Country report for Morocco

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Abstract

This chapter discusses soil preservation and protection in Morocco. It highlights key challenges such as gaps in the legal framework, weak enforcement mechanisms, and insufficient integration of sustainable land management practices. The chapter explores the implications of these issues on soil health, food security, and environmental sustainability, particularly focusing on the need to address soil degradation and promote more effective land use policies.

An analysis of the existing legal framework reveals that while environmental laws contain strong provisions, their implementation faces significant obstacles due to fragmented legislation and a lack of enforcement capacity. Specific attention is given to the need for a unified environmental code, the establishment of specialised jurisdictions for environmental disputes, and the complexities arising from diverse land tenure systems.

The chapter also presents key findings regarding the role of both public authorities and civil society in promoting soil protection. It offers recommendations to strengthen legal frameworks, improve policy coordination, and empower stakeholders. It concludes by emphasising the urgent need for a dedicated authority for soil conservation, particularly considering emerging environmental challenges, such as climate change and industrial pressures.

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Chapter contents

Summary 351
1 Introduction 353
1.1 Geographic data 354
1.2 The population 354
1.3 The economy 355
1.4 Education 356
1.5 The climate 356
1.6 Information on the organisational structure of the state 357
1.6.1 The form of the state 357
1.6.2 Legislative competence 358
1.6.3 Executive competence 358
2 Soil degradation 359
2.1 The state of the environment in Morocco 359
2.2 Soil types in Morocco 360
2.3 The main factors of soil degradation 360
3 International law and bilateral and multilateral agreements 362
4 The legal framework applicable on the ground in Morocco 363
4.1 The Constitution 363
4.2 General information on soil protection policies 363
4.3 General environmental law 365
4.4 Conservation and exploitation of forests 367
4.5 Soil protection and restoration 367
4.6 Combating air pollution 368
4.7 The coastline 369
5 Legal texts concerning the main factors of soil degradation 370
5.1 Urban planning 371
5.2 Pollution and waste management 372
5.3 Cross-cutting issues 373
5.3.1 Environmental assessment 373
5.3.2 Provisions relating to public participation 374
5.3.3 Access to environmental information 374
5.3.4 Access to the courts 375
5.3.5 Instruments specific to foreign investments 376
5.3.6 Compliance with public law 377
5.3.7 The question of the enforcement of foreign judgments 377
5.3.8 Fair or legal acquisition of land 377
5.3.9 Fair taxation 379
5.3.10 Legal requirements for environmental monitoring 379
5.3.11 Availability and accessibility of data 380
5.3.12 Expertise and support from research institutions 381
5.3.13 Staff and technical equipment 383

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6 Specific information on the legal framework concerning the main factors of soil degradation 383
6.1 Agriculture 383
6.2 What is more? 385
6.3 The mining sector 386
7 Recommendations 388
7.1 The legal framework and public policies 388
7.2 Law enforcement, monitoring, access to environmental information, etc. 389
7.3 The land 389
7.4 Foreign investors 390
7.5 The industry 390
References 391

Summary

This chapter highlights the vital role of soil as an essential resource for agriculture and other economic sectors in Morocco. It explores the challenges of soil degradation, driven by both climatic and human-induced factors, and stresses the need for environmentally sustainable management to protect this crucial resource. Spanning 712,550 km², Morocco boasts diverse geographical features, from mountains and plateaus to plains. The country has approximately nine million hectares of cultivated land and 65 million hectares of rangeland. However, factors such as erosion, overgrazing, and unsustainable agricultural practices have led to the degradation of over 40% of the nation's land.

Morocco's climate is varied, with a Mediterranean climate in the north and a desert climate in the south, making the country susceptible to frequent droughts. Water stress is becoming increasingly severe, with per capita freshwater availability declining. In response to these challenges, the National Water Plan 2020-2050 aims to mobilise non-conventional water resources. The combination of recurring droughts and soil degradation threatens agricultural production and food security, making Morocco more reliant on imports, particularly wheat. To address these issues, the government launched the "Generation Green 2020-2030" plan to enhance the sustainability of the agricultural sector.

While the importance of soil is widely recognised, Morocco currently lacks a specific legal framework for its protection. Several environmental laws and strategies address soil indirectly, with the 2011 Constitution acknowledging the right to a healthy environment. Additionally, Morocco has ratified various international conventions to safeguard natural resources. This chapter identifies multiple factors contributing to soil degradation and emphasises that stakeholders must focus on soil restoration and protection to ensure food security and environmental sustainability.

