Framework for Effective Land Administration

A reference for developing, reforming, renewing, strengthening, modernizing, and monitoring land administration

Expert Group on Land Administration and Management

United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM)

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The United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM) as the apex intergovernmental body seeks to play the lead role in setting the agenda for global geospatial information management and to promote its use to address key global challenges. UN-GGIM is the forum to liaise and coordinate among Member States, and between Member States, international organizations and stakeholders.

Secretariat for the United Nations Committee of Experts on Global Geospatial Information Management
Global Geospatial Information Management Section
Statistics Division
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Content:

Acronyms

ABLOS	Advisory Board of the Law of the Sea
CBO	Community Based Organisation
CoFLAS	Costing and Financing of Land Administration Services
CSO	Civil Society Organisation
DRM	Disaster Risk Management
FELA	Framework for Effective Land Administration
FFPLA	Fit-For-Purpose Land Administration
FIG	International Federation of Surveyors
GLTN	Global Land Tool Network
GNSS	Global Navigation Satellite Systems
GEC	Gender Evaluation Criteria
GLTN	Global Land Tool Network
HILUCS	Hierarchical INSPIRE Land Use Classification System
ICT	Information and Communication Technology
IFC	International Finance Corporation
IGIF	Integrated Geospatial Information Framework
IHO	International Hydrographic Organization
INSPIRE	Infrastructure for Spatial Information in Europe
IPCC	International Panel on Climate Change
ISO	International Organization for Standardization
LA	Land Administration
LBF	Land Based Finance
LADM	Land Administration Domain Model
LAS	Land Administration System
LGAF	Land Governance Assessment Framework
MBI	Market-Based Instruments
MOOC	Massive Open Online Course
MSP	Marine/Maritime Spatial Planning
NGO	Non-Governmental Organisation
NPO	Not-For-Profit
NSDI	National Spatial Data Infrastructure
NUA	New Urban Agenda
OGC	Open Geospatial Consortium
PhD	Doctor of Philosophy
PPP	Public-Private-Partnership
R&D	Research and Development
SDGs	Sustainable Development Goals
STDM	Social Tenure Domain Model
UN	United Nations
UNECE	United Nations Economic Commission for Europe
UN-FAO	Food and Agriculture Organisation of the United Nations
UN-Habitat	United Nations Human Settlements Programme
UN-GGIM	United Nations Committee of Experts on Global Geospatial Information Management
VGGT	Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security

Executive Summary

The United Nations Committee of Experts on Global Geospatial Information Management[1] at its eighth session in August 2018 encouraged its subordinate Expert Group on Land Administration and Management (Expert Group) to continue its advocacy and awareness raising of the merits and benefits of effective and efficient land administration and management systems[2], and to formulate overarching policy guidance that could be referenced by Member States. In this regard, the Expert Group considered and included all existing and appropriate globally accepted concepts and approaches for effectively and efficiently relating people to land; documenting, recording and recognizing people to land relationships, in all their forms, towards securing land and property rights for all[3].

The 2030 Agenda for Sustainable Development is a global plan of action for people, planet, prosperity, peace and partnerships. If realized, lives will be profoundly improved, and the world transformed for the better. Member States, when adopting the outcome document of the United Nations, "Transforming our world: the 2030 Agenda for Sustainable Development", determined to take the transformative steps needed to shift the world onto a sustainable and resilient development path, continue on a collective journey, ensuring that no one is left behind[4].

Considering that the greater majority of humanity do not enjoy secure land rights[5], to create sustainable and inclusive societies, there is a need to accelerate efforts to document, record and recognize people to land relationships in all forms[6,7,8,9]. The Expert Group recognizes this urgent need, cognizant of the diverse social, environmental, and economic circumstances, at national and sub-national levels.

Land administration relates people to land and informs on the 'how', the 'what', the 'who', the 'when' and the 'where' of land tenure, land use, land value, and land development[10]. Land administration systems are the basis for recording the complex range of rights, restrictions and responsibilities related to people, policies and places. Effective land administration must be fit-for-purpose, appropriate and adequate, interoperable and sustainable, flexible and inclusive, and able to accelerate efforts to document, record, recognize, and monitor people to land relationships, in all forms. Effective land administration provides humanity with better access to and security of land and property rights, noting that not all actors can be satisfied with every land administration decision, is able to mitigate issues relating to land as a root cause triggering conflict, and supports leaving no one behind - the commitment of the 2030 Agenda.

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[1] In its resolution 2011/24 of 27 July 2011, in recognition of the need to promote international cooperation in the field of global geospatial information, ECOSOC established UN-GGIM as the apex intergovernmental mechanism for making joint decisions and setting directions with regard to the production, availability and use of geospatial information within national, regional and global policy frameworks with Member States. On 27 July 2016, ECOSOC adopted resolution 2016/27 to strengthen and broaden the mandate of UN-GGIM, and invited the Committee to report on all matters relating to geography, geospatial information and related topics.

[2] For FELA, 'land administration' is defined broadly and seen to incorporate theories and approaches related to cadastre, land registration, and land information systems. It supports broader land management activities.

[3] http://ggim.un.org/meetings/2018-Deqing-Expert-Group/documents/Report%20of%20the%20Expert%20Group%20to%20the%20Committee%20of%20Experts%20(eighth%20session).pdf

[4] The preamble of the General Assembly Resolution 70/1 Transforming our world: the 2030 Agenda for Sustainable Development

[5] As defined later, land rights are broadly defined to include water, housing, biota, mineral, and other resource rights

[6] Enemark, S., Bell, K. C., Lemmen, C. H. J., & McLaren, R. (2014). *Fit-for-purpose land administration*. International Federation of Surveyors (FIG).

[7] Zevenbergen, J., Augustinus, C., Antonio, D., & Bennett, R. (2013). Pro-poor land administration: Principles for recording the land rights of the underrepresented. *Land use policy*, *31*, 595-604.

[8] Deininger, K. W. (2003). *Land policies for growth and poverty reduction*. World Bank Publications.

[9] FAO and CFS Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security http://www.fao.org/3/a-i2801e.pdf

[10] http://ggim.un.org/meetings/2018-Deqing-Expert-Group/documents/Concept_Note.pdf

This Framework for Effective Land Administration (FELA), acts as an overarching policy guide, provides a reference for Member States when developing, renewing, reforming, strengthening, modernizing, or monitoring land administration. Specifically, the Framework seeks:

- To implement the Integrated Geospatial Information Framework[11] to the land sector, and support the achievement of the Sustainable Development Goals;
- To develop a comprehensive vision for understanding, advocating and promoting effective land administration;
- To provide strategic guidance towards country-specific action plans to be prepared and implemented;
- To advocate continuous strengthening of land administration and management procedures, techniques, and tools; and
- To enhance multilateral partnerships through policy discourse or harmonisation for effective land administration with a view to further guiding already existing policies in Member States.

The Framework for Effective Land Administration is presented to the United Nations Committee of Experts on Global Geospatial Information Management for endorsement. The Framework is developed for all countries, both developing and developed, all jurisdictions and all other stakeholders. It is composed of four parts. The first part describes contextual background and drivers for FELA. The second part defines effective land administration and how that relates to the Sustainable Development Goals. The third part provides a high-level vision statement, goals, requirements, and outcomes. The fourth part responds to the vision by elaborating on nine pathways for effective land administration and includes a series of priority actions as a guidance for implementation.

Effective land administration caters to all people, and must:
- Develop confidence and trust, promote security, safety, peace and peace building;
- Accelerate the proportion of population with tenure security;
- Allow economic development by supporting land value capture revenue systems that are equitable and transparent;
- Strengthen multi-disciplinary and multi-sectoral participation to achieve integrated geospatial information;
- Contribute to smart and resilient rural and urban societies, with equitable spatial/land-use planning, and land development;
- Ensure participatory and inclusive land use, and land use planning;
- Promote the recognition of the inherent rights of indigenous and vulnerable peoples to their lands, territories and resources, and recognise collective traditions, customs and customary tenures, consistent with existing obligations under national and international law;
- Encourage efficient, sustainable and fair land markets, where appropriate, that take into account land tenure, value, use and land development aspects;
- Cater to all circumstances, situations and people – in times of peace and prosperity, in times of stress and hardship (including disaster and conflicts, forced migration and human displacement, poverty, food and water scarcity);
- Enable partnerships, bringing and building together knowledge, skills and experiences on land tenure, land value, land use and land development; and

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[11] http://ggim.un.org/IGIF/

- Promote preparedness and resilience on climate change issues, and support biodiversity, conservation, and ecosystem sustainability.

