Country report for Madagascar

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Abstract

This chapter focuses on sustainable soil management in Madagascar. It highlights the challenges in translating environmental policies into actionable strategies, particularly emphasising the need for effective land management and soil conservation practices. The chapter explores the implications of these challenges, especially in relation to agricultural productivity, ecosystem health, and broader socio-economic development.

An analysis of the existing legal framework and policies reveals significant gaps, particularly in the integration of soil management into sectoral laws and the absence of a dedicated legal framework for soil preservation. Specific attention is given to the Environmental Charter and the General State Policy (2024), with a focus on the complexities arising from decentralised governance, land tenure systems, and the lack of coordination between key sectors such as agriculture, urbanisation, and mining.

The chapter also presents key findings, such as the need for stronger political will, enhanced local authority involvement, and improved awareness and education on sustainable soil practices. Recommendations are made to strengthen legal frameworks, decentralise natural resource management, and integrate environmental considerations into all development sectors. It concludes by emphasising the urgent need for a dedicated soil law and comprehensive implementation strategies, particularly given the growing challenges posed by population pressure, urbanisation, and climate change.

Chapter contents

Summary

In Madagascar, while the foundations for sustainable development have been established, much work remains to turn policy into concrete actions. The Environmental Charter outlines six key priorities for action: developing human resources, promoting sustainable and equitable development through effective natural resource management, conserving biodiversity, improving living conditions for both urban and rural populations, balancing population growth with resource development, and enhancing environmental management tools, particularly around land issues. To meet these priorities, a variety of approaches must be developed, including decentralising natural resource management, raising awareness, promoting sustainable agricultural practices, strengthening land management, and integrating environmental concerns into sectoral policies.

The Environmental Action Plan (EAP), which spans fifteen years and is divided into three phases, outlines operational goals, focusing on reducing natural resource degradation and reversing deforestation. The plan also calls for the establishment of Environmental Units within ministries and the mandatory use of Strategic Environmental Impact Studies for major development projects. All national development programmes must incorporate environmental considerations through the environmental assessment process.

The new General State Policy (2024) underlines the need for a balanced approach to human development and ecological resources. It recommends that sectoral policies and strategies focus on the seven key axes outlined for sustainable soil management. This chapter provides detailed sectoral recommendations on issues related to agriculture, urbanisation, land management, mining, and industry. While the causes of land degradation in these sectors are diverse—ranging from environmental, political, legal, technical, socio-economic, and cultural factors—common threads emerge, particularly the need for urgent attention to soil preservation at the national level.

On the part of the Malagasy administration, the state must show political will by clearly defining its policies and strategies for land management. This includes developing a legal framework to combat soil degradation, outlining the benefits of sustainable land management, identifying the main causes of degradation, and proposing technical, legal, and social solutions. An integrated monitoring system, involving local authorities, customary leaders, and designated officials, should be established to oversee the implementation of these policies. Awareness and mobilisation efforts must engage both public and private entities, with training for local authorities who will be responsible for enforcement. Legal sanctions for non-compliance should be clear and enforceable.

The success of large-scale investments, both national and foreign, must be ensured through strengthened oversight and adherence to sustainable land management laws. Given that this policy is a new approach, it is suggested that pilot projects be

implemented to test its effectiveness, refine it based on real-world observations, and demonstrate its importance to the public.

Decentralised local authorities (CTDs), which are enshrined in Madagascar's Constitution, will be instrumental in the success of the proposed sustainable soil management policy. These local authorities must take responsibility for monitoring and regulating land use and must be supported with both technical and financial resources from the central government.

Additionally, education programmes on sustainable land management should be integrated at all levels of schooling, with special attention given to training professionals in the field. Experimental projects should also be used to demonstrate effective soil management practices.

Although not formally recognised by law, customary chiefs play an important role in managing community land use. It is crucial to formalise their role in the legal framework, particularly in terms of land management, to ensure peace and stability.

In conclusion, this chapter stresses the need for a collaborative approach to soil preservation in Madagascar, involving clear legal frameworks, institutional support, community engagement, and education. The success of the proposed soil management policy will depend on effective cooperation between the government, local authorities, and communities, alongside the mobilisation of resources and strong enforcement mechanisms.

1 Introduction

Soil, a living and vital component of the geosphere, is the foundation of life on earth. Africa is richly endowed with natural resources, particularly its soil. However, the continent faces severe land degradation, with 65% of its soils compromised and nearly three million hectares of forest lost each year, resulting in a 3% reduction in the gross domestic product (GDP).[1] This chapter reviews Madagascar's legal framework regarding soil protection, examining the causes of soil degradation, including agricultural practices, mining, urbanisation, land tenure challenges, and poor governance, such as corruption and weak enforcement mechanisms. In Madagascar, slash-and-burn agriculture is particularly damaging, threatening the iconic baobab forests, with 4,000 hectares destroyed annually.[2] These forests are crucial for both the ecosystem and local communities, providing essential resources for food and cosmetics.[3] Sustainable land

1 See https://www.banquemondiale.org/fr/news/feature/2016/11/14/africas-bold-and-ambitious-endeavor-restoring-100m-hectares-of-land-by-2030, accessed 23 December 2024.

2 See https://theconversation.com/madagascars-ancient-baobab-forests-are-being-restored-by-communities-with-a-little-help-from-ai-229019, accessed 23 December 2024.

3 See https://ledsgp.org/app/uploads/2015/07/policy-and-financing-for-sustainable-land-management-sub-saharan-africa.pdf, accessed 23 December 2024.

management is key to reversing land degradation, which impedes agricultural growth, exacerbates poverty, and threatens biodiversity. At the 22nd Conference of the Parties (United Nations Climate Change Conference), sub-Saharan African countries committed to restoring and sustainably managing 100 million hectares of land by 2030.[4] This chapter assesses Madagascar's current laws on soil protection, identifying strengths, gaps, and areas for improvement and offering recommendations for creating a more effective, integrated legal framework for sustainable soil management.

1.1 Demographic, geographic, climatic, and institutional data

The Republic of Madagascar is an island nation located in the Indian Ocean, geographically separated from the African continent by the Mozambique Channel. Stretching 1,580 km in length and 580 km in width, Madagascar covers an area of 587,000 km², making it the fourth-largest island in the world, after Greenland, New Guinea, and Borneo. The capital city is Antananarivo. Malagasy is the national language, with both Malagasy and French serving as official languages. The country is surrounded by several islands and archipelagos, including the Comoros (and Mayotte), the Mascarene Islands (including Réunion and Mauritius), and the Seychelles. The official currency is the Ariary (Ar or MGA).

According to provisional data from the 2018 General Population and Housing Census (RGPH-3) conducted by the National Institute of Statistics (INSTAT), Madagascar's population was estimated at 25.7 million,[5] with slightly more women (13,015,251) than men (12,658,945).[6] The population is distributed between rural and urban areas, with 10.4 million women and 10.3 million men in rural areas, and 2.6 million women and 2.4 million men in urban areas. The Malagasy population is notably young, yet faces significant challenges, including a high poverty rate, with 80.7% of the population living below the poverty line in 2023, earning less than USD 2.15 per day.[7]

Madagascar experiences a tropical climate, characterised by two distinct seasons: a hot and humid summer from November to April, and a cool and dry winter from May

4 See https://www.banquemondiale.org/fr/news/feature/2016/11/14/africas-bold-and-ambitious-endeavor-restoring-100m-hectares-of-land-by-2030, accessed 23 December 2024.

5 See https://documents1.worldbank.org/curated/en/099220011092219139/pdf/BOSIB0717e1bcd0990919008933ddc517f9.pdf, accessed 23 December 2024.