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The chapter stresses the urgency of adopting sustainable soil management practices and strengthening the legal framework to protect this fragile resource. Collaboration among stakeholders, along with a commitment to integrated environmental policies, is crucial for ensuring a sustainable future for soil in Morocco. By tackling these challenges through legal reforms, public awareness, and strategic land management, Morocco can better safeguard its soil resources and ensure the long-term sustainability of its agriculture, environment, and food security.

To improve the legal framework for environmental protection, it is essential to revise and strengthen existing laws to address implementation challenges. A participatory approach, incorporating scientific research into legal development, will make laws more practical and enforceable. The creation of an environmental code and specialised courts for environmental disputes will also enhance enforcement. Public authorities should mandate the use of clean technologies in industries, and a dedicated authority for soil conservation should oversee policies related to agriculture, urban planning, and industry. Additionally, mechanisms should be established to allow citizens to challenge harmful policies, giving communities a voice in protecting the environment.

To improve law enforcement and public awareness, actions such as designating World Environment Day as a national event could raise awareness of climate change and environmental issues, particularly among young people. Environmental laws should be unified into a comprehensive framework to ensure accessibility and legal certainty. Civil society organisations should be empowered with the necessary tools and support to strengthen environmental protection efforts. Furthermore, an institutional and technological system for managing and using soil data will help create more coordinated and strategic approaches to soil conservation.

For better land management, incentives should be provided to encourage the revitalisation of barren lands with a focus on sustainability. A review of the collective land management system is necessary to incorporate soil protection into national development plans. Prohibiting investment projects on forest lands will help preserve these vital areas. The diversity of land tenure systems poses challenges to cohesive soil protection policies, and efforts should be made to harmonise these systems in line with national soil conservation goals.

The creation of an environmental protection fund is recommended to support projects focused on preserving natural resources and fostering private sector involvement in sustainability efforts. The decarbonisation of industry should be prioritised to align with global climate goals and encourage responsible investment. Supporting the integration of small and medium-sized enterprises (SMEs) into industrial value chains can foster regional equity and create sustainable jobs. Identifying and classifying productive lands as protected areas will prevent degradation from industrial activities, ensuring these lands continue to support agriculture, food security, and ecological balance.

In conclusion, this chapter outlines a comprehensive, multi-faceted approach to soil conservation, integrating legal reforms, industrial transformation, and public

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engagement. By implementing these recommendations, Morocco can protect its soil resources and ensure sustainable land management and environmental protection for future generations.

1 Introduction

Soils are vital natural resources essential for agriculture and economic activities. However, soil degradation, driven by climate, natural conditions, and especially human activities, affects fragile soils. Sustainable agricultural, forestry, and pastoral practices are key to maintaining soil health, boosting productivity, and protecting the environment.

Morocco faces food security challenges, mainly due to climate change, droughts, and its reliance on imports, especially wheat.[1] Reduced rainfall, high temperatures, and low dam levels have affected crop conditions. 2023 cereal production was 15% below average, and the country's global food security ranking has fallen. Population growth and soil degradation add pressure on food systems.

Morocco is investing in agricultural innovation through the Green Generation 2020-2030 and the Green Morocco Plan to address these issues. Agriculture, contributing 14% to the gross domestic product (GDP), remains central to the economy but faces ongoing threats from climate change and resource depletion.[2]

Sustainable soil management is crucial for Morocco's natural resource preservation and economic development. Soil health supports agriculture, forestry, livestock, mining, and construction. Practices such as crop rotation, soil conservation, and efficient water management can boost agricultural productivity while protecting the environment. Soil preservation also supports ecosystems and strengthens resilience to climate change.

Sustainable mining practices and responsible waste management are essential for protecting soils and ecosystems, ensuring long-term viability and fostering balanced development. Given Morocco's reliance on agriculture and agri-food industries, sustainable soil management is vital for economic stability. This chapter examines Morocco's environmental state, legal framework, and development prospects, offering recommendations to improve soil management.

