State of Land Information in Madagascar

An Open Data Action Framework

land portal

ODC
open data charter

About the Open Up Guide (OUG) reports

The **State of Land Information** (**SOLI**) research and reports seek to provide an overview of available government data and information on key land issues. The aim of the research is to uncover the many different sources of land data and information at the country-level and help to identify data and information gaps. The research also provides a technical assessment against open data criteria derived from international standards. The reports establish a baseline for targeted interventions to improve the information ecosystem. The Land Portal has published SOLI reports for South Africa, Uganda, South Sudan, Tanzania, Kenya, and Senegal. We aim to develop SOLI reports for a dozen countries in Africa by 2024.

Though SOLI reports are independent research products, they also serve as the first step in the implementation of the Open Up Guide for Land Governance.

The **Open Up Guide for Land Governance** is a tool for national and local government agencies with a mandate for or an interest in making their land governance data open and available for others to re-use. The Open Up Guide is the result of a collaboration between the Land Portal Foundation and Open Data Charter.

July 2023

Contents

Introduction

This State of Land Information (SOLI) report analyzes the current state of land data in Madagascar, assessing the availability of land information and how this information complies with open data standards.

Why Open Data

As the momentum around international land monitoring initiatives increases, there is an unprecedented global demand for free, accessible, and usable land data and information. Increased digitization of information, internet usage, and growing demand for data transparency have expanded the land information ecosystem. The African Union's Model Access to Information Law to give effect to Article 9 of the **African Charter on Human and Peoples Rights**,[1] supports increased access to information.

At the 2016 Paris Open Government Summit, the Government of Madagascar committed to open government and improved government transparency and access to information. In 2017 it established the EITI data policy on data access, dissemination, and re-use of data in the extractive industries, developed an online Geoportal aimed at linking cadastral and other sector data, and established a multi-stakeholder group to promote the use and adoption of open data. Despite the growing recognition and political will of the government with regards to the importance of opening access to information, Madagascar does not yet have access to information law. In 2023, land data in Madagascar is not open. It remains undocumented or offline, inaccessible, fragmented, poorly managed, and unusable. This reduces the government ability to formulate strategies and policies to deliver land related services. Open access to data and information promotes transparency, equity, and participation, and supports sustainable development.

---

1   Ratified by Madagascar in 1992: Retrieved on 22 November 2022 from **https://www.achpr.org/states**

The European Commission's Expert Group on **FAIR data**[2] sees strong economic benefit and value from data, information and underlying infrastructure.[3] This is endorsed by research on how FAIR data can support innovation, improved service delivery and accountability[4] and further evidenced by the **United Kingdom's new National Data Strategy**.[5] Opening up land data would contribute to achieving the sustainable development goals in **Madagascar**[6] and assist the global effort to improve access to land information, achieve global land indicators on sustainable development and improve land governance.

Global Indices

Indices are used to track and understand progress towards achieving specific indicators. The results can be used to address data gaps, support a country to publish more data and improve information and evidence for policy making.

A key global data indicator is the **2022 Global Data Barometer**[7] survey, which did not assess Madagascar, and Madagascar also does not appear in the **(2016/2017) Global Open Data Index**.[8] In 2017 Madagascar scored 6 out of a 100 and was ranked among the last three of 187 countries in the global **Open Data Inventory (ODIN)**.[9] In 2020, Madagascar's ranking improved to 137th with an overall score of 40 out of a 100. While this indicator measures the completeness of mostly statistical data and adherence to open data standards and does not specifically assess land data, it does indicate progress in opening statistical data in Madagascar.

Objectives of the Report

This report on the land data ecosystem in Madagascar is the first step towards providing a baseline and diagnostic tool to inform conversation around land and data governance. It aims to complement existing initiatives to improve the accuracy and extent of land data in Madagascar and identify opportunities to improve public access to all forms of land information.

Land data in Madagascar is often incomplete and inaccurate. An open land data future requires strengthened support for programs to improve the accuracy and coverage of land information. In assessing the openness of land data in Madagascar this report acknowledges the baseline challenges for improving data quality and the sustained response needed to achieve an effective open data regime.

---

2   Retrieved on 16 June 2023 from **https://www.go-fair.org/fair-principles/**

3   European Commission. (2018). Turning FAIR into Reality: Final Report and Action Plan from the European Commission Expert Group on FAIR Data. EC Directorate General for Research and Innovation. Retrieved on 16 June 2023 from **https://op.europa.eu/en/publication-detail/-/publication/7769a148-f1f6-11e8-9982-01aa75ed71a1/language-en/format-PDF/source-80611283**

4   Reinsel, D., Gantz, J., & Rydning, J. (2018). The Digitization of the World: From Edge to Core. IDC. Retrieved on 16 June 2023 from **https://www.seagate.com/files/www-content/our-story/trends/files/idc-seagate-dataage-whitepaper.pdf**

5   Retrieved on 16 June 2023 from **https://www.gov.uk/government/publications/uk-national-data-strategy/national-data-strategy#fn**:2

6   Retrieved on 16 June 2023 from **https://madagascar.un.org/fr**

7   Retrieved on 14 June 2023 from **https://globaldatabarometer.org/results/**

8   Retrieved on 14 June 2023 from **https://index.okfn.org/place.html**

9   Retrieved on 14 June 2023 from **https://odin.opendatawatch.com/Report/countryProfileUpdated/MDG?year=2020**

The chapter on **Data Governance** describes Madagascar's legal framework for data governance, examines its international and national commitments to access to information, its instruments for data and information governance, and it summarizes Madagascar's legal framework for opening information. Good data governance ensures transparency about the purposes for collecting, storing, and disseminating information. The next chapter on **Availability of Land Data and Information** examines the available land data and information provided by the government organizations responsible for Madagascar's land administration. The available data and information are described for each of the six categories of land data.

The report reviews six key land data categories (*Table 1*).

Table 1: Land Data Categories

	CATEGORY 1: **LEGAL AND POLICY DATA AND INFORMATION**	The availability of data and information on laws, policies, rules, regulations, processes and procedures regarding land and data governance across all data categories.
	CATEGORY 2: **LAND TENURE DATA AND INFORMATION**	Data and information on the relationships that individuals and groups have with respect to land and related resources and their allocation; cadastral information (formal, informal, customary/indigenous) including the legal survey records to determine parcel boundaries; the creation of new properties or alteration of existing properties; and transfer of properties though sale, lease or mortgaging.
	CATEGORY 3: **LAND USE DATA AND INFORMATION**	The available data and information related to control of land use; including zoning, enforcement of land uses, public land use at the national, regional, and local level that is available in the country.
	CATEGORY 4: **LAND DEVELOPMENT DATA AND INFORMATION**	An overview of the available land data and information relating to the building of new physical infrastructure and utilities; the implementation of construction planning; public acquisition of land; expropriation; change of land use through granting of planning permissions, and building and land-use permits; and the distribution of development costs.
	CATEGORY 5: **LAND VALUE DATA AND INFORMATION**	Available land data and information on the assessment of the value of land and properties; the calculation and gathering of revenues through taxation; and the management and adjudication of land valuation and taxation disputes and land markets.
	CATEGORY 6: **OTHER LAND DATA AND INFORMATION**	This category may vary according to country specific context, but may include data and information relating to mineral resources, infrastructure, agricultural census data, socio economic census and survey data, public asset data, public procurement data, beneficial ownership data and other key data sets for resilience and climate change.

The **Open Data Assessment** chapter evaluates the "*openness*" of Madagascar's land information, by assessing it against 10 criteria for open data, as used by international best practice (Table 2). The score for openness score is provided as part of the assessment and reflects the current situation as well as providing a baseline for future improvements. This baseline assists with understanding the current state of data and supports future usability of data for informed decision making, data-dependent services and to meet the public needs and interests.

The **Conclusion** highlights the key findings from this research project and sets out the next key steps to consolidate the sound foundations that have been identified. The final chapter of this report provides an **Open Data Action Framework** which serves as a practical guide for the Government of Madagascar to optimize the management and utilization of land data through streamlining access, promoting collaboration, and building capacity among stakeholders. It offers general recommendations and sets out an action plan to build capacity and publish open data, develop an information infrastructure for internal and external providers and consumers, and the necessary legal and policy steps.

This research does not attempt to quantify or assess the quality of the data, or determine what constitutes the "*best*" data, beyond it being open. Data users are best placed to identify the data they are looking for, what they wish to use it for, and how appropriate it is for their needs.

Table 2: Open Data Assessment Criteria

🖥	ONLINE	✓	STANDARDS
🔒	ACCESSIBLE	⬇	DOWNLOADABLE
💵	FREE	CC	OPEN LICENCE
⏱	TIMELY	0110 1001 1010	MACHINE READABLE
🏷	METADATA	</>	UNIFORM RESOURCE IDENTIFIERS

Methodology

This state of land information assessment uses the **Modern Land Administration Theory**[10] as a conceptual framework. This theory argues that land administration agencies should support sustainable development by creating a more integrated information system across government sectors. It prioritizes an information environment that manages land and associated resources to respond to national and global imperatives such as poverty reduction, sustainable agriculture, sustainable settlements, economic development, and conflict management.

10   Williamson, I., Enemark, S., Wallace, J., & Rajabifard, A. (2010). Land Administration for Sustainable Development. Redlands: ESRI. Retrieved on 20 June from **https://cepa.rmportal.net/Library/natural-resources/Land%20Administration%20for%20 Sustainable%20** Development.pdf

This report assesses land governance data on the core land administration functions of land tenure, land use, land value, and land development. This data and information enable performance monitoring and evaluation. Legal and policy information on land governance and other relevant land data and information are also included. For each of these six categories, key information sources were identified and assessed for availability, timeliness, standardization, and openly licensing. Inputs on this categorization and methodology are welcome to continuously improve the process.

This report focuses on government data sources as it has become clear that in terms of land governance, the government is the primary custodian of land data. This assessment assumes that the typical land administration functions are operating well and that government departments can function as an integrated whole for the purposes of planning and sustainable development.

While prioritizing government data and the public sector as producers of land data, the report recognizes that many other actors may play a role in the production of data. The research team, comprising local and international researchers, conducted legal and policy reviews, and facilitated three workshops (two in Antananarivo and in Majunga–Boeny Region) with key land data and information stakeholders. In addition, the team conducted key stakeholder interviews and surveys to assess the specific data needs of various user groups to complement and validate the desktop research.

Dataset as Unit of Analysis

8

The "*dataset*" is the primary unit of analysis. A dataset is defined as "*a structured collection of information, including statistical data, bibliographic data, spatial data and multimedia contents*".[11] For example, it can list property ownership and boundaries details, contain statistical information about the number of women landowners, or be a bibliographic database of publications or law on a certain topic of land governance. The assessment focuses on government datasets produced as part of ongoing functions, not ad-hoc project data which entities (donor, private, NGO) might create using data about a specific issue for single use.

Usefulness of the Report

This SOLI report is accessible and free for use and re-use by anyone. It may be of particular use for policymakers and other government officials within Madagascar who have an interest in opening land data. It is a baseline for Journalists, development agencies, and others to use for further work and inquiry into land and data transparency. Researchers will be able to identify information gaps and research priorities.
A land practitioner working at the local or global level may use it to monitor land governance performance against international indicators.

---

11   As defined in: Land Portal Foundation. (2018). The SOLI Research Guide.

Data Governance in Madagascar

This section discusses the legal framework for data governance, both generally and in relation to land. Land data governance is defined as the legal, policy and management principles that inform the equitable and ethical collection, use and dissemination of data.
This section highlights legal rights to access information and legal obligations to make information available to the public.

Domestic Commitments on Access to Information

The **2010 Constitution of Madagascar**[12] establishes a right to information which may not be subject to constraint, except where there is infringement of public order and morality. Exercise of the right to information is also subject to duties and responsibilities, as specified by law (art. 11). As of June 2023, Madagascar has not adopted legislation to implement the Constitutional right to information.

The Access to Information and Knowledge Sharing Charter

The **2013 Access to Information and Knowledge Sharing Charter**[13] has no legal force, but does set out key principles concerning the right to information. Its default assumption is that, while access to information is a Constitutional right, it must still be requested and is subject to denial of access. This assumption is contrary to open data's default presumption of free and open access.

Although not legally enforceable, the Charter has provided the basis for a draft Access to Information Law, which was finalized in August 2020, but has not yet been submitted to Parliament.[14] Finalizing the draft law is an essential step towards implementing the Constitutional right to information.

---

12   Retrieved on 14 September 2022 from **https://www.constituteproject.org/constitution/Madagascar_2010.pdf?lang=en**

13   Retrieved on 14 September 2022 from
      http://www.csi.gov.mg/wp-content/uploads/2014/05/Charte_acces-l-information_Version-finale.pdf.

14   Mr. Fetra RAKOTONDRASOAVA General Director of Communication at the Ministry of Culture and Communication Madagascar. Medialab Pour Elles close-out event. Louvre Hotel Antananarivo 8 April 2022 by CFI Medias Development.

The Charter defines public information as:

"All data or knowledge produced or received within mission frameworks by public services and acquired by study or experience in the form of writing, graphics or presented on paper, audio, video and audiovisual, or in electronic format (Principle 1)".

Under the Charter, public organizations must store and manage their data in a form and manner that promotes the right of access to information (Principle 3). Principle 8 provides that access to information may be exercised by email, free of charge, when the material requested is available in electronic format. These Principles provide a basis for open data in Madagascar, but do not establish standards for its storage, management, and on-line accessibility.

The charter lists a wide range of public organizations that must store and manage data to allow public requests for information. They include decentralized territorial collectives, public programs and projects, public enterprises, entities governed by public law, local authorities, and entities governed by private law with a public service mission (Principle 8).
Any refusal by a public organization to disclose requested information may be subject to appeal to the Courts (Principle 2).

The Charter sets out a voluntary mechanism for organizations to sign up to its principles to signal a commitment to public information access. As of June 2023, there are 26 signatories to the Charter: 19 are government agencies, four are from the private sector; one is a development learning center, and the final signatory is from the Extractive Industries Transparency Initiative. Each signatory must nominate a person or establish a one-stop service within their organization to act as a contact point for information requests. Each signatory must within a year set out a policy governing access, transfer, exchange, and use of their information.

The Charter lists a relatively broad range of exceptions to the Constitutional right to information, including information relating to personal or private information, national defense security, and Council of Ministers or Government Council deliberations. Information may also not be disclosed where disclosure would cause harm to other countries, international organizations, the foreign policy of Madagascar, industrial property rights, copyright, and associated rights, or fair and just competition (Principle 6). All these exceptions require further clarification for the Charter to provide an effective basis for open data regulation in Madagascar.

The Law on Personal Data Protection

The **2014 Law on Personal Data Protection**[15] sets out relatively broad exceptions to the Constitutional right to information, including personal data, and information relating to national security, defense and public safety (arts. 7, 15, 39). It is modeled on the data protection law of the European Union.[16]

---

15   Retrieved on 22 November 2022 from **https://www.afapdp.org/wp-content/uploads/2015/01/Madagascar-L-2014-038-du-09-01-15-sur-la-protection-des-donn%c3%a9es-%c3%a0-caract%c3%a8re-personnel.pdf**

16   See 'Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data'. Retrieved on 22 November 2022 from **https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX**:31995L0046&from=EN.

It also establishes the Malagasy Commission for Data Processing and Freedoms (CMIL–Commission Malagasy sur l'Informatique et des Libertés) to monitor and implement personal data protections in the public and private sector (art. 28).[17] The CMIL is not operational and has not yet been constituted even though the 2014 law is already in effect, and no requirements for notifications of breaches have yet been established in law. The Commission has no website or online presence.

The **2016 Code of Media Communications**[18] similarly sets out defense, security and public safety restrictions on the Constitutional right to information.[19] While the Code establishes a right for journalists to obtain information without hindrance on all facts of public interest, it requires journalists to refrain from infringing on the privacy of individuals, even when those individuals have political functions or roles, unless the infringement is justified in the public interest. The Code imposes substantial fines for contempt of Court, defamation, or insult carried through the media, not only on journalists but also on editors, directors, media managers and owners.[20]

The National Statistics Practices Law

The **National Statistic Practices Law No. 2018-004**[21] provides the clearest expression of open data principles in Malagasy law. It regulates statistics authorities in Madagascar which include the National Statistical Office and all organizations or services authorized by legislation or regulation to develop, produce, and disseminate public statistics.

- Article 13 requires public statistics to be presented in a clear and comprehensible form, disseminated in a practical and appropriate manner, and accompanied by necessary metadata and analytical comments.
- Article 14 requires the dissemination of public statistics in such a way as to allow use by all users at the same time.
- Article 12 requires statistical authorities to ensure equal access to public statistics for all users without any restriction other than respect for statistical secrecy.

The National Statistic Practices Law has no implementing regulation or decree. The Malagasy government plans a National Statistic System (NSS) for access by citizens, organizations, researchers, companies, media, or any other types of users. The NSS will be constituted by a National Statistics Council (NSC), the National Statistics Office and other public statistics agencies.[22] Developing the NSS and its agencies remains a work-in-progress in Madagascar.

11

---

17   CMIL is yet to be established as a working organization.

18   Retrieved on 22 November 2022 from **https://ictpolicyafrica.org/en/document/zyx01ea6bc?page=1**

19   See Decision No. 30-HCC/D3 of August 12, 2016, Concerning Law No. 2016-029 on the Code of Media Communication. Retrieved on 22 November 2022 from **https://ictpolicyafrica.org/en/document/zyx01ea6bc?page=1**.

20   The Minister of Communications is empowered to order closure of a media organization for breach of the Code. For criticisms of the Code see Jour J à Madagascar, pour l'adoption du controversé Code de la communication [D-Day in Madagascar, for the Adoption of the Controversial Communication Code], RFI (July 7, 2016); Malgache [RSF and the UPF Denounce the Adoption of the Communication Code by the Malagasy Parliament], Reporters Sans Frontiers website (July 8, 2016).

21   Retrieved on 22 November 2022 from **https://www.assemblee-nationale.mg/wp-content/uploads/2019/11/Loi-n%C2%B02018-004_fr.pdf**

22   The institution of a National Statistic System and National statistics Council is set out in Title III of Law No. 2018-004, but no implementing action has been taken.

Although the National Statistic Practices Law establishes open data principles in Madagascar, its definition of public statistics does not include data on land governance. Further, as set out in Section 3.3 below, land governance authorities have not applied open access public statistics principles to data on land.

Open Data Advocacy

The **Madagascar Initiative for Digital Innovation (MAIDI)**[23] has led an open data advocacy movement in Madagascar since 2017. MAIDI acts as an intermediary for data requests from public organizations and has established an open data platform that is compliant with open data standards. It is a voluntary, non-government organization that does not establish legal rights and obligations relating to data governance in Madagascar.

International Commitments on Access to Information

Madagascar has ratified several international legal instruments that include open data principles. While these instruments are yet to be reflected in domestic legislation, they do establish international law obligations on the state of Madagascar. The **International Covenant on Civil and Political Rights (ICCPR)**[24] covers "*freedom to seek, receive and impart information and ideas of all kinds, regardless of frontiers, either orally, in writing or in print, …, or through any other media*" (art. 19(2)).[25] The **African Charter on Human and Peoples Rights**,[26] recognizes access to information as a fundamental human right. The **United Nations Convention Against Corruption (UNCAC)**[27] requires signatories to adopt "*procedures or regulations allowing members of the general public to obtain, where appropriate, information on the organization, functioning and decision making processes of its public administration and, with due regard for the protection of privacy and personal data, on decisions and legal acts that concern members of the public*" (art. 10(a)). Madagascar is also a signatory to the **Sustainable Development Goals (SDGs)**,[28] which recognize access to information as a key goal for sustainable development of society.

Land-Specific Legal Framework

The Constitution of Madagascar provides for "*transparent administration of information concerning land*" (art. 34). Importantly, this reference to transparent administration of land information is not stated as a component of the Constitutional right to information, but in the context of Constitutional protections of private property from expropriation.

---

23   Retrieved on 22 September 2022 from **http://www.association-maidi.mg**

24   Ratified by Madagascar in 1971. Retrieved on 22 November 2022 from **https://indicators.ohchr.org/**

25   Retrieved on 22 November, 2022 from
      https://treaties.un.org/doc/publication/unts/volume%20999/volume-999-i-14668-english.pdf"

26   Ratified by Madagascar in 1992. Retrieved on 22 November 2022 from **https://www.achpr.org/states**

27   Ratified by Madagascar in 2004. Retrieved on 22 November 2022 from
      https://www.unodc.org/unodc/en/corruption/ratification-status.html

28   Retrieved on 22 November 2022 from **https://sustainabledevelopment.un.org/index.
      php?page=view&type=6&nr=195&menu=139**

Article 34 states:

> *"The State guarantees the right to individual property. No one may be deprived of it except by way of expropriation for the cause of public utility and subject to a fair and prior indemnification. The State assures the facility of access to land property through the appropriate juridical and institutional provisions and a transparent administration of information concerning land".*

In other words, Article 34 covers the Constitutional protection of private property, not legal rights or obligations relating to open land data.