6 See https://demostaf.web.ined.fr/index.php/catalog/202/study-description#:~:text=INSTAT%2DRGPH%2D2018-,Madagascar%20%2D%20Recensement%20g%C3%A9n% C3%A9ral%20of%20the%20population,of%20the habitation%20(2018)&text=It%20is%20the%20third%C3%A8me,1975%2C%20the%20second%C3%A8me%20 in%201993.&text=This%20census%20is%20the%20third%C3%A8me,place%20in%201975%20and%201993, accessed 23 December 2024.

7 See https://www.undp.org/fr/madagascar/propos-de-madagascar; https://www.banquemondiale.org/fr/country/madagascar/overview, accessed 23 December 2024.

to October. The central highlands have a temperate climate with four seasons. The eastern coast receives rainfall year-round, with precipitation reaching up to 4,000 mm annually, while the extreme southern region is arid, with only around 200 mm of rain per year.[8]

The country is highly vulnerable to extreme weather events, ranking among the world's most disaster-prone nations.[9] Frequent floods, tropical storms, cyclones, and droughts have devastating impacts on the population, making Madagascar the third most vulnerable country to the effects of climate change.[10]

Madagascar's state institutions include the President and the government; the National Assembly and the Senate; and the High Constitutional Court. The judiciary is composed of the Supreme Court, appellate courts, specialised courts, and the High Court of Justice.

1.2 Historical context of Madagascar and the education system

The history of Madagascar can be divided into four main periods:[11]

Settlement of the island: The origins of Madagascar's settlement are debated, but the most widely accepted theory suggests that the Malagasy people are descendants of migrants from Asia, Africa, and the Middle East, who arrived around the beginning of the Common Era. The Malayo-Indonesian settlers are credited with introducing irrigated rice cultivation and the outrigger canoe, while African migrants brought slash-and-burn farming and various livestock, including zebus. Arab traders introduced Islam, which remains a significant part of the culture today, along with the trade of spices, aromatic plants, and medicinal herbs.

Unification of Madagascar: Madagascar was historically divided into several kingdoms: Southern, Eastern, Western, and Central. These kingdoms remain a point of reference in Malagasy culture, and the descendants of the ancient kings are highly respected. During this era, a civil code was established, and a highly structured territorial administration was developed.

Colonisation by France: Madagascar officially became a French colony in 1896, and its agricultural, mineral, and human resources were exploited for the benefit of France. The Malagasy population protested fiercely against the colonial regime, and after years of resistance, French colonisation ended on 26 June 1960.

8 See https://edbm.mg/nouvelles-economiques_presentation-de-madagascar/, accessed 23 December 2024.

9 See https://www.hi.org/fr/actualites/madagascar---l-impact-humanitaire-du-changement-climatique, accessed 23 December 2024.

10 See https://www.reseau-canope.fr/fileadmin/user_upload/Projets/AFRICA_2020/Madagascar.pdf, accessed 23 December 2024.

11 See https://www.madadecouverte.com/madagascar-histoire.php, accessed 23 December 2024.

Independence: Madagascar gained independence on 14 October 1960. The country went through three republics, with the Fourth Republic being established by a new Constitution on 17 November 2010. This Constitution introduced a strong presidential system, where the President of the Republic holds significant power, though legislative power remains with Parliament. The Fourth Republic continues to follow a flexible separation of powers, allowing the executive to dissolve Parliament if needed.

The Malagasy education system: Education in Madagascar is overseen by public and private institutions, comprising four cycles: preschool, basic education, secondary education, and higher education.[12] The system is managed by various ministerial departments responsible for National Education, Employment, Technical Education, Vocational Training, Higher Education, and Scientific Research. However, the education system faces challenges due to the country's economic and social situation. The national education budget is insufficient to meet the country's needs, and there are significant regional disparities. Currently, 80% of primary school teachers are recruited and paid by parents, placing a heavy financial burden on families and contributing to high dropout rates.[13] The shortage of well-trained teachers and educational resources, combined with overcrowded classrooms, further hinders the quality of education. In response, the French Development Agency (AFD) has supported the Improvement of the Quality of Education (AQUEM) project since 2014, aligning with the Interim Education Plan (2013-2015) and the Sector Plan approved by the Malagasy government in 2018.

1.3 Malagasy society and the land (soil)

In Madagascar, the terms "land" and "soil" are synonymous, both referred to as *tany* in Malagasy. The 2005 Law 2005-019, which governs land rights, does not define the term "land" or "soil."[14] Although land or soil is not legally defined under the current legislation, environmentalists have a certain concept of these notions. They refer to the land as the national territory, which includes both terrestrial and maritime space, as well as terrestrial and marine biodiversity. Therefore, discussions on soil or land protection should also encompass the protection of the sea, marine resources, and the territorial marine space. Approximately 62% of the population lives in rural areas, while

12 See https://www.ifadem.org/fr/pays/madagascar/systeme-educatif, accessed 23 December 2024.

13 See https://www.afd.fr/fr/carte-des-projets/ameliorer-la-qualite-de-leducation-madagascar-aquem, accessed 23 December 2024.

14 See https://edbm.mg/wp-content/uploads/2017/12/loi-2005-019_statuts_des_terres.pdf, accessed 23 December 2024.

38% reside in urban centres.[15] The population is notably young, with around 64% under 25 years old and nearly 47% under fifteen.[16]

Malagasy culture is diverse and continues to play a significant role in daily life. Customs, rites, *fady* (prohibitions), and rituals are deeply intertwined with the practices and beliefs of the people.[17] The cultural landscape of Madagascar is shaped by its various ethnic groups and regions, offering a unique insight into the country's history, spirituality, and way of life.

For the Malagasy people, land holds deep sacred value, considered the primary natural capital for sustenance and production. The word "land" can be interpreted in two ways: as a noun, it refers to the relationships between people and the land, and as a qualifier, it pertains to the rules regarding private ownership. Land encompasses the land base, its ownership, exploitation, and taxation.

The meaning of land varies depending on the social context. For the state, land is considered a public or private asset that requires protection. For researchers, it is a biophysical entity that supports ecosystem functions. Environmental stakeholders see it as natural capital that provides essential ecosystem services. For indigenous communities, the land is viewed as a nourishing mother, vital to their identity and survival.

In Madagascar, land is not only a physical asset, but a sacred inheritance passed down through generations.[18] Its market value is secondary to its cultural, sentimental, and identity-based significance. The land's history and its connection to the Malagasy people are paramount, transcending material concerns.

1.4 On the legal land regime and land policy

The Malagasy land legal system is heavily influenced by French colonisation (1895–1960), blending French civil law with Malagasy customary law. This system is considered "dualistic," as it features both modern written laws and elements of traditional law that continue to persist.[19] In the Malagasy legal framework, the Constitution is the highest legal authority, followed by laws and regulations (decrees and orders), which are mandatory once published in the Official Journal.

According to Article 3 of the Constitution, Madagascar is a decentralised state, structured around three levels of governance. This system includes decentralised territorial services, which are extensions of the central government, and Decentralised

15 See https://futures.issafrica.org/geographic/countries/madagascar/, accessed 23 December 2024.
16 See https://faolex.fao.org/docs/pdf/mad151060.pdf, accessed 23 December 2024.
17 See https://maison-de-madagascar.ch/culture-coutumes-rites-fady-a-madagascar/, accessed 23 December 2024.
18 Evers & Seagle (2012).
19 See https://www.legiscompare.fr/web/IMG/pdf/170904_la_chouette_fp_madagascar.pdf, accessed 23 December 2024.