FELA with its nine pathways seeks to provide the reference and guidance for Member States when establishing, strengthening, co-ordinating and monitoring their land administration nationally or sub-nationally. FELA aligns directly with the overarching and strategic Integrated Geospatial Information Framework (IGIF), implements the IGIF for the land sector. The nine pathways of FELA provide a mechanism towards effective leadership, advocacy, mobilization and actions to effectively document, record and recognize people to land relationships in all forms for the wellbeing of society, environment and economy.

FELA will leverage the IGIF Implementation Guide as a reference resource for governments to assess, design, plan, implement and maintain effective land administration in their country in such a way that positive transformational change and benefits are enabled, visible and sustainable.

This Framework is intended as a living document, to be periodically reviewed, updated, and tailored to suit circumstances, the changing global context, and evolving political, technological, economic, environmental and societal landscapes.

Background

Seventeen Goals to Transform Our World

On 1 January 2016, the 17 Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development – adopted by world leaders in September 2015 at an historic UN Summit — officially came into force. From 2016 through to 2030, these Goals universally apply to all countries and will mobilize efforts to end all forms of poverty, fight inequalities and tackle climate change, whilst ensuring that no one is left behind. The 17 Goals and 169 targets demonstrate the scale and ambition of the agenda.

Figure 1: Sustainable Development Goals (SDGs) [12]

The SDGs are a call for action by all countries to promote prosperity while protecting the planet. They recognize that ending poverty must go hand-in-hand with strategies for economic growth, also address societal needs including education, health, social protection, and job creation, all within the frame of tackling climate change issues, biodiversity loss, and environmental protection. People to land relationships directly and indirectly influence all SDGs.

Goal 1 End poverty in all its forms everywhere	
Target 1.4 By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance	Indicator 1.4.2 Proportion of total adult population with secure tenure rights to land, (a) with legally recognized documentation, and (b) who perceive their rights to land as secure, by sex and type of tenure
Goal 5 Achieve gender equality and empower all women and girls	
Target 5.a Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources, in accordance with national laws	Indicator 5.a.1 (a) Proportion of total agricultural population with ownership or secure rights over agricultural land, by sex; and (b) share of women among owners or rights-bearers of agricultural land, by type of tenure Indicator 5.a.2 Proportion of countries where the legal framework (including customary law) guarantees women's equal rights to land ownership and/or control

Figure 2: Examples of Goals, Targets and Indicators related to land

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[12] https://sustainabledevelopment.un.org/?menu=1300

Global Agenda and Guidelines

The global agenda of policies, guidelines, tools and methods references concepts and approaches from global organizations, internationally recognized donor agencies, development partners, peak professional bodies, academia, NGOs and CSOs, and related networks. It builds upon the contemporary notion that all people have the right to an adequate standard of living[13], regardless of whether underlying people-to-land relationships are formal, informal, statutory, customary, legal, legitimate, or otherwise in nature.

Genesis for these rights can be found in Article 25 of the UN Universal Declaration of Human Rights (1948), with subsequent declarations, statements, and agendas proclaiming specific recognition relating to housing[14], food[15], and the holding of property by indigenous groups, migrants, and returning refugees[16]. Further support is found in statements calling for supportive institutions and practices relating to these rights[17], including conflict resolution[18].

Most contemporarily, the overarching goals of the VGGTs are to achieve food security for all, and support the progressive realization of the right to adequate food in the context of national food security. Endorsed by the Committee on World Food Security on 11 May 2012, the VGGTs promote secure tenure rights and equitable access to land, fisheries and forests with respect to all forms of tenure: public, private, communal, indigenous, customary or informal.

The New Urban Agenda (NUA) represents a shared vision for a better and more sustainable urban-rural future. If well-planned and well-managed, urbanization can be a powerful tool for sustainable development for both developing and developed countries. The importance of land in urban development and the need to monitor land governance in urban areas is underscored in the New Urban Agenda, endorsed by Member States during the Habitat III Conference on 20 October 2016.

Equal impetus can be found in UN-FAO[19] (Food and Agriculture Organization) and UN-Habitat[20] (United Nations Human Settlement Program), and the Global Land Tool Network[21] (GLTN) and the International Panel on Climate Change[22] (IPCC), all with prominent advocacy and tool development related to land administration and management. Publications and recommendations from global donors and development partners such as the World Bank[23] also influence the approaches, methods and tools presented here. Additionally, policies and tools developed in regards to land rights for all[24], fit-for-purpose

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[13] https://www.un.org/en/universal-declaration-human-rights/
[14] See - 1976 Vancouver Declaration; Habitat Istanbul 1996, paragraph 40b (www.un.org/multiflow/wp-content/upload/2015/10/istanbul-declaration.pdf)
[15] See - 1945 FAO Constitution, Preamble; World Food Summit 1996, 2002; MDGs, 2000 (No 1, 3 and 7 - eradicate hunger, promote gender equality, ensure environmental sustainability
[16] See - UN Declaration on the Rights of Indigenous Peoples 2007; Convention Concerning Indigenous and Tribal Peoples art 16; International Convention on Economic, Social and Cultural Rights art 11; International Convention on the Protection of the Rights of Migrant Workers art 15; Principles of Housing and Restitution of Property for Refugees and IDP's art 5 and 7; European Convention Human Rights and Fundamental Freedoms art 1; American Convention on Human Rights art b21, African Charter on Human and Peoples Principles art 14
[17] See - 1972 Stockholm Declaration principle 2; 1996 WFS objective 1.2;1992 Rio Global Plan of Action - with geoinformation as a basis for policy formation
[18] See - 2019 UN Guidance Note of the Secretary General on The United Nations and Land and Conflict
[19] http://www.fao.org/home/en/
[20] https://unhabitat.org/
[21] https://gltn.net/
[22] See 2019 IPCC Special Report on Climate Change, Desertification, Land Degradation, Sustainable Land Management, Food Security, and Greenhouse gas fluxes in Terrestrial Ecosystems
[23] https://www.worldbank.org/
[24] https://unhabitat.org/books/secure-land-rights-for-all/

land administration[25,26], pro-poor land recordation[27], the continuum of land rights[28], women's access to land[29], the Social Tenure Domain Model[30], the United Nations Declaration on the Rights of Indigenous Peoples[31], the Guidance Note of the Secretary General on Land and Conflict[32], the Sendai Framework for Disaster Risk Reduction[33] and the Framework and Guidelines on Land Policy in Africa[34], amongst others, are referenced within FELA. Further, the Land Governance Assessment Framework[35] (LGAF) and foundational work of Land Policies for Growth and Poverty Reduction[36] inform the strategic pathway relating to accountability and the underlying framework respectively. Likewise, the ISO 19152 Land Administration Domain Model[37], an endorsed ISO standard, with links to OGC[38] (Open Geospatial Consortium) and the International Hydrographic Organization[39] (IHO) (S-121 Maritime Limits and Boundaries) informs the principles at the level of data and information management. Practical tools to reduce corruption and fraud, whilst also enhancing the ability of people and organizations to resist these[40], also influence FELA.

Global Geospatial Information Management

UN-GGIM at its fourth session in August 2014 approved the addition of a new work item, "the application of geospatial information related to land administration and management" into the provisional agenda for its fifth session. In its supporting statement, The Netherlands urged UN-GGIM "*to act and UN-GGIM can play a powerful role in this. Doing this, UN-GGIM will enforce the post-2015 agenda .. .. .. Good land administration, considering both formal and informal rights of the use and ownership of land, is a basic requirement for social and economic development .. .. ..*". In its decision at the fifth session, UN-GGIM acknowledged the importance and need for geospatial information as an essential base for an effective and efficient land information system to support the administration of land policy frameworks, customary rights, security of tenure, property rights, sustainable development and overall social, environmental andeconomic well-being.

The Addis Ababa Declaration on Geospatial Information Management Towards Good Land Governance for the 2030 Agenda[41] affirms the importance of good land administration and management as the pillar of good governance and efficient governments to address the challenges and opportunities of the 2030 Agenda. The Declaration was the culmination of the Fourth High-Level Forum on Global Geospatial Information Management held from 20 to 22 April 2016. The Declaration makes specific reference to the VGGTs and supports the development of fit-for-purpose land administration, particularly in developing countries. It confirms that up-to-date information that is consistently available and accessible over space

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[25] https://www.fig.net/pub/figpub/pub60/Figpub60.pdf

[26] Enemark, S., K. C. Bell, C. Lemmen and R. McLaren (2014). Fit-for-Purpose Land Administration., Copenhagen: World Bank and International Federation of Land Surveyors.

