

ILMS INTERNATIONAL
LAND
MEASUREMENT
STANDARD

International Land Measurement Standard: Due Diligence for Land and Real Property Surveying

International Land Measurement Standard Coalition





International Land Measurement Standard: Due diligence for Land and Real Property Surveying

International Land Measurement Standard Coalition

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1st edition

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1 Introduction

Land is a vital and limited national resource. Yet in many countries there is currently a lack of transparency both in land rights and land interests. The lack of transparency often becomes more apparent during the land transfer process.

In many developing and developed countries, large tracts of land are held on an informal basis. This may result in people living with insecure tenure and the effects of opaque interests. This can make it extremely difficult to achieve the UN Sustainable Development Goals (SDGs) that support good land administration. (The UN SDGs are included in *Appendix A* of this standard.)

ILMS: Due diligence for Land and Real Property Surveying is a land measurement standard that supports a sustainable future both for people and legal entities. **ILMS** is both a standard and a due diligence framework to enable evidence-based assessment of land and property and is designed to address the current lack of transparency in land rights and land interests.

ILMS is divided into five parts. The introduction details the standard's development and the drive behind it. Part 2 provides additional context around land information systems, the application of the standard and links with other international standards. Parts 3 and 4 cover the components that make up the due diligence framework and give examples of how this may be completed in both data rich and data poor environments. Key terms are then defined in part 5.

1.1 ILMS Coalition

The International Land Measurement Standard Coalition (the Coalition) is a non-governmental, not-for-profit coalition of land professionals from over 30 not-for-profit member organisations. The Coalition formed in 2016 after a meeting at the UN's Food and Agricultural Organisation (FAO). The Coalition aims to bring about consistent due diligence for land and real property surveying globally. This is to be achieved through the creation and adoption of **ILMS**.

The Coalition has not identified any pre-existing standard relating to 'due diligence for land and real property surveying' that would be suitable for adoption on a global basis. The Coalition is committed to **ILMS** and encouraging world markets to accept and adopt it as the primary standard for consistent due diligence reporting about land and real property surveying globally.

Following the publication of **ILMS**, the Coalition members may choose to issue guidance notes to provide their members with further technical guidance on the adoption and implementation of **ILMS** within their local market(s).

The Coalition is liaising with governments and other stakeholders on a project, local, regional, state, national and international level to seek adoption of the **ILMS**. A list of **ILMS**-supporting partners is given on the **ILMS** Coalition website – <https://ilmsc.org/>.

The Coalition members are as follows:

- American Society of Farm Managers and Rural Appraisers (ASFMRA) USA
- Asia Pacific Real Estate Association (APREA) Asia Pacific
- Asociación Española de Geómetras Expertos (AEGEX) Spain
- Association of Authorised Land Surveyors (AALS) Malaysia
- Belgium Union of Surveyors (OBGE) Belgium
- Bund der Öffentlich bestellten Vermessungsingenieure e.V. (BDVI) Germany
- Central Association of Agricultural Valuers (CAAV) UK
- Chamber of Surveying and Cadastre Engineers of Turkey (CSCE) Turkey
- China Land Surveying and Planning Institute (CLSPI) China
- Comité de Liaison des Géomètres Européens (CLGE) Europe
- Commonwealth Association of Surveying and Land Economy (CASLE) British Commonwealth of Nations
- Consiglio Nazionale Geometri e Geometri Laureati (CNG) Italy
- Fédération Internationale des Administrateurs de Biens et Courtiers Immobiliers (FIABCI) Global
- Fédération Internationale des Géomètres (FIG) Global
- Ghanaian Institution of Surveyors (GHIS) Ghana
- International Federation of Housing and Planning (IFHP) England
- International Valuation Standards Council (IVSC) Global
- L'Ordre des Géomètres Experts (OGE) France
- L'Union Méditerranéenne des Géomètres (UMG) Mediterranean states
- Malta Institution of Surveyors (MIS) Malta
- National Society of Professional Surveyors (NSPS) USA
- New Zealand Institute of Surveyors (NZIS) New Zealand
- Österreichische Gesellschaft für Vermessung und Geoinformation (OVG) Austria
- Real Estate Institute of Botswana (REIB) Botswana
- Royal Institution of Chartered Surveyors (RICS) Global

- Russian Cadastral Engineers (RCE) Russia
- Society of Chartered Surveyors Ireland (SCSI) Ireland
- South African Geomatics Institute (SAGI) South Africa
- Union Arabe des Géomètres (UAG) Lebanon.

The Coalition presents this first edition of **ILMS**.

On behalf of the **ILMS** Coalition Trustees:

- James Kavanagh (RICS) – Chair
- Maurice Barbieri (CLGE) – Vice-Chair
- Pedro J. Ortiz-Toro (AEGEX) – General Secretary.

1.2 Standard Setting Committee

The Coalition set up a Standard Setting Committee (SCC) to create **ILMS**. The Standard enables and informs the due diligence process for land and real property surveying. The SCC was formed in January 2017 and commissioned by the Coalition to research and develop a global due diligence standard for land and real property surveying, which is compatible with existing land and property information sources, both formal and informal. The SCC comprises a cross-section of technical experts from 18 countries with a combined expertise covering over 100 different markets.

The SCC acts independently of the Coalition and its members.