Territorial Communities (CTD), which are guaranteed administrative and financial autonomy by the Constitution and defined by law.[20]

Madagascar operates under a multi-party semi-presidential unitary republic. The President serves as the head of state, elected for a five-year term, while the prime minister acts as the head of government. Executive power rests with the government, while legislative power is shared between the government and a bicameral Parliament, comprising the National Assembly and the Senate. Judicial power is independent and is exercised by the Supreme Court, the High Constitutional Court, and the High Court of Justice.

The National Assembly consists of 160 representatives, elected by direct suffrage every five years. The Senate is made up of 90 senators, with two-thirds elected by local legislators and the remaining third appointed by the president, all serving five-year terms. The prime minister, appointed by the president from the majority party in the National Assembly, heads the Council of Ministers, which oversees the day-to-day administration of the government.

The Prime Minister and Parliament jointly initiate legislation, with the government responsible for its implementation. The President has the authority to dissolve the National Assembly, while the National Assembly can pass a motion of censure to compel the Prime Minister and Council of Ministers to reverse their decisions. The Constitutional Court adjudicates election disputes, ensures compliance with the Constitution and organic laws, and resolves conflicts between public institutions.[21]

1.5 What about customary rules?

Malagasy law remains profoundly influenced by custom, which continues to serve as a living source of law in specific areas. Customary law, recognised since 1962, was further reaffirmed in 2004. However, for custom to be applicable, it must be clear, well-established, and not contradict public order or good morals.[22] While customary rules can help shape legal standards and guide judges, they sometimes complicate the application of statutory laws. In cases where law and custom conflict, custom may prevail, even if it contradicts formal legal provisions.

The "Dina" is a type of collective agreement rooted in Malagasy tradition, representing a set of customary rules designed to organise society. It emanates from the genuine will of the people, reflecting their collective needs. Faced with pressures on natural resources that disrupt the economy, ecology, and social fabric of the land, the

20 See https://edbm.mg/wp-content/uploads/2022/06/GUIDE-JURIDIQUE.pdf, accessed 23 December 2024.

21 See http://www.hcc.gov.mg/wp-content/uploads/2015/09/ORD-2001-003.pdf, accessed 23 December 2024.

22 Esoavelomandroso (2020).

Dina is often used in governance, conservation, and sustainable resource management. An example of Dina's effectiveness can be seen in the "Tapia Forest" project, initiated by the "Marina" project, which imposes a series of restrictions to protect the endemic Tapia tree.[23] The Dina, which prohibits, among other things, activities such as cutting and uprooting trees, coal mining, burning, agricultural development, and infrastructure construction. It also mandates the removal of invasive species, including pines and eucalyptus trees, and requires the restoration of two Tapia trees per household annually.

Additionally, the Dina regulates fishing practices by prohibiting the use of nets with mesh sizes smaller than 4 cm, the capture of fish smaller than 7 cm, and fishing during spawning periods or in spawning areas. These measures aim to ensure the sustainable management of lakes. Any violations of Dina's rules are met with sanctions known as "Vonodina," which typically involve monetary or other forms of compensation as specified by the community agreement.[24]

1.6 Relevant environmental policy and regulations

The following key principles form the foundation of Madagascar's sustainable development policy: developing human resources; promoting sustainable, equitable, and harmonious development through effective management of natural resources; rehabilitating, conserving, and managing Madagascar's rich biodiversity; improving the living conditions of urban and rural populations; ensuring a balance between population growth and resource development; enhancing environmental management tools; and addressing land-related issues.

Recognising the escalating environmental degradation and biodiversity loss, largely driven by poverty and economic challenges, the government of Madagascar created its first National Environmental Action Plan (EAP) in 1989 with support from the World Bank, international agencies, and non-governmental organisations.[25] Since the 1990s, environmental management and sustainable development have been central to Madagascar's public policies, which are supported by Technical and Financial Partners.[26] After ratifying the Convention on Biological Diversity (CBD) in June 1992, Madagascar placed a strong emphasis on the development and sustainable

23 See https://planete-urgence.org/projet-tapia-preservation-de-la-foret-de-tapia-soie-sauvage-apiculture-a-madagascar/, accessed 23 December 2024.

24 See https://www.equatorinitiative.org/fr/2017/06/30/le-dina-un-outil-de-developpement-durable/, accessed 23 December 2024.

25 See https://mg.chm-cbd.net/implementation/politique-nationale-de-lenvironnement, accessed 23 December 2024.

26 See https://www.droit-afrique.com/upload/doc/madagascar/Madagascar-Loi-1990-33-charte-environnement-MAJ-2004.pdf, accessed 23 December 2024.

management of its overexploited natural resources.[27] As part of this effort, the country pioneered the transfer of environmental responsibility to local communities, notably through the implementation of the Secure Local Management Law in 1996, a key component of the Environmental Sustainable Development Programme (2016).[28]

Two primary legal texts safeguard the environment in Madagascar: Law No. 2015-003 of 20 January 2015, which updates the Malagasy Environmental Charter that has been in effect since 1990, and Decree No. 2204-167, which amends certain provisions of Decree No. 99-954 of 15 December 1999, related to the Compatibility of Investments with the Environment (MECIE Decree). The political and legal framework governing sustainable development in Madagascar is encapsulated in several key policies and strategies:

- The Constitution;
- General State Policy (PGE) (2024-2028);
- The National Development Plan (PND);
- The Updated Malagasy Environmental Charter;
- The New Energy Policy (2015-2030);
- The National Environmental Policy for Sustainable Development (2015);
- The National Water, Sanitation, and Hygiene Strategy; and
- The New Land Policy (2018–2030).

These policies are implemented through legal frameworks across various sectors. The National Environmental Policy for Sustainable Development aligns with the country's broader objective of achieving the Sustainable Development Goals (SDGs).[29] Both the PGE and the PND prioritise environmental protection to ensure the long-term sustainability of poverty reduction and national development efforts. Key legislative texts for environmental protection include:

- Law 2015-003 of 13 February 2015, updating the Environmental Charter.
- Decree No. 99-954 of 15 December 1999, regarding investment compatibility with the environment, amended by Decree No. 2004-167 of 3 February 2004 (MECIE Decree).
- Order No. 6830/2001 of 28 June 2001, establishing public participation procedures in environmental assessments.
- Interministerial Order No. 4355/97 of 13 May 1997, defining and delineating sensitive areas.

Environmental assessment procedures, including Environmental Impact Assessments (EIA) and Environmental Commitment Programmes (PREE), are guided by the MECIE Decree. The Environmental Charter mandates that no project may commence

27 See https://www.un.org/fr/observances/biological-diversity-day/convention, accessed 23 December 2024.

28 See https://www.fao.org/faolex/results/details/en/c/LEX-FAOC178891/, accessed 23 December 2024.

29 See https://www.undp.org/en/sustainable-development-goals, accessed 23 December 2024.

without obtaining an environmental permit, and all related activities must comply with the provisions of the MECIE Decree regarding environmental assessments.

1.7 The Constitution and soil protection

Historically, Malagasy constitutions have placed significant emphasis on environmental protection and natural resources management. However, the current Constitution of the Fourth Republic mentions environmental protection only in its Preamble (paragraphs 7 and 10-15). While it acknowledges the importance of environmental protection, it does not explicitly recognise a right to the environment within the body of the text. Additionally, no specific safeguard measures are articulated, and the concept of "land" is notably absent. The Constitution generically references natural resources, leaving the inclusion of land as one of its components ambiguous. Similarly, the theme of sustainable management is addressed only vaguely, with a focus on preserving resources for future generations, limiting its constitutional commitment to a recommendation rather than enforceable measures.