[27] https://gltn.net/download/designing-a-land-records-system-for-the-poor/

[28] https://unhabitat.org/books/framework-for-evaluating-continuum-of-land-rights-scenarios/

[29] https://gltn.net/download/women-and-land-in-the-muslim-world/?wpdmdl=11954&refresh=5c7364b4175d21551066292

[30] https://stdm.gltn.net

[31] https://www.un.org/development/desa/indigenouspeoples/declaration-on-the-rights-of-indigenous-peoples.html

[32] https://www.un.org/en/events/environmentconflictday/pdf/GN_Land_Consultation.pdf

[33] https://www.unisdr.org/we/coordinate/sendai-framework

[34] https://www.uneca.org/sites/default/files/PublicationFiles/fg_on_land_policy_eng.pdf

[35] http://www.worldbank.org/en/programs/land-governance-assessment-framework

[36] http://documents.worldbank.org/curated/en/485171468309336484/Land-policies-for-growth-and-poverty-reduction

[37] https://www.iso.org/standard/51206.html

[38] http://www.opengeospatial.org/

[39] http://www.s-121.com/w/index.php/Main_Page

[40] https://www.transparency.org/whatwedo/tools

[41] http://ggim.un.org/meetings/2016-4th_HLF/documents/Addis_Declaration_Final_22Apr2016_rev.pdf

and time underpins good land administration and management, leading to good land governance and sustainable development.

At the sixth session, the Expert Group was encouraged to address the issue of fit-for-purpose land administration and geospatial information required to support effectively and efficiently the need to secure land and property rights for all. UN-GGIM in its seventh session in August 2017, urged the Expert Group to continue to address the overarching policy guidance required for establishing effective, efficient, sustainable and interoperable land administration and management systems.

Integrated Geospatial Information Framework

The Committee of Experts at its eighth session in August 2018 adopted the Integrated Geospatial Information Framework to provide a basis, a reference and a mechanism to support establishment or improvement of national geospatial information management arrangements. It can also coordinate activities to achieve alignment between existing national capacities, capabilities and infrastructures, including some aspects of the land sector. IGIF aims to translate high-level concepts to practical implementation guidance for use by Member States and does this by leveraging seven (7) underpinning principles, eight (8) goals and nine (9) strategic pathways.

IGIF comprises three parts as separate, but connected, documents: Part 1 is an Overarching Strategic Framework; Part 2 is an Implementation Guide; and Part 3 is a Country-level Action Plan. The three parts comprise a comprehensive Integrated Geospatial Information Framework that serve a country's needs in addressing social, environmental and economic factors; which depend on place-based information in a continually changing world. IGIF focuses on place-based information that is integrated with any other meaningful data to solve societal and environmental problems, acts as a catalyst for economic growth and opportunity, and to understand and benefit from a nation's development priorities and the Sustainable Development Goals.

Part 1 - Overarching Strategic Framework sets the context of **'why'** geospatial information management needs to be strengthened and why it is a critical element of national social, environmental and economic development. It focusses on the role of geospatial information in the digital age and how that information is integral to government functions at all levels.

Part 2 - Implementation Guide describes **'what'** actions can be taken to strengthen geospatial information management. The Implementation Guide is a reference resource that provides information for governments to design, plan, establish, implement and maintain nationally integrated geospatial information frameworks in their country in such a way that transformational change is enabled, visible and sustainable.

Part 3 - Country-level Action Plan (CAP) is specific to each country and details **'how'** the guiding principles, options, and actions specified in the Implementation Guide will be carried out, when and by whom. Importantly, the CAP is a plan, not a program that is implemented.

Effective Land Administration

Land administration informs the 'how', the 'what', the 'who', the 'when' and the 'where' of land tenure, land use, land value, and land development[42]. Land administration is described as the process of determining, recording, disseminating, and updating information about the relationship between people and land[43]. Land administration is considered responsible if it continuously aligns processes and resources with dynamic societal demands[44]. The term 'land' should be interpreted in the broad sense, also including water bodies (rivers, lakes, seas, oceans) and spaces above and below the surface, that is, air space and subsurface spaces[45].

The need for effective land administration

Considering that a large proportion of humanity do not enjoy recorded land and property rights, there is a need to accelerate efforts to document, record and recognize people to land relationships in all their forms[46,47,48]. This land administration gap[49] occurs within increasingly stressed and integrated global and national contexts regarding social, environmental and economic sustainability. People to land relationships cut directly and indirectly across all the SDGs. The integrated nature of the 2030 Agenda for Sustainable Development and its 5Ps (People, Planet, Prosperity, Peace and Partnership)[50] demand effective land administration, realized through integrated geospatial information, for land policies, land tenure, land value, land use, and land development.

People - End poverty and hunger in all forms and ensure dignity and equality

Information on land tenure, land use, land value, and land development are known to enable economic opportunities, reduce land related disputes[51], including those over fishing rights[52], and support food security through subsistence and family farming, agricultural productivity and urban food access[53]. For the vulnerable and marginalized, often including indigenous people, internally displaced peoples, ethnic minorities, and women in particular, access to land is demonstrated as crucial for ensuring social and economic development, food security, empowerment, protection from violence and health hazards. Land and access to land is an enabler of participation. Secured access to land stabilizes societies in crisis and conflict[54] – with lack of access having the opposite effect. Efforts to support gender equality in terms of access to land, working conditions, and social recognition, require more attention. Land related challenges linked to provision of underpinning physical infrastructure and sustainable consumption in cities, rural areas, and marine zones demand attention. **Effective land administration supports poverty eradication,**

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[42] http://ggim.un.org/meetings/2018-Deqing-Expert-Group/documents/Concept_Note.pdf

[43] ISO, 2012

[44] Zevenbergen,J., de Vries, W., & Bennett, R.,. (2016) Advances in Responsible Land Administration. CRC Press.

[45] https://fig.net/resources/publications/figpub/pub61/Figpub61.pdf

[46] Enemark, S., Bell, K. C., Lemmen, C. H. J., & McLaren, R. (2014). *Fit-for-purpose land administration*. International Federation of Surveyors (FIG).

[47] Zevenbergen, J., Augustinus, C., Antonio, D., & Bennett, R. (2013). Pro-poor land administration: Principles for recording the land rights of the underrepresented. *Land use policy*, *31*, 595-604.

[48] K.Deininger - World Bank (2017)

[49] Also referred to as the 'cadastral divide' [49]

[50] https://sustainabledevelopment.un.org/post2015/transformingourworld

[51] Henssen, J. (2010). *Land registration and cadastre systems: principles and related issues*. Technische Universität München

[52] https://stableseas.org/publications/maritime-terrorism/state-piracy-2018-human-cost

[53] Rockson, G., Bennett, R., & Groenendijk, L. (2013). Land administration for food security: A research synthesis. *Land use policy*, *32*, 337-342.

[54] https://gltn.net/download/women-and-land-in-the-muslim-world/?wpdmdl=11954&refresh=5c7364b4175d21551066292

food security, and can support ensuring dignity and equality through documenting, recording and recognizing people to land relationships in all forms, notwithstanding the potential to undermine dignity when the information is misused.

Planet - Protect our planet's natural resources and climate for future generations

The changing climate and growing population increases the number of natural disasters, affects the resilience of the vulnerable and marginalized, who are typically not addressed through any land administration and land management system[55]. Population increases and technological development promote intense competition for resources. Areas with higher population density and urbanization have differing levels of economic development and poverty. They are often prone to natural disasters from the impact of climate change. The increasing pressures on communities, and on natural and built environments, including marine areas[56], challenge the achievement of the SDGs. Current approaches to the delivery of land-based ecosystem services are often poorly managed and planned. Effective land administration systems should play a role in supporting improved land-based services, contribute to mitigating climate change, and supporting both integrated ecosystem and landscape based approaches[57],[58]. **Effective land administration ensures preparedness and resilience, participatory and inclusive land use planning, monitoring of land-cover change[59], sustainable resource management, building back better, and the protection of our planet's natural resources and environment for future generations.**

Prosperity - Ensure prosperous and wellbeing of communities

Fair land taxation, value capture, enforcement of land controls, and sustainable land management interventions are only possible with land administration and management systems. In practice, many of these system lack accountability and many mass appraisal systems are outdated. A plurality of land administration and management systems also exists, particularly in developing contexts, where parallel systems with different objectives and embedded cultural norms, may not always be catered for in statutory law, and which significant interoperability challenges. Overlapping systems can result in misuse, abuse or overuse of land, thereby hindering land use in a sustainable and responsible manner. Importantly, there is a need to ensure that no one is left behind. **Effective land administration enables access to tenure security and efficient land markets fostering prosperity, wellbeing of all communities, revenues for authorities, and fulfilled lives through sustainable land management, land use, land development and land markets.**

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[55] Unger, E-M., Zevenbergen, J., Bennett, R., Lemmen, C. (2017). Application of LADM for disaster prone areas and communities. Land use policy, 80, 118-126

[56] See ongoing work of the Intergovernmental conference on an international legally binding instrument under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction at https://www.un.org/bbnj/