This first edition of **ILMS** was prepared by the Coalition's SCC. The SCC members and co-authors are:

- Rob Mahoney (Global) Chair
- Duncan Moss (Global) Vice-Chair
- Thomas Jacubeit (Europe) Vice-Chair
- Alexander Aronsohn (Global) Executive Secretary.
- Alexander González (Central America)
- Andy Smith (UK)
- Anil Kashyap (India/ SE Asia)
- Charisse Griffith-Charles (Caribbean)
- Chris Williams-Wynn (Southern Africa)

- Gabriel Arancibia (North/Central/South America/Central Asia)
- Kwasi Baffour Awuah (West Africa)
- Li Li (China)
- Miguel Diaz (South/Central America)
- Pascal Lalande (Global)
- Piyush Tiwari (Oceania)
- Richard Baldwin (Global)
- Roberto Bandieri (Europe)
- Sarah Sherlock (Europe)
- Tigistu Gebremeskel (East Africa)
- Ting Kien Hwa (Asia)
- Tony Mulhall (Global).

1.3 International Land Measurement Standard (ILMS)

ILMS is an international principle-based standard for land and property information. Its adoption will reduce risk in land and real property surveying and promote better land governance, robust conveyancing, secure lending and land registration. **ILMS** provides global consistency by setting a standard for assembling land information that can be applied at a project, local, regional, state, national or international level. **ILMS** is therefore both a standard and a due diligence framework to enable evidence-based assessment of land and property.

ILMS is flexible and can be adopted incrementally and/or partially in line with the sustainable fit-for-purpose principles (see 3 *ILMS Components*) such as those being globally adopted in land administration. It will also advance best practice. Beyond due diligence, **ILMS** takes account of existing rights such as communal rights, tribal rights and gender rights, and considers the hierarchy of land rights within any land parcel.

ILMS may prompt market demand for publicly accessible and transparent registers of land information.

The Coalition directed that **ILMS** should:

- serve the public interest
- focus on key land information elements, as required to de-risk and aid the land and property due diligence processes
- document the status of land tenure security and land rights
- support advancement of the SDGs.

ILMS is a framework for:

- enabling the due diligence reporting process on land and property matters to take place for people and legal entities
- strategic guidance for reporting on land and property assets in support of reporting systems, such as the International Financial Reporting Standards (IFRS)
- advancing transparency, integrity and consistency.
- identifying what is on the ground, what information is available and the quality of the available information, rather than what is legislated or implied – this also includes recognition of gender specific issues.

In practice, **ILMS** can be adopted systematically and is capable of being used in all markets whether a functioning Land Information Systems (LIS) exists or not. **ILMS** provides a due diligence structure for the collection and collation of land and real property surveying information.

1.4 UN Sustainable Development Goals

The UN launched its Sustainable Development Goals 2030 in 2015 and **ILMS** has direct relevance to several of these important goals. 'Soft-law' issues in relation to land governance and land administration, such as proposals for the effective registration of land title, have been recommended by the UN's Food and Agricultural Organisation (FAO) in Voluntary Guidelines on the Responsible Governance of tenure of Land, Fisheries and Forests in the Context of National Food Security (VGGT). See *Appendix A* of this standard for the UN SDGs.

1.5 Global Land Tool Network (GLTN)

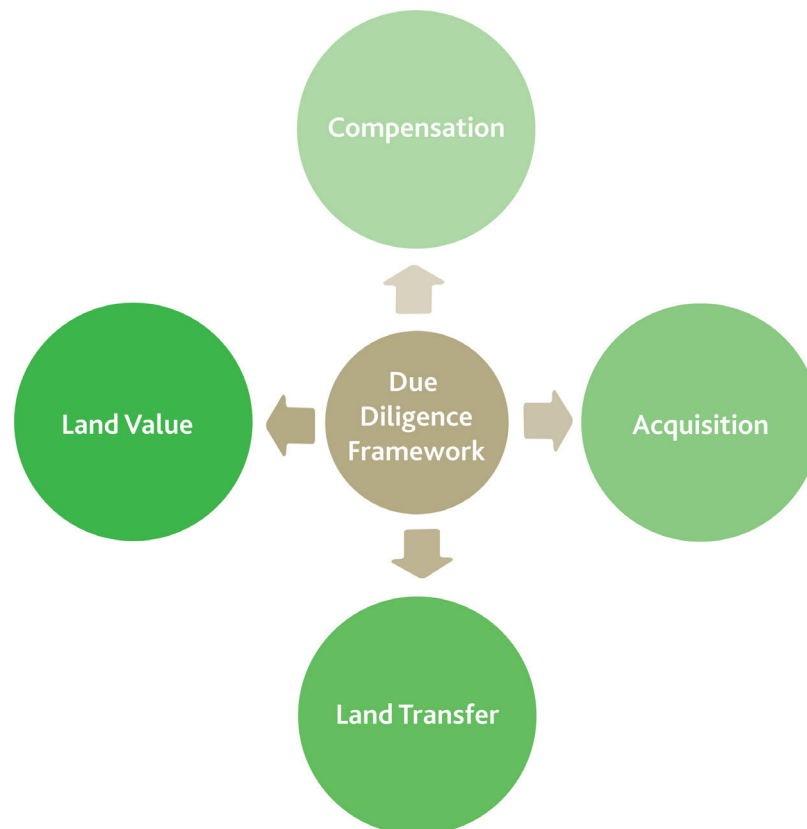
UN Habitat's Global Land Tool Network (GLTN) is committed to increasing access to land and tenure security for all. The Coalition initially reviewed the sustainable fit-for-purpose philosophy to understand where the most pressing issues are and where **ILMS** is most applicable.

ILMS aims to resolve a number of land and tenure security issues by establishing international best practice around what information needs to be compiled to enable an effective and practical understanding of the due diligence requirements for land and real property surveying reporting.

1.6 Application of ILMS

ILMS is both a standard and a due diligence framework. The framework is an important first step in achieving consistent land and real property due diligence. ILMS works with existing international and national standards to provide the basis for improving existing processes and achieving greater transparency and consistency within and between jurisdictions.