Madagascar's framework for sustainable land management, however, is supported by a series of political, strategic, legislative, and regulatory instruments developed after it ratified the United Nations Convention to Combat Desertification (UNCCD) in 1997. In 2003, a National Action Plan (NAP) was formulated through Decree No. 2003-199 of 11 March 2003 and later aligned with updated strategies in 2015 by Decree No. 2015-747 of 28 April 2015. These updates aimed to strengthen climate change adaptation and mitigation actions, integrate climate considerations at all governance levels, and promote research, development, and technology transfer in support of sustainable development.

SDG 15, titled "Life on Land," calls for the sustainable management of terrestrial ecosystems, the preservation of biodiversity, and the combatting of deforestation, desertification, and land degradation. The goal also emphasises mitigating the impacts of natural disasters. In Madagascar, the protection of ecosystems and biodiversity is integrated into national planning and poverty reduction strategies, with specific emphasis on combating desertification and land degradation through frameworks such as the Malagasy Environmental Charter.

Decades of human-driven overexploitation and poor land management practices have led to severe ecosystem degradation, biodiversity loss, and diminished ecosystem services. These issues, in turn, negatively affect the living conditions of populations reliant on natural capital, particularly land resources. Discussions on sustainable land management in Madagascar have centred on poverty reduction, sustainable development, food and water security, climate change, biodiversity conservation, landscape restoration, and the government's commitment to addressing these challenges. One

notable policy initiative is the "Policy Letter on Land Degradation Neutrality," enacted through Decree No. 2017-757 of 5 September 2017.

The foundations for sustainable management in Madagascar date back to legislation such as Order No. 73-073 of 1 December 1973, which, in Article 26, highlights the long-standing legislative concern for sustainable rural development. Furthermore, Madagascar's commitments under the CBD reinforce the importance of conserving ecosystems, species, and genetic resources. Article 6 of the CBD outlines general measures for conservation and sustainable use, requiring parties to rehabilitate degraded ecosystems and restore biodiversity. It also promotes the recovery of threatened species through the development and implementation of management strategies or action plans.

In sum, Madagascar has developed a multi-layered framework for sustainable development and environmental management. However, the lack of robust constitutional safeguards and detailed provisions for land management highlights the need for further refinement and integration of environmental governance within its legal and institutional systems.

1.8 Malagasy foreign policy

Madagascar is an active member of several regional and international organisations. These include the Indian Ocean Commission (IOC), which it chaired from February 2022 to May 2023, the Southern African Development Community (SADC), the Indian Ocean Rim Association (IORA), the African Union (AU), the Common Market for Eastern and Southern Africa (COMESA), and the International Organisation of La Francophonie (OIF).[30]

1.9 International environmental conventions ratified by Madagascar

Madagascar is a signatory to a wide range of international agreements and conventions related to environmental management, which all projects must adhere to.[31] These include:

- Rio Convention on Sustainable Development (1995);[32]

30 See https://www.diplomatie.gouv.fr/fr/dossiers-pays/madagascar/presentation-de-madagascar/, accessed 23 December 2024.

31 See https://www.scribd.com/document/379843012/Conventions-Internationales-Ratifiees-Par-Madagascar, accessed 23 December 2024.

32 See https://unfccc.int/fr/processus-et-reunions/les-conventions-de-rio, accessed 23 December 2024.

- African Convention on the Conservation of Nature and Natural Resources (1969);[33]
- Ramsar Convention on Wetlands of International Importance, especially as Waterfowl Habitat (1998);[34]
- Convention concerning the Protection of the World Cultural and Natural Heritage (1982);[35]
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (1975);[36]
- Convention on the Conservation of Migratory Species of Wild Animals (CMS);[37]
- Vienna Framework Convention for the Protection of the Ozone Layer (1994);[38]
- United Nations Framework Convention on Climate Change (UNFCCC) (1998);[39]
- Kyoto Protocol on Climate Change;[40]
- Convention on Biological Diversity (CBD) (1995);[41]
- Stockholm Convention on Persistent Organic Pollutants (POPs) (2005);[42]
- International Treaty on Plant Genetic Resources for Food and Agriculture (2006);[43]
- Minamata Convention (2014);[44]
- Convention for the Safeguarding of the Intangible Cultural Heritage (2006);[45] and

33 See https://www.ecolex.org/fr/details/treaty/african-convention-on-the-conservation-of-nature-and-natural-resources-tre-000492/, accessed 23 December 2024.
34 Text of the Convention at https://www.ramsar.org/sites/default/files/documents/library/current_convention_text_e.pdf, accessed 23 December 2024.
35 See https://whc.unesco.org/fr/conventiontexte/, accessed 23 December 2024.
36 See https://bi.chm-cbd.net/sites/bi/files/2020-10/conven-comm-interna-esp-faun-flor-sauva-menac-extinct.pdf, accessed 23 December 2024.
37 See https://www.cms.int/sites/default/files/instrument/CMS_text_fre.PDF, accessed 23 December 2024.
38 See https://ise.unige.ch/isdd/IMG/pdf/convention_de_vienne.pdf, accessed 23 December 2024.
39 See https://unfccc.int/resource/docs/convkp/convfr.pdf, accessed 23 December 2024.
40 See https://unfccc.int/resource/docs/convkp/kpfrench.pdf, accessed 23 December 2024.
41 See https://www.ifdd.francophonie.org/wp-content/uploads/2021/09/747_Resume_CdP14_biodiversite_2018-2.pdf, accessed 23 December 2024.
42 See https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-15&chapter=27&clang=_fr, accessed 23 December 2024.
43 See https://openknowledge.fao.org/server/api/core/bitstreams/87da23da-6091-4576-ac03-dc7470e9b54f/content, accessed 23 December 2024.
44 See https://www.nrdc.org/sites/default/files/minamata-convention-on-mercury-manual-FR.pdf, accessed 23 December 2024.
45 See https://ich.unesco.org/en/convention, accessed 23 December 2024.

- Convention on the Protection and Promotion of the Diversity of Cultural Expressions (2005).[46]

These commitments reflect Madagascar's dedication to global efforts in environmental conservation and sustainable development.

1.10 The economic situation

Madagascar's economy is predominantly based on agriculture. Economic growth is projected to strengthen from 3.8% in 2023 to 4.5% in 2024, driven by key sectors such as agriculture, mining, manufacturing (particularly textiles), and telecommunications. The tourism sector is also gradually recovering from the impacts of the pandemic.[47]

Despite its abundant natural resources and unique biodiversity, Madagascar faces significant challenges. Natural disasters, including cyclones and floods, coupled with recurring political crises rooted in corruption and poor governance, are primary drivers of poverty and hinder socio-economic progress. In 2021, the country ranked 173rd out of 191 on the United Nations Development Programme's Human Development Index.[48]

With a population estimated at 30.3 million in 2023, Madagascar struggles with a persistently high poverty rate.[49] While the country's economic situation showed slight improvement in 2023 compared to 2022, challenges stemming from the global health crisis and geopolitical tensions persisted. Real GDP is anticipated to grow by 4.6% in 2024, yet poverty remains alarmingly high.

A World Bank report launched in February 2024, assessing poverty and living conditions over the past decade (2012–2022), revealed concerning trends.[50] National poverty has stagnated, with 75.2% of the population classified as poor in 2022—including 79.9% in rural areas and 55.5% in urban areas. While rural poverty declined slightly, urban poverty increased significantly by 31.5%, particularly in secondary cities where it surged from 46% to 61%. This alarming rise in urban poverty is attributed to declining economic opportunities, a worsening business environment, and insufficient investment in education, healthcare, and urban infrastructure.