[57] https://www.cbd.int/ecosystem/

[58] https://www.cifor.org/library/4136

[59] As required by the United Nations Framework Convention on Climate Change

Peace - Foster peaceful, just and inclusive societies

Competition and conflict over land will intensify with the growing pressures of climate change, population growth, agricultural production, migration and urbanization. The United Nations (UN) Secretary-General's Guidance Note on Land and Conflict seeks to help the UN system to be more responsive to the emerging needs of Member States due to the growing evidence of the link between land, armed conflict, and human rights abuses. Governments should consider tenure insecurity issues relating to human displacement and migration, competition over land, land use conflict, and public lands, and that these need intervention from the state[60]. **Effective land administration prevents land-related conflicts, stabilizes situations and fosters peaceful, just and inclusive societies[61].**

Partnership - Implement the agenda through a solid global partnership

Effective land administration promotes effective public and public-private partnerships, and also CSO cooperation and collaboration[62]. Partnerships build knowledge and experience, alongside human, technological and financial capacity to enhance effective land administration arrangements. They bring together different strengths and perspectives that stimulate creativity and innovation, often through unique capabilities of different member, and drive achievement of common goals. **Effective land administration enables partnerships at all levels – international, regional, national and community – bringing together diverse but interoperable and complementary capabilities, experiences, technologies, integrated data, knowledge and resources.**

Global commitment

The 2030 Agenda emphasizes that global partnerships are key to realizing our Agenda[63] and affirm a strong commitment to its full implementation. The United Nations recognizes that achievement will take a revitalized and enhanced global partnership, bringing together governments, civil society, the private sector, system and other actors and the mobilization of all available resources[64]. Effective land administration strives towards peace and strong institutions, and can be leveraged to mitigate land as a root cause of conflict, and also support the "leave no one behind" overarching principle of the SDGs, and address and promote the recognition and protection of all human rights.

Sustainable development demands effective land administration. Effective land administration supports sustainable development.

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[60]Mitchell, D. (2011). Assessing and Responding to Land Tenure Issues in Disaster Risk Management. FAO-Land Tenure Manuals.
[61] http://ggim.un.org/meetings/2018-Deqing-International-Seminar/documents/3.Clarissa-Augustinus.pdf
[62] Target 17.17 under Goal 17 - strengthen the means of implementation and revitalize the global partnership for sustainable development.
[63] Paragraph 40, Transforming our World: the 2030 Agenda for Sustainable Development (A/RES/70/1)
[64] Paragraph 60, Transforming our World: the 2030 Agenda for Sustainable Development (A/RES/70/1)
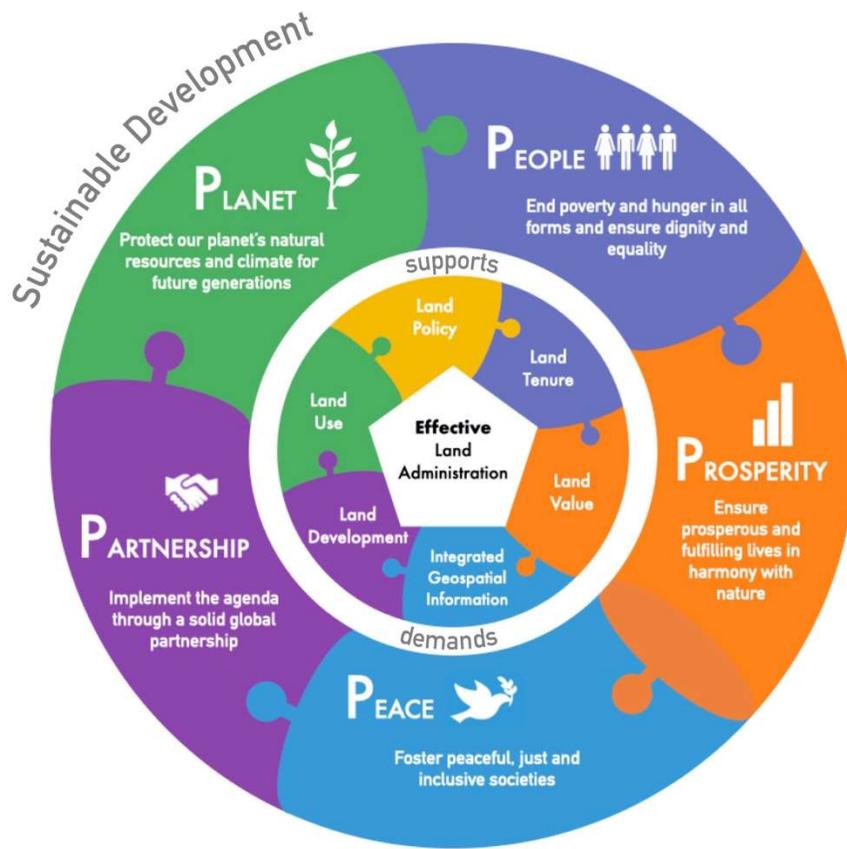
Figure 3: Sustainable Development and Effective Land Administration

Framework for Effective Land Administration Envisioned

This Framework for Effective Land Administration (FELA) is a reference for developing, renewing, reforming, strengthening, modernizing, or monitoring land administration, cognizant of national priorities and circumstances. FELA aligns directly to the overarching and strategic Integrated Geospatial Information Framework[65] (IGIF) as adopted by the United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM) at its eighth session in August 2018. FELA implements the IGIF for the land sector.

Vision

Secured people to land relationships in all forms for the wellbeing of partnerships, planet, prosperity and peace.

Mission

To provide leadership, coordination and internationally recognized standards, and support responsible innovation and partnerships, for effective land administration to realise sustainable social, environmental and economic development.

Goals and Requirements

The nine requirements and goals of effective land administration are aligned with the nine strategic pathways of the IGIF.
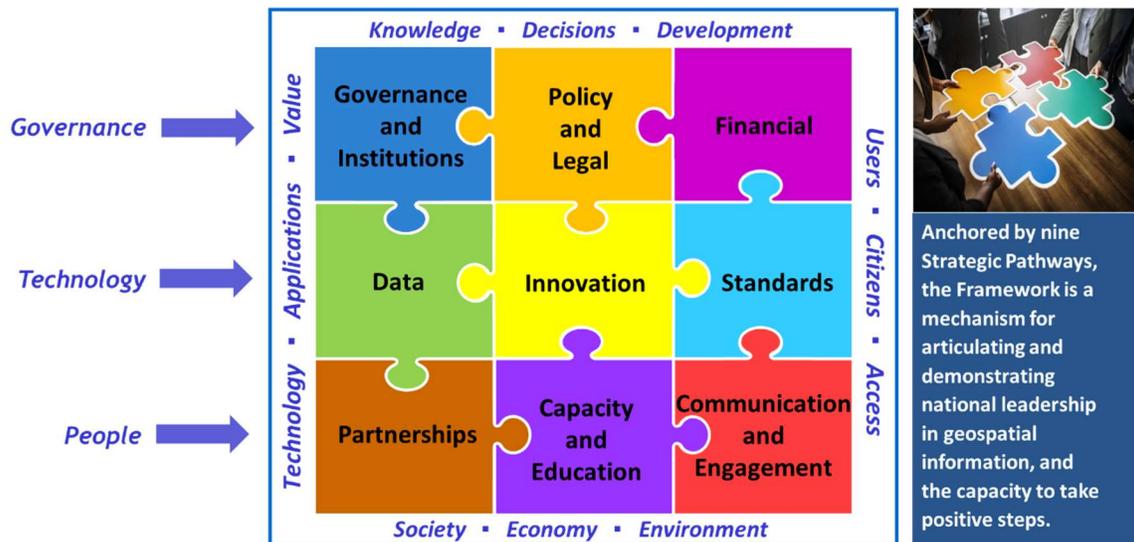

Figure 4: Nine Strategic Pathways of the Integrated Geospatial Information Framework

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[65] http://ggim.un.org/meetings/GGIM-committee/8th-Session/documents/Part%201-IGIF-Overarching-Strategic-Framework-24July2018.pdf

FELA Goals	FELA Requirements	FELA Pathways
Transparency and accountability increased	Accountable and transparent governance	Governance, Institutions and Accountability*
Gender-responsive and inclusive of vulnerable groups	Inclusive and recognizes all forms of tenure	Policy and Legal
Affordable investments and economic return assured	Affordable with sustainable business models	Financial
Reliable data and service quality attained	Data maintained, secure and not duplicated	Data
Responsible and innovation oriented	Upgradable systems and approaches	Innovation
Interoperability and integration supported	Considers internationally agreed standards	Standards
Cooperation, partnerships, and participation leveraged	Strengthens partnerships and supports collaboration	Partnerships
Capacity, capability, knowledge transfer and exchange attained	Facilitates capacity development and knowledge transfer and exchange	Capacity and Education
National engagement and communication enhanced	Advocates for effective land administration	Advocacy and Awareness*

Figure 5: Overview of the Goals, Requirements, and Pathways of FELA
*FELA references the nine strategic pathways of the Integrated Geospatial Information Framework (IGIF),
FELA implements the IGIF for the land sector through its nine pathways as listed above[66,67].