Figure 1: ILMS Framework Applications



ILMS may assist in numerous scenarios including:

- tenure security/property rights
- land value
- land transfer
- land acquisition
- financial asset reporting
- taxation
- inheritance/succession

- land usage
- communal rights
- non-market land exchanges
- compulsory acquisition
- consolidation
- land reattachment (physical as well as title)
- displacement
- resettlement
- reclamation
- subsidy payments
- fair compensation
- environmental protection
- land re-allotment
- dispute resolution.

ILMS is designed to be applied in a flexible manner, responding to local circumstances and proportionate to the risk. It is not prescriptive. A data rich environment might allow all main elements and multiple sub-elements of the due diligence framework to be completed. A poor data environment might limit the number of components that can be collated from documentary sources and might highlight the need for additional data collection.

2 ILMS and Land Information Systems (LIS)

Effective land administration is essential for the good governance of land. LIS are key enablers of effective land administration. Ideally, LIS should contain all the information necessary for verifying land parcels, validating legitimate rights, establishing land use and establishing tax obligations. A properly functioning LIS facilitates the capture and recording of information material to this verification and validation process – particularly at the point where land and real property rights and interests are being transferred. However, in many parts of the world, functioning LIS do not exist or are not yet fully developed.

ILMS is designed to operate in any market either with or without an LIS. **ILMS** aims to combine international best practices around land and property information that need to be collated as part of an informed due diligence process.

2.1 ILMS and Other International Standards

ILMS follows the development and release of the International Construction Measurement Standards (ICMS) and International Property Measurement Standards (IPMS). It is also aligned with and intended to be used with the International Ethics Standards (IES). IES is vital to **ILMS** as it asserts and sustains the critical role of ethics in professional practice, essential to meet the needs of the global market in maintaining public trust and confidence. ICMS established standards for the construction costs of buildings and IPMS established standards for measuring the floor areas of buildings.

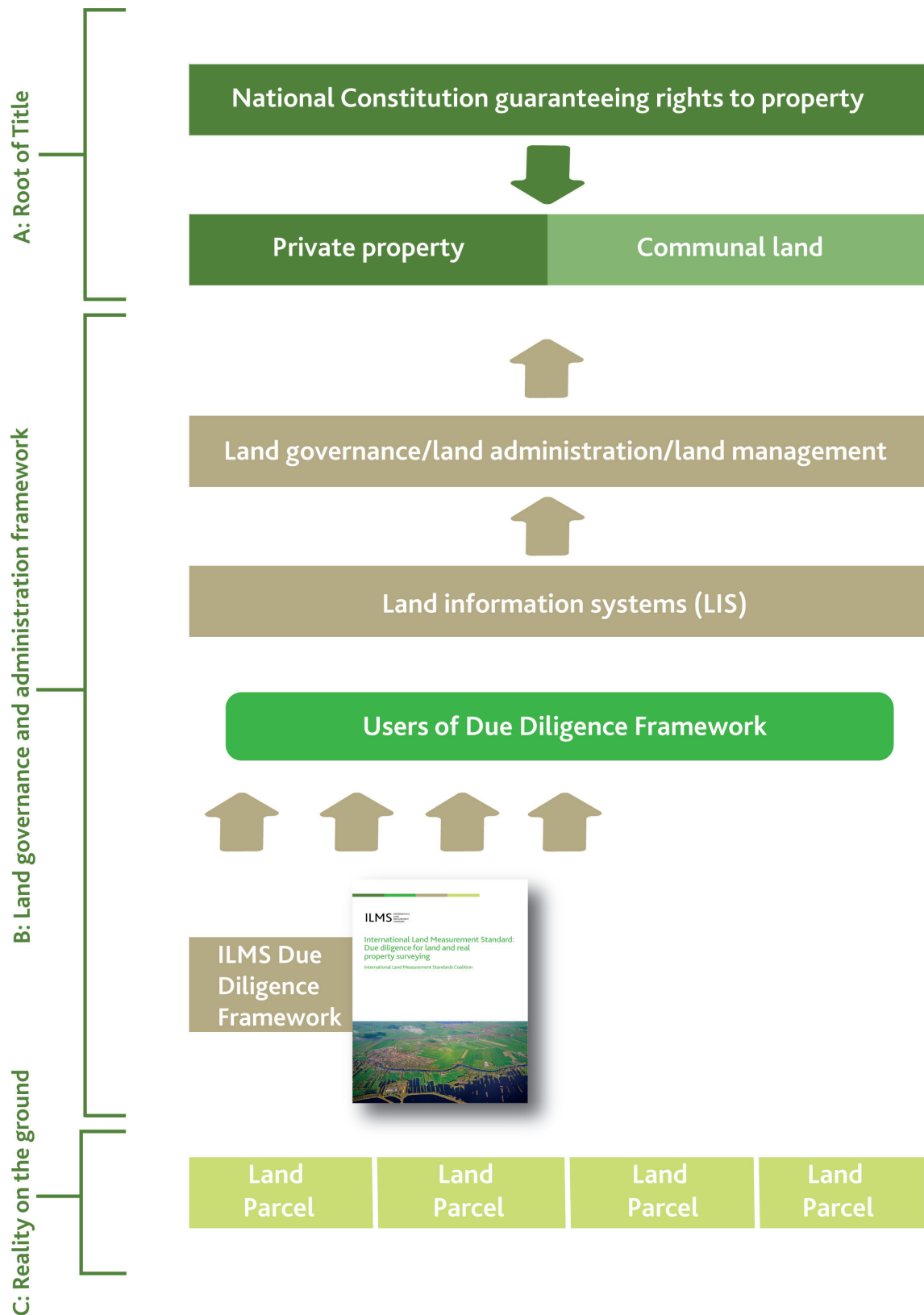
For **ILMS**, a key element agreed by the Coalition members was that the standard would be compatible and accord with ICMS and IPMS, also feeding into International Valuation Standards (IVS) and International Financial Reporting Standards (IFRS). This will ensure that **ILMS** is implemented in an ethical manner, which meets the standards contained in the International Ethical Standards (IES).