There is no single land law in Madagascar that provides a basis for transparent administration of land information. No specific legal provisions set out open data principles in relation to titles, topographic or geographic information system (GIS) data. No national land information system integrates data relating to tenure, boundaries, use, planning, valuation, and development. No law or policy establishes a National Spatial Data Infrastructure (NSDI).

Multiple laws in Madagascar establish data distinctions according to land categories including titled land, untitled land, state land, and special status land. Separate laws govern specific subject-matter issues such as land use planning and land taxation. While these subject-matter laws apply to all categories of land, each establishes distinctive institutions and data governance regimes for their respective areas of operation.

The **2005 Land Law**[29] is the overarching land law which establishes categories of private, state and special status land (*Loi No. 2005-019 du 17 Octobre 2005 – fixant les principes régissant les statuts des terre*). Other laws govern specific categories of land, as follows:

- **Private Land.** The 1960 Land Ordinance regulates titled private land under the Torrens system of land administration. The 2006 Law on Untitled Land regulates untitled private land through land certificates and local plans of occupation.
- **State Land.** The 2008 Law on Public Domain Land regulates land within the public domain of the state. The 2008 Law on Private Domain Land regulates land within the private domain of the state. The 1962 Decree on Long-Term Leases allows the grant of long-term leases over state private domain land.
- **Special Status Land.** The 2005 Land Law defines special status land to include investment zones, forest areas, protected areas, and natural resource management land. Specific laws govern each type of special status land – including the 2017 Law on Special Economic Zones, the 1997 Forests Law, and the 2017 Extractives Industries Transparency Initiative Law.

Other land data laws include the 2015 Law on Land Use Planning, the 1999 Mining Code, and the 2009 General Tax Code.

---

29   Loi n° 2005-019. Retrieved on 22 June, 2023 from **https://cnlegis.gov.mg/page_find_direct_mots/**

The following section describes the land data regime established by each of these laws.

The 1960 Land Ordinance[30]
(Ordonnance N. 60-146 du 3 Octobre Relative au Régime Foncier et L'Immatriculation)

The 1960 Land Ordinance regulates land titles. For titled land, members of the public may request a paper copy of a legal situation certificate (CSJ – *certificat de situation juridique*). The legal situation certificate reflects the data recorded in the land title, which is a copy of the page of the land book setting out registered property rights over a surveyed plot of land (art. 3, 2005 Land Law).[31]

Land books are administered by the Ministry of Territorial Planning and Land Services (MATSF). Land books are not available for inspection other than through CSJ applications. However, the Ordinance allows for public hearings relating to first-time applications for a land title (art. 165). Article 181 of the 1960 Land Ordinance allows for implementing regulations to define the forms and conditions of publishing land titles data.

Land books include information on registrable rights to land. They do not include information on the legal use of land, the valuation of land, or the nature of buildings on the land. Where there is a transfer of titled land, the parties must request an extract of topographic data from the Topographical Services Directorate (*Service de Circonscription Topographique*) – which also forms part of MATSF. The extract displays the spatial coordinates of the land and must be signed by both parties to register changes to the land title.[32]

The 2010 Decree on the Madagascar Cartographic Institute
(Decree No. 2010-0395 of June 10, 2010, Relative Foiben-Taosarintanin'i Madagasiakara (FTM)).

The 2010 Decree established FTM as a Public Administrative Establishment (EPA) that is an Affiliated Organization of MATSF and is situated in the *Institut Géographique et Hydrographique de Madagascar* (Geographical and Hydrographic Institute of Madagascar).[33] FTM manages a geographic and hydrographic data infrastructure system known as INDGH that is intended to operate in conjunction with land titles data managed by MATSF.

Specific FTM responsibilities relate to geodetic networks, topographic maps, geographical referencing, aerial and ortho photographs, urban addresses, and the delimitation of administrative subdivisions and decentralized territorial collectives. The 2010 Decree does not establish legal rights or obligations for FTM to make available spatial data of this kind to the public.

---

30   Ordonnance n° 60-146 du 3 octobre 1960. Retrieved on 22 June, 2023 from **http://justice.mg/wp-content/uploads/textes/1TEXTES%20NATIONAUX/DROIT%20PRIVE/Textes%20sur%20le%20foncier/lois%20et%20ordonnances/12.pdf**

31   Decree No. 21 020/2012-VPDAT/SG/DGSF of the Deputy Prime Minister in charge of Development and Planning sets a fee for legal situation certificate requests.

32   Decree No. 21 021/2012-VPDAT/SG/DGSF of the Deputy Prime Minister in charge of Development and Planning.

33   Retrieved on 22 November 2022 from **https://web.facebook.com/FTMMadagascar**.

The 2006 Law on Untitled Land[34]
(Loi N. 2006-031 du 24 novembre 2006 – fixant le régime juridique de la propriété foncière privée non titrée)

The 2006 Law on Untitled Land regulates land held under land certificates. Certified land is untitled land that has been recorded through a local plan of occupation (*plan local d'occupation foncière – PLOF*). The identification of rights to untitled land is carried out by a local reconnaissance commission (*Commission de Reconnaissance Locale*). The commission is to identify parcels of land through processes that are open, notified to the public, and provide opportunities for objection to the issue of a land certificate (art. 11).

The 2006 Law on Untitled Land envisages mutual alignment of land title and certificate data. The local land office (*guichet foncier*) must communicate all records and documents prepared for untitled land to MATSF to align land information. For its part, MATSF is legally obliged to notify local land offices whenever there is creation of a land title, to allow updating of the local plan of occupation (art. 22).

As with land titles, land certificates do not include information on the legal use of land, the valuation of land, or the nature of buildings on the land. However, land certificates are combined with cartographic data through the local plan of occupation. The local plan of occupation includes data on state public and private domain land, titled private land, and special category land as well as (where possible) existing occupation of the land (Art. 4).

Members of the public have a legal right to inspect local plans of occupation. However, the 2006 Law does not require publication of local plans of occupation in an on-line open data format. The nature and availability of land data in local plans of occupation are considered in more detail in Section 4 below.

The 2008 Law on Public Domain[35]
(Loi n° 2008-013 3 July 2008 – sur le domaine public)

The 2008 Law on Public Domain does not establish a regime for the recording of data on state public domain land. The law defines public domain land as land reserved for public use that cannot become private land (art. 4; see also art. 5, 2005 Law). However, the Law does allow the titling of public domain land in the name of the state – in which event the land title is recorded in MATSF (art. 1).

Public domain land other than coastal areas and public roads may also be converted to private domain land through the 2008 Law on Private Domain.

15

---

34 Loi n° 2021-016. Retrieved on 22 June from **https://cnlegis.gov.mg/page_find_direct_mots/**

35 LOI n° 2008–013 sur le domaine public. Retrieved on 22 June, 2023 from **https://www.assemblee-nationale.mg/wp-content/uploads/2020/11/Loi-n%C2%B0-2008-013-sur-le-domaine-public.pdf**

The 2008 Law on Private Domain[36]
(Loi n° 2008-014 23 July 2008–relative au domaine privé de l'Etat, des collectivités décentralisées et des personnes morales de droit public)

——

The 2008 law does not establish legal rights or obligations to provide public data on the grant of rights to private domain land. While the existence of private domain land may be noted on a local plan of occupation, the law does not require the recording of information as to concessions over private domain land – including rents, valuations, duration, conditions, and the identity of the concession-holder.

The 2008 Law on the Private Domain of the State establishes a procedure for conversion of public domain land to a status of private domain. Land under the private domain of the state may be granted to private parties through temporary occupation permits or 30-year concession contracts (see also arts. 13 & 17, 2005 Law).

Information on the grant of private domain land is divided among regional governments and the Ministry responsible for state domain property. Under Article 27 of the 2008 Law:

- Regional governments have responsibility for the grant of rights to rural private domain land where the area is less than or equal to 50 hectares, and to urban private domain land where the area is less than or equal to 1000 m².
- The Minister in charge of state domain property has responsibility for the grant of rights to rural private domain land where the area is greater than 50 hectares, and to urban private domain land where the area is more than 1000 m².

The National Land Fund provides a mechanism for the funding of decentralized land services that includes management of records relating to investment leases.[37]

The 1962 Decree on Long-Term Leases[38]
(Ordonnance 62-064 du 27 septembre 1962 relative au bail emphytéotique)

——

The 1962 Decree regulates rights and obligations under long-term leases granted over state private domain land. While these leases are registrable as land titles with MATSF, the Decree does not establish a system for the publication of long-term lease information in open data format.

——

36   LOI N° 2008-014 sur le Domaine Privé de l'Etat, des Collectivités Décentralisées et des personnes morales de droit public. Retrieved on 22 June, 2023 from **http://www.i-tantsoroka.mg/dossier/loi/3d4ccaa4a07cc88cb9e7df92ab5a509d.pdf**

37   Décret No 2012-752–Instituant le Fonds National Foncier ou FNF, Arts. 1 & 2. Retrieved on 22 November 2022 from **http://extwprlegs1.fao.org/docs/pdf/mad203571.pdf**.

38   Ordonnance 62-064 du 27 septembre 1962 relative au bail emphytéotique. Retrieved on 22 June, 2023 from **https://observatoire-territoire.mg/lois/ordonnance-n-62-064-du-27-septembre-1962-relative-au-bail-emphyteotique-j-o-n-248-du-12-10-62-p-2224-modifiee-par-la-loi-n-96-016-du-13-aout-1996-j-o-n-2381-ed-sp/**

The 2017 Law on Special Economic Zones[39]
(Law No. 2017-023)

The 2017 Law on Special Economic Zones establishes a 'one-stop shop' to facilitate access to land for investors in designated special economic zones (SEZ). SEZ Developers receive a renewable 30-year concession right to land from the state (art. 51). The developer then enters lease contracts with investors requiring land in a SEZ. The SEZ Authority organizes and provides required land use permits to the SEZ developer, including building permits and subdivision permits (art. 54). The 2017 Law does not require the SEZ Authority to publish information on SEZ land leases, development and planning in open data format. This includes information on rents and valuation of SEZ leases.

The 1997 Forests Law[40]
(Loi n° 97-017 portant révision de la législation forestière)

The 1997 Forestry Law and its implementing regulations establish a regime for the grant of logging concessions to categories of forest area in Madagascar. The law and its regulations do not establish rights or obligations to provide open data on logging concessions. The 2013 Inter-Ministerial Decree establishes a Forest-Land Inter-Ministerial Commission, which has a brief to avoid reportedly widespread overlaps of forest-land concessions in Madagascar.[41]

The 2017 Extractives Industries Transparency Initiative (EITI) Law[42]
(Décret n° 2017-736 du 30 août 2017 portant institutionnalisation de l'Initiative pour la Transparence des Industries Extractives (EITI) Madagascar et fixant ses attributions, son organisation et son fonctionnement).

The 2017 EITI Law seeks to implement the global Extractive Industries Transparency Initiative in Madagascar. The EITI establishes standards to encourage the release of resource concessions data in the mining, oil, and gas sectors. The EITI Law in Madagascar establishes an Independent Administrative Council to produce an EITI audit report, including investigations and reconciliations of EITI data.[43] Outside of audit reports, the Law does not require publication of EITI concessions information in open data format.[44]

---

39   Loi n°2017-023 relative aux Zones Économiques Spéciales. Retrieved on 22 November, 2022 from **https://edbm.mg/wp-content/uploads/2017/12/Loi-n-2017-023_ZES.pdf**

40   Retrieved on 22 November 2022 from **http://extwprlegs1.fao.org/docs/pdf/mad11242.pdf**

41   See Inter-Ministerial Order n°2007/2013. Retrieved on 22 November, 2022 from **https://swm-programme.info/documents/20142/284375/MDG_RE_LP_2007_20130204.pdf/fb6341bf-94b0-afb4-839e-abffc7ec35b2?t=1602081328345**.

42   Retrieved on 22 November, 2022 from **https://staging.resourcedata.org/dataset/rgi-ecret-2000-308-portant-creation-et-fixant-les-statuts-du-bureau-du-cadastre-minier-de-madagascar/resource/1fa3f29d-c8d1-483e-88d0-7fd45916aca8/proxy**

43   The Administrative Council does not have an online presence, and audit reports have not been made available.

44   See further 4. Below as to delays in the production of reports by EITI agencies in Madagascar.

The 1999 Mining Code[45]
(LOI n° 99-022 du 19 Août 1999 portant Code Minier).

The 1999 Mining Code and its implementing regulations do not establish legal rights to access data on mining concessions. The 1999 Mining Code defines the process for obtaining mining permits, including in relation to environmental impact assessments. Pursuant to the Code, a 2000 Decree[46] establishes a Mining Cadastre Bureau in Madagascar (BCMM). The BCMM Mining Cadastre provides geospatial coordinates for mining permits in Madagascar. The 2000 Decree allows for public access on request to Mining Cadastre data. However, the Decree does not require publication of mining concessions information in open data format.

The 2015 Law on Land Use Planning[47]
(Loi n° 2015–051 portant Orientation de l'Aménagement du Territoire)

The 2015 Law on Land Use Planning establishes the following land use planning instruments:

- The National Spatial Planning Policy
  (*Politique Nationale de l'Aménagement du Territoire – PNAT*).
- The National Spatial Planning Scheme
  (*Schéma National de l'Aménagement du Territoire – SNAT*).
- The Regional Spatial Planning Plan
  (*Schéma Régional de l'Aménagement du Territoire – SRAT*).
- The Municipal/Communal Spatial Planning Scheme
  (*Schéma d'Aménagement Communal – SAC*).
- The Inter-Municipal/Communal Spatial Planning Scheme
  (*Schéma d'Aménagement Inter-Communal – SAIC*).
- The Master Urban Plan (*Plan d'Urbanisme Directeur – PUDi*).
- The Detailed Urban Plan (*Plan d'Urbanisme de Détail – PUDé*).

Article 5 provides for regional planning to be based on guiding principles that include the participation of public organizations, socio-economic actors, and citizens in the making, implementing, and evaluating decisions.

The 2015 Law requires urban, provincial, and regional land use plans to include cartographic documents such as local plans of occupation (arts. 44, 46). Under Article 54, local plans of occupation must be made available to central government agencies and decentralized territorial collectives for the development of land use plans.

18

---

45   Retrieved on 22 November 2022 from
     https://www.oatf-madagascar.mg/wp-content/uploads/2020/07/Loi-n-2005-021-du-17-octobre-2005.pdf

46   Retrieved on 22 November 2022 from
     https://staging.resourcedata.org/dataset/rgi-ecret-2000-308-portant-creation-et-fixant-les-statuts-du-bureau-du-cadastre-minier-de-madagascar/resource/1fa3f29d-c8d1-483e-88d0-7fd45916aca8/proxy

47   Loi n° 2015–051 portant Orientation de l'Aménagement du Territoire. Retrieved on 22 June, 2023 from
     http://www.i-tantsoroka.mg/dossier/loi/6242bc3492c4ebe61483b139fec61977.pdf

The 2015 Law also establishes a national Observatoire du Territoire to maintain a public database on land use planning instruments (art. 59).[48] The Observatoire du Territoire now includes the functions of the former Land Observatory, which had been established by a 2010 Decree with a brief to monitor implementation of the 2005 Letter of Land Policy.[49]

Land Laws and Open Data

The land laws of Madagascar establish fragmented data regimes that depend on classifications of land, the type of data required, and the level or agency of government where data is stored. Under this legal regime, some data are made available on a reactive basis upon application from the public. Other data are not available to the public as a matter of law or are made available because of administrative discretion rather than legal right. Little or no land information is required by law to be open access: i.e., downloadable on-line, machine-readable, in an open format, and covered by an open data license.

---

48   The Observatoire du Territoire has published details of national, urban, and regional land use plans on its website. Retrieved on 22 November, 2022 from **https://observatoire-territoire.mg/siloat/acceuil.php**

49   See Decree No. 2021-852 of August 25, 2021, as amended and supplemented by Decree No. 2022-013 of January 12, 2022.

Availability of Land Data and Information

This section describes the six categories of land data and information discovered in Madagascar.[50] These categories represent land governance data that are the most relevant and that need to be readily available, timely, and standardized to increase public impact. The data to be considered for analysis should ideally relate to the primary functions of government in administering land. Modern land administration theory, which prioritizes the management of land to support sustainable social, economic, and environmental development, provides the first four categories: **land tenure**, **use**, **value**, and **development**. The remaining two categories are the enabling legislative framework for land governance within which these functions operate and "*other land data*" relevant to the country.

Land data stakeholders comprise three broad categories: public sector agencies responsible for land governance, internationally funded donor projects and civil society initiatives. The most important of these is the Ministry of Territorial Planning and Land Services (MATSF), at national and local level. Given the developmental status of Madagascar, international donor funded projects of land related initiatives also play a major role in collecting and managing of land information as well as civil society which manages land related research projects in specific regions.

Public institutions act generally as land project implementers and are guided by the policies of the current government. They are the primary land administration service providers to citizens. These services include issuing land use authorizations, land ownership titles, land valuation and taxation rates, mining permits and construction and development permits. In executing these duties and functions, government authorities invariably generate land data. Currently much of this data is collected manually, although the process and information are increasingly made digital.

The Ministry of Territorial Planning and Land Services (MASTF) delivers land certificates for landowners so therefore should retain the entirety of land ownership data. Its topography and domanial departments are organized vertically from its highest central level to the smallest representation called "*land office*" in remote communes. The Ministry of Environment and Sustainable Development manages forest and protected land areas. The Ministry of Mining and Strategic Resources manages mining activities. It delivers mining permits to individuals and mining companies.

---

50   See Table 2.

The Ministry of Justice is responsible for land conflict data through its role in resolving land disputes, including historical land dispute data. The Ministry of Economy and Finances determines land tax fees, and rates and is responsible for land value data. The Ministry of Culture and Communication (MCC) oversees drafting the Access to Information Law and has the key role to cover access to all data types, although it is not typically thought of as a data custodian. The national government is responsible for shaping the national legal institutional framework through drafting legal text within the National Assembly for the line ministries.

Figure 1: MASTF Organogram[51] (See Appendix A for full names of departments)

21

---
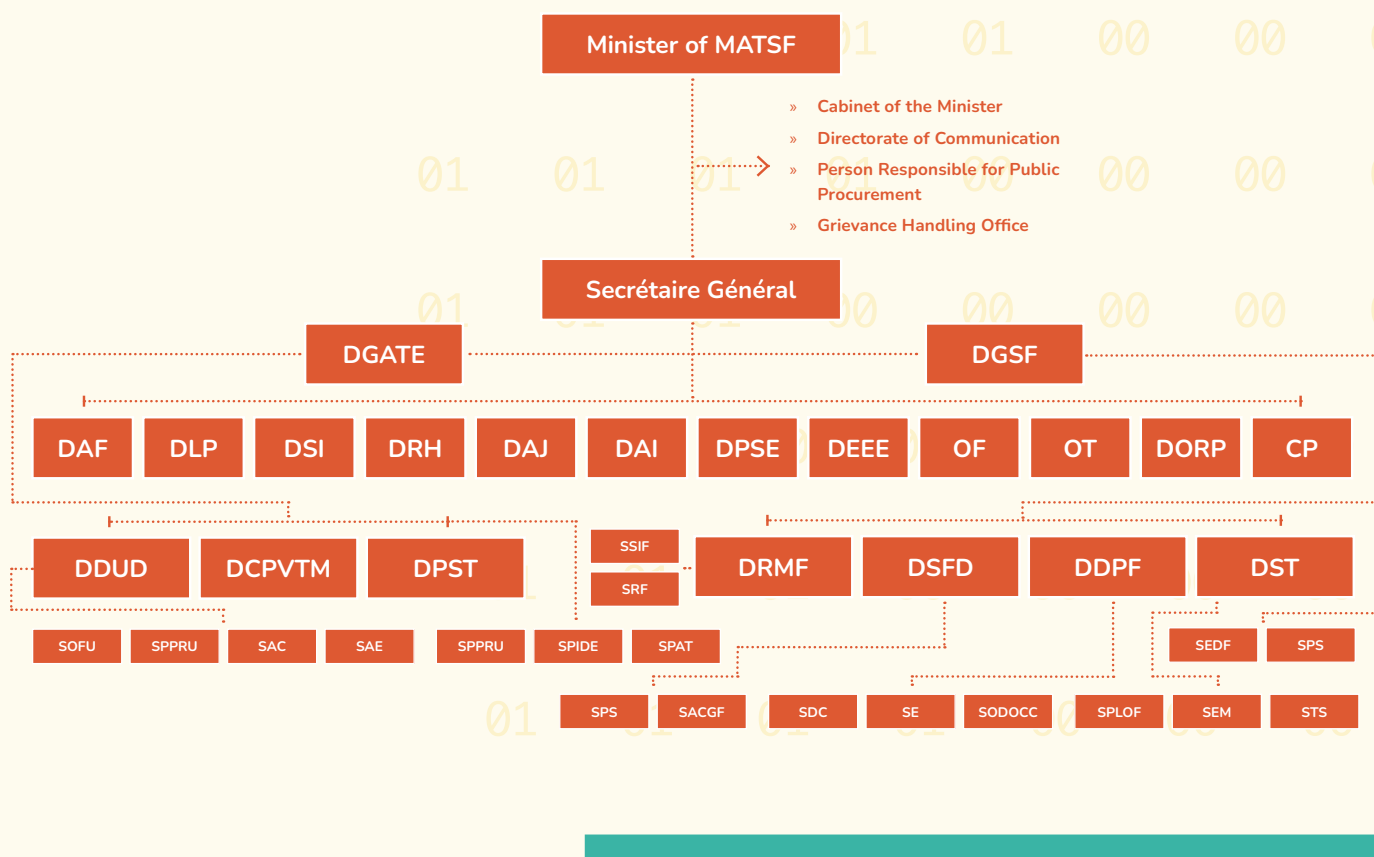
51   For the full names of all the departments See Appendix A

The major land data custodians in Madagascar include:

- The Ministry of Territorial Planning and Land Services (MATSF) with its "*deconcentrated*" land offices (land titles).
- Decentralized Territorial Collectives with their land offices (land certificates; local plans of occupation).
- The National Cartographic Authority of Madagascar (Foiben-Taosarintanin'i Madagasikara – FTM) (GIS data).
- The Mining Cadastre Bureau in Madagascar (BCMM) (location of mining permits).
- Regional Governments (regional land use plans; small-scale logging and agriculture concessions).
- Ministry of Forests (larger-scale forest concessions).
- Ministry of Land Use Planning (land use plans).
- National Territory Observatory (OATF) (land use planning/land certificate surveys).