1 See https://www.fao.org/giews/countrybrief/country.jsp?code=MAR, accessed 7 December 2024.

2 See https://www.ires.ma/sites/default/files/docs_publications/presentation_1.pdf, accessed 7 December 2024.

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1.1 Geographic data

Morocco is in the northwest of the African continent, bordered by the Atlantic Ocean to the west and the Mediterranean Sea to the north, together providing approximately 3,600 km of coastline. It lies between latitudes 20°30' to 36° north of the equator and longitudes -1° to -17°30' west of Greenwich. Covering an area of 712,550 km², Morocco is a country of diverse geography, with mountains, plateaus, plains, and continental dunes.[3] The country's altitude ranges from -55 meters at Sebkha Tah to 4,165 meters at Jbel Toubkal, the highest point in North Africa. Large permanent rivers flow through the country, with lengths varying from 200 km to 1,200 km.

Morocco has around nine million hectares of cultivated land, approximately 65 million hectares of rangeland, and around nine million hectares of forests. Most of the country is dominated by the Sahara Desert in the south. It is bordered by the Atlantic Ocean to the west, the Mediterranean Sea to the north, Algeria to the east, and Mauritania to the south.

Morocco also has two significant maritime facades: an Atlantic coast and a Mediterranean coast. The Atlantic coast stretches 2,934 km along the Atlantic Ocean, while the Mediterranean coast spans 512 km along the Mediterranean Sea. The Atlantic coast is considerably longer, providing Morocco with a significant maritime presence on the Atlantic.[4]

1.2 The population

According to the results of the 2024 General Population and Housing Census (RGPH), the legal population of Morocco reached 36,828,330 inhabitants as of 1 September 2024. This includes 36,680,178 Moroccans and 148,152 foreign residents. Compared to the 2014 census, the population grew by 2,980,088 inhabitants, reflecting an average annual growth rate of 0.85%, down from 1.25% between 2004 and 2014. The number of foreign residents in Morocco increased by 61,946 between 2014 and 2024, with an annual growth rate of 5.6%. In urban areas, the population reached 23,110,108, growing by 2,677,669 inhabitants between 2014 and 2024, at an average annual growth rate of 1.24%. In contrast, rural areas saw a population of 13,718,222, an increase of 302,419 from the 2014 census, with a lower average annual growth rate of 0.22%.[5]

3 See https://www.donneesmondiales.com/afrique/maroc/index.php, accessed 7 October 2024.

4 See https://fr.diplomatie.ma/fr/geographie-du-maroc; https://www.larousse.fr/encyclopedie/divers/Maroc_géographie_physique/185525, accessed 7 October 2024.

5 See Decree No. 2.24.1009 establishing the Legal Population in Morocco; https://www.hcp.ma/Population-legale-du-Royaume-du-Maroc-repartie-par-regions-provinces-et-prefectures-et-communes-selon-les-resultats-du_a3974.html, accessed 7 October 2024.

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1.3 The economy

In 2022, Morocco's GDP at current prices reached 1,330.2 billion DH, reflecting a 4.4% increase compared to 2021. The Organisation for Economic Co-operation and Development (OECD) Economic Survey of Morocco projects real GDP growth of 3.5% in 2024 and 4.0% in 2025. The primary drivers of this growth are expected to be the services sector and exports, with continued expansion in the manufacturing sectors, especially in automotive and electronics. Public debt stands at approximately 70% of GDP, which is significantly higher than the historical average of 59.81% observed between 1965 and 2022. While this debt ratio is approaching the peak of 117.71% reached in 1985, it remains well below the low of 21.66% recorded in 1965.[6]

The Moroccan economy is increasingly characterised by sectoral diversification. Traditionally dominated by agriculture, the country has seen significant expansion in other sectors such as industry, tourism, and services. Agriculture now contributes around 12% to GDP, while industry accounts for 27%, and services make up 61%.[7]

The Moroccan economy has displayed resilience in the face of several challenges, including a global economic slowdown, inflationary pressures, the earthquake in Al Haouz province, and recurring droughts. Despite these challenges, growth has accelerated, with GDP increasing by 3.4% in 2023. This growth has been driven by strong consumption, rising investment, a rebound in the tourism sector, and thriving export-oriented manufacturing sectors, particularly in automotive and aeronautics.[8]

Foreign investment in Morocco has steadily increased over the past decade, with most foreign companies investing in the manufacturing sector, particularly in automotive and pharmaceuticals. Other significant sectors attracting foreign investment include real estate, telecommunications, tourism, energy, and mining.

