizens immediately obtain the benefits.

2. Why should developing countries not use state of the art technology to build highly accurate land administration solutions, as in developed countries?

Within the FFP approach, the use of state of the art positioning and surveying technology may be required to support some land administration activities. However, in most developing countries there are insufficient trained personnel and financial resources and, in fact, the majority of properties, especially in rural regions, do not require high accuracy solutions to define boundaries for land rights.

The FFP approach advocates the predominant use of imagery to identify and record visible boundaries. This technique is cost effective, does not need highly trained professionals or expensive equipment and is therefore scalable. These initial FFP boundaries can be upgraded in terms of the quality and scope of evidence of land rights information when required. It should be remembered that this is how most of the land administration solutions in developed countries evolved over several centuries.

FAQs
for understanding the Fit-For-Purpose Approach
(p. 21)

FREQUENTLY ASKED QUESTIONS

1. What are the biggest challenges in adopting the FFP approach?

There are three key challenges confronting countries implementing the FFP approach. The first centres on the adoption of a new paradigm that is not driven by state-of-the-art positioning and surveying technology and the seduction of higher and higher accuracy. This requires a mind-set change across a very conservative set of land professionals and an effective change management strategy. The second relates to revising the legal and regulatory framework to provide the required flexibility to accommodate the FFP approach. Changes to laws can be problematic and time consuming, and politicians need to be well briefed on the need for change. The final key challenge focuses on the need to build scale quickly through effective capacity building. The FFP approach is dependent upon building a network of locally trained land officers to create a critical mass of resources to quickly build and maintain national land administration systems.

2. What is the difference between conventional cadastral systems and the FFP land administration solution – and what are the benefits?

While conventional cadastral systems use high accuracy field surveys of the individual land parcels based on standards and regulations, the FFP approach uses large-scale aerial or satellite imagery showing the way land is divided into spatial units (parcels and plots) for specific use and occupancy. While conventional cadastral systems use documentation of the surveyed parcel as a basis for entering rights into a land registry, the FFP approach uses the aerial or satellite imagery in the field to identify, delineate and adjudicate the visible parcel boundaries, and the rights (whether legal or legitimate) are determined and entered directly into a register. This is a participatory approach undertaken by locally trained land officers and involves all stakeholders. Furthermore, while conventional cadastral systems are highly standardized, the FFP approach is flexible in terms of accuracy and also in relation to the variety of tenure types to be secured.

The FFP approach focuses on the purpose of the systems, such as providing security of tenure for all and managing the use of all land. The land administration system can then be upgraded and incrementally improved over time in response to social and legal needs and emerging economic opportunities. Benefits arise by achieving a functional system encompassing all land and people within a short time, for relatively low cost, and supporting incremental improvement when relevant and required. This will enable the achievement of political aims and objectives in relation to economic growth, social and gender equity, and environmental sustainability.

The process and principles for building the spatial, legal and institutional framework are presented in the following Part 2, Chapters 4 to 6.

FAQs
for understanding the Fit-For-Purpose Approach

1. Why would politicians be attracted to adopting the FFP approach?
2. Why should developing countries not use state of the art technology to build highly accurate land administration solutions as in developed countries?
3. What are the biggest challenges in adopting the FFP approach?
4. What is the difference between conventional cadastral systems and the FFP land administration solution – and what are the benefits?

Thank You

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