Generally, there is a lack of online digital data. Madagascar and its land administration agencies do not have publication and data sharing agreements with different agencies of the government. Data is commonly not collected in a systematic manner which results in data fragmentation and sporadic updating of data on an "*as needed*" basis. Based on interviews with Observatoire du Territoire Database Management Service staff, it can be said that:

- A data agreement protocol is signed between the government entity providing the data and the Observatory prior to the exchanges. The data obtained by the Observatory are to be "*superimposed*" on their internal data to carry out their evaluation missions. The observatory intends to enable use of this information for analysis and to be able to carry out a diagnostic about the land governance in a particular region.
- This protocol is limited to the exchange of data but not to their putting it online. It is up to the official holder of the data to put their data online when needed.
- Insufficient financial resources available for the appropriate data management systems and procedures make it very difficult for the ministry to update data "*just for the sake of updating data*".[52]

A range of current interventions to improve land governance data collection are supported by international partners such as the World Bank (CASEF Project, PIC), the European Union (TAFITA Project), GIZ (ProPFR, PLAE), AD2M and USAID. Their primary objective is to strengthen data collection capacity to support the registration of 2 million land certificates issued before the end of 2023.

52   Ratsialonana, R. (2015). Madagascar–Cadre d'Analyse de la Gouvernance Foncière (CAGF): Report Final. The World Bank. Retrieved on 16 June 2023 from **https://documents1.worldbank.org/curated/en/252091504865351736/pdf/119620-WP-P095390-FRENCH-PUBLIC-7-9-2017-10-13-55-MadagascarFinalReport.pdf**

The World Bank Group's land sector project "*Madagascar Agriculture Rural Growth and Land Management Project*" (CASEF/Croissance Agricole et Sécurisation Foncière), dans sa Composante 2: "*Support to Land Policy and Land Rights Registration*". This project addresses uncertain land rights as a major constraint to agricultural investment by (a) supporting the land policy reform process and (b) clarifying land rights and strengthening land administration at the local level.[53] It also includes acquisition of imaging data (aerial orthophotographs) covering 12 of Madagascar's 23 regions.

Civil society is also working on land information data transparency, accountability, and mapping. in the Sehatra Iombonana ho an'ny Fananantany (SIF),[54] translated as *Land Stakeholders Solidarity (LSS)*, is a national NGO formed with a group of 20 national associations throughout the 23 Madagascar regions. Their objectives are to facilitate access to land ownership for citizens, particularly the vulnerable groups, to achieve food sovereignty. Another NGO, SAHA,[55] is focused on aspects of land development such as land questions. It describes itself as an accompanying and supporting organization for local development. While these groups are not major data custodians, they are important beneficiaries of open data systems and, given the state of data in Madagascar, could potentially be significant role players in opening data.

23

---

53   Retrieved on 22 November, 2022 from
      https://documents1.worldbank.org/curated/zh/705911551754907069/pdf/Project-Paper-
      Madagascar-Agriculture-Rural-Growth-and-Land-Management-Additional-Financing
      -P166133-02112019-636873337025822034.pdf

54   Retrieved on 22 November 2022 from
      http://www.sif-mada.mg/
      Note that the website was not available during the period of this research.

55   Retrieved on 22 November 2022 from
      https://www.saha.mg/organisation/

Category 1: Legal, Institutional and Policy Data

The Constitution of Madagascar is available on-line in French and English. Madagascar's key legislation relating to land is available on-line in French. The primary official repository of Malagasy laws and regulations is the **National Center of Legal and Legislative Information and Documentation (CNLEGIS)**.[56] Laws available on CNLEGIS website are only in PDF format. This database provides access to legislation according to subject area. Subjects include urban planning, agriculture, environment, and domain. Access to legislation within each section is searchable by several parameters including search by type, date, keyword, title, and number.

The section 'Domaine' provides comprehensive access to laws and regulations relating to land, divided into categories which include public domain, private domain, and expropriation. Expropriation contains several decrees relating to the specific act of public acquisition for development purposes.[57]

The data is comprehensive but there is no official repository of draft legislation or decrees for public comment.

The key national land policies for Madagascar are available on-line, including the:

- **National Land Program 2016-2020**
  (*Programme National Foncier 2016-2020*)
- **Letter of Land Policy**
  (*Nouvelle Lettre de Politique Foncière 2015-2030*)
- **National Land Fund**
  (*Décret No 2012-752–Instituant le Fonds National Foncier ou FNF*).

The key central Ministries and agencies have their own websites – other than the National Cartographic Authority of Madagascar (FTM) which has a Facebook page.[58] Typically, regional, and common governments do not have websites. The website of the **Observatoire du Territoire**[59] includes a geospatial portal, an on-line system for building permit applications and a library section of bibliographic data, including laws, policies, rules, and procedures. The bibliographic data is generally available as pdf documents which can be downloaded with no registration or login required. These on-line data services are discussed further below.

24

---

56   Retrieved on 22 November 2022 from
      http://www.cnlegis.gov.mg/%20page_find_direct_mots/.

57   See Ordonnance n°60-146 du 3 octobre 1960. Retrieved on 22 November, 2022 from
      https://landwise-production.s3.amazonaws.com/2022/03/Madagascar_Land-Tenure-Ordinance_1960_French.pdf

58   Retrieved on 22 November 2022 from
      https://www.facebook.com/FTMMadagascar/

59   Retrieved on 22 November 2022 from
      https://observatoire-territoire.mg/

Category 2: Land Tenure Data

Land tenure data in Madagascar is divided into land titles (for titled land) and land certificates (for untitled land).[60] Land titles are issued by the Ministry of Territorial Planning and Land Services (MATSF), and land certificates are issued by decentralized territorial collectives through a special administrative agency known as *guichet foncier*. The 2016 Letter of Land Policy issued by the Government of Madagascar notes that only a "*small proportion of rights-holders have formalized their rights to property with land services and land offices.*" The letter advises that the reasons for widespread failures to register rights to land include the fact that "*the majority considers that their rights are secured through social recognition and the use of 'small papers' (petits papiers) as acts of transfer of rights or proof of ownership*".[61]

Petits papiers represent an informal system of land tenure information in Madagascar that is not regulated or recognized by law. They are extensive in rural and poorer urban areas, and typically involve the local *fokontany* office, which is the lowest level of government in Madagascar. *Petits papiers* usually list the names of the owner(s), the basis for their rights to the land, surface area of the land, the use of the land, and the names of neighbors.

The following discussion focuses on land titles and land certificates as formal land tenure data sets in Madagascar and provides the rationale for assessing the extent to which Malagasy land information meets open data standards. Land titles data suffers from accuracy problems and access and availability restrictions. Surveys undertaken by the Observatoire du Territoire highlight these accuracy problems.

Land Title Information

Consistent with the Torrens systems of land administration, registrable rights under the 1960 Land Ordinance include ownership, usufruct, use, long lease, surface rights, easements and other servitudes, and mortgages and other security interests (Art. 10). The reference to registrable long leases includes the so-called emphytéotique lease, which is granted to investors over state private domain land.[62] Rights which are not registrable in the land titles register include short-term leases, informal sales, and acquisitive prescription (long-term possession) of land.

Under Article 85 of the 1960 Ordinance, applicants for registration of rights must provide a declaration setting out the specified types of information (See Table 3). The Ordinance does not set out requirements for first-time registration applications to record information in digital formats. Typically, paper formats are used. The Ordinance requires extensive public notification of a request for first-time registration of a plot of land (Arts. 85, 87). Article 85 requires applicants to file a declaration with the registrar in French or Malagasy (*See Table 4*).

---

60 Untitled land is defined as land that is occupied but is not yet titled or surveyed; and is not private or public domain land, or special category land (arts. 1&2, 2006 Law).

61 Letter of Land Policy (Nouvelle Lettre de Politique Foncière 2015-2030). Retrieved on 22 November 2022 from **https://www.saha.mg/wp-content/uploads/2019/03/Lettre_de_politique_fonciere.pdf**.

62 See Ordonnance 62-064 du 27 septembre 1962 relative au bail emphytéotique.

Table 3: Type of Information for a Land Title

» **Name, domicile, date of birth, and marital status**

» **If married, the name of the spouse and details of the marriage**

» **A local address for service of documents relating to the registration application**

» **A description of the land along with its buildings and crops, if relevant, together with its location in an urban municipality or, if the land is in a rural municipality, an indication of the boundaries of the land.**

» **A description of the land along with its buildings and crops, if relevant, together with its location in an urban municipality or, if the land is in a rural municipality, an indication of the boundaries of the land.**

» **An estimate of the value of the land.**

» **Details of the property rights including leases of more than three years together with the names of the rights-holders.**

» **A sketch plan of the land to be registered**

» **Any contracts or notarial evidencing the rights to be registered.**

Table 4: Type of Information Needed for a Public Notification

» **The applicant's names, place of residence, and marital status**

» **A description of the building to be registered, including its municipality, property boundaries, and tenants**

» **The name under which the building is to be registered**

» **Estimated value of the building**

» **Details of relevant property rights, including any leases of three years or more**

» **Building plans**

Article 87 requires the registrar to publish an extract of the application in the Official Journal as soon as possible after it has been submitted. An extract of the application is sent to:

- The clerk of the court at first instance, and is displayed on the court notice board for 20 days
- The public prosecutor
- Mayor of the region in which the building is located
- Those who have property rights in relation to the building in question

Article 88 requires that notice of the application is displayed:

- At the entrance to the town hall of the building's municipality
- On the building to be registered.

Land registration requires three separate systems: a system to issue land titles (the document specifying ownership), a cadastral operation to issue cadasters (the map displaying the boundaries of the land), and a third system for land certification, which issues a "*land certificate*" document (linking the individual to the parcel). This has resulted in three separate databases under the jurisdiction of separate government entities. Land registration rights are managed in three separate processes: 1) individual land registration leading to the issuance of the "*land title*" document, 2) the cadastral operation leading to the issuance of the "*cadaster*" document, and 3) the land certification system leading to the issuance of the "*land certificate*" document. Each process has a storage system: the land title is kept in the land book, the "*cadasters*" are kept in the cadastral matrix and the land certificate is kept in the parcel register in local machines at land offices. This has resulted in the data being separated between local land offices and the topographic service.[63]

BOX 1: The Fundamental Challenge of Out-of-Date Land Titles Data.

The nature and availability of land titles data in Madagascar is fundamentally affected by problems of currency and accuracy. In 2020, the **World Bank reported**[64] the results of a survey conducted by the Observatoire du Territoire on land titles in the capital city of Antananarivo. The Observatoire du Territoire survey found that:

▸ Three-quarters of official land documents do not correspond to the current land occupants. Only 25% of survey parcels are recorded in the name of current owners.

▸ Very few land registrations carried out more than 20 or 30 years ago have been updated. Transactions by sale or inheritance are rarely recorded.

▸ Applications to update the register are subject to lengthy delays. Approximately 50% of unprocessed applications are more than five years old and 28% are more than 15 years old.

▸ MATSF records of a titled parcel of land are typically out-of-date because of informal subdivisions in rapidly growing urban areas. A single titled parcel may now hold as many as 40 households because of unrecorded subdivisions.

The World Bank report concludes that the urban land information system is not functional because of the impossibility of updating documents. As a result, "*it is not possible to make an exhaustive inventory of properties on the basis of documents held by MATSF, even for land that belongs to the state or its municipalities*".

27

63   Retrieved on 22 November, 2022 from **https://documents1.worldbank.org/curated/en/252091504865351736/pdf/119620-WP-P095390-FRENCH-PUBLIC-7-9-2017-10-13-55-MadagascarFinalReport.pdf**

64   Andrianirina, Ratsialonana Rivo; Raserijaona, Gaël; Anand, Aanchal; Teyssier, André, Towards an Urban Land Reform in Madagascar?: Support to Urban Land Policy, 31-2. Washington, D.C.: World Bank Group. Retrieved on 22 November 2022 from **http://documents.worldbank.org/curated/en/517211592452939643/Towards-an-Urban-Land-Reform-in-Madagascar-Support-to-Urban-Land-Policy**

Land Certificates and Local Plans of Occupation Information (PLOF)

The historical challenges of land titling in Madagascar led to the 2004 Letter of Land Policy and 2005 National Land Program, which sought to respond to "*massive demand for land tenure security*" through decentralizing land administration and issuing land certificates (rather than land titles) over untitled land. Rights to untitled land are recorded through the development of a local plan of occupation (*plan local d'occupation foncière – PLOF*).

The PLOF lists data on state public and private domain land, titled private land, and special category land as well as existing occupation of the land. It has been identified as a current key data resource which has potential to be a basis for opening land data in Madagascar in the future,

Figure 2: Centralized and decentralized land systems are connected through the PLOF. Source: (INDDL, 2019)[65]

CURRENT SITUATION

Titled land or cadastral — Land and state Administration → Land title Cadastre

PLOF

Untitled private land — Communes → Land

LOCAL LAND OCCUPANCY PLAN

RESPONSIBILITIES

» **The Specialized Bureau, Chief of CIRTOPO**
» **Land counter agents, the Mayor, DAGFD**

Current land management institutional processes restrict data availability. The PLOF, a community-level map of existing land tenure, which is maintained at the local level, brings together known boundaries for land, including public and private land. It is the key artifact because it combines plots from both Madagascar's centralized (titled land) and decentralized (untitled land) land management systems. Figure 2 above demonstrates this connection. Local PLOFs must combine views of formally titled land with informal (non-titled) land (*Figure 3*).

---

65   Institut National De La Décentralisation Et Du Développement Local (INDDL). 2019. Présentation du PLOF. Retrieved on 22 November, 2022 from **http://i-tantsoroka.mg/dossier/outils/1238061219-08-2019bcaaba954e6f6a1f85ba565abae9 d4c3.pdf**

Figure 3: Titled and untitled land plots are combined in the PLOF. Source: (INDDL, 2019)

LES LIMITES ADMINISTRATIVES (COMMUNE ET FOKONTANY)

Les Parcelles certifiées

Le PLOF initial

Le Fond image

Certificat foncier

Titre foncier

Domaine public
Route Réserve
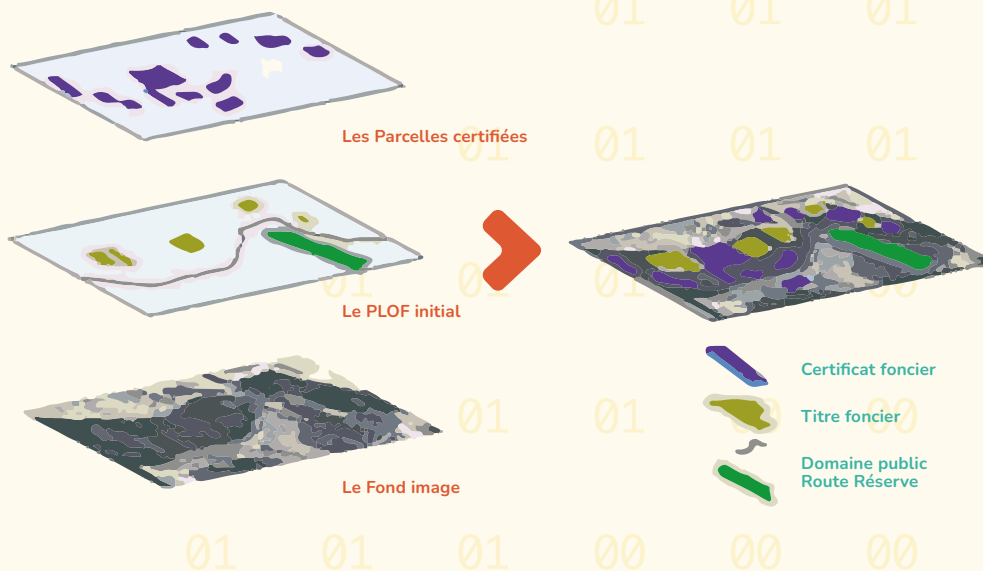
Information on these lands is, therefore, theoretically available (Madagascar's CAGF, 2012) but only from local land offices. This suggests that data for both centralized and decentralized land management systems in Madagascar could be made available through the local level PLOFs.

Antananarivo-ville and Antananarivo Atsimondrano, two districts in Madagascar with the most registered land, have implemented a digitization project for land certificates. A machine acting as a "*one-stop land office*" can print certificates of legal status for landowners on demand. This requires digital geo-referenced GIS data (such as orthophotos), managed through local Resource and Land Administration Information Centers (RLIC) and the use of local plans of occupation. If untitled private land is transferred, the land certificate is canceled, a new certificate is issued in the name of the right-holder (art. 17, 2006), and the land office must update the local plan of occupation to reflect the issue of a new certificate (art. 13, 2006 Law).

Members of the public may request a certificate and inspect a local plan of occupation at the local land office without payment of the fee. However, no comprehensive database of PLOFs is accessible to the public. While the National Territory Observatory links to local plans of occupation on its geospatial portal, only two plans were available for on-line viewing as at the date of this report.

Data Challenges

The 2016 Letter of Land Policy documents the ongoing challenges for land data accessibility through land certification and local plans of occupation in Madagascar:

Special status areas. The legal status of land tenure in special status areas requires clarification to extend the rollout of local plans of occupation across Madagascar. Areas where the tenure status of occupiers is unclear include forest areas, investment zones, and reserved areas such as designated Farming Areas for Rural Enhancement (AMVR) and Areas of Land Planning (ZAF) for economic development.

Titled land with unfinished cadastral data. Titled land may not be subject to local plans of occupation. Yet, several areas lack complete up-to-date cadastral information even though they are designated as titled. The most common case involves completion of a topographic grid of surveyed land plots, but no completion of adjudication and titling for rights to those plots. The MATSF now has an ad hoc process to designate areas with 'unfinished cadastral operations' as untitled land to allow development of local plans of occupation.

Alignment of Certificate and Titles Data. As noted, local Land Offices and the MATSF must legally share and align land titles and certificate data. The digitalization of PLOFs utilizes software that promotes data sharing with MATSF. Local RLIC must also facilitate data exchange between local Land Offices and MATSF. However, the 2016 Letter of Land Policy comments that:

> *Despite these arrangements, the exchange of information is rarely done, due to a lack of will on the part of the parties concerned. This lack of information exchange prevents the updating of PLOFs, creates risks of overlapping between titles and land certificates, and hinders security...*

The Letter also notes that Information Technology systems provide a further obstacle to effective data sharing among local Land Offices and MATSF. These IT challenges include acquiring and updating skills, and financing maintenance and upgrades of equipment.