Outcomes

The overarching goal of FELA is to support global policy coherence in land administration – with a view to guiding policy development and policy operationalization in Member States with respect to the IGIF for the land sector.

Effective land administration caters to all people, and must:
- Develop confidence and trust, promote security, safety, peace and peace building;
- Accelerate the proportion of population with tenure security;
- Allow economic development by supporting land value capture revenue systems that are equitable and transparent;
- Strengthen multi-disciplinary and multi-sectoral participation to achieve integrated geospatial information;
- Contribute to smart and resilient rural and urban societies, with equitable spatial/land-use planning, and land development;
- Ensure participatory and inclusive land use and use planning;

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[66] The titles of the pathway 'Governance, Institutions and Accountability' and 'Advocacy and Awareness' differ to the corresponding strategic pathways of the IGIF, as decided during the Deqing expert group meeting in September 2018
[67] https://ggim.un.org/meetings/2018-Deqing-Expert-Group/documents/EG-LAM-Summary-Report-09-Oct-2018.pdf

- Promote the recognition of the inherent rights of indigenous and vulnerable peoples to their lands, territories and resources, and recognise collective traditions, customs and customary tenures, consistent with existing obligations under national and international law;
- Encourage efficient, sustainable and fair land markets, where appropriate, that take into account land tenure, value, use and land development aspects;
- Cater to all circumstances, situations and people – in times of peace and prosperity, in times of stress and hardship (including disaster and conflicts, forced migration and human displacement, poverty, food and water scarcity);
- Enable partnership, bringing and building together knowledge, skills and experiences on land tenure, land value, land use and land development; and
- Promote preparedness and resilience on climate change issues, and support biodiversity, conservation, and ecosystem sustainability.

Stakeholders

This Framework for Effective Land Administration (FELA) seeks greater cooperation, coherence and commitment between all cross-sector stakeholders and decision-makers, not limited to governments and government agencies, United Nations system or international organizations. FELA seeks engagement with non-governmental organizations, civil society, international development partners, philanthropic foundations or bodies, the private sector, academia and communities, among others. FELA further calls for strong commitment of all stakeholders and key partners involved in land administration and management to realize the SDGs and subsequently the goals of this framework.

Using and Applying

FELA can be assessed for alignment, transferred, and disseminated to national and community levels. The innovative use of land information and geospatial technologies help Member States to better understand, formulate policies on, and manage land in a holistic fashion. Where appropriate and validated, these lessons can be shared back to the living FELA framework. Each of the nine FELA pathways comes with a specific objective, related back to the SDGs and the IGIF, and leads to the articulation of approaches, methods and tools, specific to land administration and management, that can be used for FELA implementation, monitoring and evaluation.

Nine Pathways of the Framework for Effective Land Administration

The nine strategic pathways of IGIF[68] guide FELA. The main areas of influence of the IGIF equally apply: people, governance, and technology. The strategic pathways are intended to guide the implementation of FELA, support the IGIF implementation more broadly, and ultimately achieve the SDGs and sustainable development. The nine FELA pathways are linked and overlap. For ease of communication in FELA, and like the IGIF, they are described independently. Linkages between the nine pathways are highlighted where appropriate.
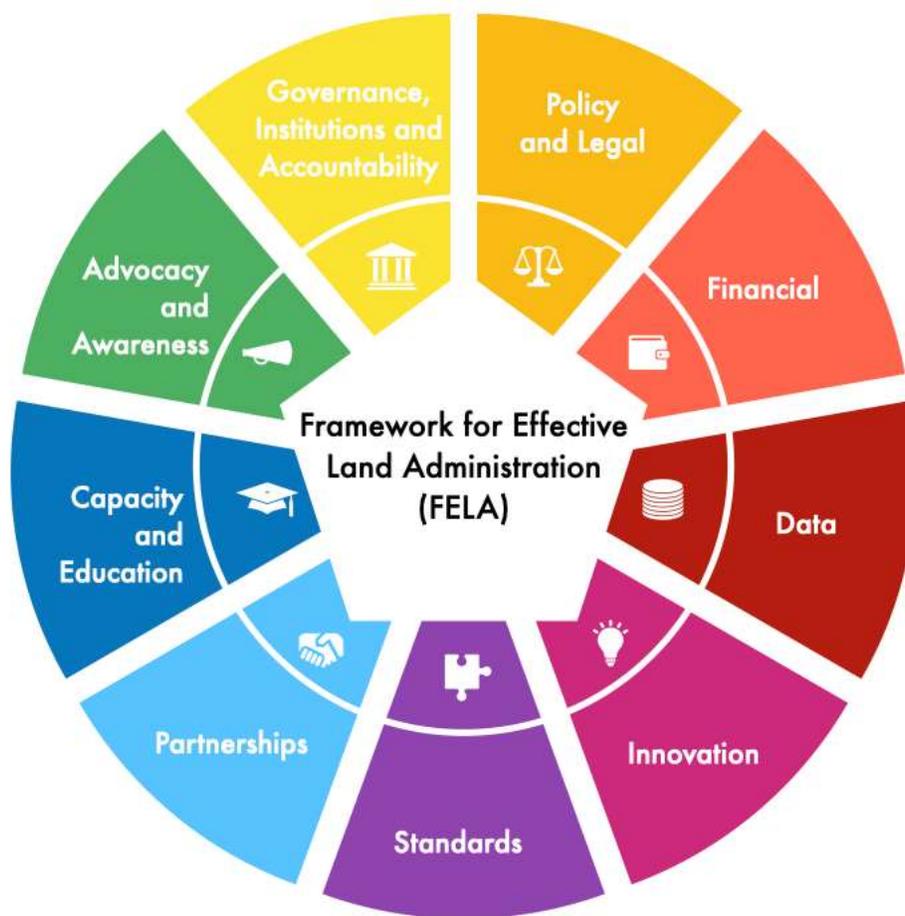
Figure 6: Nine Pathways of the Framework for Effective Land Administration

Pathway I: Governance, Institutions and Accountability

Land administration is a societal activity both shaping and shaped by governance, institutions, and associated with accountability. All SDGs focus on the enhancement and reform of governance, institutions and associated accountabilities. IGIF identifies the themes as a standalone strategic pathway, and calls for the articulation of clear governance models, leadership, institutional structures, and a clear value proposition. These are intended as a means to strengthen multi-disciplinary and multi-sectoral participation, and a commitment to achieve integrated geospatial information.

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[68] http://ggim.un.org/meetings/GGIM-committee/8th-Session/documents/Part%201-IGIF-Overarching-Strategic-Framework-24July2018.pdf

For governance models, land administration is an essential aspect of broader land governance regimes, and includes all actors, processes, standards and resources involved in determining land tenure, land use, land value, and land development. Responsible land governance structures must be established - fitting the country context – with effective and efficient land institutions. Leadership in the land sector should be centered upon transparency, accountability, inclusiveness, accessibility, participation, and should be responsive to gender, youth, the vulnerable and the marginalized. Plurality is accepted - in terms of available land governance approaches, including market-based, networked, and more conventional hierarchical/institutional approaches - provided there is adherence to good governance principles. Networked approaches can enhance multi-lateral, multi-sectoral, and multi-disciplinary collaboration – with inclusivity and transparency further supported.

In terms of institutions and leadership, it is important to attain political endorsement and strengthen institutional mandates for land administration. This can be done through continual advocacy, transparency and awareness raising across multiple sectors – both intra and inter-agency - across governments, at all levels, with professionals, industry, investors, CSOs, NGOSs, academia, the local community, indigenous people and minority groups. Actors from all sectors can play a role in leadership and ideally there is cross-sectoral championing. Upon this collaborative basis an enabling environment for development of policies, standards and regulations is delivered, leading towards cooperative data creation, co-creation and sharing.

In terms of value proposition, land administration actors should take a lead in developing and enforcing accountability and transparency in terms of procedures, metrics and indicators. Doing so justifies and strengthens mandate, roles and responsibilities, amongst the community and society more broadly.

Pathway II: Policy and Legal

Land administration often finds its basis in statutory land law and policy. In the SDGs, there is no specific law and policy theme, rather they are cross-cutting or implied. IGIF explicitly highlights the requirements for the establishment of robust policy and legal frameworks relating to geospatial information. These are considered essential for enabling the availability, accessibility, exchange, application and management of geospatial information.

The creation and existence of sound policy and legal frameworks relating to land tenure, land use, land value, and land development is fundamental. These should enable the creation and ensure the existence of effective land administration that is available, accessible, inclusive, participative, gender- and minority-responsive, transparent, and supports the exchange, application and management of land information to all. These frameworks should also define the degree of responsibility of various legal institutions for dispute settlement.