Despite the challenges posed by global geoeconomic fragmentation, Morocco's unique advantages—such as its strategic geographic location, trade agreements, renewable energy potential, robust infrastructure, and stable business environment—position the country to experience a potential shift in its foreign direct investment (FDI) attractiveness.

However, gross FDI receipts have recently declined due to the impact of the COVID-19 pandemic. According to the Foreign Exchange Office, FDI inflows represented an average of 3.2% of GDP between 2012 and 2022, but this figure decreased to 2.2% of GDP in 2023.

6 See https://maroc-diplomatique.net/dette-publique-plombs-en-2024/, accessed 7 October 2024.
7 See https://www.moroccobusiness.fr/post/agriculture-maroc-2024, accessed 7 October 2024.
8 World Bank (2024); OECD (2024).

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1.4 Education

Morocco has made significant progress in education over the past two decades, particularly in expanding access to primary education and increasing enrolment in secondary education.[9] The Strategic Vision 2030 for Education aims to improve quality through three key pillars: ensuring equity and equality in education, enhancing the quality of schooling, and promoting individual and societal development through education. Vision 2030 focuses on equitable access to education, particularly for rural and disadvantaged areas, ensuring rights for people with disabilities, and improving infrastructure. It also emphasises improving teacher training, restructuring school cycles, creating links between general and vocational education, and enhancing school governance.

Morocco has established institutions for assessment and monitoring, including the Higher Council for Education, which guides policies on education and research.[10] Despite these efforts, challenges remain, such as the low quality of apprenticeships and high youth unemployment, raising concerns about the alignment of education with labour market needs.

The higher education system in Morocco consists of public universities, non-university institutions, and private institutions, with 448 institutions serving over 1.2 million students. Since 2003, various reforms have been implemented to improve higher education, including the National Charter of Education, Law 01-00, and the Vision 2030 strategy, which continues to prioritise equitable access and quality improvements across the sector.

1.5 The climate

Morocco's climate is influenced by its position between temperate low-pressure systems and the subtropical Azores high, creating a transition zone between temperate and desert climates. The climate varies regionally: coastal areas have a temperate climate, while the south and east are desert.[11] The northern part experiences a Mediterranean climate, the west is oceanic, and the interior is continental, with the south being Saharan. The climate features hot, dry summers with little precipitation and mild winters on the coast, but colder inland and in mountainous regions.

Morocco's vast arid and semi-arid regions face frequent climatic crises, making the ecosystem fragile. Precipitation is highly variable, ranging from under 100 mm in

9 See https://www.oecd-ilibrary.org/docserver/9789264301832-fr.pdf?expires=1732744195&id=id&accname=guest&checksum=8229CE2F8596151EA94B2C29AC078172, accessed 7 October 2024.

10 See https://www.csefrs.ma/wp-content/uploads/2020/05/Rapport-ES-re%CC%81gule%CC%81.pdf, accessed 7 October 2024.

11 See 2022https://unfccc.int/sites/default/files/resource/Morocco%20BUR3_Fr.pdf, accessed 7 October 2024.

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the south to 1,200 mm in the north. The years 2019-2022 were the driest in decades, with a 32% rainfall deficit, stressing water resources and raising concerns about future supplies.[12]

Over the last two decades, Morocco has shifted from "water shortage" to "water stress."[13] The average annual rainfall is about 140 billion m³, with renewable water resources around 22 billion m³, including 18 billion m³ of surface water and 4 billion m³ of groundwater.[14] Freshwater availability per capita has dropped from 2,500 m³ in 1960 to 606 m³ today, marking a critical water shortage. Dams were only 34% full by February 2022, compared to 51% the previous year. This shortage has led to the overuse of groundwater, causing falling water levels, contamination, and soil erosion. Groundwater supplies over 90% of rural water and irrigates 40% of agricultural land.

Morocco launched the National Water Plan 2020-2050, focusing on non-conventional water sources, including wastewater treatment, brackish water demineralisation, and seawater desalination.[15] However, water scarcity remains a challenge, exacerbated by pollution, soil erosion, and increased demand from a growing population, urbanisation, and agriculture. These pressures are deteriorating the quality and availability of water resources.[16]

1.6 Information on the organisational structure of the state

1.6.1 The form of the state

The first article of the Constitution of 2011 establishes Morocco as a constitutional, democratic, parliamentary, and social monarchy. It highlights the separation of powers, balance, collaboration, citizen participation, good governance, and accountability. The country's unifying constants include Islam, national unity, the constitutional monarchy, and democratic choice.