This first edition of **ILMS** focuses on the information required for due diligence for land and real property surveying. Future editions of **ILMS** may address wider issues such as land administration, land governance (see 5 *Definitions*), land policy, land reform and land tenure.

2.2 Conceptual Land Information Systems Framework

Figure 2 shows the conceptual constitutional, legal and administrative framework under which ILMS may operate.

Figure 2: Conceptual Constitutional, Legal and Administrative Framework



2.3 Requirements when Applying ILMS

All users should comply with these requirements in relation to the relevant land parcel. The following information should be retained on file or in the report, subject to the necessary due diligence, together with references including date of creation, author, method of creation and any limitations:

- purpose of the instruction (land transfer, assessment, etc.)
- date of the instruction (land transfer, assessment, etc.)
- name and address of the parties to the instruction
- unique identifier of land parcel/location (address, parcel coordinates or other unique identifier)
- unit of measurement and conversion factor, if applicable (e.g. acres to hectares) and coordinate system used (section 2.5)
- signature, complete with date, of the person responsible for compilation of the information
- academic qualifications/professional qualifications and licence/registration number (if applicable, or appropriate competency/experience)
- appendix containing information used, referenced or relied on including author, date, purpose and methodology (see *Appendix B: Geospatial Data Accuracy Table*).

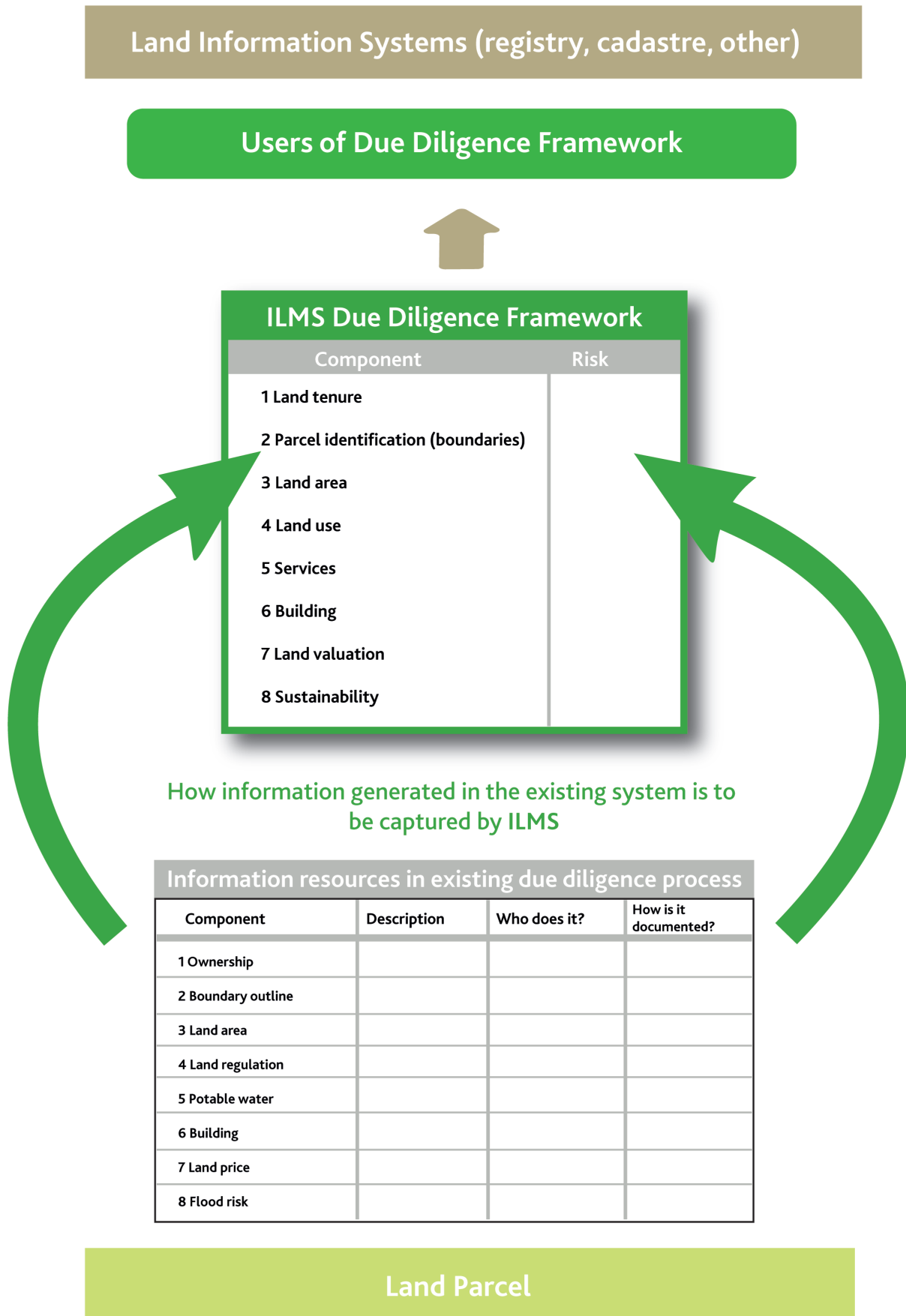
2.4 Undertaking Due Diligence Using the ILMS Framework

In some instances, the information required to complete and update the relevant LIS components may be derived from numerous different sources that support the due diligence process by the appropriate professionals. Further details on the process are shown in Figure 3.