Urban land management. The decentralized land administration introduced by the 2005 reforms has largely aimed at rural areas. The 2016 Letter of Land Policy states that the modernization of land services in urban areas requires attention, including mechanisms to link land use and development planning with land tenure and cadastral services. These mechanisms are also currently hindered by challenges linking central GIS data with urban records on titles, land use and development approvals.

GIS Data. The National Cartographic Institute (FTM) acts as a central repository and manager of GIS data that includes geodetic networks, topographic maps, geographical referencing, aerial and ortho photographs, urban addresses, and the delimitation of administrative subdivisions and decentralized territorial collectives. Many of these datasets, however, derive from the colonial era and have not been updated since 1980.

BOX 2: The (Current) Accuracy of Land Tenure Data[66]

In 2012, the World Bank Land Governance Assessment Framework (LGAF) report commented that, unlike land titles, land certificates were largely accurate and up-to-date due to their relatively recent development. The 2016 Letter of Land Policy estimates that around a third of Madagascar is now covered by local plans of occupation.

In 2020, the Observatoire du Territoire estimated that 325,000 land certificates had been issued by 542 communes or municipalities. This result, after 15 years of land certification, compares favorably with the 665,000 land titles issued over a period of 120 years for the entire country. Processing times for certificate applications are estimated at around 7 months at a cost of US $14 per certificate.

Land certification programs in rural areas have been supported by the **World Bank's Food Security and Social Protection Emergency Project (PURSAPS)**,[67] and **Agricultural Growth and Land Security Project (CASEF)**.[68]

Challenges with the accuracy of central GIS data are reported to include the disappearance of geodetic and other markers, difficulties to access geodetic points located on mountain tops, and poor-quality recordkeeping for paper/analogue records. Technical challenges include old referencing systems which are not interoperable or compliant with contemporary global systems and standards.[69]

Madagascar has no National Spatial Data Infrastructure (NSDI) laws or policies to integrate GIS data into other land data systems. This absence, combined with technical GIS data challenges, creates little or no sharing of GIS data among government agencies, and across levels of government. It is still the case that GIS data users must pay to develop project-specific data through sectoral budgeting rather than standardized payment of a fee to FTM.[70]

66 Sources: (1) Land Administration Reform in Madagascar: The theory, the practice, and the lessons learned. Fanomezantsoa, Herilala Research Officer, Coordination Office of Land Reform (Madagascar) Government Fellow, UNU-EGOV Guimarães, Portugal April 4, 2017.

(2) Andrianirina, Ratsialonana Rivo; Raserijaona, Gaël; Anand, Aanchal; Teyssier, André, Towards an Urban Land Reform in Madagascar?: Support to Urban Land Policy, 31-2. Washington, D.C.: World Bank Group, **http://documents.worldbank.org/curated/en/517211592452939643/Towards-an-Urban-Land-Reform-in-Madagascar-Support-to-Urban-Land-Policy**

67 Retrieved on 22 November, 2022 from **https://projects.banquemondiale.org/fr/projects-operations/project-detail/P147514?lang=fr**

68 Retrieved on 22 November, 2022 from **https://projects.banquemondiale.org/fr/projects-operations/project-detail/P151469?lang=fr**

69 See further Eric Thalgott, France: Modernization and decentralization of Land Tenure Services in Madagascar EILAT 2009–ISRAEL FIG Working Week 3,8 May 2009.

70 Eric Thalgott, France: Modernization and decentralization of Land Tenure Services in Madagascar EILAT 2009–ISRAEL FIG Working Week 3,8 May 2009

Category 3: Land Use Data

Adoption of open data standards relating to land use in Madagascar faces many challenges. While fragmentation of data sources and providers is a key challenge, the underlying problem is a large gap between the actuality of land use and the content of formal land use data sets. In urban areas, in particular, physical patterns of human settlement are changing rapidly because of in-migration, demographic growth, and informal subdivisions of land. These changes must be reflected in formal datasets for land tenure planning, not only to prevent conflict over land, but also to allow integrated systems to cover emerging challenges such as climate and disaster risks. Open data, therefore, must link data on actual land-use with plans to control the use of land.

PLOFs have emerged in Madagascar as a key '*bottom-up*' mechanism to generate data on land use, while also delimiting land tenure and the borders of private, state, and special status land. As set out above, they must be included in regional and communal land use planning instruments. Linking land use planning with land use data generated by local plans of occupation provides an important step towards closing the gap between formal datasets and the actuality of land use in Madagascar. This is particularly the case for city areas where there are proposals to adopt and extend urban PLOFs.

The key data providers on land use in Madagascar include:

- The **Observatoire du Territoire Geo-Portal (Siloat)**[71]
- Ministry of Territory Planning and Land Services (MATSF)
- Ministry of Agriculture with the Center for Geoinformatics Application in Rural Development (CGARD)
- Ministry of Public Infrastructures (MPI)
- Ministry of Mining and Strategic Resources with the Bureau des Cadastres Miniers de Madagascar (BCMM)

The fundamental challenge facing these data providers is the gap between formal land use data and the actuality of land use in Madagascar because:

- Legal classifications of land (e.g., forests, or special economic zones) often fail to reflect the purposes to which the land is used in practice; and
- Most land titles data is out-of-date and does not reflect actual land holdings and subdivisions of land.

The following discussion focuses on formal land use datasets and considers compliance with open data standards data accuracy, availability, and accessibility.

---

71   Retrieved on 22 November 2022 from **https://observatoire-territoire.mg/carte/#/carte/map-siloat**

Siloat: The Observatoire du Territoire Geo-Portal

The main source of land use planning data is the **Observatoire du Territoire Geo-portal known as Alphanumeric Siloat**[72] which is available on-line and is a work-in-progress.

The Siloat includes references to the land use planning instruments established by the 2015 Law on Land Use Planning (see Section 3 above). Not all instruments, however, are available on-line (e.g., the National Spatial Planning Policy – PNAT). The instruments for which on-line data is made available include:

- **Regional Spatial Planning Plans (SRAT)**[73] – 12 are listed of which 8 are recorded as completed, 3 suspended, and 1 under progress. As at the date of this report, the Observatoire du Territoire hyperlinks to completed SRAT were not working.

- **Municipal/Communal Spatial Planning Schemes (SAC)** – 12 are listed of which 10 are recorded as completed, and 7 under progress. As at the date of this report, the Observatoire du Territoire hyperlinks to completed SAC were not working.

- **Inter-Municipal/Communal Spatial Planning Scheme (SAIC)**[74] – 4 are listed of which 2 are recorded as completed. As at the date of this report, the Observatoire du Territoire hyperlinks to completed SAIC were not working.

- **Master Urban Plans (PUDi)**[75] – 15 are accessible on-line, representing all major urban areas in Madagascar. PUDi data is provided in text format and as maps of 1/10000, georeferenced according to the national coordinate system (including zoning, layout of the main roads, preliminary master plans for water supply and sanitation, etc.).

- **Detailed Urban Plans (PSU)**[76] – 11 are listed but there are no hyperlinks to PSU yet in the Geoportal.

Other Sources of Land Use Data

Protected Areas: The Ministry of Environment and Sustainable Development (MESD) has established the **Protected Areas System for Madagascar (PASM) data sharing platform**[77] which provides a repository of decrees that identify and delimit a protected area. The decree and geo-located coordinates to the area should be forwarded to the Ministry of Mining and Strategic Resources to exclude the area from mining permits. The data are available to the public for download in a vector format. Currently, data is available for the Vakinankaratra/Alaotra Mangoro regions only. The PASM website presents the location of PAs with spatial coordinates, an embedded link to google maps, and the total area of the zone, including:

- The altitude, climate, and relief of the PA.

- The various means of accessing the PA.

- The administrative regions within which the PA falls.

- The various species found within the PA's limits.

33

---

72   Retrieved on 22 November 2022 from **https://observatoire-territoire.mg/siloat/acceuil.php**.

73   Retrieved on 22 November 2022 from **https://observatoire-territoire.mg/siloat/outilsplanification/SRAT**.

74   Retrieved on 22 November 2022 from **https://observatoire-territoire.mg/siloat/outilsregional/SAIC**.

75   Retrieved on 22 November 2022 from **https://observatoire-territoire.mg/les-contenus-des-pudis/**

76   Retrieved on 22 November 2022 from **https://observatoire-territoire.mg/pude/#**.

77   Retrieved on 22 November 2022 from **https://www.parcs-madagascar.com/apropos.php**.

The Madagascar Protected Area System is managed by both Madagascar National Parks (MNP), and non-MNP bodies that include NGOs, Universities, and private individuals. The MNP manages 43 Protected Areas comprising National parks (IUCN category II), Special reserves (IUCN IV), Protected Landscapes and Seascapes (IUCN V), and increasingly PAs with sustainable use of natural resources (*See Table 5 below*). Once achieving status as a protected area, the PA is generally managed with multi-level governance structures incorporating local communities and regional authorities.[78]

Table 5: The different categories of PASM Protected Areas

Protected Area Categories	Management goals	
Category I	Natural Reserves Integral	Protected area managed for scientific and/or wildlife protection purposes within a perimeter that represents a particular ecosystem
Category II	National Parks	Protected area managed for the protection of important ecosystems and recreational and educational purposes
Category III	Natural Monuments	Protected area managed primarily to preserve a specific natural or natural/cultural feature
Category IV	Special Reserves	Protected area managed primarily for conservation and protection of habitats or species with management intervention
Category V	Harmonious Landscapes Protected	Protected area managed primarily for landscape or seascape conservation/recreation, and where harmonious human/ nature interactions contribute to maintaining biodiversity
Category VI	Natural Resource Reserves	A protected area managed primarily for the sustainable use of natural ecosystems.

Mining Data

As noted in Section 3, the Ministry of Mining and Strategic Resources has established a **Bureau of Madagascar Mining Cadasters (BCMM)**.[79] The mining cadastral data covers the entire national territory. Information on the types of permits is made available in text on the website, along with applicable texts and laws.

The website also provides a **visual interface**[80] to view maps and spatial information of the mining permits on five spatial layers: mining permits, for roads, protected areas, permanent rivers and regional capitals.

The dataset includes the boundaries of areas covered by mining permits, geospatial data for mining zones, personal data such as the permit owner's name, and the permit type and mining square numbers. This data was available for viewing in tabular format but was not downloadable and contained more than 500 individual records. If a permit is also transferred to another owner, the BCMM holds the ownership history data. **Ownership data relating to mining permits is available on-line**.[81] Members of the public may also access the dataset.

78   C.J. Gardner et al. (2018), 'The rapid expansion of Madagascar's protected area system', Biological Conservation, 220, 29–362. Retrieved on 22 November, 2022 from **https://blueventures.org/wp-content/uploads/2021/03/Gardner_et_al_2018_The_ rapid__expansion_of_Madagascar_s_protected_area_system.pdf**

79   Retrieved on 22 November 2022 from **https://bcmm.mg/**

80   This facility was not active at the time of this research. Retrieved on 22 November 2022 from **http://bcmm.mg/cartographie/cartographie.php**

81   Retrieved on 22 November 2022 from **http://bcmm.mg/cartographie/tableau.php**

Category 4: **Land Development Data**

Land development data includes data and information on building permits, public acquisition of land and conflicts over land.

Building Permits

Since 2020, the Observatoire du Territoire has managed an on-line system for building permits known as **MATAC (Ministry of Territorial Development: Authorization to Construct).**[82] MATAC enables the following online functions: filing files, processing and examining requests, electronic transfer of files between technical services, monitoring the progress of each file and sending notifications and notice of payment to claimants.

MATAC applicants must submit documents that include the description of the project, the construction plans, proof of ownership and information concerning the applicant. The automated processing systems of MATAC link application information with relevant land use planning and construction standards. MATAC commenced as a pilot project in 19 Communes.

MATAC has the potential to act as an open data platform for building permits that is interoperable with land use planning systems. However, there are substantial challenges as most construction occurs in Madagascar without planning permits. For example: the **World Bank LGAF Report**[83] estimates that over 80% of new constructions in Madagascar do not have building permits. The report notes that in Antananarivo there are around 580 applications for planning payments, of which 230 are accepted per year. These formal rates compare with estimates that 15,000-20,000 new households migrate to the city every year. The report comments that "*the large numbers of illegal developments cause conflicts (approximately 460 complaints are filed annually to the Urban District of Antananarivo by neighbors*".

Public Acquisition of Land.

There is no publicly available data on public purpose acquisition of land in Madagascar. This includes data relating to the number of compulsory land acquisitions by the government per year, or the standards adopted for valuation and compensation in relation to such acquisitions.

The key challenge for public land acquisition in Madagascar remains the accuracy of land tenure information. Land acquisitions tend to create conflict over land because records of rights to land are often informal or out-of-date. Establishing who owns land is an essential prerequisite for valuation and compensation.

---

82   Retrieved on 22 November 2022 from **https://www.matac-madagascar.mg/**

83   Retrieved on 22 November 2022 from **https://landportal.org/node/74482**

The **World Bank 2020 Report**[84] on Urban Planning in Madagascar states that:

"Projects are often subject to delays of several months since the process is blocked by unsolvable problems of identification of the beneficiaries to be expropriated and compensated. The complex and unofficial situation of the occupants, renters, owners, heirs, and co-heirs of the first and second generation means that the project operators themselves must take responsibility for the regularization procedures of the different rights before being able to provide compensation... An example is provided by the Northeast Bypass Project, which was financed by the AFT and the European Investment Bank. Out of 232 parcels impacted by the first segment of the work, almost 75% of the owners could not be compensated because their land status was not up-to-date, generally because of unregistered changes in status. A time-consuming and onerous regularization effort was launched, involving, in some cases, an appeal before the courts..."

Conflicts~ over Land.

There is no publicly available data on conflicts over land in Madagascar. In 2012, the Observatoire du Territoire estimated that around 30% of cases before the Civil Court of Antananarivo related to land. The Observatoire du Territoire survey identified the following land issues commonly before the Courts:

- family conflicts linked to inheritance, especially when one of the co-heirs transfers parts of an undivided property to a third party.
- the case of double or multiple sales of the same property.

84   Andrianirina, R., Raserijaona, G., Aanchal, A., & Teyssier, A. (2020). Towards an Urban Land Reform in Madagascar? : Support to Urban Land Policy. The World Bank. Retrieved on 22 November 2023 from **https://documents.worldbank.org/en/publication/documents-reports/documentdetail/517211592452939643/towards-an-urban-land-reform-in-madagascar-support-to-urban-land-policy**

Category 5: Land Value Data

Land value data is not available either in open format or as official research reports and analysis. However, the Ministry of Finance has made available an **on-line simulation platform (IMMO)**[85] for citizens to obtain an estimate of land value. The simulation requires information such as location of region, district, commune, zone type, accessibility description, water and power availability, beach distance, land inclination and the surface area of the land in question.

Land Taxation

The **2021 General Tax Code**[86] establishes three relevant types of taxation for land valuation purposes in Madagascar: (1) land tax, (2) building tax, and (3) registration and transfer fees. The Code allows for standard valuations of land to be set by the Board of Taxation for the purposes of land tax where market values are not available. However, the Code does not set out rights and obligations to provide open data relating to land valuations, but rather establishes a system that relies extensively on self-assessment of land values by persons subject to land, building, or transfer taxes. **Land tax** is an annual tax of general application to land irrespective of legal status or the type of land use. There are exceptions for state land. The tax is assessed based on market value as determined from the most recent transfer, or in the absence of transfer, by reference to standard values set by the Board of Taxation (Art. 10. 03.08). **Building Tax** is also an annual tax that covers residential, commercial, and industrial buildings. Exemptions apply for buildings that are used by government agencies for public service or benefit, and which do not generate revenue. The tax is assessed as a proportion of rental value, as determined by criteria set out in the Tax Regulations 2008. **Registration and transfer fees** are charged on the transfer of registered rights to land. Transfers may take place through sale, gift, inheritance, charitable or religious donation, or merger/subdivision. The law applies a registration fee in proportion to the market value of the right transferred.

The tax system has an online portal and requires the filing of tax information to be carried out digitally. The **HETRAOnline**[87] tax registration system creates an opportunity to streamline and publish land tax data in more interoperable formats. It also makes available in PDF format regulatory and legislative text regarding financial matters, including that related to land taxes and valuation such as registration and transfer fees. The **World Bank 2020 Report on Urban Planning** sums up the magnitude of the potential for improving information on housing and property in Madagascar.

---

85   Retrieved on 22 November 2022 from **https://immo.impots.mg/**

86   Retrieved on 22 November 2022 from **http://www.impots.mg/en/153-n-general-tax-code-2021**

87   Retrieved on 22 November 2022 from **https://hetraonline.impots.mg/**

It provides the following comment on the housing datasets that underpin collection of land tax in Madagascar:

"The last official survey of building property was carried out by the Commune Urbaine d'Antananarivo (CUA) in 1990 with the support of the World Bank and within the framework of the Antananarivo Plain Development Project. It made it possible to count 97,772 buildings. In 1998, a projection based on figures from 1990 established an estimation of 117,000 existing buildings, and this figure constitutes the tax base on which the municipality has based its tax collection for the past 20 years. An estimation made in 2017 by the Malagasy Institute of City Professions (IMV), using digital maps, nevertheless found some 300,000 structures. Consequently, 61% of the buildings in the capital elude the IFPB, representing a considerable deficit since the annual property tax revenue represents 20% of the annual budget of the CUA.

In the 5th city district, the survey supported by the GIZ in 2018 made it possible to count 43,000 buildings compared to the 27,000 identified by the declarative approach, for a total of 16,000 taxable buildings that escape property taxes. The fact that the land database is not updated also leads to enormous financial losses. As a matter of fact, the informal approach to changes in property status deprives the government and the municipalities of direct and indirect tax revenues such as: i) The taxation of land transactions (sales, inheritances, leases) via registration fees (DE), and the tax on capital gains on property (IPVI) collected by the tax centers; ii) Property taxation: Property Tax on Building Property (IFPB) collected by the CUA; iii) Revenues collected by the State-owned land and land-mapping services: fees and costs linked to recording, conservation, demarcation, map reproduction, etc. The DE and IPVI, estimated annually at between 16 to 40 billion MGA, represent 3 to 5% of the total tax revenues that contribute to the government budget. Revenues from the land services of the city of Antananarivo, with a total of approximately 140 million MGA per year, represent between 12 and 20% of the domestic revenues of the land services."

Category 6: **Other Land Data**

Several other custodians produce data related to other land functions:

Coastal Areas: MATSF through the Coordination and Planning Unit for Maritime Territories has developed GIS data on coastal areas that includes beach delimitation, identification of mangroves, and locations of seaside resorts. The dataset is not available online but is available to the public through an office visit.

Road Data. The Ministry of Public infrastructure (MPI) maintains national data and roads, including location, size, use, and bridges. This dataset is available to the public on request. Currently, MPI is working to develop a single on-line platform for road data from all its departments. The dataset will include information about past, current and future projects, along with the relevant current funder, so that the Ministry can provide real-time monitoring of road projects. Openstreetmap Madagascar[88] also makes Road data available under an open license on their on-line platform. The information is a product of voluntary work by volunteers throughout the country.

Agriculture Data. The Center for Geoinformatics Application in Rural Development (CGARD) is a department of the Ministry of Agriculture that was created in 2018. The Centre maintains data available to the public on request on:

- **Agricultural zones.** This dataset is derived from Sentinel 2 satellite imagery made available by the Government of India. The satellite imagery provides an overview of agricultural areas in Madagascar and allows the identification of different types of agricultural use as well as agricultural road networks and sand-covered areas. The dataset was generated in 2018, and currently lacks the funding for continuing updates.
- **Potential agricultural zones.** This dataset derives from a presidential project known as "*Green Title*", which supported youth entrepreneurs in the agriculture sector as part of the FIHARIANA program[89]. CGARD rôle was to identify potential agricultural zones in selected regions.

Real Estate Data. The **Société d' Equipement Immobilier de Madagascar (SEIMAD)**[90] is a mixed private/public entity that buys and sells housing, including apartments. SEIMAD maintains a database for five urban areas that includes real estate data from 1950, as well as current project-specific data that includes 2187 homes and apartments. The dataset includes the location of housing along with the names of owners. Members of the public may access the data on request, but the information made available excludes the names of owners (unless there is a Court order for disclosure).

Airports Data. The **Madagascar Initiatives for Digital Innovation (MAIDI)**[91] provides an **open dataset on airports**[92] using information provided by the Madagascar Civil

39

---

88   Retrieved on 22 November 2022 from **https://www.openstreetmap.org/relation/447325**

89   FIHARIANA is an entrepreneurial program of the Republic of Madagascar where entrepreneurs submit their projects and get evaluated to be selected for funding.