Madagascar's economic progress remains compromised by weak state institutions, widespread corruption, a largely uneducated population, susceptibility to climate

46 See https://www.unesco.org/creativity/fr/2005-convention, accessed 23 December 2024.
47 See https://www.banquemondiale.org/fr/country/madagascar/overview#:~:text=Le%20d%C3%A9ficit%20de%20la%20balance,du%20PIB%20%C3%A0%20moyen%20terme, accessed 23 December 2024.
48 UNDP, Human Development Report (2021/2022: 337).
49 Ibid.
50 See https://www.banquemondiale.org/fr/country/madagascar/publication/madagascar-afe-poverty-assessment-navigating-two-decades-of-high-poverty-and-charting-a-course-for-change, accessed 23 December 2024.

shocks, and vulnerability to external disruptions.[51] These factors create uncertainty about the country's development prospects.

The agricultural sector, although vital to the economy, lacks a comprehensive legal framework addressing soil and land management. This oversight exacerbates land degradation, necessitating an in-depth examination of how various sectoral activities contribute to this critical issue.

2 Mining sector

2.1 The legal framework

The mining sector in Madagascar is regulated by Law No. 2023-007 of 27 July 2023, which revises the Mining Code. Within Title VI regarding the obligations related to mining activities, Chapter II is entirely dedicated to environmental protection, clearly defining obligations based on the type of mining activity undertaken. In Chapter III, the law introduces improvements in hygiene and safety standards, emphasising the importance of safeguarding both human health and the environment, thereby steering the mining sector toward a more responsible and sustainable approach.

Under Title IV, Chapter II of this law, all mining permit or authorisation holders are required to conduct an environmental study, either through an PREE or an EIA. The criteria for these assessments are outlined in Annex I of the Environmental Compatibility Decree (MECIE Decree) No. 99-954 of 15 December 1999, as amended by Decree No. 2004-167 of 3 February 2004.

Article 3 of the MECIE Decree stipulates that all public or private investment projects, regardless of whether they require authorisation or approval from an administrative authority, and if they have the potential to harm the environment, must undergo an impact study. Additionally, Article 253 of the Mining Code requires that, beyond a mining permit, an environmental permit or authorisation must be obtained before commencing any mining activities, based on the scale or location of the project. Article 306 further obligates permit holders to repair any damage caused to private or public property and the environment because of their operations.

Non-compliance with environmental commitments or the Specific Environmental Management Plan, as per Articles 34 to 37 of the MECIE Decree, constitutes a violation and triggers sanctions specified in the decree.

On the social and economic front, the Code underscores the importance of ethical and responsible mining practices. Article 241 requires mining permit holders to develop a Corporate Social Responsibility plan, aimed at ensuring good social integration

51 Swiss Embassy for Madagascar, Economic Report (2024).

of projects. This includes establishing an environmental provision dedicated to environmental rehabilitation, protection, and reforestation.

Madagascar boasts significant mineral reserves, including nickel, cobalt, and ilmenite, which dominate the country's mining industry.[52] Other resources, such as coal, iron, graphite, and limestone, are still under exploration. The country is on the verge of a major expansion in large-scale mining operations, with many projects in development.

According to the African Development Bank (AfDB), Madagascar's mining sector holds considerable potential for economic growth. In its 2023 report, the AfDB estimated that the sector could contribute up to 14% of GDP by 2025, driven by increasing global demand for strategic minerals such as ilmenite, nickel, and cobalt.[53] It has been projected that in 2024, mining is a key pillar of the Malagasy economy, providing both national and local benefits. It is projected that 50–55% of operational costs for current mines—amounting to approximately USD 370 million—will be spent on local goods and services, making mining a cornerstone of industrial development in Madagascar.[54]

Despite its economic benefits, the mining sector presents significant environmental challenges, particularly concerning soil degradation. Large-scale mining operations often lead to habitat destruction, soil erosion, and contamination, posing risks to Madagascar's rich biodiversity and fragile ecosystems. While the revised Mining Code introduces measures to mitigate environmental damage, ensuring effective implementation and enforcement remains critical to balancing economic gains with sustainable environmental management.

2.2 Major mining investments

Law No. 2001-031 of 8 October 2002, which established the Special Regime for Large Investments in the Malagasy Mining Sector, was developed in alignment with the 1998 Mining Policy.[55] This law outlines criteria for project selection, including investment thresholds, foreign exchange implications, taxation, customs, and associated legal rights and obligations. To mitigate illegal land use in mining activities, the current Mining Code incorporates measures detailed in Articles 39, 61, 70, 79, 87-89, and 91.

Major mining investments are governed by establishment agreements, such as the Ilmenite Project, which define the specific tax and customs frameworks applicable to

52 See https://midi-madagasikara.mg/des-gains-economiques-considerables-pour-madagascar-selon-la-bad/, accessed 23 December 2024.
53 African Development Bank, Madagascar Country Report (2023).
54 CSRM (2014).
55 See https://www.droit-afrique.com/upload/doc/madagascar/Madagascar-Loi-2001-31-grands-investments-miniers-MAJ-2005.pdf, accessed 23 December 2024.

each project.[56] These agreements mandate compliance with sustainable soil management practices as per prevailing legal provisions, including the Mining Code, the Environmental Charter, and their respective implementation texts.

For instance, QMM SA is required to adhere to both national and international environmental standards, including relevant policies, conventions, ISO certifications, IFC guidelines, and industry norms.[57] Given the inherent impacts of mining activities on natural resources and human environments, strict adherence to environmental regulations is essential. This includes compliance with the requirements for environmental assessments and the management of sensitive areas, both during the operational phase and after the cessation of mining activities.

2.3 The main causes of soil degradation

The main causes of soil degradation in mining occur throughout the various phases of the mining lifecycle.[58] During the preparatory and installation phase, which can last between two to 20 years depending on the project, activities such as feasibility studies, construction, deforestation, blasting, and the installation of infrastructure and wastewater and waste treatment facilities contribute to soil disruption. In the operating phase, lasting ten to 50 years, resource extraction, discharges, intensive exploitation of resources, heavy vehicle and machinery traffic, and the maintenance and repair of infrastructure further degrade the soil. Finally, during the site closure phase, activities such as sealing mining shafts, restoring exploited areas, and dismantling buildings and infrastructure also impact soil quality. Each phase underscores the critical need for effective soil management and mitigation strategies to minimise environmental harm.

2.4 Illegal mining projects and their environmental impacts

In Madagascar, many mining operations are carried out illegally, bypassing established mining regulations and environmental protection laws. These activities frequently ignore environmental assessment protocols, with corruption being a primary driver. As a result, several environmental problems arise, creating significant barriers to sustainable land management. These include illegal mining operations without permits, modifications to the landscape such as the removal of plant cover, alteration of the

56 See https://omnis.mg/mines/le-projet-ilmenite-de-fort-dauphin/#:~:text=Situ%C3%A9%20%C3%A0%20Tolagnaro%2C%20au%20sud, millions %20of%20tons%20of Ilm%C3%A9nite, accessed 23 December 2024.

57 See https://www.riotinto.com/-/media/Content/Documents/Operations/QMM/RT-QMM-Brochure-summary-FR.pdf, accessed 23 December 2024.

58 Sectoral EIA Guide for Open Pit Mining Project (2005).

topography, destruction of vegetation, disruption of the drainage network, and obstruction of water flow. Additionally, illegal mining leads to land disputes, conflicting land uses, uncontrolled environmental pollution, and human displacement. Other issues include land grabbing, contamination from oils, greases, hydrocarbons, chemical products, and mining waste, as well as the degradation of soil quality.