The Kingdom follows a decentralised territorial organisation based on advanced regionalisation.[17] The King is the guarantor of national independence and territorial integrity (Article 42). He exercises his powers through royal decrees and is responsible for appointing the head of government, ministers, governors, ambassadors, and officials in key positions. The King also holds the authority to dismiss ministers, dissolve

12 Ministry of Equipment and Water and General Directorate of Meteorology (2023).
13 Naciry (2017).
14 Ministry of Equipment and Water, Hydraulics Department (2023).
15 The National Program for Drinking Water Supply and Irrigation (PNAEPI) 2020-2027.
16 See https://projet.oss-online.org/maghreb-eau/sites/default/files/2020-01/Etat-des-Lieux-Secteur-Eau-Maroc.pdf, accessed 7 October 2024; https://www.ires.ma/sites/default/files/docs_publications/Avenir_de_leau_au_Maroc-Rapport_de_synthese.pdf, accessed 7 October 2024.
17 Fadil (2022).

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Parliament, and make strategic decisions regarding national security.[18] He serves as the supreme commander of the Armed Forces and chairs important councils related to security and judiciary matters. He also chairs the High Council of the Judiciary and the High Council of Ulemas, in his capacity as Commander of the Faithful.[19]

1.6.2 Legislative competence

The Moroccan Parliament consists of two chambers: the House of Representatives and the Chamber of Councillors.[20] The 395 members of the House of Representatives are directly elected for five years by universal suffrage. The Chamber of Councillors, with 120 members, is indirectly elected for six years, representing local authorities, professional chambers, and employees.[21] Members of Parliament hold their mandate from the nation, with personal voting rights and parliamentary immunity. The Presidents of both chambers and the heads of the Standing Committees are elected at the start of the legislature and again in the third year. Members of the Chamber of Councillors are elected for nine years, with three-fifths chosen by local authorities and two-fifths by professional chambers and employees.

Parliament holds two sessions annually, with the option for extraordinary sessions requested by a majority of either chamber or the government. Sessions are public, and each chamber has its internal regulations, reviewed for constitutional compliance by the Constitutional Court. Parliament's powers include legislative authority and government oversight. It legislates, votes on laws, monitors government action, and evaluates public policies. The Head of Government and Parliament members can initiate laws, with drafts concerning local authorities and social affairs prioritised by the House of Councillors. Amendments to laws can be proposed by both chambers and the government. The agenda is set by each chamber's bureau, and laws are adopted through voting and ratification.

1.6.3 Executive competence

The King of Morocco appoints the Head of Government from the majority party resulting from legislative elections. The Head of Government then proposes the list of ministers and members of the government to the King.[22] The government is

18 Eluassi (2020).
19 See https://fr.diplomatie.ma/fr/systeme-politics-du-royaume-du-maroc, accessed 7 October 2024.
20 See https://www.asgpf-francophonie.org/documents/documents/BicamerismeauMaroc_M.Khouja_vf.pdf, accessed 7 October 2024.
21 Ahmyiane (2019).
22 See https://www.cg.gov.ma/fr/attributions-du-government, accessed 7 October 2024.

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accountable to both the King and Parliament. Once appointed, the Head of Government presents the government's program to both Houses of Parliament. This program outlines the government's planned actions across economic, social, environmental, cultural, and foreign policy sectors. It is debated by both chambers and followed by a vote in the House of Representatives. The government is formally invested after obtaining the confidence of the House of Representatives through a majority vote in favour of its program. The government exercises executive power, implementing its program, enforcing laws, managing the administration, and overseeing public companies and institutions. Under the authority of the Head of Government, regulatory powers may be delegated to ministers, with acts countersigned by the relevant ministers.

In addition to the executive authority, other institutions, such as the police, public prosecutor's office, and judiciary, are responsible for enforcing laws in Morocco.

2 Soil degradation

Soil degradation refers to the physical, chemical, or biological processes that diminish the productive capacity of soils or the usefulness of natural resources.[23] A soil is considered degraded when it loses some of its key qualities, such as its ability to store water and nutrients, provide support for plant roots, act as a reservoir for biodiversity, filter pollutants, and sequester carbon. Soil degradation also includes a decline in soil quality.