90   Retrieved on 22 November 2022 from **https://seimad-immo.com/fr/accueil/**

91   Retrieved on 22 November 2022 from **https://www.association-maidi.mg/**

92   Retrieved on 22 November 2022 from **https://www.openstat-madagascar.com/uploads/bdds/6194f319a6cae_liste_des_aerodromes_1er_semestre_2017.pdf**

Aviation Authority on the **OpenStat Madagascar**[93] portal. OpenStat also makes data on a further 83 databases available on three themes related to population, economy, and finance. MAIDI is governed by Ordinance No. 60-133 of October 3, 1960, of the MAIDI Association. It was officially created on February 2, 2017, in Antananarivo with the aim of promoting open data, data journalism and e-democracy in Madagascar.

How Open is Land Data and Information in Madagascar?

Category 1: Legal and Policy Data

Partially open

Category 2: Land Tenure Data

Not open

Category 3: Land Use Data

Slightly open

Category 4: Land Development Data

Not open

Category 5: Land Value Data

Not open

Category 6: Other Land Data

Slightly open

● Not open　　● Slightly open　　● Partially open　　● Fully open

93　Retrieved on 22 November 2022 from **https://www.openstat-madagascar.com/**

Open Data Assessment in Madagascar

This chapter assesses the data types described in the previous section – legal policies, land tenure, land use, land development, land value and other land data types – against open data criteria identified in the publication, **Open Up Guide for Land Governance**.[94] It scores Madagascar's publicly available government databases or datasets against ten open data criteria set out in *Table 6* below. The open data compliance scoring options are described in *Table 7*.

While an openness score is provided as part of the assessment, it is important to note that this reflects the current situation and provides a baseline for the future. Opening data is a process, and any assessment of openness should be seen as a continuum. This baseline assists with understanding the current state of data and supports future usability of data for data-dependent services and to meet the public interest.

---

94   Retrieved on 22 November, 2022 from
https://landportal.org/library/resources/open-guide-land-governance-version-20-following-public-comments

Table 6: Open Data Assessment Criteria

CRITERIA	DESCRIPTION
Online	Availability of key land resources and whether or not the data is available online or offline
Accessible	Describe how accessible the data is to users. Consider whether you are required to register, log in or request access in order to be able to access the resource.
Free	There is no charge for the data.
Timely	Data is updated according to an acceptable time frame.
Metadata	Information that explains the origin of the dataset and how it is maintained. It could be information about the structure of the data, the type of data, the quality of the data or the conditions determining the inclusion/exclusion of data.
Standards	Information that describes whether the data conforms to a particular standard if appropriate. Consider whether the data is only available in proprietary formats, or whether open formats are used. It also may includes evidence of standards for a particular type of content domain such as land administration data (Land Administration Domain Model (LADM)-ISO 19152:2012)
Downloadable	The data can be downloaded in bulk in open formats.
Open licence	The data is licensed for legal reuse by anyone, using, for example, a Creative Commons Attribution by 4.0 International licence.
Machine-readable	Presented in open formats which can be read electronically without human intervention, for example, APIs (application programming interfaces.)
Uniform Resource Identifiers	A URI may be thought of as a permanent name given to an online information resource so that it can always be identified by search queries.

Table 7: Open Data Assessment Scoring

SCORE	DESCRIPTION
Fully/Very Open	The digital data meets all or most of the open data criteria.
Partially Open	The digital data meets more than half of the open data criteria.
Slightly Open	The digital data meets few of the open data criteria or there is digital land governance data but it is not yet online.
Not Open	There is no evidence of digital or open data.

Table 8: Overall Results of the Open Data Assessment for Madagascar's Land Data

44

45

	Online	Accessible	Free	Timely	Metadata	Standards	Downloadable	Open licence	Machine readable	Linked Data (URIs)	TOTAL
Legal	Partially Online	Fully Accessible	Fully Free	Very Timely	No Metadata	No Standards	Partially Downloadable	No Open License	Not Machine Readable	No URI	Partially Open
Land Tenure	Not Online	Not Accessible	Not Free	Not Timely	No Metadata	No Standards	Not Downloadable	No Open License	Not Machine Readable	No URI	Not Open
Land Use	Partially Online	Fully Accessible	Slightly Free	Slightly Timely	No Metadata	No Standards	Slightly Downloadable	No Open License	Not Machine Readable	No URI	Slightly Open
Land Devpt	Slightly Online	Not Accessible	Fully Free	Not Timely	No Metadata	No Standards	Slightly Downloadable	No Open License	Not Machine Readable	No URI	Not Open
Land Value	Not Online	Not Accessible	Slightly Free	Not Timely	No Metadata	No Standards	Not Downloadable	No Open License	Not Machine Readable	No URI	Not Open
Other Land Data	Partially Online	Not Accessible	Partially Free	Not Timely	Partial Use of Metadata	No Standards	Slightly Downloadable	Slight Use of Open License	Not Machine Readable	No URI	Slightly Open
OVERALL	Slightly Online	Slightly Accessible	Slightly Free	Not Timely	Slight Use of Metadata	No Use of Standards	Slightly Downloadable.	No Use of Open Licenses	Not Machine Readable	No Uniform Resource Identifiers	**Slightly Open**

Overall Result

Across all land data categories , the most data is held by the **Observatoire du Territoire**[95], an entity within the **Ministry of Territory Planning and Land Services**[96] responsible for producing and capitalizing on information, knowledge and ideas on land management, urban planning and land tenure. This entity collaborates with other key sectors such as agriculture, mining, and forestry.

The Observatoire du Territoire has multiple roles. It is a producer, holder, and user of data. It provides decision-makers and stakeholders with credible territorial information (collection, capitalization, processing, sharing and dissemination) on land dynamics, land use and reading the territory. As a data user, it has an active stake in quality production and data sharing and its multiple roles incentivize it to be both inward looking and outward looking in its data production activities.

An exhaustive online search was conducted to assess six categories of land data in Madagascar: 1) Legal, Policy & Institutional Framework data, 2) Land Tenure data, 3) Land Use data, 4) Land Development data, 5) Land Value data and, 6) Other relevant land data. There is little evidence of government agencies producing and publishing open or digital land data. Research on the website of the Observatoire du Territoire which offers a portal for access to territorialized information (Geoportal), territorial planning tools and elements for reading the territory found that while some land information and data is made available, this is generally not in accordance with open data principles.

The lack of online data does not indicate that the data does not exist. It may exist offline or in closed networks and may be shared through informal means outside an official government portal. Documentation on existing data may also be conducted offline or purely internally within an organization. To overcome this lack of online information on land data availability and to identify the potential existence of closed (inaccessible) data, interviews were conducted with public officials, civil society organizations and private sector stakeholders that are part of the observatory. This included a site visit to the Observatoire, where a static list (Microsoft Word format .doc) of available information/datasets with some metadata (e.g., producer, online/offline status, year of production) was provided.[97] Most of the documents listed are yet to be published online, and the Observatoire anticipated online publication in the near term.

95   Retrieved on 22 November 2022 from
     https://observatoire-territoire.mg/presentation/

96   Retrieved on 22 November 2022 from
     http://www.matsf.gov.mg/

97   Retrieved on 22 November, 2022 from
     https://docs.google.com/document/d/17DIfNNMjhwc0bFFvhD9iDad_N426CnPY/edit?usp=share_link&ouid=102299048209215540303&rtpof=true&sd=true
     and **https://docs.google.com/document/d/1iE-4zoFDsiGElysHUeGMu0AQP_vkXsUF/edit?usp=share_link&ouid=102299048209215540303&rtpof=true&sd=true**

The real issue of interoperability is due in part to a lack of digitalization as some data is currently created and stored in paper format. The complexity of Madagascar's land governance means that land data is spread across several agencies, with each ministry having its own center of expertise, role, and information management function. Due to the inter-ministerial nature of land management across a range of functions, land data is diffused across different ministries and has limited coordination or publication.

Bibliographic data on land data's legal, institutional, and political context are available online and can be downloaded. The sources of these data are incomplete and varied—some documents can be found on the National Assembly[98] website and others on the **National Center for Legislative and Legal Information and Documentation# (CNLEGIS)**[99] website.

Data on land registration and remote sensing imagery are not accessible online and are only available from, and available for, land services and topographic services. Some initiatives are attempting to open certain data categorized as "*communication*" or "*publicity*" data (communication-focused outputs or information) through digital certificates of legal status (CSJ) and providing topographic maps (via a publicly accessible vending machine). These digital services have been piloted in 2022 in two districts of Antananarivo and were announced in the **media**.[100] Land registration data or data on land status from non-governmental sources could not be verified.

98   **https://assemblee-nationale.mg/**
99   **https://cnlegis.gov.mg/**
100 **https://midi-madagasikara.mg/2020/05/19/services-fonciers-des-guichets-electroniques-pour-la-delivrance-de-csj-et-de-plans/**

Criteria 1: **Online**

Online open data is "*digital data that is made available with the technical and legal characteristics necessary for it to be freely used, reused, and redistributed by anyone, anytime, anywhere*".[101] Online open data on the Internet offers equal access for everyone who has Internet access, and it encourages transparent, accountable, efficient, responsive, and effective governments and civil society and private sector organizations.

This criterion assesses land governance datasets that are available online, including via tools for mobile and offline use. It also considers datasets that are digital and used online within government and other organizations, but which are not yet publicly available online. A next step for a government could be to make internal digital datasets publicly available on the Internet.

Searches of online repositories (such as web catalogs and data portals) and online interfaces that present or visualize information were complemented with interviews of public officials with responsibility for the datasets. In the absence of official government data, non-governmental sources can serve as a stop gap, or temporary solution, while the country works to improve its data infrastructure and resources.

How much of Madagascar's land related data is online?

Slightly Online

● Not Online   ● Slightly Online   ● Partially Online   ● Fully Online

---
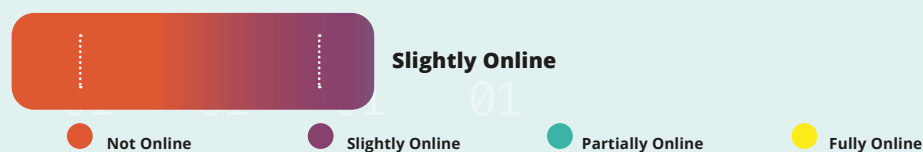
101 International Open Data Principles.
https://opendatacharter.net/principles/

Table 9: Online Criterion Score

CATEGORY	SCORE	NOTES
Legal, Policy and Institutional Framework Data	*Partially Online*	Most found was "bibliographic data" in the legal and political category. This was in the form of legal or policy documents made available on the **Malagasy National Assembly**[102] website. Most land-related regulations and policies are available online on government platforms in PDF format.
Land Tenure Data	*Not Online*	No land tenure data was found online. Information from the Local Land Use Plans containing data on land tenure and land use is available from local land offices in paper format.
Land Use Data	*Partially Online*	The web portal of the Observatoire du Territoire includes 17 other data sets that are public and freely available with no log in barrier. Information from the Local Land Use Plans containing data on land tenure and land use is available in paper format from local land offices but not online. Some geolocalized land use data such as residential areas, buildings and roads are online on OpenStreetMap.
Land Development Data	*Slightly Online*	Sland development data and information were found online.
Land Value Data	*Not Online*	No land value data and information were found online.
Other Land Data	*Partially Online*	Government sourced data found online includes boundaries of protected areas belonging to the Madagascar Protected Areas System, available online on the **GeoNode**[103] Madagascar platform. Digital data on land ownership (Property registration procedure) was not found online. Some additional geographic data on infrastructure are available online on the **OpenStreetMap**[104] Global Community Platform and statistical data can be found on **OpenStat**[105]. Administrative boundaries from the national to the *Fokontany*[106] cale (level 4) is online on the **Humanitarian Data Exchange (HDX)**[107], intended to be used by humanitarian actors to respond to emergencies (climatic hazards, drought, ...). Data on the geology of Madagascar are online on Data Basin.

Overall Score: Slightly Online

49

---

102 **https://assemblee-nationale.mg/**
103 **https://www.resiliencemada.gov.mg/layers/geonode**:limite_sapm
104 **https://www.openstreetmap.org/**
105 **https://www.openstat-madagascar.com/bdd/transport/96-donnees-sur-les-aerodromes-actifs-a-madagascar**
106 Le Fokontany est le plus petit échelon de gestion administrative territoriale à Madagascar
107 **https://data.humdata.org/**

Criteria 2: **Accessibility**

This criterion assesses whether the land data is easily discoverable, accessible, and made available without bureaucratic or administrative barriers which can deter people from accessing it. This includes seeing whether users must identify themselves through registration, log in, or a request for access. It is normal for users who wish to bulk download data or use an API to supply an email address to receive updates of the data. This criterion also assesses whether access is easy for people with disabilities.

Land data production is sporadic, according to the expressed needs of government departments. No structures exist to offer systematic access to data, but instead on an as needed basis for the department concerned. This data is usually exchanged manually as a one-off transaction, whether in digital or paper format. This approach to data management and access disregards any obligation to provide routine and systematic access to data consumers, including the public. As such land data in Madagascar is not accessible.

Any one-off access to land data is generally limited to government institutions and their collaborators (contractors such as consulting firms or NGOs implementing land census projects for example). Researchers can access some data by means of an official request in writing. The data are often buried in the information systems of the consultants or consulting firms commissioned to carry out the work, or the land services that collected the data. Some "*analysis*" data are sometimes available within published reports, but no link to the data is provided. A copy of title data is available on request from the land departments, generally for a fee (like the Certificat de Situation Juridique) to the owner.

How much of Madagascar's land related data is accessible?

Slightly Accessible

● **Not Accessible**   ● **Slightly Accessible**   ● **Partially Accessible**   ● **Fully Accessible**

Table 10: Accessibility criterion score

CATEGORY	SCORE	NOTES
Legal, Policy and Institutional Framework Data	*Fully Accessible*	Legal and policy information is generally available online with no login barriers.
Land Tenure Data	*Not Accessible*	*6/29 accessible.* Exclusive access to the Direction des Domaines et de la Propriété Foncière and its branches (land title, land register) and to the Guichets Fonciers (land certificate). To obtain information on a plot of land, users must make a request to the Domains Department, which must provide the plot number.
Land Use Data	*Fully Accessible*	*25/33 accessible.* The web portal of the Observatoire du Territoire includes 17 other data sets that are public and freely available with no log in barrier.
Land Development Data	*Not Accessible*	No land development data could be found online.
Land Value Data	*Not Accessible*	A **tax simulator**[108] is available on the platform making it possible to calculate how much tax should anyone pay for land transfers and mutations (détermination des valeurs administratives des immeubles)
Other Land Data	*Not Accessible*	6/65 accessible
		Overall Score: Slightly Accessible

---

108 **http://immo.impots.mg/**

Criteria 3: **Free**

This criterion assesses whether the online land data is released free of charge.[109] It excludes bibliographic data such as online articles available from non-governmental sources.

Some online data on national roads of provincial interest and roads of communal interest provided by the **FTM**[110] as the National Mapping Authority, National Geographic and Hydrographic Data Infrastructure are available for sale to the public directly at their premises. Other ministerial departments that need these data can obtain them free of charge through administrative correspondence. The data on the development of the territory is contained in reports such as the **national development schemes**[111] website of the **Territory Observatory**.[112] Other regional and communal development schemes are not yet available, but are listed on the website as currently open for consultation.

How much of Madagascar's land related data is free?

Slightly Free

● Not Free   ● Slightly Free   ● Partially Free   ● Fully Free

Table 11: Free criterion score

CATEGORY	SCORE	NOTES
Legal, Policy and Institutional Framework Data	*Free*	Legislation and Regulatory texts and policies are available on the Internet at no cost.
Land Tenure Data	*Not Free*	Land ownership data is not accessible online but 5 offline datasets are available for a fee. Access to land ownership information such as contained in the cadasters (land titles and land certificates) is manually available subject to a fee.
Land Use Data	*Slightly Free*	One online land use dataset was available for free, (**Statistical Data on Urban Development**[113])

---

109   **https://opendatacharter.net/principles/**
110   **https://cnlegis.gov.mg/page_acces_pdf/eoVisRdnW83**
111   **https://observatoire-territoire.mg/snat-contenu/**
112   **https://observatoire-territoire.mg/**
113   **http://www.matsf.gov.mg/transparence-des-donnees/**

CATEGORY	SCORE	NOTES
Land Development Data	*Fully Free*	7/7 free. The national planning schemes are freely available as digital PDF reports. Project for the Elaboration of the **Master Plan for the Development of the of the Economic Axis TaToM**[114] are free
Land Value Data	*Slightly Free*	The **tax simulator**[115] for mutation is open and is the only way available for the public to determine their land values.
Other Land Data	*Partially Free*	Some cartographic products such as administrative data produced by the Geographical and Hydrographic Institute of Madagascar require payment of a fee. Some statistical Data on **land and maritime planning is available**[116] for free from MATSF. Spatial data on climate and risk analysis, also from MASTF, can be found **here at no charge**. Economic development plans and project data for the Emergence of Madagascar strategy is also available at no charge. [117] [118]

Overall Score: Slightly Free

114 **https://openjicareport.jica.go.jp/pdf/12340758_01.pdf**

115 **https://immo.impots.mg/**

116 **http://www.matsf.gov.mg/transparence-des-donnees/**

117 The Plan for the Emergence of Madagascar 2019-2023 Retrieved on 22 November, 2022 from
     http://www.mefb.gov.mg/assets/vendor/ckeditor/plugins/kcfinder/upload/files/PEM.pdf

118 Initiative for the Emergence of Madagascar. Retrieved on 22 November 2022 from
     http://iem-madagascar.com/#

Criteria 4: **Timeliness**

This criterion is evaluated if the online land data is published in a timely manner, without undue delay. Data will be comprehensive and accurate, and released in accordance with prioritization that is informed by consultations with open data users, including citizens, other governments, and civil society and private sector organizations (CITAR).

The **United Nations Population Fund (UNFPA)**[119] provides technical and financial support for governments for population and housing censuses. As per their recommendation, population and housing census should be conducted at least once every 10 years.

For Madagascar, the first general population and housing census (**RGPH**[120]) was carried out in 1975, the **second RGPH in 1993**[121] and the **third and last RGPH in 2018**[122]. No known frequency for updating the data is specified. The data is not updated in a systematic way but is determined by conditions and other parameters such as the availability of funding from partners and the requests made by the organizations needing the data.

- SRAT[123] should be updated every 20 years and revised every 5 years (Decree 2019-1931).
- SAC and SAIC[124] should be updated every 15 years.
- PCD should be updated every 5 years.

How timely is Madagascar's land related data updated?

Not Timely

● Not Timely   ● Slightly Timely   ● Partially Timely   ● Fully Timely

119 **https://www.unfpa.org/census**

120 **https://www.education.gov.mg/annonces/recensement-general-de-population-de-lhabitation-rgph/**
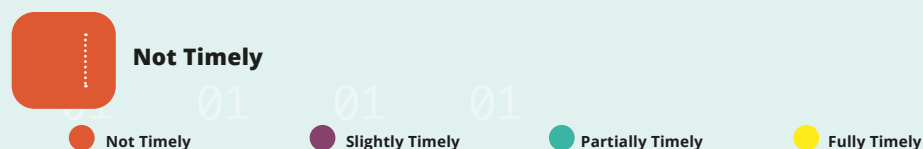
121 A part of the results available: **https://www.instat.mg/documents/upload/main/INSTAT_RGPH_1.pdf**

122 **https://www.instat.mg/documents/upload/main/INSTAT_RGPH3-Definitif-ResultatsGlogaux-Tome1_17-2021.pdf**

123 **https://cnlegis.gov.mg/uploads/D2019-1931.pdf**

124 **https://cnlegis.gov.mg/page_acces_pdf/eoVjtQisRdnW8**

Table 12: Timely criterion score

CATEGORY	SCORE	NOTES
Legal, Policy and Institutional Framework Data	*Very Timely*	Legal, policy and institutional framework data is updated until 2023 on the **CNLEGIS** website. Some regulatory texts, after their update or any amendments that have been made, take a little time before being published, in the order of a few days to a few weeks. The Mediatized Communication Code was enacted in 2016 and published on the **Ministry of Justice website** in 2019.
Land Tenure Data	*Not Timely*	Land tenure data is not generally available and Statistical data on urban development is published only as operational achievements in the following year only.
Land Use Data	*Slightly Timely*	Documents such as development schemes and plans are published on the Observatoire du Territoire website a year or more after their final validation.
Land Development Data	*Not Timely*	As most of the Land Development and Information data is not online, this category has not been evaluated. The only existing online platform is MATAC for building permit application procedures. Statistical data on urban development is published as achievements in operation years preceding the year of publication.
Land Value Data	*Not Timely*	The regulatory document containing information on Land Value is the General Tax Code (CGI). No valuation data or data on the frequency of data updates or publications was found.
Other Land Data	*Not Timely*	No known frequency for updating the data is specified. The data is not updated in a systematic way but is determined by conditions and other parameters such as the availability of funding from partners and the requests made by the organizations needing the data. Some of the data available online are more than two years old. Data on the 2004 Agricultural Census was published on the INSTAT website in 2007.