Illegal mining activities severely hinder effective land management, resulting in landscape degradation, soil erosion, contamination, loss of vegetation cover, and disruption of local communities. These activities contribute to environmental damage such as landslides, flooding, and the alteration of watercourses. To address these issues, the Mining Code, through Articles 142 and beyond, has established control zones aimed at formalising illegal mining activities. This initiative mandates administrative, technical, and environmental supervision for artisanal miners, requiring them to form groups and adhere to specific environmental commitments outlined in a management plan. While the legal framework for the mining sector includes general environmental protection provisions, it lacks specific legislation dedicated to sustainable soil management, which remains a critical gap in addressing the full scope of environmental challenges.

2.5 Challenges and recommendations for the mining sector

The stakes are incredibly high in Madagascar's mining sector. The country is not only rich in mineral resources but also holds one of the world's most significant reserves of biodiversity, with over 80% of its species being endemic.[59] As Madagascar seeks to expand its mining industry and attract foreign direct investment, a critical question arises: How can large-scale mining be reconciled with the need for sustainable development, particularly regarding environmental protection and the social rights of vulnerable populations?

A 2023 assessment by the International Institute for Sustainable Development highlighted the need for a robust legal framework governing Environmental and Strategic Impact Assessments in the extractive industries sector.[60] Such a framework offers clear benefits: (i) establishing a transparent roadmap for conducting high-quality ESIAs, (ii) clearly defining the roles, responsibilities, and collaborative efforts of all stakeholders, and (iii) preventing social and legal disputes that may arise from mining activities.

Furthermore, the government must strengthen its commitment to implementing the Extractive Industries Transparency Initiative standards to ensure the legal framework

59 See https://dicf.unepgrid.ch/madagascar/biodiversity, accessed 23 December 2024.
60 See https://www.iisd.org/system/files/2023-05/cadre-juridique-eies-secteur-minier-madagascar.pdf, accessed 23 December 2024.

is both resilient and robust.[61] This framework should be complemented by principles and regulations that focus on sustainable soil management to ensure long-term environmental and social benefits.

3 Land sector

Land tenure, as defined by the Food and Agriculture Organization (FAO), refers to a system of rules created by a society to regulate its members' behaviour.[62] These rules determine how property rights over land are distributed, as well as how the rights to use, control, and transfer land are allocated, along with the associated responsibilities and limitations. In simple terms, land tenure defines who can access which resources, for what period, and under what conditions.

Since 2005, Madagascar has launched an innovative land reform aimed at legally recognising local land rights and decentralising land management.[63] However, despite these commitments to protect farmers' land rights, the government has simultaneously supported the transfer of large areas of land—some of which were already appropriated—to foreign investors. This reveals the ambivalence in Madagascar's land policy. The crucial question then arises: How does the Malagasy land tenure system contribute to soil degradation in the country?

3.1 The Malagasy land system

Order No. 62-036, which amends Order No. 60-146 concerning the land registration system, applies to all types of land, whether developed or undeveloped, as well as to mining areas, with specific provisions for the latter outlined in this ordinance and related regulations. As part of its ongoing land reform efforts initiated in 2005, the Malagasy government introduced the Land Policy Letter in 2015, setting a horizon of 2015-2030. This policy's primary goal is to "use land as a lever for sustainable development by securing diverse rights, promoting collaborative land management, and addressing both current and future land needs."

The land tenure system in Madagascar is a hybrid one, combining elements of modern civil law and customary practices. While titled lands offer formal legal security, most untitled rural lands are governed by local traditions. This dual system complicates land management and often leads to uncertainties and conflicts, especially in areas affected by rural migration. Despite this, traditional practices are not officially recognised by the state, which prioritises formal legal procedures. Approximately 85%

61 See https://eiti.org/countries/madagascar, accessed 23 December 2024.
62 See https://www.fao.org/4/y4307f/y4307f05.htm, accessed 23 December 2024.
63 Burnod & Andriamanalina (2017).

of rural lands in Madagascar remain unregistered, leaving landholders vulnerable to conflicts, expropriation, and challenges in accessing agricultural credit.[64]

The 2005 land reform introduced land certificates as a simplified mechanism to secure unregistered lands, but this process remains limited due to institutional, financial, and social barriers.[65] In Madagascar, land title remains the primary method for securing property rights, offering absolute, inalienable ownership protected by law.[66] However, its effectiveness is hampered by several factors, such as a complex and lengthy administrative process and an incomplete land registry. As the Malagasy land registry does not cover the entire country, the identification and formalisation of property rights become more difficult.

State-owned lands, including public domains, nature reserves, infrastructure areas, and lands designated for investment projects, are considered state property. While private state lands can be acquired, the management of these lands is often marked by conflicts with local communities, especially when customary land rights are not acknowledged during land allocation.[67]

3.2 Challenges and recommendations for the land sector

The land tenure system in Madagascar is highly complex, presenting numerous challenges that need to be addressed for the sector to effectively support sustainable land and soil management. These challenges include the lack of legal provisions specifically addressing land use or exploitation within the legal framework, the failure to recognise and integrate customary land management practices, and the inconsistencies and contradictions between various sector-specific laws and land legislation. Additionally, the dominance of mining, forestry, and tourism sectors often comes at the expense of agricultural land use, while conflicts arise from the absence of a Local Land Use Plan (PLOF), which is necessary to prevent overlapping rights and conflicts between sectors such as agriculture, mining, and infrastructure.[68] Furthermore, there is a lack of soil protection measures for private land holdings. These issues contribute to significant socio-economic and environmental consequences, such as poverty hindering agricultural development, the exclusion of vulnerable communities, social conflicts, and soil fertility degradation.

64 Transparency International, Land and Corruption in Africa Baseline Survey (2015).
65 See https://www.foncier-developpement.fr/publication/fiche-pedagogique-la-certification-fonciere-a-madagascar-entre-2005-et-2021-quels-beneficiaires-et-quels-effects/, accessed 23 December 2024.
66 See https://textes.lexxika.com/lois-malagasy/droit-foncier/loi-fixant-les-principes-regissant-les-statuts-des-terres/, accessed 23 December 2024.
67 See https://faolex.fao.org/docs/pdf/mad90303.pdf, accessed 23 December 2024.
68 See https://sarytany.mg/services/amenagement-travaux-fonciers/amenagement-foncier/, accessed 23 December 2024.

To address these challenges, several key actions are needed, including gaining a clearer understanding of the diverse land tenure regimes in Madagascar and formalising them, establishing a single, multidisciplinary institution responsible for overseeing sustainable soil management, ensuring consistency between land-related sectoral laws, modernising the land information system, accelerating efforts to secure land tenure, improving urban land management through tools such as the PLOF, regularising land occupations in urban areas, strengthening land governance by training state agents, fostering public-private partnerships, combating corruption, and enhancing administrative oversight. Additionally, political measures are needed to recognise land claims based on customary practices, and the legitimacy of traditional authorities should be recognised, as they play a crucial role in maintaining stability and effectiveness within customary land tenure systems, including land allocation and conflict resolution.

4 Urbanisation

4.1 The phenomenon of urbanisation in Madagascar

Rapid urbanisation is a global phenomenon that is reshaping both urban and rural landscapes, with significant consequences for soil quality and the environment. Madagascar, similar to many African nations, is not immune to this trend. Currently, around 20% of the Malagasy population resides in urban areas, a proportion that continues to grow, with an average annual increase of 2.3% from 1993 to 2018.[69] Today, more than one in three households live in cities, and demographic projections suggest that nearly half of the population will be urban dwellers within the next decade, signalling a fundamental shift in the country's structure. This rapid urbanisation in Madagascar is driving significant changes in land use.