ILMS may also operate in jurisdictions without any existing or functioning LIS framework. Where this is the case it will still provide the parties and their professional advisers with a standard around the due diligence for the land and real property surveying information that needs to be collected, verified and disclosed.

In some instances, the information required to complete and update the relevant **ILMS** components may be derived from multiple different sources or may not be available. The information included should be validated and qualified as far as possible and practicable as part of the due diligence process by the appropriate professionals. Where the information is incomplete an acknowledgment of the attempts made to obtain such information, and the reasons it was not possible to obtain, should be recorded.

Figure 3: Due Diligence Model



How information generated in the existing system is to be captured by ILMS

Information resources in existing due diligence process			
Component	Description	Who does it?	How is it documented?
1 Ownership			
2 Boundary outline			
3 Land area			
4 Land regulation			
5 Potable water			
6 Building			
7 Land price			
8 Flood risk			

2.5 Accuracy of Land Parcel Measurement

Appropriate sources of data or measuring and computing processes should be used to satisfy the requirements of clients, users and national (including nationally developed) regulations and legislation where these exist. Fit-for-purpose requirements range from a very broad approximation for some temporary purpose or lower value asset to a precise calculation for higher value land transfer or other reasons.

2.6 Information Integrity

The referencing of all information is to enable current and future users to identify exactly what information was used and/or relied on to compile the current assessment.

Compliance with **ILMS** requires that all information sources used to compile the due diligence should be disclosed. Where known, the information should be clearly referenced and have the following attributes stated in the final report:

- the date the information was created and subsequently updated
- the source and provenance of the information's creator/author
- the original purpose for which the information was created
- how the original information was compiled
- any limitation or exclusions on the information
- any assumptions made.

3 ILMS Components

This section lists each specific **ILMS** component in framework order. Each component is of equal importance.

ILMS incorporates the sustainable 'fit-for-purpose' (FFP) approach, designed to meet the needs of society today and which can be incrementally improved over time. Its key concepts are that **ILMS** is:

1. **Sustainable** in that the approach must be FFP for the particular jurisdiction and have a built-in capacity to enable the development of land markets to benefit future generations.
2. **Flexible** in the spatial data capture approaches to provide for varying use and occupation.
3. **Inclusive** in scope to cover all tenure and all land.
4. **Participatory** in approach to data capture and use to ensure community support.
5. **Affordable** for the government to establish and operate, and for society to use.
6. **Reliable** in terms of information that is authoritative and up-to-date.
7. **Attainable** to establish the system within a short timeframe and within available resources.
8. **Upgradeable** with regard to incremental improvement over time in response to social and legal needs and emerging economic opportunities.

Each of the following eight key land information components can incorporate 'sustainable fit-for-purpose' principles that can mean a very basic level of information or in some cases a high level of information given data availability. The sustainable FFP needs to be contextualised within the jurisdiction it is applied. Every national land transfer and administration system should be fit-for-purpose independently of its allocation of resources and/or wealth.

- The bullet points within each component are given as examples only. High income/data rich geographies may allow every data element to be captured. Informal and other data poor geographies may not. The listing is not prescriptive or exhaustive and there is an understanding that different geographies and purposes will require different levels of data.
- The flexibility of sustainable fit-for-purpose land administration principles should apply.
- Explanation of difference between standard requirements and available field-based information.
- Complete as much of the reporting framework as possible to the highest practicable standard as required by the instruction. If the data cannot be obtained to complete all the components this should be recorded along with the reasons. The effect on the overall reliability of the information provided should be considered as this may prejudice the outcomes that are achievable (see *Appendix C*).

There is the possibility that matters such as rights may exist that are not apparent from initial inspection or research. In these instances, the test of reasonableness and proportionality may apply.

3.1 Land Tenure

Where practicable and in line with local market practice, land tenure should be documented, recorded and held as a publicly accessible record. In a data-rich industrialised environment, documented and recorded tenure would contain the following information:

- unique parcel/condominium/lease identifier for each individual land parcel; where applicable, an official designation – this identifier has to be applied for each component
- type of land tenure (i.e. ownership, occupational right, interest, etc.)
- name of owner(s) (individual, joint, communal, other)
- record of gender of owner(s)
- name of occupier (individual, joint, communal, other)
- a narrative description of land (including recorded documentation and boundaries)
- length of tenure
- rights, restrictions and responsibilities in, over, on or under the land, whether these are recorded, visible or apparent and whether beneficial or deleterious
- other rights and restrictions (public and/or private) in relation to the land (e.g. easement, covenants, encumbrance, lien, license, statutory restrictions such as Public Law Restrictions)
- condominium rights
- the extent of any known legal claims that exist in relation to the land parcel and or parcels therein should be identified – the extent of any probable unverified claims that may exist but are not evidenced in writing should be identified where possible
- physical site inspection and or verification
- any known differences that exist between documented boundaries, legal boundaries and physical boundaries should be identified where possible to do so
- cadastral or registered index map(s) of the topological relationship of all parcels visualised at adequate/ appropriate scale for parcel size.

3.2 Parcel Identification

The boundaries of the overall land parcel and any unique parcels therein should be described in detail to allow the overall area to be identified in an unambiguous manner. It should include:

- satellite or aerial orthoimage of the overall land parcel together with any unique parcels therein with all boundaries indicated and, where possible, presented at an adequate scale to allow clear visibility and interpretation of the features
- coordinates of each boundary corner or pivot point must be defined in a reference system; where a national CRS (coordinate reference system) is in existence it should be used – in countries without a specific national reference system, WGS 84 UTM should be used
- dependent on the local or regional availability of GNSS solutions, this should be used (in combination with other methods) for boundary demarcation and verification
- dimensions of each boundary line or arc in length and grid azimuth, as recorded at the time of survey; if obtained in any other manner specify same and state limitations and restrictions
- area/volume of parcel complete with a statement of area where possible stating any limitations or restrictions
- site plan of the overall land parcel complete with each individual parcel (cadastral or index or whatever is used nationally).