2.1 The state of the environment in Morocco

The Moroccan state is committed to environmental monitoring, as mandated by Article 24 of Framework Law 99-12 on the National Charter for the Environment and Sustainable Development. This law requires the government to conduct continuous monitoring of environmental quality, gather and analyse data related to the state of the environment, and disseminate this information.

Morocco's climate varies across regions, contributing to its rich biodiversity. The Kingdom ranks second in the Mediterranean in terms of biological diversity, boasting over 24,000 animal species and more than 7,000 plant species. The country's fauna has an overall endemism rate of 11%, while vascular plants have an impressive 20% endemism rate, making Morocco one of the regions with the highest biodiversity endemism.[24] Morocco is home to 29 ecosystems of significant ecological value, recognised for their richness in flora and fauna. The Department of Sustainable

23 Ginzky et al. (2021: 383).

24 See https://decarbonation.cgem.ma/wp-content/uploads/2023/03/La-Transition-du-Maroc-vers-un-Economie-Verte_-Etude-globale-PAGE-Maroc-2022.pdf, accessed 7 October 2024.

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Development has declared ten national parks and 154 Sites of Biological and Ecological Interest (SIBE), covering a vast area of 2.5 million hectares. Additionally, 38 wetlands, spanning nearly 320,000 hectares, are designated Ramsar sites, highlighting the importance of these areas for global biodiversity. Forests cover nine million hectares of Morocco, housing seven million people. The Moroccan coastline extends 3,446 km, including 2,934 km of Atlantic coastline and 512 km along the Mediterranean.

This vast natural wealth has led to growing awareness of the need for a sustainable and inclusive transition. Morocco has made significant strides in adopting environmentally friendly practices and promoting green economy initiatives. These efforts are reflected in strategic frameworks such as the New Development Model of Morocco (NMD), the National Sustainable Development Strategy (SNDD), the National Climate Plan (PCN), the National Household Waste Program (PNDM), and the Renewable Energy Strategy (SER). These projects aim to protect biodiversity, promote sustainable production and consumption, and support a green economy.

2.2 Soil types in Morocco

Soil faces various challenges that hinder sustainable agricultural production and development. To effectively address these constraints, it is crucial to understand the types of soils found across Morocco and their distribution.

Morocco uses the "French Soil Classification" (CPCS 1967), which categorises soils based on their morphology, climatic conditions, topography, and underlying bedrock. According to this classification, the following soil types are found in Morocco: raw mineral soils, poorly evolved erosion soils, poorly evolved contribution soils, calcimagnesic soils, Isohumic soils, Vertisols, iron sesquioxide soils (fersiallitic), browned soils, sodic soils, and hydromorphic soils. The predominant soils in Morocco include Mollisols, Vertisols, Inceptisols, and Entisols.[25] These soils are typically found in the internal mountainous areas and are characterised by shallow layers and minimal weathering, retaining features similar to their parent rocks. They are highly susceptible to erosion. Aridisols, which are found in alluvial deposits along rivers, share similarities with Entisols but are more weathered.

2.3 The main factors of soil degradation

Soil degradation can generally be divided into two main categories: the removal and displacement of soil elements by water and wind erosion, and the degradation of soil quality through chemical or physical processes.[26] There is often confusion between

25 FAO (2014).
26 Roose (2010).

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erosion and soil degradation. While some consider erosion to be the primary cause of soil degradation, others argue that erosion primarily affects already degraded soils, exacerbating the visible signs of deterioration. Over 40% of Morocco's land is affected by soil erosion, driven by deforestation, overgrazing, and poor agricultural practices. Harsh climatic conditions, such as extended droughts followed by intense rainfall, further intensify the problem. Soil erosion is occurring at rates far exceeding international standards, with specific degradation rates ranging from 212 to over 2,000 tons per square kilometre per year.[27] Regions in the north and northwest experience rates exceeding 2,000 tons per square kilometre annually.

Regions are categorised based on the severity of soil degradation:[28] Areas with specific degradation rates exceeding 2,000 tons per square kilometre per year, such as the Rif region near Sebou (Oued Ouergha); areas with rates between 1,000 and 2,000 tons per square kilometre per year, including parts of Sebou and Loukkos; regions with specific degradation rates between 500 and 1,000 tons per square kilometre, such as certain slopes of the Oum Er Rabia wadi and Souss (Tessaout, Issen, and Bine El Ouidane); and areas with degradation rates below 500 tons per square kilometre per year.