Although urbanised areas currently cover only 0.18% of the nation's total land area, this share is growing swiftly. Between 2010 and 2018, Malagasy cities expanded by 498.86 km², at an annual rate of 62.35 km².[70] A key factor behind this growth is rural-urban migration, a trend that is especially prominent in Africa and Madagascar. This migration is driven by poverty, the depletion of agricultural land, and the search for better economic opportunities. Malagasy youth are increasingly migrating to cities, where informal jobs, though precarious, are often more accessible than in rural areas.[71] As a result, rural regions, especially those that are poor and sparsely populated, are losing their inhabitants, further deepening the urban-rural divide. This uncontrolled

69 National Institute of Statistics, Third General Population and Housing Census (2020).
70 Territorial Observatory, Indicators of Cities and Urban Diagnosis of Madagascar (2022).
71 See https://les-yeux-du-monde.fr/actualites-analysees/34122-lexode-rural-a-madagascar/, accessed 23 December 2024.

migration leads to unplanned urbanisation, exacerbating land management challenges in urban areas and contributing to widespread environmental degradation.

4.2 Legislation governing urban planning

4.2.1 Law on the Orientation of Regional Planning

Promulgated in 2016, the Land and Territorial Planning Law (LOAT) aims to foster balanced territorial development by integrating social progress, economic efficiency, and environmental protection.[72] As outlined in Article 4, the law addresses various aspects of land use planning, with a focus on environmental preservation. Specifically, it sets out key principles to prevent soil degradation during development activities, including the protection of landscapes. Among the recommended measures are: allocating sufficient productive land for agriculture, particularly in areas where river systems exist; and for extensive livestock grazing, particularly for crop rotation areas; ensuring that developments blend seamlessly with the landscape; preserving public access to the banks of lakes and rivers for movement; conserving natural sites and recreational areas; and maintaining forests for their diverse functions. The territorial planning tools outlined in Article 32 of the LOAT allow for the implementation of a comprehensive, integrated approach to territorial planning at all levels. These tools aim to align sectoral plans and programs, guiding long-term development goals that balance economic growth, social inclusion, and environmental conservation.[73]

4.2.2 Law on Urban Planning and Housing (LUH)

Promulgated in 2016, Law No. 2015-052 on Urban Planning and Housing replaced the 1963 Urban Planning and Housing Code.[74] As outlined in Article 1, the law aims to guide urban growth in a way that prioritises sustainability and inclusiveness. According to Article 95 of the Constitution, the legislature is responsible for establishing the rules governing urban planning, housing, land management, urban development, and standards related to construction and development activities.

72 See https://www.assemblee-nationale.mg/wp-content/uploads/2020/11/Loi-n%C2%B02015-051-orientation-de-lam%C3%A9nagement-du-territoire.pdf, accessed 23 December 2024.
73 See https://slideplayer.fr/slide/3500515/, accessed 23 December 2024.
74 See https://edbm.mg/wp-content/uploads/2017/12/L2015-052UH.pdf, accessed 23 December 2024.

4.2.3 Planning operations and authorisations

Urban planning authorities issue various permits to regulate the location of investments and ensure that urbanisation and land use are conducted in an orderly, environmentally responsible manner, in line with existing regulations. These permits are required for different activities, including those outlined in Articles 22 (building permits), 60 (quarrying, excavation, and land raising), 62 (dangerous, unsanitary, or inconvenient establishments), 91 (concerted development zones), and 151 (subdivisions or building permits with potential environmental harm). Each of these permits is subject to environmental protection measures to minimise negative impacts and ensure sustainable land use.

4.3 The National Land Use Planning Policy and the National Urban Development Policy

The National Land Use Planning Policy (PNAT) of 2006 and the National Urban Development Policy (PNDU) of 2019 serve as the primary guiding frameworks that shape the vision for urban development in Madagascar.[75] The PNAT emphasises sustainable natural resource management and urban development as key strategies for effectively managing growth while mitigating the destruction of natural habitats. The PNDU's Vision 2036 aims to create well-planned, safer, more resilient, inclusive, and sustainable cities that reflect the cultural identity of Malagasy society. These cities are envisioned to fulfil their roles as service providers, economic drivers, and key components of national territorial structuring. Key urban challenges outlined in this policy include improving and redeveloping informal settlements while preventing their expansion, and promoting the development of green and ecological cities. The PNDU integrates environmental considerations into urban planning, with a focus on enhancing quality of life and preserving urban landscapes.

4.4 The impacts of urbanisation on land use

Rapid urbanisation is driving significant changes in land use, leading to negative environmental impacts and a decline in the quality of life for urban residents. The unchecked expansion of cities, often poorly planned and disorganised, has resulted in the growth of informal settlements that now house over 60% of the urban population. These underserved neighbourhoods, frequently situated in areas lacking basic

75 World Bank, Madagascar Urbanisation Review (2024).

infrastructure, are breeding grounds for poverty and social inequality.[76] Sanitation remains a critical issue, with only 31% of the urban population having access to improved sanitation. Waste management is also a major challenge, as only 21% of waste is collected by organised services, while the rest is either discarded, buried, or burned by residents. Informal urbanisation is largely occurring in high-risk areas prone to flooding or landslides.[77] Nearly 48% of urban areas are vulnerable to flooding, affecting approximately 24% of the population.[78] Additionally, the 27 coastal cities, which cover around 43.8% of the country's territory and house a significant portion of the population, are increasingly vulnerable to coastal erosion.[79] These challenges further complicate urban management and heighten the risk of natural disasters. Insufficient urban planning, struggling to keep pace with rapid population growth, is accelerating soil degradation, reducing agricultural land, and amplifying disaster risks, particularly flooding and erosion.[80]

4.5 Recommendations for urbanisation

To prevent urbanisation from becoming a major driver of land degradation, it must be strategically planned and managed, utilising effective land-use planning tools and adhering to relevant legislation. In this context, several key technical proposals are recommended: the establishment of a national solid waste management policy, and the creation of an institutional, legal, and financial framework tailored to different levels of governance. Additionally, it is essential to update the PNAT, translating it into both a strategic and an operational plan, while ensuring its alignment with the PNDU.[81]

5 Other causes of soil degradation

5.1 State failure and lack of awareness among the population

This study on the legal framework of sectors most impacted by soil degradation reveals two major issues: firstly, the absence of a dedicated public policy for sustainable soil management, and secondly, the lack of a specific legal framework governing soil. To date, the fight against corruption in Madagascar has not met the public's expectations. While the state's general policy serves as the foundation for all sectoral legislation, the

76 Territorial Observatory, Indicators of Cities and Urban Diagnosis of Madagascar (2022).
77 World Bank, Madagascar Urbanisation Review (2024).
78 Territorial Observatory, Indicators of Cities and Urban Diagnosis of Madagascar (2022).
79 Ibid.
80 World Bank, Madagascar Urbanisation Review (2024).
81 Ibid.

Constitution includes principles related to the respect, protection, and development of the environment, but there is no specific provision within the Malagasy legal framework addressing sustainable soil management. This gap underscores the need for relevant ministries to align their sectoral legal frameworks with the principles and guidelines of sustainable soil management. As a result, there is a significant lack of public awareness and engagement concerning the vital role that soil plays in supporting life, as well as the detrimental effects of soil degradation on both present and future generations, and on the broader environment. In essence, citizens lack access to the necessary information and training on sustainable soil management practices and technologies that would preserve soil fertility and stability.