3.3 Land Area

The land area measurement specification will depend on the purpose for which the measurement is being commissioned. Attention should be given to survey accuracy in relation to boundaries. This component is mainly derived from the parcel identification (boundaries) component but also contains information on the planning and development area (land measurement for development purposes). During land acquisition this site/land area component (along with the building component if applicable) can be critical for establishing non-physical compensation. The land area component should include:

- land area
- areas with limited/restricted use rights are to be defined and stated separately
- planning status for the overall land parcel or any unique parcels therein with reference to a plan or image-based map or any relevant land parcel that may affect the land in question
- purpose – this can be used for a variety of purposes such as financial asset reporting, taxation, inheritance/succession and the awareness of gender rights and land usage, communal rights, non-market land exchanges, compulsory acquisition, consolidation, land reattachment (physical as well as title), displacement, resettlement, reclamation, subsidy payments, compensation, environmental protection and disputes
- where the land parcel is restricted in the third dimension (aerial/underground), these restrictions must be clearly stated – relative heights may be used but where a national height datum is in existence it should be used

- written description of identified features
- it is recognised that in some locations there may not be the resources to support site/land area measurement to international standards in which case a Sketch Site Plan with basic measurements and orientation should be used
- determination of any potential or existing overlapping parcels.

3.4 Land Use

All land use designations must be in accordance with specific legislative, planning, regulatory or other authoritative requirements and should include:

- land cover description (such as forest, meadow, swamp, bog, savanna, desert, etc. and whether partial or whole)
- comparative land use (agricultural, urban, unproductive, etc.)
- source of land use classification
- quality of soil and gradation
- legally-binding land use plans
- other characteristics (whether recognised, proposed or intended, e.g. national park, unesco world heritage, monument protection, historical sites, archaeological sites)
- date of land use (approval and implementation)
- change of land use/land cover and its date
- land development plans
- type, purpose and use of buildings if any (e.g. agricultural, residential, commercial) and whether these are ancillary to the main use of the land.

3.5 Services

This component is to enable accurate assessment of the current factual status of any services, utilities and/or other infrastructure that serves the property, whether on or abutting the land or site being considered up to and including the point of completion.

Services, utilities and/or infrastructure services include, but are not limited to, all items that form an integral part of the land or property. This also includes all third-party interests, which it is dependent on to maintain its current functionality and usability:

- road and other viable access:
 - status and quality
 - access/egress points (vehicular and pedestrian)
 - length of road frontage
 - ownership if in the ownership of another and consent(s)
- potable water supply
- waste water/sewerage disposal
- storm water drainage
- electricity (main, solar, off-grid or independently generated)
- gas
- telephony/telecommunications
- internet access
- other municipal services (specify)
- garbage disposal
- postal service
- transport (public or other facilities).

3.6 Building

All building(s) contained within the perimeter of the Land Parcel should be checked to ensure that the building(s) complies with all the appropriate planning and other regulations and building codes. In instances where the building(s) is ancillary to the authorised use of the Land, in addition to the above, the following details should be provided where available. If these are not available then this reduces the amount of the information being considered:

- aerial image including the date the image was originally captured
- photograph of the building(s) façade and date the image was originally captured
- current use and separation of diverse usage within building(s), or, if dilapidated, the previous use of the building(s)
- record of current or previous building occupation
- statement on all buildings and structures whether authorised or unauthorised
- estimated age of the buildings
- perimeter measurements of the building IPMS
- percentage of land occupied by the building(s)
- area of any ancillary hard surface
- relevant certification/documentation (i.e. local government building and planning certificates)
- number of floors
- planning use/authorised use/unauthorised use
- environmental issues (energy use/hazardous building materials/contamination, etc.).

3.7 Land Valuation

All land transfers should be in accordance with national standards. Where there is no established national standard in place then practitioners should include the following within their land transfer:

- identity of the party/parties providing the market evidence, client and other intended users
- asset being considered and if part of a connected transaction
- relevant standard or local norms adopted
- purpose (i.e. land transfer, taxation, compulsory purchase, etc.)
- relevant date
- nature and sources of information relied on
- nature and extent of investigations made including any relevant limitations
- currency used
- attributed valuation, if included
- date of the valuation, if included
- valuation standard adopted if used
- signature of the person responsible for the **ILMS** assessment.

3.8 Sustainability

This component enables accurate assessment of the current factual status of any sustainability factors that impact the land or property, whether on or abutting the land or property being considered up to and including the point of completion.

The sustainability component comprises relevant economic, social, cultural and environmental factors, and the following could be considered in the due diligence assessment:

- environmental issues and climate change
- natural disasters (probability of earthquakes, volcanic eruption, hurricanes, drought, flooding)
- political climate (e.g. stability of government, changes of policy, war and conflict)
- economic climate
- social value and common law rights, including tribal land
- situational environment (e.g. proximity to other activities impacting land use – mining, power stations, etc.).

4 ILMS in Practice

4.1 Due Diligence Framework

This framework includes the eight individual components described, which may be expanded on if further information is available and/or required. This section sets out the detailed steps needed to complete the information, while sub-sections 4.2 and 4.3 highlight examples of completion in data rich and data poor environments.

The steps to complete the **ILMS** due diligence framework are as follows.