Conventionally, land administration is mandated through national or state land laws, and underpinning land policy frameworks. Systems have developed with supportive policies, legislation, safeguards, accountability mechanisms, and protections around data and privacy. This strong legal backing often differentiates land data from other types of geospatial information. Land data laws and directives may have prescribed collection, ordering, and storage methods. However, to successfully attain the SDGs, it is important to recognize the dualist and pluralist inherent to some land administration systems, particularly in developing contexts. Parallel systems may have evolved over time and parts may be closely linked to

the cultural and customary ways of life, which may not always be catered for by statutory law[69]. The customs, traditions and land tenure systems of indigenous peoples are equally to be recognized alongside statutory law. Similarly, in coastal zones, multiple legal regimes may coexist[70]. A platform for coexistences and complementary laws and policies is necessary.

Land policies related to the establishment, renewal and strengthening of land administration should be grounded in social, environmental and economic needs. Holistic land policies based on sustainability principles will result in more efficient legislative design and administration. Land policies should reflect the whole-of-government nature of land administration, building upon evidence that 60-70%[71] of government legislation are spatially or land related. A large portion of government agencies either collect, provide or use land information, and land policies should promote inter-sectoral collaboration and land information sharing. Local level empowerment is important in land policy design and local governments need to be given an active role in land policy creation, co-creation and implementation. Integration of land policies across and between levels of government is critical. For example, environmental issues often cross administrative boundaries and land policies developed and implemented through coordination of different levels of government are more likely to be effective. Land policies should also include appropriate incentive schemes. When designing land policies, the appropriate mix of social, environmental, economic and moral incentives need to be determined. Examples include market-based interests (MBIs), compensation arrangements, land care agreements, reward schemes or even penalties. In all cases, the norms and ideals underpinning the land policies should be made easily available, accessible and recognizable in different modes of communication.

Land legislation should be inclusive, participatory, and transparent. International guidelines and frameworks should inform legislative design and those laws and regulations should support institutional cohesion. Guiding principles may include those relating to good governance principles as defined in the VGGTs, NUA, Pinheiro, Sendai, FFPLA principles, or the Marine Spatial Planning Roadmap for marine areas (MSP)[72]. Examples of policies can also be retrieved from the African Union Framework and Guidelines on Land Policy in Africa, as well as the Declaration on Land Issues and Challenges in Africa, by the African Union Heads of State. The importance of local level empowerment in land law development is also recognized in the Gender Evaluation Criteria (GEC), International Finance Corporation (IFC) standards, and the Continuum of Land Rights. These concepts and tools offer strategies for supporting and incentivizing inclusion. The ability of governments to organize and integrate land information can be greatly improved if attributes relating to rights, restrictions, and responsibilities - including spatial extent, duration, people involved, and purpose - are defined in a uniform fashion and stored in authentic registers. Legislation should enable and not prohibit innovative use of technology and alternate tools to capture data and complete transactions. Accountability should also be embedded into legislation with performance-based legislation often providing a suitable approach. Legislation must consider data privacy and licensing issues, including protecting and safeguarding indigenous and local knowledge.

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[69] https://www.un.org/development/desa/indigenouspeoples/declaration-on-the-rights-of-indigenous-peoples.html
[70] Available at http://docs.iho.int/mtg_docs/com_wg/ABLOS/ABLOS_Conf10/ABLOS_X_Presentations.zip Slide 5 of
Marine_Spatial_Planning_from_a_local_perspective-Swedish_case_study-Nilsson.pdf in Session_7
[71] See: Bennett, R., Wallace, J., & Williamson, I. (2008). Organizing land information for sustainable land administration. Land Use Policy, 25(1), 126-138
[72] http://www.mspglobal2030.org/wp-content/uploads/2019/04/Joint_Roadmap_MSP.pdf

To aid putting policy and law into practice, decisions about land administration design, data integration and land administration functions and processes should be driven by the rule of law. Though, it is recognized that statutory law represents only one way to achieve effective change in land administration. Community awareness and information provision and access, can be equally effective and more efficient in promoting uptake, use, and upgrades of land administration and management systems.

Pathway III: Financial

Financial aspects of land administration relate to the establishment and maintenance costs of a system and the underlying data and records within, and also where and how the financial benefits of the system are distributed back to society. Finances are a cross-cutting theme in the SDGs with explicit mention in both SDG 8 and 12. Financial aspects are also explicitly identified under a standalone strategic pathway in IGIF that establishes the business model, develops financial partnerships, and identifies the investment needs and means of financing for delivering integrated geospatial information management, and the need to be able to measure and realize the benefits. The financial strategic pathway of IGIF stresses the necessity for sound, accountable and transparent financial governance, management and arrangements, helps to focus on the importance of understanding the implementation costs and the required ongoing financial commitment necessary for maintenance.

It is important to promote the achievement of a sustainable economy, and economic justice through land administration that can be sustained and maintained on an ongoing basis. Land administration is one of the limited examples in the geospatial domain, that in addition to supporting administration and governance activities, have historically acted as a revenue generation tool for governments, be it through duties, tax, or charging for information. Therefore, the identification or development of land administration business models is essential. These must not only be sustainable and affordable for land administration stakeholders, but also generate value for society as a whole for the realization of sustainable revenue streams. This may involve using concepts such as pay-per-use or cost recovery mechanisms - however, it is important that any financing mechanism is instituted in a fair, accessible and responsible manner. It is also an imperative to broaden financial participation in land administration through the development of financial partnerships, for example, with the not-for-profit (NPO) sector or donor agencies or development partners, in cases where parts of a community may not have the means to readily access the land administration system. In all cases, but particularly those where land administration systems are neither established nor complete, clear articulation of the funding sources and investment options are encouraged. Identifying and using methods for measuring the socio-economic costs and benefits of land administration is also important.

A variety of tools from the domains of economics and finance are available to support financial understandings and management of land administration. These variously focus on budgeting methods, the role of donors, and finance models. Costing and Financing of Land Administration Services[73] (CoFLAS), a guideline and set of methods allowing the exploration, identification and prioritization of costs for developing and running the land services, provides one example. Importantly, the model considers human capacity and strategic options. Additionally, Land Based Finance[74] (LBF) is an instrument by which local governments expand their revenue base and generate funds that will help them realize their service delivery, infrastructural delivery and maintenance goals. Public-private partnership (PPP) methods are

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[73] https://gltn.net/tag/coflas/
[74] https://gltn.net/land-based-financing/

also a popular financing model. The IFC Standards[75] deliver basic guiding principles in regard to land based economic development and fair compensation. Tools such as 'Valuing Unregistered Land'[76] and 'Valuation of Unregistered Land: A policy guide'[77] inform and equip government with information of informal land markets.

Pathway IV: Data

Land data is the core of land administration. Data cuts across all SDGs in terms of evaluation and monitoring of progress. It also supports the day-to-day activities of people and their interaction with built and natural environments. This linking role between people and planet only increases with the growing use of ICT and web technologies. IGIF identifies 'data' as a standalone strategic pathway. IGIF calls for the establishment of fundamental data themes (forming part of a geospatial data framework), and custodianship guidelines for best practice collection, curation, management, and delivery of integrated geospatial information. These should be appropriate for cross-sector and multidisciplinary collaboration. The overarching objective is to enable data custodians to meet their data management, sharing and reuse obligations through the execution of well-defined data supply chains for organizing, planning, acquiring, integrating, managing, maintaining, curating, publishing and archiving geospatial information.

Data relating to land tenure, land use, land value, and land development are fundamental geospatial data themes within any jurisdiction. This data informs on the 'how', the 'what', the 'who', the 'when' and the 'where' of land tenure, land use, land value, and land development. It underpins the processes and transactions that enable changes to the status of land tenure, land use and land value. These land data and land processes should be appropriate, accessible, affordable and integratable with other data organized under the UN Global Fundamental Geospatial Data Themes[78]. Integrated land data may not be obtainable in the short term and requires ongoing investment. The land data may be gathered from a wide range of sources, scales and sensors - but, in all cases, should generally deliver its metadata and enable standardized identification of the spatial extent, time period, and people to which the right, restriction or responsibility pertains to. Defining requirements of land data are the need for appropriate spatial accuracy, the requirement to be temporally up-to-date, and to be backed up, assured and potentially insured by an authority. Without these elements, the data is quickly undermined in terms of societal use and relevance. Availability, accessibility, and interoperability of the land data are also necessities for effective land administration. LADM ISO 19152 (Land Administration Domain Model) and IHO S-121 (Maritime Limits and Boundaries) provide starting points for creating these qualities.