Wind erosion is a significant concern, though data on its extent is lacking.[29] The most recent National Colloquium on Forests estimates that 250,000 hectares in Errachidia and 30,000 hectares in Ouarzazate are at risk from wind erosion.

Several human activities contribute to soil degradation. Unsustainable agricultural practices, such as deep ploughing and intensive tillage, weaken soil aggregates and disrupt the soil structure. This leads to the destruction of habitats for organisms that contribute to soil formation and stability, resulting in soil erosion, increased susceptibility to compaction, reduced water retention, and decreased nutrient recycling capacity. Overgrazing accelerates soil erosion by reducing protective vegetation cover and increasing soil compaction. This disrupts ecosystems and leads to significant biodiversity loss. The Moroccan Ministry of Agriculture lists overgrazing as a primary driver of desertification.

Deforestation is primarily driven by human activities, with agricultural expansion responsible for 90% of global deforestation, according to the Food and Agriculture Organization of the United Nations (FAO). In Morocco, forest cover is declining at a rate of 17,000 hectares per year,[30] while reforestation efforts have not exceeded 20,000 hectares annually under the new forestry strategy for 2020-2030. Overall, Morocco loses 31,000 hectares of forest annually.[31]

Urban expansion also contributes to soil degradation, as land is converted for housing, infrastructure, and amenities. This leads to soil sealing and the loss of fertile land,

27 Boukhari et al. (2019).
28 Chikhaoui & Naimi (2011).
29 Benbrahim et al. (2004).
30 See https://www.cese.ma/media/2023/10/Avis-ecosystemes-forestiers-du-Maroc-VF.pdf, accessed 7 October 2024.
31 Benzyane (2007: 47).

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disrupting ecosystems and biodiversity.[32] Industrial and mining activities are another significant source of soil degradation. They can release toxic pollutants, heavy metals, and other hazardous substances into the soil. The pollution from industrial and mining sources is often inadequately measured and addressed by current legislation. Inappropriate management of industrial waste and improper disposal of chemicals can lead to widespread soil contamination.

Finally, soil salinisation poses a growing threat to food security, particularly due to the intensification of agriculture and poor irrigation practices. This process reduces the area of irrigated land by 1-2% annually.[33] In Morocco, nearly 500,000 hectares of land, including 160,000 hectares in irrigated areas, are affected by soil salinisation.

3 International law and bilateral and multilateral agreements

Morocco has consistently aligned itself with the international community in environmental protection and the fight against climate change, ratifying numerous international conventions and agreements.[34] These include conventions addressing waste and hazardous chemicals, such as the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal,[35] the Stockholm Convention on Persistent Organic Pollutants,[36] the Rotterdam Convention on Hazardous Chemicals and Pesticides in International Trade,[37] and the Minamata Convention on Mercury.[38]

Additionally, Morocco has ratified multiple conventions related to fauna and flora, including the International Convention on the Protection of Plants (ratified in 1972),[39] the International Convention for the Protection of New Varieties of Plants (2006),[40] the African Convention on Conservation of Nature and Natural Resources (1977),[41] the Ramsar Convention on Wetlands (1980),[42] and the Convention on Biological Diversity (1995).[43]

Morocco has also supported agreements targeting atmospheric protection, such as the Vienna Convention for the Protection of the Ozone Layer (1995),[44] the Montreal

32 See https://openknowledge.fao.org/server/api/core/bitstreams/74b4394d-b389-4450-a4d7-bd37ab751c31/content, accessed 7 October 2024.
33 Gana, Oumara & Elyoussf (2022).
34 See https://www.environnement.gov.ma/fr/lois-et-reglementations/conventions-et-accords, accessed 7 October 2024.
35 Adopted 22 March 1989, United Nations Treaty Series, Vol 1673.
36 Adopted 22 May 2001, United Nations Treaty Series, Vol 2256.
37 Adopted 10 September 1998, United Nations Treaty Series, Vol 2244.
38 Adopted 10 October 2013, United Nations Treaty Series, Vol 2888.
39 Adopted 6 December 1951, United Nations Treaty Series, Vol 828.
40 Adopted 2 December 1961, United Nations Treaty Series, Vol 815.
41 Adopted 15 September 1968, Organisation of African Unity, OAU Treaty Series, No 15.
42 Adopted 2 February 1971, United Nations Treaty Series, Vol 996.
43 Adopted 5 June 1992, United Nations Treaty Series, Vol 1760.
44 Adopted 22 March 1985, United Nations Treaty Series, Vol 1513.