1. Complete each of the components within the example worksheet (included in *Appendix C*). Enter the details and date of recording. Highlight whether the information obtained is formal or informal, whether there is any documentary support and, if so, what form this takes. In instances where there is no information or where the component is not applicable, it should be stated within the **ILMS** due diligence framework that 'No information is available' or 'The component is not applicable'.
2. Complete any additional comments in relation to the component, such as information based on verbal evidence.
3. Review all the sub-components (see *3 ILMS Components*) for how accurate/reliable the information is within that overall component. Then use a traffic light system to report the information provenance. This is a general indication of the possibility that the information relied on within the framework may not be up-to-date, may differ from an objective assessment, have questionable content or come from a source that is difficult to verify. The system uses red (R), yellow (Y) and green (G), where green indicates high quality information, yellow limited, disputed or questionable information and red indicates no information or potentially unreliable information.
4. Repeat this process (1 to 3 above) for each component.

4.2 Example 1: Data Rich Environment

ILMS – Due Diligence Framework						
Property Address/Identifier:						
	Component	Basis	Date	Documentary support	Author status	Information provenance (R/Y/G)
1	Land tenure	<i>Land registry</i>	<i>xx/xx/xx</i>	<i>Title review xx/xx/xx</i>	<i>Relevant professional xx/xx/xx</i>	G
2	Parcel identification (Boundaries)	<i>Land registry</i>	<i>xx/xx/xx</i>	<i>Cadastre review xx/xx/xx</i>	<i>Relevant professional xx/xx/xx</i>	G
3	Land area	<i>Independent survey report</i>	<i>xx/xx/xx</i>	<i>Statement of area xx/xx/xx</i>	<i>Relevant professional xx/xx/xx</i>	G
4	Land use	<i>Independent survey report</i>	<i>xx/xx/xx</i>	<i>Local area plan and survey report xx/xx/xx</i>	<i>Relevant professional xx/xx/xx</i>	G
5	Services	<i>independent survey report</i>	<i>xx/xx/xx</i>	<i>Services and utility providers xx/xx/xx</i>	<i>Relevant professional xx/xx/xx</i>	G
6	Building	<i>Independent survey report</i>	<i>xx/xx/xx</i>	<i>Building survey xx/xx/xx</i>	<i>Relevant professional xx/xx/xx</i>	G
7	Land valuation	<i>Independent valuation</i>	<i>xx/xx/xx</i>	<i>Valuation report xx/xx/xx</i>	<i>Relevant professional xx/xx/xx</i>	G
8	Sustainability	<i>Independent survey report</i>	<i>xx/xx/xx</i>	<i>Sustainability report xx/xx/xx</i>	<i>Relevant professional xx/xx/xx</i>	G

4.3 Example 2: Data Poor Environment

ILMS – Due Diligence Framework						
Property Address/Identifier:						
	Component	Basis	Date	Documentary support	Author status	Information provenance (R/Y/G)
1	Land tenure	<i>Verbal confirmation</i>	<i>xx/xx/xx</i>	<i>No information available</i>	<i>Vendor</i>	<i>R</i>
2	Parcel identification (Boundaries)	<i>Agent's verbal report</i>	<i>xx/xx/xx</i>	<i>No information available</i>	<i>Sales agent</i>	<i>R</i>
3	Land area	<i>Independent survey report</i>	<i>xx/xx/xx</i>	<i>Statement of area xx/xx/xx</i>	<i>Sales agent</i>	<i>Y</i>
4	Land use	<i>Owner</i>	<i>xx/xx/xx</i>	<i>None</i>	<i>Owner</i>	<i>R</i>
5	Services	<i>No information available</i>	<i>xx/xx/xx</i>	<i>No information available</i>	<i>No information available</i>	<i>R</i>
6	Building	<i>Not applicable</i>	<i>xx/xx/xx</i>	<i>Not applicable</i>	<i>Not applicable</i>	<i>G</i>
7	Land valuation	<i>Local sales agent</i>	<i>xx/xx/xx</i>	<i>Verbal opinion</i>	<i>Local sales agent</i>	<i>R</i>
8	Sustainability	<i>Independent survey report</i>	<i>xx/xx/xx</i>	<i>Energy report xx/xx/xx</i>	<i>Tradesperson xx/xx/xx</i>	<i>R</i>

5 Definitions

For the purpose of this standard the following terms are defined.

Boundary: A line that marks the limits of an area. Boundaries can be a Physical Boundaries and Legal Boundaries, which are not all coincident and take many forms. This includes straight or curvilinear surfaces between known coordinated points or Physical Boundaries based on physical features.

Building: An independent structure forming part of a property.

Due Diligence: An assessment that is considered reasonable and practicable in the environment where the ILMS instruction is being executed. In all circumstances the application of ILMS must not conflict with local regulatory requirements.

International Land Measurement Standard (ILMS): An international principle-based standard for land and property information. ILMS is a standard and a due diligence framework to enable evidence-based assessment of land and property.

Land: A defined spatial area of the planet that can be uniquely identified in two or three dimensions by Boundaries. Land includes all-natural features and buildings, improvements and structures of aesthetic value in, on, under, or over the land.

Land Administration: The process of determining, recording and disseminating information about ownership, value and use of land and its associated resources. These processes include the determination (sometimes called 'adjudication') of land rights and other attributes, surveying and describing these, their detailed documentation, and the provision of relevant information for supporting land markets. In some countries the terms Land Administration, Land Governance and Land Management are sometimes used interchangeably.

Land Administration Domain Model (LADM): Provides terminology for land administration, based on various national and international systems, that is as simple as possible to be useful in practice.

Land Governance: The policies, processes and institutions by which land, property and natural resources are managed. (See **Land Administration**.)

Land Information System (LIS): A tool for legal, administrative and economic decision-making, and an aid for planning and development which is often described as consisting of a database(s) containing spatially referenced land-related data for a defined area and of procedures and techniques for the systematic collection, updating, processing and distribution of that data. When we use the term LIS in an ILMS context, we are using it in a more abstract sense to make it universally applicable rather than limiting the definition to that of a particular implementation in a specific jurisdiction. LIS often comprises multiple systems and databases held by a number of organisations at the federal, regional and municipal level. Therefore, it may be helpful to think of LIS as a system of systems rather than a single unified system.