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[75] https://www.ifc.org/wps/wcm/connect/Topics_Ext_Content/IFC_External_Corporate_Site/Sustainability-At-IFC/Policies-Standards/Performance-Standards

[76] https://www.rics.org/de/news-insight/research/research-reports/valuing-unregistered-land/

[77] https://unhabitat.org/wp-content/uploads/2018/05/Guide_Valuation_unregistered_Land.pdf

[78] http://ggim.un.org/documents/Fundamental%20Data%20Publication.pdf

To support the creation and maintenance of land data, data custodianship, acquisition, management, supply chain, curation, metadata concerns, delivery strategies and mechanisms are needed. These should consider cross-sector and multidisciplinary issues - along with privacy and security concerns - and ultimately enable inclusive access and better ordering, integration and searching of information relating to property rights, restrictions, and responsibilities. Integrated and shared land data about land tenure, land use, land value, land development, with other geospatial data, supports the link to the overarching IGIF. Theories, concepts, standards, including past experiences in spatial data infrastructures (SDI) can support the development of these data frameworks, leveraging the IGIF more generally.

Whilst the importance of data cannot be understated, like other service sectors, it is increasingly recognized that land information systems and the transaction processes and services they support should be organized around the activities and service needs of people. The Global Land Indicator Initiative (GLII)[79] recommends land indicators for globally comparable data to monitor land governance. A strong trend towards land transactions (e.g. transfer, subdivide, mortgage) being made available online and affordable to all people is observed, and encouraged by VGGTs, NUA, INSPIRE and FFPLA guidelines.

Pathway V: Innovation

Innovation in land administration is both opportunity and necessity. The emergence of ICT and web technologies challenges manual procedures and techniques developed in the non-digital era. SDG 9 recognizes the importance of innovation, particularly coupled with infrastructure - and continuing on - IGIF recognizes innovation as a standalone strategic pathway. IGIF recognizes that technology and processes are continuously evolving. They create enhanced opportunities for innovation that governments, and other stakeholders, can use to more quickly bridge the digital divide - and in the case of land administration - the cadastral divide[80].

Land administration innovation can be driven by societal pull on the one hand, and technological push on the other. Together these forces encourage process improvement and technical advancement for the recordation, access and dissemination of land data for all, and the promotion of creativity and innovation.

For societal pull, the concept of 'land rights for all' has led to the development of the 'continuum of land rights' and 'fit-for-purpose land administration'. This results in new techniques that re-concentrate land administration efforts on being flexible, accessible (including open access), participatory, achievable, upgradable, cost-effective, easy-to-use, and conflict sensitive, amongst other characteristics[81]. A key principle is that different rights, restrictions and responsibilities can be mapped in different ways – using tools and techniques that best fit with the societal, environmental and economic value. Different property rights, restrictions and responsibilities can also be recorded and registered in different ways. Whilst land parcels provide the predominant method of organizing land rights, restrictions and responsibilities, non-parcel-based land interests also need recognition and appropriate recording. These often relate to the spiritual, natural or built environments (e.g. carbon rights, solar rights, biota rights, water rights, and so on). These interests may be spatially defined as volumes, networks, points - and may have fuzzy spatial and temporal boundaries. The emergence of 'responsible land administration' that demands new land

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[79] https://gltn.net/global-land-indicators-initiative-glii/#
[80] Bennett, R. M., Van Gils, H. A. M. J., Zevenbergen, J. A., Lemmen, C. H. J., & Wallace, J. U. D. E. (2013, April). Continuing to bridge the cadastral divide. In *proceedings of the Annual World Bank Conference on Land and Poverty* (pp. 8-11).
[81] Enemark, S., Bell, K. C., Lemmen, C. H. J., & McLaren, R. (2014). *Fit-for-purpose land administration*. International Federation of Surveyors (FIG).

administrative approaches enhance livelihoods and that potential pros and cons within land administration initiatives are identified early.

For technology push, it is noted that transition or transformation should always be coupled to societal readiness and need. Satellite systems, affordable GNSS, airborne platforms, sensors, and modern terrestrial systems and high-resolution aerial imagery dramatically impacted upon land administration techniques over preceding decades. More recently, the emergence of cloud technologies and widespread mobile uptake further influences the capture, storage, and dissemination of land rights and transaction information. Emerging technologies including 3D data models and visualization tools, artificial intelligence (including machine learning and deep learning), automated feature extraction, change detection mechanisms, big data analytics, the internet of things, crowdsourced data, and blockchain. These will continue to provide opportunity and also disruption. In all cases, each development and innovation requires assessment of data protection as well as ethical aspects in line with country context and 2030 Agenda.

Pathway VI: Standards

Standards for land administration policies, laws, organizations, financing, transactions, and particularly data and technology are increasingly available at national, regional, and global levels. The SDGs standardize the global development agenda including the indicators for monitoring and evaluating them. IGIF seeks to ensure the adoption of best practice standards and compliance mechanisms that enable legal, data, semantic and technical interoperability, which are considered fundamental to delivering integrated geospatial information and knowledge creation. Standards also assist cost reduction and support removal of duplication and maintenance efforts.

FELA is both a reference itself and provides reference to international land administration standards. It also highlights the existence and value of standards at regional and national level. Significant contributions have emerged in land administration with regards to standards, particularly through initiatives of UNECE, UN-Habitat, FAO, World Bank, ISO, IHO, OGC, and FIG, all at the global level. At global level the resolution on a global geodetic reference frame for sustainable development (A/RES/69/266)[82] represents a foundational global reference. At regional level, initiatives such as INSPIRE demonstrate the potential for agreement amongst differing nation states. At national level, significant efforts at standardization and sharing are observed in NSDI initiatives and national land and property information strategies, taking advantage of developments with ICT and web technologies. Across all initiatives, the objective is to enable different information systems to communicate and exchange data through interoperability (legal, semantic, and technical). In this regard, the use of standards is strongly encouraged.

Cadastre 2014[83] provides an example of a strategic-level standard that garnered significant uptake across national contexts. The document comprises six (6) visionary statements and was translated into over 20 languages and greatly influenced the development of land administration systems. In parallel, tools variously supporting benchmarking of land administration agencies, including strategies, management, and operations functions were readily developed - with the 'Cadastral Template' tool and national datasets providing a simple blueprint for interoperability. The standard for parcel identifiers[84] provided a technical guide for the foundational issue of spatial identification of land rights. In the past, different

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[82] https://undocs.org/en/A/RES/69/266
[83] https://fig.net/resources/publications/figpub/pub61/Figpub61.pdf
[84] http://www.unece.org/fileadmin/DAM/hlm/documents/Publications/guidelines.real.property.e.pdf

agencies used different spatial identifiers, and integration and efficiency demands uniform units and identifiers to be adopted. More recent and broader in nature are the 'Doing Business'[85] reports and 'Land Governance Assessment Framework'[86] (LGAF) and country report process - both with explicit components relating to land administration processes and data. The Land Administration Domain Model (ISO 19152) provides an ISO endorsed data model whereas the Social Tenure Domain Model (STDM), in Annex I of the LADM, provides a concept and data model to record all people to land relationships. ISO/TC211 is working on the second edition of LADM[87, 88]. The IHO S-121 standard focuses on maritime limits and boundaries. Further developments are emerging with regards to standards for the valuation of unregistered lands, 'Valuing Unregistered Land'[89] and 'Valuation of Unregistered Land: A policy guide'[90]. The ISO 19144 for Geographic Information Classification Systems[91] specifies a land cover meta language and other regional initiatives at the European level include the Hierarchical INSPIRE Land Use Classification System[92] (HILUCS).

Pathway VII: Partnerships

Partnerships are an inherent element of land administration. In the contexts of the SDGs they gain importance: the SDGs cannot be achieved without effective cross-sector and interdisciplinary cooperation, academic and private sector partnerships within countries, and cross-cultural and international cooperation. IGIF recognizes the increased importance of partnerships in the context of geospatial information management, identifying them as a stand-alone strategic pathway, calling for a specific focus on a culture of establishing trusted partnerships, strategic alliances, and shared values relating to geospatial information management.

Regardless of the context, partnerships form the basis for effective land administration. This includes the creation and harnessing of strong relations within and between the public sector, private sector (via PPPs), academia, CSOs, NFPs, NGOs, professional bodies, coordinating organizations, and international agencies and societies. Land administration stakeholders are found in each of these sectors. The types and nature of partnership depends on the country context.

Beyond core land administration functionality relating to land tenure, land value, land use, and land development, partnerships in land administration extend into SDIs, and specifically NSDIs, when it comes to information dissemination and sharing. SDI concepts, methods, and tools can be leveraged from within the land administration domain, to support trust, access, dissemination, use, and sharing with regards to land information.