5.2 Deforestation

In Madagascar, slash-and-burn agriculture, locally known as "tavy," is a major driver of deforestation, particularly in regions where land availability is scarce.[82] On the cleared and burned land, farmers primarily grow rainfed rice, along with maize, cassava, and sweet potatoes. They rely on simple, traditional methods, such as perforating the soil with a wooden rod, placing the seeds in the holes, and covering them with soil. In addition to subsistence farming, pasture fires and the demand for wood energy further contribute to deforestation.[83] Around forested areas, poorer households often depend on agriculture for their livelihoods, and agricultural expansion, along with traditional livestock farming, occurs at the expense of forests.[84] This dependence on land and resources makes local populations even more vulnerable. The loss of natural vegetation from deforestation and fires depletes the organic content of soils, leading to increased runoff and severe erosion.[85] It is widely recognised that the current deforestation of the highlands is entirely driven by human activity, with the demand for timber and pastures for livestock. Without the protective forest cover, the soil is left exposed, and the grasslands become fragmented. As a result, organic matter is destroyed or lost, and rainfall causes rapid soil erosion.[86] Deforestation and poor agricultural practices, such as improper tillage, are the primary factors contributing to soil degradation. In Madagascar, the loss of organic matter due to fires and the failure to replenish nutrients is the predominant process driving soil degradation.

82 Ministry of Environment and Sustainable Development, Madagascar National REDD+ Strategy, adopted by Decree No. 2018-500 of 30 May 2018, 3-6.
83 See https://www.wwf.mg/en/?1967916/Madagascar-nouveau-front-de-deforestation, accessed 23 December 2024.
84 Minten, Zeller & Randrianarisoa (2000: 79-118).
85 Chabalier (1997).
86 Segalen (1948).

5.3 Climate change

According to data from the Ministry of the Environment, the development of Madagascar's NAP has helped assess areas impacted by desertification and land degradation, driven by climate change, and track their dynamics over time.[87] Of the island's 23 regions, twelve are affected, encompassing 30.24% of the total area, with priority action zones for combating land degradation covering 28.76% of these areas. Erosion is driven by specific climatic factors, such as rain and wind, which can become particularly intense, as is currently the case. When the soil is not shielded by sufficient vegetation, these factors lead to rapid degradation of the surface soil layers.[88]

The severity of this climate-driven degradation is evident in several ways: a marked dry season, during which herbaceous vegetation disappears, leaving the soil vulnerable at the onset of the rainy season; intense precipitation, manifesting as torrential downpours with peak intensities reaching several millimetres per hour; and a wind regime that is both regular (trade winds, monsoons) and violent (cyclones), with speeds that can be very high. The ongoing progression of soil degradation not only threatens the food security of the population but also exacerbates the impacts of climate change.

6 Overall recommendations

6.1 For Malagasy environmental policy

In Madagascar, the foundations for sustainable development have been established, but much work remains to be done. The policy must be translated into concrete actions aligned with the six key priorities of the Environmental Charter: (i) developing human resources; (ii) promoting sustainable, equitable, and harmonious development through effective natural resource management; (iii) rehabilitating, conserving, and managing Madagascar's biodiversity heritage; (iv) improving the living environment for both urban and rural populations; (v) ensuring a balance between population growth and resource development; and (vi) enhancing environmental management tools while addressing land issues. At the action level, the following approaches need to be developed: decentralising natural resource management to local communities; limiting unrestricted access to resources to enhance their value; raising awareness among citizens; removing barriers that lead farmers to adopt harmful production methods through mini-projects; finding alternatives to destructive practices; strengthening land management; incorporating environmental considerations into sectoral policies; and developing specific environmental management tools.

87 Ministry of Environment, Ecology, and Forests, Final Report of the Land Degradation Neutrality Target Setting Programme (2018).

88 Fournier (1949: 97-103).

The operational implementation of the Environmental Policy is outlined in the EAP included in the Charter of Environment, which spans fifteen years and is divided into three phases.[89] Its objectives focus on curbing natural resource degradation and reversing deforestation. To enhance sectoral environmental management, the establishment of Environmental Units within ministries and the integration of Strategic Environmental Impact Studies for major development projects are key outcomes of the EAP. All national development programs must integrate environmental considerations through the environmental assessment process. The alignment of sectoral investments with environmental protection requirements is ensured by adhering to environmental assessment procedures.

The new General State Policy (2024) emphasises the need for adequate responses to re-establish a sustainable and harmonious balance between human development and ecological resources.[90] It is, thus, recommended that sectoral policies and strategies focus on the seven key axes outlined above for sustainable soil management. Detailed sectoral recommendations, presented at the end of each chapter, address the issues affecting agriculture, urbanisation, land management, mining, and industry. The causes of land degradation in these sectors are diverse and manifest in political, legal, technical, socio-economic, and cultural contexts. However, certain recurring elements emerge across all sectors, underscoring the need for urgent attention to soil preservation at the national level.

6.2 On the side of the Malagasy administration

First and foremost, the Malagasy state must demonstrate political will by clearly defining its policy and strategy for land management in Madagascar. It is essential to justify the need for regulating land use and exploitation to ensure that soils maintain their "nourishing function." A dedicated legal framework to combat soil degradation must be developed in line with this policy. This legislation should outline the benefits of sustainable land management for humanity, identify the main causes of degradation, and propose technical, technological, legal, and social solutions to address the issue.

An integrated monitoring system, involving local authorities, customary leaders, and designated public officials, must be established to oversee implementation. Key sectoral departments, particularly those responsible for the environment, agriculture, industry, land, urbanisation, and mining, must align their legal frameworks with the overarching law governing soil. Awareness and mobilisation efforts should engage all public and private entities, with targeted training programs for CTDs, which will be

89 See https://shs.cairn.info/revue-tiers-monde-2007-2-page-435?lang=fr, accessed 23 December 2024.

90 See https://www.ivorary.org/politique-generale-de-letat-2024-2028-vers-plus-de-realisme-et-pourquoi-pas-plus-de-concretisation/, accessed 23 December 2024.

responsible for local control. Legal sanctions for non-compliance with legal and regulatory requirements must be both clear and enforceable.

To ensure the effectiveness of large-scale investments, whether national or foreign, the central state must strengthen its oversight and ensure that all investments comply with legal and regulatory provisions for sustainable land management in Madagascar. Given that this will be the country's first experience with such a policy, it would be prudent to implement pilot projects to assess the strategy's effectiveness, refine it based on real-world observations, and demonstrate to the population the crucial importance of this policy for their current and future well-being.

It is important to recognise that, under the constitution, one of the key roles of decentralised local authorities (CTDs) is to contribute to the economic, social, cultural, and environmental development of their regions. Therefore, they will bear the responsibility for the success of the sustainable soil management policy. In addition to the specific legal framework that governs soil, CTDs will require technical and financial support from the central government, along with the necessary equipment to effectively implement and enforce this new policy.

6.3 On the part of the administrators

To preserve its environmental and natural resources, the Malagasy population must receive enhanced training and support in sustainable natural resource management, particularly in soil conservation. Madagascar's decentralised governance model, as guaranteed by the Constitution, mandates the transfer of authority and financial resources to the CTDs. These local authorities must therefore take responsibility for monitoring and regulating land use and exploitation. They are ideally positioned to raise awareness among various population groups, particularly farmers, landowners, and rural residents, who are the primary land users.

Incorporating sustainable soil management into the education system is essential. Educational programs focused on these practices should be integrated at all levels of schooling, including in specialised centres or professional institutes, where training for professionals and operators is vital for the country's overall sustainable development. Furthermore, experimental projects should be developed to serve as practical demonstrations of sustainable land management practices.

In Madagascar, the roles of customary chiefs within communities have not been legally formalised, but they traditionally hold significant influence over decisions that affect the common good. One of the responsibilities of current leaders should be to legally formalise these traditional practices, particularly those related to land management, to ensure peace and stability in the country.

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