Overall Score: Not Timely

Criteria 5: **Metadata**

This criterion assesses whether the online land governance data include consistent core metadata, that the data is fully described, all documentation accompanying the data is written in clear, plain language; and that data users have sufficient information to understand the source, strengths, weaknesses, and analytical limitations of the data.[125]

Metadata provides information about one or more aspects of data within a dataset. It summarizes basic information about data, which can make it easier to track and work with. Core metadata is a limited set of metadata which provides important, fundamental information about data, and should be defined by common vocabulary across all datasets. Core metadata elements may include the dataset title, source, publication date, and format, and other relevant information that describes the dataset and supports discoverability (that is, makes it easier for users to search for and find the dataset with confidence).[126]

Is Madagascar's land related data accompanied by metadata?

Slight use of metadata

● No Use of Metadata   ● Slight Use of Metadata   ● Partial Use of Metadata   ● FUll Use of Metadata
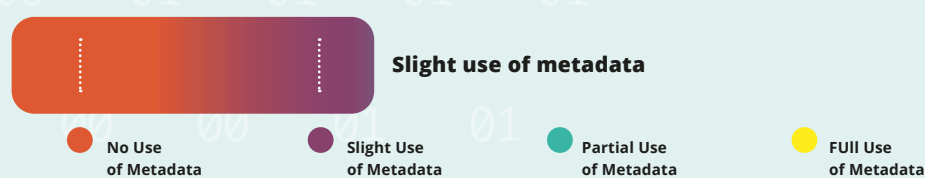
Table 13: Metadata criterion score

CATEGORY	SCORE	NOTES
Legal, Policy and Institutional Framework Data	*No Metadata*	Bibliographic data resources in the "Legal, Policy and Institutional Framework" category were not provided with metadata.
Land Tenure Data	*No Metadata*	There is no tenure data available online.
Land Use Data	*No Metadata*	The data provided by the Observatoire du Territoire did not have metadata. The titles of the table listing these data provided can be assimilated as metadata elements but without being written in due form. Similarly, the data found on the Territory Observatory's website do not contain metadata.
Land Development Data	*No Metadata*	No metadata record found for this category. The data on the website of the Territory Observatory do not contain any metadata.
Land Value Data	*No Metadata*	No metadata found for this category

---

125 Retrieved on 22 November 2022 from **https://opendatacharter.net/principles/**

126 Open Data Charter Definition of Key Terms. Retrieved on 22 November 2022 from **https://drive.google.com/file/d/1ruIYMNsHLAvfv9gOlmLDMhEWI_pM_dmL/view**

CATEGORY	SCORE	NOTES
Other Land Data	*Partial Metadata*	Select government sources, such as the INSTAT and the Ministry of Livestock provide documentation of methods and definitions that accompany their **statistical outputs**.[127] Two spatial datasets (on protected area systems and geology) and one statistical dataset (on airports) are accompanied by their metadata. These metadata contain all the characteristic elements of a metadata such as the title of the dataset, the license, the date of publication, the keywords, the geographical coverage, and the name of the contact point. However, no methodological description of data collection was found. The metadata sheet on the geological data provided by Institut de Recherches pour le Développement complies with ISO 19115 and INSPIRE standards. The only metadata from government sources for the boundaries of protected areas belonging to the **Madagascar Protected Areas System**[128] published on the **Mahatsangy Geonode-Madagascar platform**.[129] This metadata contains a summary of the data and other information such as title, publication date, keywords and format. Although downloadable in HTML, text, or XML format, no documentation or description of the strengths, weaknesses, and analytical limitations of this metadata was found.

Overall Score: Slight Use of Metadata

127 Retrieved on 22 November 2022 from
https://www.instat.mg/documents/upload/main/INSTAT_RGPH3-Definitif-ResultatsGlogaux-Tome1_17-2021.pdf

128 Retrieved on 22 November 2022 from
https://mg.chm-cbd.net/implementation/programmes-thematiques/aires-protegees/Aires_protegees

129 Retrieved on 22 November 2022 from **h
ttps://www.resiliencemada.gov.mg**

Criteria 6: Standards

This criterion identifies information that describes whether the data conforms to a particular standard. It considers, for example, whether the data is only available in proprietary formats, whether open formats are used, or whether it has adopted or adapted the standards for a particular type of content domain such as land administration data (Land Administration Domain Model (LADM)-ISO 19152:2012).

The data available online did not allow us to determine whether there were standards applied to the data. For data on land tenure, a document from the **National Institute of Decentralization and Local Development (INDDL)** presents the Local Land Use Plan (PLOF) for use by land agents, including a section on production methodology. In the document, in the section on monitoring and quality control work, part "*verifiable deliverables*", it is stipulated that "*PLOF databases meet the required standards and qualities*". This is not modeled on any of the existing land administration domain models, including the LADM.

The planning documents resulting from the **Land Observatory platform**[130] were developed according to methodological guides established after the capitalization of the experiences in order to standardize the deliverables in detailing the design stages, themes and processes to be followed. These methodological guides are not available online.

At the regional level, the regional plans are developed according to the "*Methodological guide for the integration of climate resilience in the Regional Development Plans (PRD) and the Regional Land Use Plans (SRAT)*". At the local level, the Municipal Development Plan is subject to a methodological guide called "*SAC Methodology*". For the mapping part, a cartographic standard has been developed to produce essential maps of SAC documents.

The Communal Development Plan is drawn up according to a "*PCD Guide*", of which an example of "*PCD Guide integrating the cultural dimension*" is provided by the Local Development Fund (FDL), a service attached to the Ministry of the Interior, available online.

These tools have been validated by the MATSF with the stakeholders like FTM, the Environmental Office (ONE), public university, other ministry departments and various partners such as GIZ.

Does Madagascar's land related data make use of standards?

No use of standards

| ● No use of standards | ● Slight use of standards | ● Partial use of standards | ● Full use of standards |

---

130   https://observatoire-territoire.mg/opt/

58
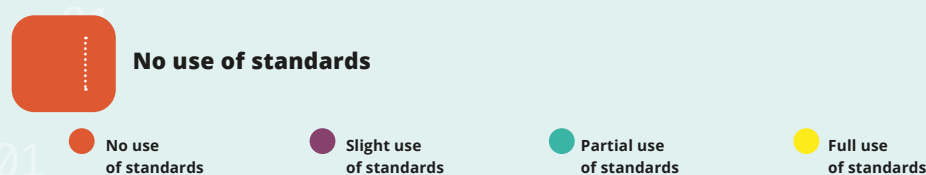
Table 14: Standards criterion score

CATEGORY	SCORE	NOTES
Legal, Policy and Institutional Framework Data	*No Standards known*	No known standards were used.
Land Tenure Data	*No Standards known*	PLOF: Methodology for the use of land office agents
Land Use Data	*No Standards known*	Methodology for harmonization of deliverables (SRAT, SAC, PCD)
Land Development Data	*No Standards known*	**MATAC tool**[131]: a **general conditions for use (GCU)**[132] available on the website
Land Value Data	*No Standards known*	No land value data is published.
Other Land Data	*No Standards known*	The **General Population and Housing Census result (RGPH3)**[133] mention that "all activities planned as part of the implementation of the census are carried out according to international standards"
		Overall Score: No use of standards

---

131 **https://www.matac-madagascar.mg**

132 **https://www.matac-madagascar.mg/liens_utile/MATAC_Condition_utilisation.pdf**

133 Definitive results of RGPH3, p8:
   https://www.instat.mg/documents/upload/main/INSTAT_RGPH3-Definitif-ResultatsGlogaux-Tome1_17-2021.pdf

Criteria 7: **Downloadable**

This criterion assesses whether the land governance data are made available for users to download in human-and machine-readable formats, including via Application Programming Interfaces (APIs) (software intermediaries that allow two applications to talk to each other). It does not assess the bibliographic articles cited in the Data Matrix.

Data from governmental sources found on the **SILOAT Geoportal**[134] (Localized Information System of the Territorial Planning Observatory) are contained in reports in PDF format which is not an open format. These territorial planning tools, such as regional (SRAT) and inter-municipal (SAIC) or communal (SAC) development plans, and urban (PUDi and PUDé) planning plans, serve as a reference framework for the policies, programs and projects of the ministries and decentralized territorial authorities. The interface lacks a direct and intuitive download button, and some data is for viewing only.

According to the Head of the Territory Observatory's Database Management Department, the platform is currently under maintenance but once this maintenance is completed, these documents will be downloadable in PDF format and the list of these tools will be downloadable in XLS format.

Data found outside the Government of Madagascar was typically easier to download, such as the UN FOALEX database, which provides CSV downloads of their list of existing policies and frameworks. However, the policies themselves are not being archived by foreign agencies and are not readily available for download. Therefore, international agencies like the UN do not act as substitutes for domestic repositories.

Mass downloads and the downloads by API are not available.

Is Madagascar's land related data downloadable?

Slightly Downloadable

● Not Downloadable   ● Slightly Downloadable   ● Partially Downloadable   ● Fully Downloadable

134 **https://observatoire-territoire.mg/**
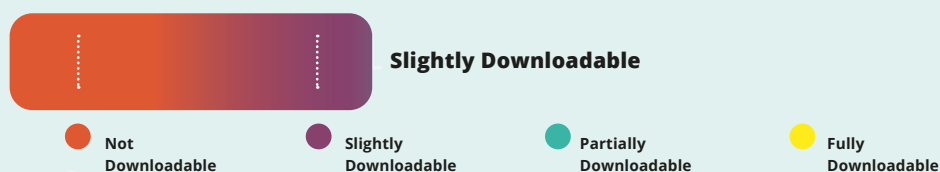
Table 15: Downloadable criterion score

CATEGORY	SCORE	NOTES
Legal, Policy and Institutional Framework Data	*Partially Downloadable*	Considered as bibliographic datasets. All are downloadable but without bulk downloads or API's
Land Tenure Data	*Not Downloadable*	There is no land tenure data available online.
Land Use Data	*Slightly Downloadable*	Territorial planning tools plans such as SRAC, SAIC, SAC, and PUDi are available for download.
Land Development Data	*Slightly Downloadable*	**MATAC tool**[135] is available on the website with very limited downloads.
Land Value Data	*Not Downloadable*	There is no valuation data online.
Other Land Data	*Slightly Downloadable*	Some portals offer downloads in spatial formats
	Overall Score: Slightly Downloadable	

135 **https://www.matac-madagascar.mg**

Criteria 8: **Open License**

This criterion assesses whether land governance data are released under an open and unrestricted license that ensures that data users can easily find and understand the conditions for their data access and reuse.[136] The most common open license government use is the Creative Commons Attribution CC-BY International 4.0 License which allows users to copy, reuse and redistribute the information provided they attribute the copyright owner.[137]

Data found from within Madagascar was either not provided under an open license or no license information was specified. The different websites that publish data and the different platforms do not set out an open license. For example, the **website of the Observatoire du Territoire**[138] claims copyright "*All rights reserved*" at the bottom of the page but does not specify a license allowing reuse. The Observatory's Database Management System, the service is not responsible for the data license in case of data exchange with other services. The data coming from other sources and published on the site are not intended to be downloadable. The Observatory acquires data from other providers and overlays them legally with their data to facilitate the reading of the territory. In most cases, the license of the data is not specified during the exchange. In another example, **INSTAT's data visualization platform**[139] displays the copyright notice at the bottom of the main **INSTAT website**,[140] stating "*all rights reserved*" but also does not specify a license allowing re-use.

Data from sources other than the national government, including global datasets, varied in their open license coverage. FAO databases are covered by an **open data licensing policy**.[141] however external data did not factor into the assessment score. Among all the datasets evaluated, only three datasets specified limited open licenses (CC-BY-SA or CC-BY-NC). These were the infrastructure data in **OpenStreetMap**,[142] the **airport data**[143] and the **geology data**[144] of the western part of the country.

136 Retrieved on 22 November 2022 from **https://opendatacharter.net/principles**

137 Retrieved on 22 November 2022 from **https://creativecommons.org/licenses/by/4.0/**

138 Retrieved on 22 November 2022 from **https://observatoire-territoire.mg/**

139 Retrieved on 22 November 2022 from **https://dataviz.instat.mg/plateforme**

140 Retrieved on 22 November 2022 from **https://instat.mg/**

141 Retrieved on 22 November 2022 from **https://www.fao.org/publications/card/en/c/CA7570EN/**

142 Retrieved on 22 November 2022 from **https://www.openstreetmap.org/**

143 Retrieved on 22 November 2022 from **https://www.openstat-madagascar.com/bdd/ transport/96-donnees-sur-les-aerodromes-actifs-a-madagascar**

144 Retrieved on 22 November 2022 from **http://sphaera.cartographie.ird.fr/rect/IRD_MDG_BAME_1973_300000.zip**

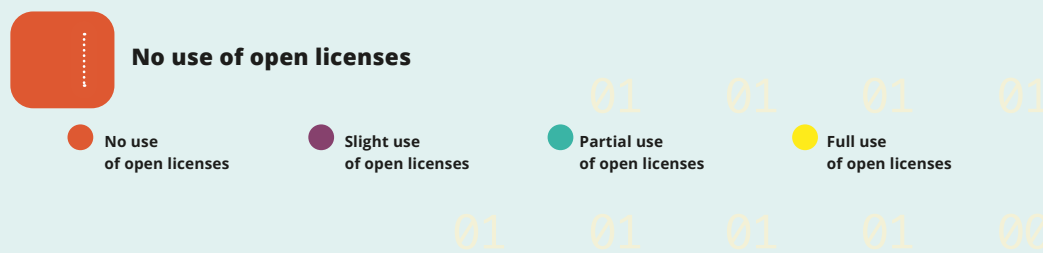## Does Madagascar's land related data make use of open licenses?

No use of open licenses

● No use
of open licenses

● Slight use
of open licenses

● Partial use
of open licenses

● Full use
of open licenses

Table 16: Open License Criterion score

CATEGORY	SCORE	NOTES
Legal, Policy and Institutional Framework Data	*No Open License*	The **Territory Observatory Portal**[145] has a copyright reservation for all rights on the website but does not license for reuse
Land Tenure Data	*No Open License*	There is no publicly available digital land tenure data.
Land Use Data	*No Open License*	The Territory Observatory Portal has a copyright reservation for all rights on the website but is not licensed for reuse. Based on interviews the Observatory's Database Management System service is not responsible for data licensing and data published on the site cannot be shared or downloaded.
Land Development Data	*No Open License*	
Land Value Data	*No Open License*	There is no publicly available digital land value data.
Other Land Data	*Slight Use of Open Licenses*	Only the infrastructure dataset in OpenStreetMap, the **airport dataset**[146] and the **geology dataset of the western part of the country**[147] had specified limited open licenses (CC-BY-SA or CC-BY-NC).

Overall Score: No Use of Open Licenses

---

145 Retrieved on 22 November 2022 from **https://observatoire-territoire.mg/**

146 Retrieved on 22 November 2022 from **https://www.openstat-madagascar.com/bdd/transport/96-donnees-sur-les-aerodromes-actifs-a-madagascar**

147 Retrieved on 22 November 2022 from **http://sphaera.cartographie.ird.fr/rect/IRD_MDG_BAME_1973_300000.zip**

Criteria 9: Machine Readability

This criterion assesses whether the land governance data is made available in formats that can be read and manipulated by either machines or humans (machine-readable and human-readable). Machine-readable data is "*Data in a data format that can be automatically read and processed by a computer.*"[148] This is needed by analysts downloading data in bulk for example, for policy development, analysis, or visualization.

For all categories, no machine-readable data was found for government sources. The format of the documents and data often requires specific software, but some resources could be downloaded in csv format.

Is Madagascar's land related data machine readable?

Not machine readable

● Not Machine Readable   ● Slightly Machine Readable   ● Partially Machine Readable   ● Fully Machine Readable

Table 17: Machine-readability criterion score

CATEGORY	SCORE	NOTES
Legal, Policy and Institutional Framework Data	*Not machine readable*	Among the available bibliography data, most of it is not machine-readable since it is essentially in non-convertible Portable Document File (PDF) format.
Land Tenure Data	*Not machine readable*	No land tenure data is available digitally.
Land Use Data	*Not machine readable*	Most of the spatial data is contained in the maps in image format and if raw data exists, it is in a proprietary format (ECW, TAB, Shapefile).
Land Development Data	*Not machine readable*	
Land Value Data	*Not machine readable*	No land value data is available digitally.
Other Land Data	*Not machine readable*	Statistical data was primarily found in PDF format
Overall Score: Not Machine Readable		

148   Open Data Handbook. **https://opendatahandbook.org/**

Criteria 10: Linked Data
(Uniform Resource Identifiers - URI)

This criterion assesses whether land governance data is made available as Linked Data. Linked Data is "*structured data, which is interlinked with other data, so it becomes more useful through semantic queries. It builds upon standard Web technologies such as HTTP, RDF and URIs, but rather than using them to serve web pages only for human readers, it extends them to share information in a way that can be read automatically by computers. Part of the vision of linked data is for the Internet to become a global database*".[149]

As a result of the lack of truly open digital data, no evidence could be found of the use of uniform resource identifiers to make data more discoverable. As more open data is made available, interest in Linked Data could occur.

Does Madagascar's land related data make use of URI?

No use of URI

● No use of URI   ● Slight use of URI   ● Partial use of URI   ● Full use of URI

Table 18: Use of uniform resource identifiers score.

CATEGORY	SCORE	NOTES
Legal, Policy and Institutional Framework Data	*No URI*	No use made of URI's
Land Tenure Data	*No URI*	No use made of URI's
Land Use Data	*No URI*	No use made of URI's
Land Development Data	*No URI*	No use made of URI's
Land Value Data	*No URI*	No use made of URI's
Other Land Data	*No URI*	No use made of URI's
Overall Score: no URI		

---

149 What is linked data? Accessed Feb 11, 2022. **https://jsld.org/**

Conclusions

Madagascar has established the foundations for making its land data and information open and available for the government and others to reuse. The establishment of the Observatoire du Territoire is a significant milestone. Its work promoting, popularizing, and making available public data to assist communities monitor whether environmental protections are being upheld, and to support rights claims over geographical areas inhabited for generations, is a big step towards achieving data openness and transparency.

Madagascar's existing regulatory framework will continue to establish the necessary institutional structures to advance further and ensure long-term sustainability. Implementation of the Open Up Guide for Land Governance is helping all parties recognize current work and identify future challenges. They have learnt about key open data concepts, developed a shared vocabulary and understanding about open data, and are sharing their own experiences and knowledge.

Critical knowledge about land data and information held by primarily government sources, covering custodians, licenses, timeliness, and other open data criteria, has been improved. As the government is at an early stage in opening its land data, there are technical, managerial, institutional, and political challenges and opportunities to consolidate the mostly local data initiatives. An immediate priority is to identify other public entities and stakeholders with a role in the land data ecosystem as information producers or consumers. This project has worked together with MASTF, and it is now time to understand and connect with the external data re-users' community, academia, civil society organizations and journalists. To achieve this, a broader stakeholder mapping process and continued capacity building are proposed. Two immediate opportunities are firstly to work internally with the various new governmental groups to make their data available and secondly to build a new communication channel for data users.

A key step is to guarantee the constitutional right to information by moving towards and adopting an Access to Information Law in Madagascar. The 2013 Access to Information and Knowledge Sharing Charter established the basic principles of the right to access public information in Madagascar; this right is not fully guaranteed. Little public information and data is publicly available, citizens must make a request to access it, and the government can deny the request. This position is contrary to the principle of universal right to access public information. The African Union has made available and ratified a model Access to Information Law for African countries that may serve as an ideal starting point.

This mapping exercise has revealed that a large percentage of land data is either not publicly available or needs improvement to achieve the openness standards recommended by the Open Up Guide for Land Governance. Implementing an open data policy to promote data openness and reuse in a standardized manner, with data quality and technological consolidation parameters, and metadata and data dictionaries will progress this and demonstrate important leadership.

At the technical level, building on the single public platform to make data available will streamline processes across government and provide a unified channel for citizens to re-use the government's open data to achieve economic and sustainable growth.