The increasing role of non-government actors included in land administration sees them playing an active role in the creation, collection, storage, and dissemination of land administration laws, data, and transactions and perceived property rights[93]. This is supported by the principle of subsidiarity[94] and the emergence of networked ICT, and particularly internet technologies. The network of partnerships requires

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[85] http://www.doingbusiness.org
[86] http://www.worldbank.org/en/programs/land-governance-assessment-framework
[87] http://ggim.un.org/unwgic/presentations/6.2_Christopher_Body.pdf
[88] https://docs.opengeospatial.org/wp/18-008r1/18-008r1.html
[89] https://www.rics.org/de/news-insight/research/research-reports/valuing-unregistered-land/
[90] https://unhabitat.org/wp-content/uploads/2018/05/Guide_Valuation_unregistered_Land.pdf
[91] https://www.iso.org/standard/44342.html
[92] http://inspire.ec.europa.eu/codelist/HILUCSValue/
[93] https://www.prindex.net/
[94] https://www.eurofound.europa.eu/observatories/eurwork/industrial-relations-dictionary/subsidiarity

clear identification and articulation of roles, responsibilities and oversight. Data custodianship should remain with the agency or entity mandated to collect, manage and disseminate it.

The IGIF Partnership pathway lists multiple types of partnerships. Those that may be of relevance at national, regional, or local levels to land administration include PPPs (including build-own-operate, service level agreements), universal distribution and information sharing agreements, participatory land administration processes, and mapping activities with community organizations and indigenous communities/peoples organisations.

Pathway VIII: Capacity and Education

Capacity development[95] is regularly recognized as a major focus area when it comes to achieving sustainable land administration. The issue cuts across numerous SDGs and is directly dealt with under Goal 4. IGIF identifies capacity and education as a stand-alone strategic pathway, requiring attention in the context of sustainable and integrated geospatial information management. Capacity development and education is about transformations that empower individuals, leaders, organizations and societies and must be country-driven. Strengthening awareness, knowledge and know-how, improving competencies, skills and instincts with education, training, continual development, and lifelong learning improves capacities for governments, organizations, communities and individuals.

The development of enduring knowledge and skills transfer in land administration is essential. This must be at the required level, for all land administration stakeholders, be they local, national, sub-national or international, or based in government, private sector, academia, civil society, community or with the not-for-profit sector. Knowledge development and transfer involves the creation and use of targeted initiatives including capacity development, awareness raising and support of formal education programs. It includes recognition and fostering of entrepreneurship, professional workplace training, and upskilling and reskilling. Overall, the objective is to sustain and increase the awareness and level of understanding of land administration through both conventional and alternate means - including conventional skills development programs, context-based skills training, professional training, peer-to-peer learning, vocational training and inter-governmental training programs. Capacity development also includes skills establishment and strengthening, exchange of cross-country experiences, and also incorporating nation-nation and interdisciplinary knowledge sharing.

Fundamentally, a base level of understanding of geospatial concepts and tools, and how they relate to land administration, should exist across a community and country-context. Whilst land administration professionals should always possess high level geospatial capacity, local communities with geospatial capacity are better able to use, advocate, and where necessary dispute, the land administration system. Formal education programs might not be necessary in all cases. Advantage can be taken of information provision and social learning programs. Training materials on the VGGTs are readily available and accessible.

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[95] Capacity development is "The processes whereby people, organisations and society as a whole unleash, strengthen, create, adapt and maintain capacity over time" (OECD DAC, 2006).

In terms of more formal land administration education, an increasing array of options is available. At primary and secondary educational levels, the use of geospatial tools in classrooms is aided with the development of ICT and internet technologies. At tertiary levels, geospatial concepts and tools are used across multiple disciplines and domain areas. The role of conventional undergraduate and postgraduate geospatial programs to develop land administration professionals remains highly relevant and consistent for both developing and developed contexts. In developing contexts, a marked increase in the conversion of vocational programs to fully fledged professional degree programs are evident. Initiatives from different universities and academic institutions delivering land administration and management programs support capacity development at postgraduate levels in developing countries, and in particular, the least developed countries, land locked developing countries and small island developing states - and focus on developing an interdisciplinary land administration skillset. North-South collaborative Research & Development (R&D) programs illustrate the push for PhD and R&D level capacity development. High-level land administration capacity and expertise development is generally on the rise, although, cannot be said to keep pace with demand, particularly in the context of the 2030 Agenda. For this reason, a range of alternative methods are also recognized and advocated for.

Alternate methods may include fast-tracked training programs, micro-credentialed course units, distance learning, or globally available Massive Open Online Courses (MOOC). In other contexts, it includes the training of grass-roots surveyors[96] to support large-scale country-wide land administration projects. In these cases, the role of professional land administrators is leading the curriculum development, delivery, and management of processes, approaches, data and methods.

Pathway IX: Advocacy and Awareness

Advocacy and awareness are an essential element of any contemporary land administration initiative, program, project and resultant system. Land administration cannot succeed without stakeholder acceptance and support across society. Advocacy and awareness activities can help to create and maintain this backing. All prominent global land policy initiatives mention the importance of stakeholder identification, development of engagement strategies, and actively implementing and evaluating communication initiatives. This includes the SDGs and VGGTs.

For IGIF, advocacy and awareness are recognized as a stand-alone strategic pathway. The strategic pathway recognizes that successful implementation of integrated geospatial information management relies on recognition and active participation from stakeholders and the general community. IGIF calls for engagement activities to be embedded and ongoing through the lifecycle of creation and implementation, in order to enhance the overall design and uptake of integrated geospatial information management.

Meaningful engagement with all land stakeholders is integral for the implementation of an effective land administration. This includes actively undertaking stakeholder identification, planning and execution of engagement, undertaking integrated communication strategies, and monitoring and evaluation of those activities. Depending on the scale of system or project, this might include undertaking these tasks at community, national, regional, and international level.

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[96] Also known as 'barefoot' or 'para-surveyor. These practitioners know how to use specific tools to undertake a specific part of the land administration workflow. They are trained in a fraction of the time needed to become a conventional, fully trained surveyor. https://www.gim-international.com/content/article/from-barefoot-to-air-foot-surveyors

Stakeholder identification includes engaging all relevant local communities, CSOs, NGOs, private, academic, government agencies - pertaining to the land administration system. Planning and execution activities should cluster stakeholders and identify the appropriate communication channels for sharing and engagement. This leads to the development and implementation of engagement strategies and monitoring of those. The objective is to deliver effective and efficient communication and engagement processes through the use of appropriate communication mediums to ensure informed public debates and decision making on land issues. Input from stakeholders is monitored and evaluated to ensure advocacy, empowerment, participation and the identification of locally and globally appropriate solutions.

At the international level, UN-HABITAT, FAO, ABLOS[97], FIG provide concepts and tools to support advocacy and awareness on land administration. International NGOs and NPOs provide technical approaches to support engagement through mapping and registration activities. National level NGOs and CSOs provide other options and alternatives. At the local level, any initiative seeks to align with local norms, language and capacity when it comes to appropriate and responsible advocacy and awareness raising.

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[97] ABLOS is the Joint IAG-IHO Advisory Board on the Law of the Sea (where IAG stands for the International Association of Geodesy). The Advisory Board comprises 4 representatives from IHO Member States and 4 representatives from the International Association of Geodesy (IAG) https://iho.int/en/ablos

Conclusions and Way Forward

The SDGs universally apply to all countries and mobilize efforts to end all forms of poverty, fight inequalities and tackle climate change, whilst ensuring that no one is left behind. Through the IGIF, UN-GGIM provides the broad foundations to support SDGs achievement. In terms of geospatial information relating to land, a significant proportion of humanity do not enjoy secure land and property rights. There is a need to accelerate efforts to document, record and recognize people to land relationships in all forms. Land administration relates people to land and informs on the 'how', the 'what', the 'who', the 'when' and the 'where' of land tenure, land use, land value, and land development. It should be appropriate, accessible and affordable and recognize social, environmental, and economic circumstances at the national and sub-national levels.

FELA with its nine pathways is an overarching policy guide and provides a reference for Member States when establishing, strengthening, co-ordinating, and monitoring its land administration nationally or sub-nationally. It has been designed for both the developing and developed context. FELA aligns directly to the overarching and strategic Integrated Geospatial Information Framework (IGIF). FELA implements the IGIF for the land sector. The nine pathways of FELA provide a mechanism towards effective leadership, advocacy, mobilization and actions to accelerate efforts to document, record and recognize people to land relationships in all forms and provide humanity with secure land and property rights.

Going forward, FELA will leverage the IGIF Implementation Guide as a reference resource that provides information for governments to design, plan, implement and maintain effective land administration in their country in such a way that positive transformational change are enabled, visible and sustainable. The IGIF Implementation Guide provides the specific guidance, options and actions for each of the nine strategic pathways, and equally, for FELA and its nine pathways. This will guide the user through the approach, content, rationale, options, considerations, and principles that align with actions.

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