Land Parcel: A portion of land variably described as a 'land parcel', 'immovable property' or 'real estate', etc., which becomes a 'land asset' when it is linked, through recognised ownership, right or interest of people and legal entities in that land. In describing the land parcel, efforts should be made to determine the extent to which the 'skies above and the soil below' are included or excluded in that land parcel, as property law changes from country to country.

Land Tenure: The rules and arrangements connected with owning specified interests in the land. This can be defined as the relationship, whether legally or customarily defined, among people, as individuals or groups, with respect to land and associated natural resources (water, trees, minerals, wildlife, etc.). Rules of tenure define how property rights in land are to be allocated within societies. Land tenure systems determine who can use what resources for how long and under what conditions. Land use can also be used to signify an existing land use separate from its formal designation.

Land Use: The formal designation by a governing authority of the use to which land may be put (e.g. designation of industrial, residential, commercial, retail, recreational and other uses under the master plan.)

Land Valuation: An opinion of the value of a land asset or liability on a stated basis, at a specified date. Unless limitations are agreed in the terms of engagement this will be provided after an inspection, and any further investigations and enquiries that are appropriate, having regard to the nature of the asset and the purpose of the valuation.

Legal Boundary: An intangible or invisible surface dividing one person's property from that of another. It is an exact line having no thickness or width. In fixed boundary systems, the coordinates of the boundary points are precisely established, often monumented on the ground and have precedence in law. Usually boundary surveys can only be carried out by licensed or publicly appointed surveyors who represent the state and may have quasi-judicial authority. In general boundary systems, the boundary is rarely identified with any precision either on the ground or in conveyances or transfers. It is not explicitly shown on topographic survey mapping, although in practice many topographic features are coincident with legal boundaries. Ultimately the exact position of a boundary, if disputed, can be determined only by the relevant courts in their jurisdiction.

Physical Boundary: A physical feature that can be seen such as a fence, wall or a hedge, which may, coincidentally, also follow the line of a legal boundary. The legal boundary may run within the physical boundary structure, but it might just as easily run along one particular side of the structure or include all or any part of an adjoining roadway or stream. Living boundary structures, such as hedges, can be prone to a certain degree of movement. For example, if a hedge is left untended it might take root where it touches the ground and become very wide, making its original line hard to discern. So even if the legal boundary ran along the hedge, identifying this boundary on the ground may become very difficult.

Public Legal Restrictions: A number of restrictions on land are a result of actions by government units. Many restrictions, however, are created by land developers. Such devices take several forms and can be either positive or negative in nature. They include defeasible fees, easements, equitable servitudes, and restrictive covenants.

Services: Services include all infrastructural services necessary to ensure the functional performance of the land as described. In urban areas this includes access to metalled roads, piped water, piped sewerage, electricity and telecommunications. In rural areas this will include access to metalled roads, access to water, electricity and sewage treatment facilities.

Social Tenure Domain Model (STDM): The concept provides a standard for representing 'people-land' relationships independent of the level of formality, legality and technical accuracy.

Sustainable fit-for-purpose (FFP): This concept involves applying the spatial, legal and institutional methodologies that are most adequate and available for the purpose of providing secure tenure for that specific land parcel by addressing the current constraints. This allows for incremental improvement over time.

Appendix A – UN Sustainable Development Goals (SDGs)

SUSTAINABLE DEVELOPMENT GOALS



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Appendix B – Geospatial Data Accuracy Table

Geospatial Data Accuracy Table				
(X,Y)	(Z)	Example Sources	Legacy Plot Scale	Min. Size of Feature
+/- 50mm	+/- 10mm	Scanned surveys, measured building surveys, topographic surveys, boundary dispute surveys, area registration	1:100	50mm
+/- 100mm	+/- 50 mm	Low accuracy measured building surveys, topographic surveys, high accuracy utility tracing,	1:200	100mm
+/- 200mm	+/- 50mm	Topographic surveys, aerial imagery, LIDAR surveys, low accuracy measured building surveys	1:500	200mm
+/- 500mm	+/- 500mm	Medium scale topographic surveys, infrastructure surveys, aerial imagery, UAV/LIDAR surveys, satellite imagery, parcel demarcation, GNSS enabled demarcation	1:1000	500mm
+/- 1000mm	+/- 1000mm	National mapping, general boundary mapping, aerial and satellite imagery, rural cadastral surveys and parcel demarcation, GNSS enabled demarcation	1:2500	1000mm
+/-2000mm	+/- 2000mm	National mapping, parcel identification (rural), aerial and satellite imagery, UN GGIM Master level 0, Fit-for-purpose level 1	1:5000	2000mm
+/- 4000mm	+/- 4000mm	Small scale national mapping, state land mapping, aerial & satellite imagery, national parks & reservations, UN GGIM Cadastre Master level 1, Fit-for-purpose level 0	1:10 000	4000mm

Appendix C – ILMS Due Diligence Worksheet

ILMS – Due Diligence Worksheet						
Property Address / Identifier:						
	Component	Basis	Date	Documentary support	Author status	Information provenance (R/Y/G)*
1	Land tenure					
2	Parcel identification (Boundaries)					
3	Land area					
4	Land use					
5	Services					
6	Building					
7	Land valuation					
8	Sustainability					

*The system uses red (R), yellow (Y) and green (G), where green indicates high quality information, yellow limited, disputed or questionable information, and red indicates no information or potentially unreliable information.

Appendix D – Bibliography

International standards

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UN Sustainable Development Goals.
www.un.org/sustainabledevelopment/sustainable-development-goals/



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