Given the state of the information landscape in Madagascar described in this report, it was thought prudent to provide recommendations on the way forward in the form of an **Open Data Action Framework**. The Open Data Action Framework for Madagascar is critical for promoting evidence-based decision-making processes, economic development, environmental sustainability, and the responsible use of information and data technologies. It is based on the **Open Up Guide for Land Governance**,[150] a practical resource to be used by governments from developing countries to publish land-related data to improve data quality, availability, accessibility and use for improved citizen engagement, decision-making and innovation. By implementing this framework, Madagascar can position itself as a leader in open data practices and promote social development and human welfare.

The Open Data Action Framework is organized as follows. The first part is based on the **data diagnostic** derived from analysis of available information types, key user needs and data and information gaps. This allows the identification of 7 key targeted strategies and initiatives aimed at addressing these needs and enhancing the overall accessibility and usability of land data. The second part contains key activities for consideration including on open data standards, resource appropriation strategies and incorporation of land data into wider open government strategies. Finally, the third part sets out the recommendations and diagnostics into an easy to understand 3-point action plan for consideration and implementation by the Government of Madagascar and specifically the MASTF.

150 https://landportal.org/library/resources/open-data-improved-land-governance

Open Data Action Framework for Madagascar

Open data provides a critical pathway for promoting evidence-based decision-making and sustainable development. The Open Data Action Framework for Madagascar is a comprehensive and actionable plan for opening up data currently contained in the **Observatoire du Territoire**[151] (the Open Data Platform of MASTF) and the **Plan Local D'Occupation Foncière (PLOF)**, the land information system of the MASTF.

This chapter describes the findings from the data diagnostic highlighting specific data gaps and opportunities particular to Madagascar. These are then framed into key actions that are essential in encouraging the responsible use of information and land data technologies to promote social development and provide a glance into the context of land data and information in Madagascar. It highlights the key findings and makes three specific sets of recommendations for consideration by the government and specifically the MASTF in implementing more open data initiatives in Madagascar.

151 **https://observatoire-territoire.mg/**
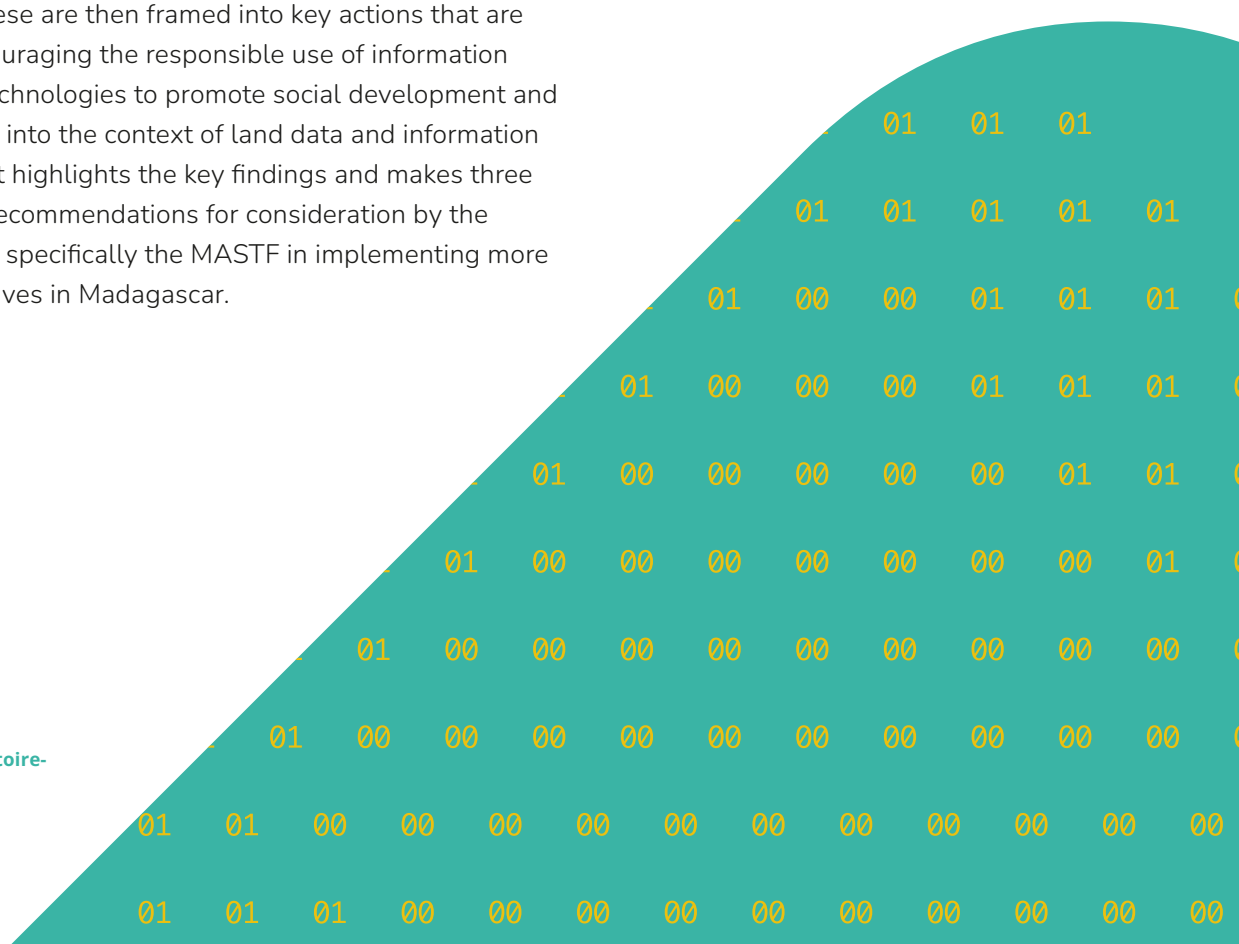
Data Diagnostic

Assessing the specific land data needs of various user groups helped identify gaps in existing data resources, as well as the types of information and formats that would be most valuable to users. The results provide the basis for targeted strategies and initiatives aimed at addressing these needs and enhancing the overall accessibility and usability of land data. The catalog of **192 data resources**[152] pertaining to land ownership, including legislation and open databases was analyzed. This enabled evaluation of the availability, quality, and comprehensiveness of land data resources, as well as identify potential areas for improvement.

Centralized Data, Decentralized Planning

Centralized land data offers numerous accessibility, consistency, and coordination advantages. Equally important is maintaining a degree of decentralization in land planning to adequately consider local contexts and needs. Striking a balance between centralized data management and decentralized planning can achieve efficient land management and preserve the autonomy and responsiveness of local authorities.

Unified Land Data Tools

Legislation and policy documentation are among the most requested types of land data, as they provide essential context for understanding land rights, usage, and regulation. A unified approach to managing this data would streamline user access and analysis, fostering better decision-making across all levels of government.

Open-Source Tools

A current challenge in centralizing land data is the cost associated with proprietary software licenses. Open-source software can provide a more cost-effective solution, ensuring that all stakeholders have access to the necessary tools for working with land data.

Digitalization of paper and PDF's

Digitalizing plans from physical papers and PDFs is an important step in making land data more accessible and usable. This process converts the information into an online format that is easy to search, analyze, share, and make available publicly. By employing the right tools and processes, governments can create a more efficient and user-friendly land data ecosystem for all stakeholders.

Prioritize Legal Data Sources

Legal frameworks and regulations constitute 21.6% of the analyzed data sources. Publishing this information is a top priority as it provides the legal, policy, and institutional foundations upon which land management and decision-making are built. The framework provides the context and guidelines for land rights, usage, and planning, and supports the interpretation and application of land use, land tenure, land development and land value data.

---

152 Land Portal Data Matrix for Madagascar. See: **https://docs.google.com/spreadsheets/d/1NLdBTS6H_VJqi8nVl4pCiJJaRqzu47fQ/edit#gid=1973512486**

Comprehensive understanding of the legal and institutional context facilitates compliance with relevant regulations and promotes transparency and accountability in land governance. Stakeholders include government officials, private landowners, researchers, and civil society organizations. By prioritizing the availability of legal framework and regulation data, the government would create an enabling environment for more effective and responsible land management, foster sustainable development and make sure that land resources are utilized in a manner that benefits all members of society.

Key Stakeholders Needs

Stakeholders reinforced the importance of land data governance for various stakeholders, its relevance across multiple sectors and professions and emphasized its importance in the day-to-day work of MASTF staff. They highlighted some of the challenges they face in accessing and using this information:

Limited Data Access

Limited data access was identified as the biggest obstacle, underlining the need for making legal framework and regulation data, as well as other types of land data, more readily available to users. By prioritizing the accessibility of this foundational information, governments can help to address the concerns of these stakeholders and support more informed decision-making in land management.

Limited User Data Skills

Although this is not universal across the government or even the MASTF, respondents highlighted the limited data quality and limited data skills amongst data users. Investing in capacity-building initiatives for land data users, such as training programs and workshops, would enhance data literacy and skills, improve the usability of land data, and foster a more robust land data ecosystem for analysis and better decision-making.

Limited Data Quality

Data quality is   a significant limiting factor. However, as it is typically a function of user needs and user capacity, investing in raising data user competency is of greater initial importance at this stage than improving data quality.

Government Officials as Main Data User

As government officials are among the main users of land data, strong collaboration, and data sharing between different levels of government is needed along with the centralizing of land data while maintaining decentralized land planning, as mentioned previously.

Complementary Data

Additional data sources could complement the existing land data repositories, such as the National Land Use Map (La Carte nationale d'utilisation des terres), the protected land registry, and other legislation and regulation documents. These additions would further enhance the value and utility of land data for many users.

PLOF (Plan Local D'occupation Foncière) Uses

Local land use data and cadastral plans serve a range of critical purposes for various ministries and national government entities across Madagascar.

Land data is vital for negotiations with private landowners, **facilitating informed discussion** and decision-making regarding land usage and acquisition. It plays a significant role in conservation efforts, enabling the identification and **management of protected areas** to preserve the country's unique ecosystems. It contributes to the efficient administration of property taxes, ensuring accurate assessments and fair distribution of the tax burden. In the tourism sector, land data can inform the development of **sustainable tourism strategies** and identify areas of potential growth. The mining industry relies on land data for **resource exploration and management**, as well as compliance with environmental regulations. Accurate land data is essential for environmental planning and monitoring, helping to assess the **impacts of human activities** and implement appropriate mitigation measures. Land data also supports socio-economic analysis by providing insights into land distribution, property values, and demographic trends, which can inform **evidence-based policy making** and urban planning.

For local governments in Madagascar, land data has a fundamental role in day-to-day operations and long-term planning. They are responsible for collecting, sharing, and analyzing consistent and accurate land data in various formats, while adhering to multiple regulations. This process requires effective coordination and collaboration between different administrative levels and agencies. Local governments need to share their land data with the central government or a centralized land data repository to gain a comprehensive, nationwide perspective on land management, support evidence-based decision-making, foster collaboration between local and national entities, and help cross-sectoral collaboration between public entities, private sector companies and civil society organizations. Through **sharing land data**, local governments can help develop national integrated land management strategies and policies, which lead ultimately to more sustainable land use practices, better resource allocation, and improved socio-economic outcomes for the communities they serve.

The Observatoire du Territoire

The Land Observatory of Madagascar is a commendable land data initiative. Its primary focus is on alphanumeric data derived from cadastral plans and judicial frameworks governing land administration and use. It also incorporates some exogenous sources of data, such as socioeconomic, mining, and demographic datasets, which can provide valuable context for land management decisions. As high value data for land administration in Madagascar is spread out through several government institutions, it is important that these institutions cooperate to make data sharing and data use fluent processes to support evidence-based land administration. This, in turn, will work as an incentive for collaboration and data sharing between a heterogenous range of actors interested in land data within Madagascar.

A key achievement of the observatory is the availability of three (SAC, SRAT and Pudé-ou-PuDi) out of the eight cadastral plans on the Geoportail Siloat on the observatory's website.

This is the first step towards sharing essential land information, with opportunities for adding the remaining plans. The observatory has laid a strong foundation for integrating the chronological evolution of land and judicial data in the future.

Figure 4: Map from the Siloat Cartography available on the observatory's website
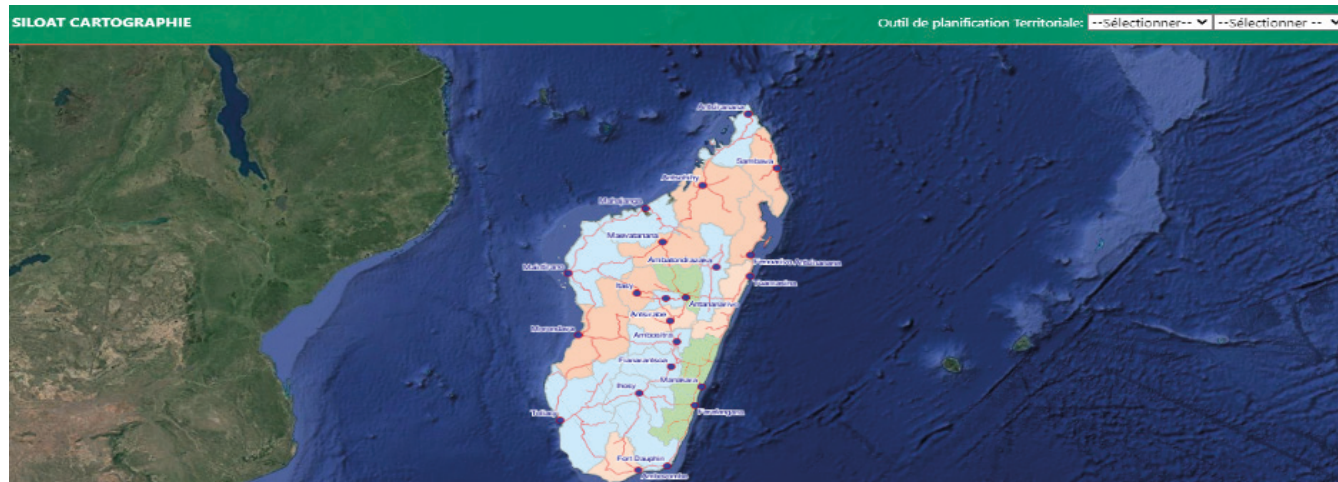
The current PDF data format in the observatory offers a starting point for viewing information. Moving to more open and user-friendly formats will unlock greater potential for analysis, visualization, and downloading of open data. The observatory's library of legislation and judicial documents related to land ownership, delimitations, and status is a valuable resource that can be enhanced with more granularity, classification, and scope. Additionally, the library contains procedure documentation within different government institutions relating to land administration. It is of the utmost importance to establish clear and specific procedures for data management within government institutions that are frequently involved in the use of land data.

Publish an Observatoire du Territoire Data Guide

Improved documentation of procedures and actions within government and land data governance guides would empower users to engage with the data more effectively. A data-oriented guide for the publication and handling of data would ensure proper data management.

Link the PLOF to the Observatoire du Territoire

Linking the PLOF (Cartographic and Digital Identification Tool) to the Observatoire du Territoire would be a significant step towards providing access to land data for a wider range of users. A system for local government users to contribute data from the PLOF to the Observatory would create an integrated dataset within the parameters of local control and central authority. Building on this would expand the Observatory's current achievements to allow the Madagascar government to better meet the needs of land data users and foster more informed decision-making in land management.

From a Geoportal to a Comprehensive Information System

The PLOF is an essential land management tool. It assigns identifiers to land status, specifies land jurisdiction by commune, displays land evolution across various characteristics, delimits territorial planning tools, and helps users understand the evolution of land development over time.

Integrating the GÉOPORTAL SILOAT of the Observatoire du Territoire with the **PLOF would provide seamless access to land data**. Developing a historical timeline would allow users to access current data and understand the evolution of land development over time.

Making all the cadastral plans on the Observatory accessible through the PLOF in open and reusable formats would provide users with comprehensive and detailed data, instead of just the three ((SAC, SRAT and Pudé-ou-PuDi)) currently available:

- SNAT (Schémas Nationaux)
- SRAT (Schéma Régionaux)
- SAIC (Schéma d'Aménagement Intercommunaux)
- SAC (Schémas d'Aménagement Communaux)
- PUDi (Plan d'Urbanisme Directeur)
- PUDé (Plan d'Urbanisme de Détails)
- PSU (Plan Simplifié d'Urbanisme)
- SSU (Schéma Simplifié d'Urbanisme)

Any additional cadastral plans should be included as they would offer greater granularity and allow for the publication of local plans. This visibility of currently available data would serve as a guiding plan for prioritizing strategic sectors and geographies.

A link to the PLOF and judiciary data is needed. As the PLOF aims to function as a tool for future territorial planning policies and other cartographic tools, it must link land demarcation changes and their corresponding changes throughout time with the corresponding institutional framework that governs that evolution. To effectively plan land demarcation policies an understanding of the standing legislation and the historical evolution of the judicial infrastructure governing land administration are needed. A monitoring system that allows government officials to update land demarcation record changes or land use and administration legislative change is also necessary. Additionally, if the PLOF aims to emulate the *Geoportail Siloat* on the Observatory's website, notes or observations are needed to explain the visualized land data and the judicial framework for the data. By implementing these recommendations, the Observatory would become the primary resource for land management data initiatives in Madagascar.

Tools that Work for the Users

Government officials, as the main users of land data, place great importance on data integrity. Visualization tools would improve their understanding of the data and help them plan for future incorporations of high-value data. To achieve these, several factors should be considered.

The tools must be tailored to meet the specific requirements of government officials. They should be user-friendly, intuitive, and compatible with existing government systems. This will achieve seamless and efficient integration of the new data sources and tools. Tools to be considered include information systems like CKAN for processing public data that allow multiple government agencies to share information with each other and a broader user audience. As already noted, CKAN, an open-source solution, can customize, personalize, and upload different data formats such as geographic data and PDF regulatory documents. Exposure risks from publishing the currently available and possibly incomplete or non-verifiable data must be minimized and visualization tools should include features allowing users to easily identify and flag potential data quality issues. Empowering government officials to carry out data quality control as more users visualize the data would improve the land data's overall integrity. Open source tools, like **Shiny**[153] dashboards and **Leaflet**[154] maps using JavaScript libraries can be used to improve user experience by providing data visualization, mapping and charting capabilities to the data repositories.

An environment that encourages sharing and identifying gaps in the existing data is essential. Visualization tools should facilitate collaboration and allow officials to see "*what's missing*" and contribute new or updated information.

A long-term open land data strategy would inform decision-making and improve land management policies. It could leverage the visualization tools, outline clear objectives, milestones, mechanisms for ongoing data improvement, ensure data integrity, and foster collaboration between various stakeholders.

74

Key Open Data Initiatives

This section highlights key initiatives on implementing open standards, resource appropriation strategies, and incorporating land data into wider open government strategies. Included are specific recommendations for each of these areas, including best practices and key considerations for Madagascar. Implementing these recommendations can improve the availability, accessibility, and quality of land data, as well as enhance the effectiveness and efficiency of open government initiatives as part of the Open Data Action Plan.

Implement Open Standards in the Technology Infrastructure

The implementation of open standards in technology infrastructure is crucial to ensure interoperability and data exchange between different systems. It can also lead to cost savings, increased efficiency, and better collaboration. Resources on how to use these standards are easily and openly available online and require no additional skills from what is already available to the MASTF in the form of the personnel responsible for administering the PLOf and the Observatoire du Territoire platform.

---

153 Shiny is an R package that enables building interactive web applications that can execute R code on the backend. See: **https://shiny.posit.co/**

154 Leaflet is the leading open-source JavaScript library for mobile-friendly interactive maps that has all the mapping features most developers ever need. See: **https://leafletjs.com/**

Embracing Open Software and Tools

As a government implementing an open data strategy for land data, it is essential to leverage open-source software and tools. Using platforms like CKAN[155] for the storage and distribution of open land data ensures transparency, interoperability, and cost-effectiveness. CKAN is a widely used, powerful, and customizable data management system that enables seamless data sharing, enhances user experience, and fosters collaboration among stakeholders. It has been widely adopted by multiple governments throughout the world.

Adopting Data Standards and Open Formats

The use of data standards and open formats such as **Keyhole Markup Language (KML)**,[156] **OpenGIS Web Map Service Interface Standard (WMS)**,[157] and **Open Geospatial Consortium (OGC)**[158] are vital in promoting effective data sharing. More recently open formats for web accessibility like **GeoJSON**[159] and **TopoJSON**,[160] together with the widely adopted shapefile format, are all vital in further enhancing interoperability, accessibility, and reusability of data. By adhering to open standards, the government ensures that land data is consistent, easy to understand, and compatible with various GIS tools and applications. This approach facilitates collaboration between different organizations and makes it easier for stakeholders to access, analyze, and integrate land data into their decision-making processes.

Creating a Secure and Accessible Land Data Portal

Developing a land data portal with login access allows land data owners to securely upload and update their organizations' data while providing users with a platform to access, download, visualize, and share open land data. The access to data should be differentiated based on a different credential level, depending on the type of user that is accessing the platform. Moreover, the land data portal could offer an **Application Programming Interface (API)**[161] for user data accessing, but also could be linked to OpenStreetMap API for retrieving their geographical and city infrastructure data. A user-friendly and secure data portal encourages stakeholder engagement, promotes transparency, and fosters data-driven decision-making. Additionally, building a data catalog to share with the land data community further enhances discoverability and accessibility of land data, enabling users to find relevant information more efficiently.

---

155 CKAN is an open-source data management system (DMS) for powering data hubs and data portals. CKAN makes it easy to publish, share and use data. It powers hundreds of data portals worldwide. See **https://ckan.org/**

156 KML is an XML language focused on geographic visualization, including annotation of maps and images.
See **https://www.ogc.org/standard/kml/**

157 See **https://www.ogc.org/standard/wms/**

158 WMS is a simple HTTP interface for requesting geo-registered map images from one or more distributed geospatial databases. See **https://www.ogc.org/**

159 GeoJSON is a format for encoding a variety of geographic data structures. See **https://geojson.org/**

160 TopoJSON is an extension of GeoJSON that encodes topology. Rather than representing geometries discreetly, geometries in TopoJSON files are stitched together from shared line segments called arcs.
See **https://github.com/topojson/topojson/wiki**

161 An application programming interface (API) is a way for two or more computer programs to communicate with each other. It is a type of software interface, offering a service to other pieces of software. See: **https://en.wikipedia.org/wiki/API**

Implement Resource Appropriation Strategies

Develop appropriation strategies to ensure resources are allocated appropriately to support open standards and other initiatives, through community and capacity building. Resource allocation is critical, and it does not have to involve large amounts, but it is necessary that allocation is made specifically for supporting open data community building and capacity building initiatives. These initiatives are important for creating a feeling of participation and community around the matter of open data. At the same time, it promotes the message that the political and technical conversation on open data is happening and allows all stakeholders to feel that they can contribute and fully engage with the issues that may arise in the context of Madagascar.

Community Building

A successful community-building strategy for governments (and MASTF in particular) in implementing open data policies for land data should focus on fostering awareness, collaboration, and skill development. Open data awareness campaigns and events can play a pivotal role in raising awareness about the land data portal and its available resources. Scrapeathons[162] allow portal users to contribute to the extension of the data catalog that the platform currently has, through the involvement of its final users. On the other hand, hackathons[163] allow the reuse of the existing land data for diverse forms of value creation. Showcasing use cases and success stories from other countries will help participants understand the potential benefits of leveraging land data for various purposes. It allows user communities to identify and develop different ways and means to use and apply the data, providing important feedback to the data custodians.

Engaging with the national and international open data community will enhance knowledge exchange and facilitate learning from global best practices. Working with key partners such as universities, mapping meetups, and the OpenStreetMap[164] community enriches the open data ecosystem. Through collaboration the government encourages the reuse of land data for academic research, technological development, and other creative projects. Providing seed grants or mentorship opportunities to promising initiatives stimulates innovation and the development of practical solutions.

Adopting a user-centered approach[165] in these events, focusing on understanding and addressing user needs, will ensure that the community-building efforts are both relevant and impactful. Tailoring skill development workshops to the specific needs of participants will empower them with the necessary tools and knowledge to engage effectively with land data and contribute to the broader open data community.

---

162   See: **https://www.imperva.com/learn/application-security/data-scraping/#**:~:text=Data%20scraping%2C%20or%20web%20scraping,the%20data%20on%20other%20websites

163   A hackathon is an event where people engage in rapid and collaborative coding over a relatively short period of time such as 24 or 48 hours. See: **https://en.wikipedia.org/wiki/Hackathon**

164   See: **https://www.openstreetmap.org/about**

165   Here is a short blog full (report also available) on user centered approaches as used by the Canadian Space Agency. See: **https://poweredbydata.org/blog/2018/8/13/3-ways-engaging-potential-data-users**

Capacity Building

An effective capacity-building strategy for land data owners in a government implementing an open data policy should encompass both technical and non-technical aspects.[166] In the **technical domain**, a comprehensive training plan is crucial for land data owners to develop competencies in data aggregation and data anonymization. This will ensure that land data is consistently organized, processed, and shared in a manner that preserves the privacy of individuals and organizations involved. On the **non-technical side**, it is essential to provide training on legal aspects and best practices for protecting data owners while sharing public information. A clear understanding of the legal framework and its implications will empower land data owners to make informed decisions about sharing data without compromising their security or privacy.

The government could organize **boot camps** and workshops that provide clear, actionable steps for participants to follow and achieve real-world outcomes in fostering open data. These "*learn-by-doing*" events should include hands-on, practical sessions covering topics such as working with spreadsheets and pivot tables, scraping local and national data, cleaning data, creating visualizations, and using GIS mapping tools. Participants should also be guided in crafting narratives around data to effectively communicate their findings and insights. Create a rule book or guide tailored to the specific legislation in Madagascar to provide land data owners with a valuable resource for understanding how to share data in compliance with local laws and regulations. This comprehensive approach will empower stakeholders to harness the full potential of open data while adhering to best practices and legal requirements. There are also numerous open data courses available online that are free.[167]

Incorporate Land Data into wider Open Government Strategies

An effective open data strategy should extend beyond land data and encompass a broader range of datasets and government functions. Integrating the land data initiative into a wider open data and open government strategy for Madagascar will ensure a more holistic approach to transparency, accountability, participation, and collaboration, as developed in the open **government principles**.[168] Familiarizing stakeholders with open government and its principles can help align the nation's open data efforts with global best practices and foster a more inclusive and transparent government.

Strengthening relationships between principal data owners is crucial for maximizing the benefits of open data initiatives. This can be achieved through articulation between the data custodians and the creation of a network and community of land data. The participants could benefit from capacity building and skill development in data prioritization and sharing, and through the development of the data infrastructure in Madagascar. Creating a **communication platform** where users can request new data under the law of access to public information or contribute data not yet available to the government can further enhance data accessibility and user engagement. Collaborative brainstorming can identify new opportunities, use cases, and strategies, as well as foster connections between data custodians and users.

---

166 For some examples of strategies and learning methodologies adopted in other geographies which aim at providing data skills and training internships see: **https://schoolofdata.org**

167 See for example the courses offered by the Open Data Institute at: **https://data.europa.eu/elearning/fr/#/id/co-01**

168 Open Government Partnership. **https://www.opengovpartnership.org/policy-area/land-rights-spatial-planning/**

Building **open data teams**[169] and identifying land data champions can drive progress and maintain momentum for open data initiatives. A dedicated land data team can help identify priority datasets in key organizations, ensuring their timely publication and accessibility. This team can also provide guidance on recognizing and prioritizing data across diverse public sector entities, ultimately contributing to a more robust and effective open data ecosystem in Madagascar.

Open Data Action Plan for Implementation

The Open Data Action Plan for Madagascar optimizes the management and utilization of land data in Madagascar. It opens and expands the data in the **Observatoire du Territoire**[170] (the Open Data Platform of MASTF) and the **Plan Local D'Occupation Foncière (PLOF)**. Based on the **Open Up Guide for Land Governance**,[171] a practical resource aimed at assisting developing countries publish land-related data, it streamlines access, promotes collaboration, and builds capacity among all stakeholders.

Implementing regular evidence-based decision-making processes using this data could raise economic development, environmental sustainability, and responsible use of information and data technologies.

The Action Plan has three components (see *Figure 5*).

- Unifying Land Plans creates two data portals. A secure internal portal allows government officials to access, share, and manage land data. A public data portal gives open access to land management legislation and normative documents. This dual approach streamlines internal land information management and promotes transparency and public accessibility.

- Prioritizing Implementation for Scaling identifies and engages with government entities to become open data champions and drive land data strategy adoption across government. They would work with stakeholders to prioritize high-value datasets, identify data that needs improved quality, open formats, anonymization, and aggregation to protect privacy, and develop data user tools. To consider the ease of dataset integration and any impact for potential users, prioritization work with stakeholders could use the MoSCoW prioritization framework.

- Capacity and Community building empowers stakeholders to utilize land data effectively. A training plan for local government officials would enhance their understanding of land data management and usage. A data appropriation strategy would engage the broader community and encourage using land data for various applications. Adopting open-source tools for land data processing would allow stakeholders to use cost-effective and versatile tools to analyze and work with land data.

169 Here is a short blog on putting together a data team. See **https://adhoc.team/2022/09/27/build-data-team-when-youre-not-sure-where-to-start/**

170 **https://observatoire-territoire.mg/**

171 **https://landportal.org/library/resources/open-data-improved-land-governance**

Figure 5: Actionable Land Data Strategy

CAPACITY AND COMMUNITY BUILDING

» Training plan in land data management and usage
» Data appropriation strategy
» Promotion and adoption of open-source tools and standards

UNIFYING LAND PLANS

» Internal Data Portal for government officials to access, share and collaborate on land data
» External Data Portal with open access to legislation and normative documents related to land management

ACTIONABLE
LAND DATA
STRATEGY

PRIORITIZING IMPLEMENTATION FOR SCALING

» Identification of open data champions
» Selection of key datasets
» Development of data user tools

Unify Land Data Plans

This component streamlines the process to consolidate land data and foster collaboration among key stakeholders. It identifies the government entities and open data champions who can drive the initiative forward and ensure proper coordination among stakeholders. Where possible, they could build on existing regulatory processes to share information.

Characterizing and prioritizing available PLOF data gives stakeholders access to the high-impact datasets that address the most pressing land management challenges. An internal data portal would connect relevant governmental entities, safeguard sensitive private data and support data anonymization through data dictionaries and metadata.

A process to select the data to feed the Observatoire will ensure comprehensive, accurate, and up-to-date information. Actions include preparing the regulatory framework for publication and promoting transparency and adherence to existing laws and regulations.
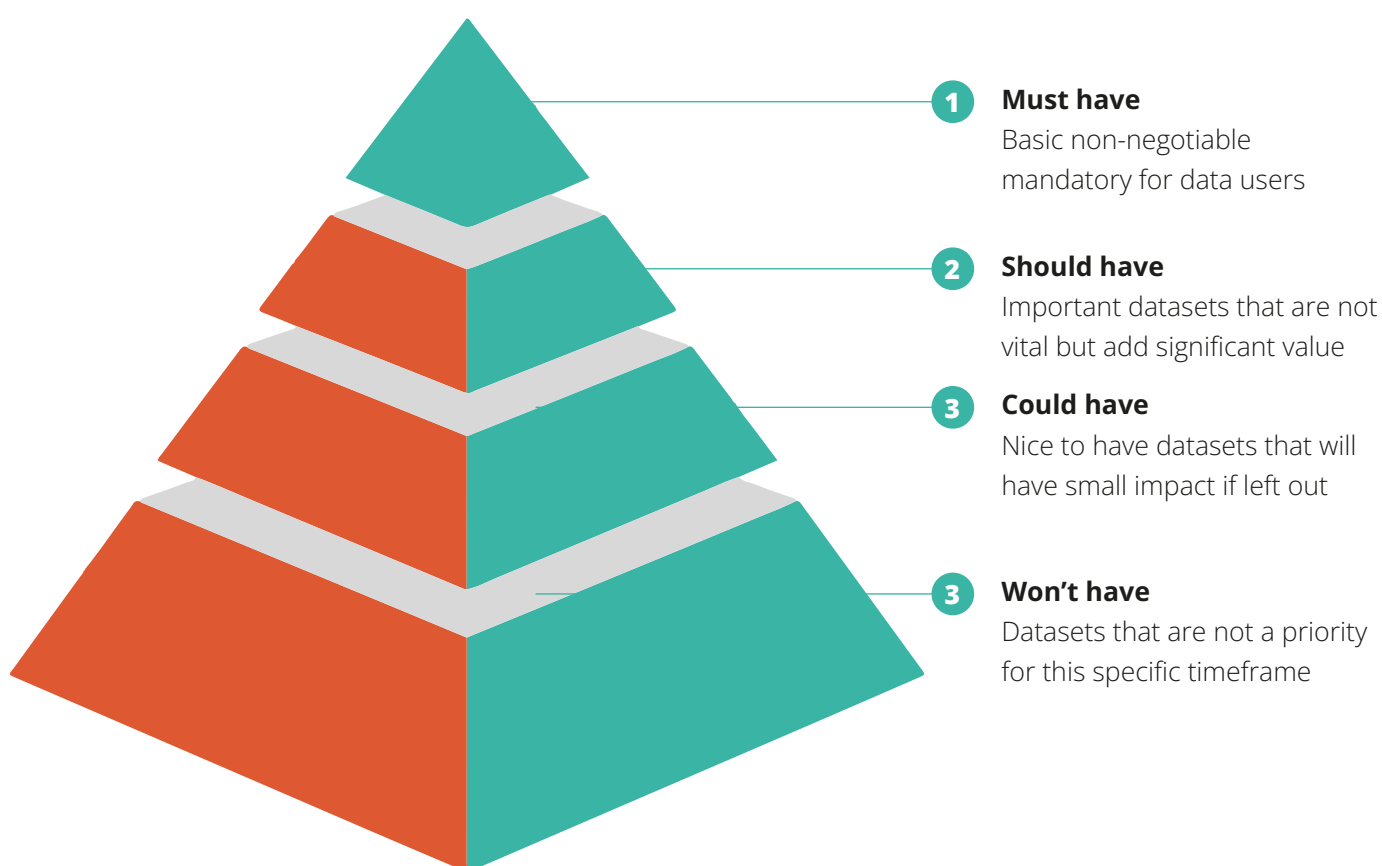
A roadmap to roll out the unified land plans will outline the steps, timelines, responsibilities, resources, and monitor progress. Unified land data plans will create a more cohesive land data strategy, optimize land management practices, and promote data-driven policymaking.

Prioritize Implementation for Scaling

This component leverages the expertise of data champions and prioritizes the most impactful use cases. The first step identifies data champions in land data entities who can advocate for the initiative and ensure its successful execution.

An internal data portal for government use and a public data portal with legislation and normative documents will help centralize land data administration and promote transparency. Prioritizing the use cases of champion users will address the most pressing challenges first, enabling quicker results and greater impact. Employing design principles will help understand user needs and map them to open-source solutions for data handling.

Figure 6: Prioritization of datasets through a MOSCOW Methodology

1 Must have
Basic non-negotiable mandatory for data users

2 Should have
Important datasets that are not vital but add significant value

3 Could have
Nice to have datasets that will have small impact if left out

3 Won't have
Datasets that are not a priority for this specific timeframe

Tools such as CKAN for managing both internal and external open data portals, as well as other tools for processing PDFs and parsing various data formats, can streamline data management and ensure data consistency. Work with stakeholders to prioritize datasets,[172] into "*must-have*" basic datasets, "*should have*" detailed datasets, "*could have*" complementary datasets, and "*won't have*" datasets, for now.

---

172   We have recommended the MOSCOW methodology. For more information on the MOSCOW methodology there are numerous blogs online to get you started, but a good resource is the chapter on the MOSCOW Methodology in the Dynamic Systems Development Method (DSDM) handbook. See resource retrieved 14 June 2023, from
https://www.agilebusiness.org/dsdm-project-framework/moscow-prioririsation.html

This approach enables the efficient allocation of resources and the focusing of efforts on the most critical datasets and can be seen in *Figure 6*.

An updated implementation roadmap reflecting these priorities must be relevant, adaptable and enable the land data strategy to scale effectively and achieve maximum impact.

Capacity and Community Building

Capacity building involves developing and implementing communication tools such as land regulation search tools and WhatsApp bots which can streamline information dissemination and facilitate engagement with stakeholders. It also enhances data collection and processing capabilities through surveys, crowdsourced data (such as OpenStreetMap), PDF processing, and search engines for documents. These tools empower stakeholders to manage and analyze land data effectively and make informed decisions.

Community building fosters a sense of ownership and collaboration among stakeholders. Internal community building should target national and local governments, ensuring they have the necessary resources and support to engage with and utilize land data effectively. Public community building should engage academia, journalists, NGOs, and the broader community to promote the use of land data in research, journalism, advocacy, and other areas of interest.

Tools such as blogs, newsletters, and social media can be employed to maintain open communication channels and keep stakeholders informed and engaged. By tying these communication tools to the "*Open*" Data Portal, stakeholders can easily access relevant information, datasets, and updates. By investing in capacity and community building, the action plan can create a vibrant ecosystem of land data users, fostering collaboration and driving innovative solutions in land management and policy.

In conclusion

The social economic development of Madagascar, as in many other countries, is predicated on readily available, reliable and accessible land data for the government and its citizens. The land data should be online, accessible, free, timely, downloadable, machine-readable, and must meet international standards for interoperability. In order to improve land management and governance through the provision of efficient and effective processes and procedures for service delivery, increased access to open land data is needed. Madagascar can significantly improve and consolidate the ongoing progress that is being made in the land data ecosystem through the development of a process to refine and implement the proposed **Open Data Action Framework for Madagascar**.

Appendix A
Departments of MASTF

- » MATSF : Ministère de l'Aménagement du Territoire et des Services Fonciers
- » DSFD : Direction des Services Fonciers Décentralisés
- » SPS : Service de la Programmation et du Suivi
- » SACGF : Service d'Appui et de Contrôle des Guichets Fonciers
- » DDPF : Direction des Domaines et de la Propriété Foncière
- » DRMF: Direction de la Réforme et de la Modernisation Foncière
- » SSIF : Service du Système d'Information Foncière
- » SRF : Service de la Réforme Foncière
- » SDC : Service des Domaines et de la Conservation
- » SE : Service de l'Expropriation
- » SODOCC : Service des Opérations Domaniales Concertées et du Cadastre
- » DST : Direction des Services Topographiques
- » SPLOF : Service des Plans Locaux d'Occupation Foncière
- » SEM : Service des Etudes et Méthodes
- » STS : Service des Travaux Spécialisés
- » SOFU : Service des Opérations et Fonciers Urbains
- » SPPRU : Service de la Planification et de la Promotion des Résiliences Urbaines
- » SAC : Service de l'Architecture et de la Construction
- » SAE : Service de l'Assainissement et des Équipements
- » DGATE : Direction Générale de l'Aménagement du Territoire et de l'Equipement
- » DAF : Direction Administrative et Financière ;
- » DLP : Direction de la Logistique et du Patrimoine ;
- » DSI : Direction des Systèmes d'Informations ;
- » DRH : Direction des Ressources Humaines ;
- » DAJ : Direction des Affaires Juridiques ;
- » DAI : Direction de l'Audit Interne ;
- » DPSE : Direction de la Programmation et du Suivi-Evaluation ;
- » DEEE : Direction des Etudes et de l'Evaluation Environnementale ;
- » OF : Observatoire du Foncier ;
- » OT : Observatoire du Territoire;
- » DGSF : Direction Générale des Services Fonciers
- » DDRP : Direction du Développement Relationnel et de Partenariat ;
- » CP : Coordination des Projets ;
- » DDUD : Direction du Développement Urbain Durable
- » DCPVTM : Direction de la Coordination, de la Planification et de la Valorisation du Territoire Maritime
- » DPST : Direction de la Planification et du Soutien au Territoire
- » SPAT : Service de la police de l'Aménagement du Territoire
- » SVGIE : Service de la Valorisation et de Gouvernance des Infrastructures et Équipements
- » SPDIE : Service de la Promotion du Développement des Infrastructures et Équipements
- » SPIL : Service de la Planification Intercommunale et Locale

82

Notes

About the Land Portal

The Land Portal Foundation was established to create, curate, and disseminate land governance information by fostering an inclusive, open, and accessible data ecosystem. Over the last decade, the Land Portal has evolved from a simple information gateway to become a knowledge broker, a resource base, a vibrant online community of users and a trusted voice within global land governance.

About the Open Data Charter

The Open Data Charter is a collaboration between over 150 governments and organizations working to open data based on a shared set of principles. ODC promotes policies and practices that enable governments and CSOs to collect, share, and use well-governed data, to respond effectively and accountability to the following focus areas: anti-corruption, climate action and pay equity.

About Datasketch

Datasketch is a social technology company that promotes the responsible use of information and data technologies to promote social development. We design and implement data-based interventions and projects to improve evidence-based decision-making processes. Our work creates bridges between data and citizens, incorporating best practices from information science through visualizations, open-source software, and public data to address important issues that improve citizens' quality of life.

LAND PORTAL FOUNDATION
Postbus 716, 9700 AS
Groningen, the Netherlands

www.landportal.org
hello@landportal.info