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Protocol (1995),[45] the UN Framework Convention on Climate Change (1998),[46] the Kyoto Protocol (2005),[47] and the Paris Agreement (2016).[48]

4 The legal framework applicable on the ground in Morocco

4.1 The Constitution

The Moroccan Constitution does not explicitly address soil but underscores environmental protection and sustainable development, affirming the right of all Moroccan citizens to a healthy and sustainable environment. Key provisions include Article 31, which obligates the state to protect the environment, combat pollution, and preserve biodiversity, and Article 35, which emphasises sustainable and human development, promoting social justice while preserving natural resources and the rights of future generations. Article 115 mandates the state to raise awareness about environmental issues and involve citizens in their protection, while Article 71 assigns legal responsibility for environmental management, natural resource protection, and sustainable development to the law. Additionally, the Constitution establishes the Economic, Social, and Environmental Council (Article 151), tasked with advising on matters related to the economy, society, and the environment, and providing opinions on national economic and sustainable development policies (Article 152). While soil is not directly mentioned, its conservation is implicitly covered under the broader principles of protecting natural resources outlined in Article 35.

4.2 General information on soil protection policies

Morocco currently lacks a dedicated public policy or strategy solely focused on soil protection. Instead, soil is considered a component of broader environmental concerns within the context of sustainable development, which has become a central pillar of the country's environmental policy. The government has committed to addressing environmental challenges through various reforms aimed at both advancing environmental progress and supporting national economic development.

To provide a comprehensive view of the national strategies influencing sustainable development and soil management, we will explore four key public policies:

The National Strategy for Sustainable Development (SNDD) 2030 is based on several guiding principles set by the Moroccan government to ensure its coherence and

45 Adopted 16 September 1987, United Nations Treaty Series, Vol 1522.
46 Adopted 9 May 1992, United Nations Treaty Series, Vol 1771.
47 Adopted 11 December 1997, United Nations Treaty Series, Vol 2303.
48 Adopted 12 December 2015, United Nations Treaty Series, Vol 3156.

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effectiveness.[49] These include the principle of international conformity, which aligns Morocco's efforts with global best practices on issues relating to climate change and biodiversity; the principle of conformity with Framework Law 99-12, which ensures the strategy is in line with Morocco's National Charter for the Environment and Sustainable Development, incorporating principles such as integration, solidarity, and participation. Additionally, the stakeholder engagement principle emphasises the importance of involving all relevant parties in the strategy's implementation, while the operational strategy principle focuses on creating a clear, actionable plan based on existing frameworks. The SNDD aims to address seven major challenges, such as strengthening governance, transitioning to a green economy, and accelerating climate change mitigation efforts. However, Morocco has identified structural obstacles in its development, prompting a revision of the strategy. The updated SNDD will focus on aligning with the New Development Model (NMD) to ensure the transformation of Morocco's economy into a green, inclusive economy while addressing inequalities and reinforcing social welfare.

The Strategic Orientations of the New Development Model (NMD), adopted in April 2021, aims to address environmental pressures, including climate change impacts on natural resources and biodiversity.[50] The model highlights the need for sustainable policies to reduce inequalities and foster economic growth while preserving the environment. A key strategy is the development of modern, socially and ecologically responsible agriculture, leveraging technology for sustainability. This includes improving productivity through precision agriculture, prioritising water conservation, and enhancing resilience to climate change. The model also focuses on strengthening local production and ensuring access to climate-resilient seeds, sustainable fertilisation, and effective pest control.

Morocco is facing increasing waste generation, with the cost of environmental degradation reaching nearly 33 billion DH or 3.52% of GDP.[51] In response, the country has adopted the National Strategy for the Recovery and Reduction of Waste (SNRVD), aligned with its sustainable development goals. The strategy prioritises the waste management hierarchy: first, reducing waste production; second, reusing materials; and third, recycling, composting, or generating energy from waste. Landfilling is considered a last resort. The strategy emphasises circular economy principles, including reducing, reusing, and recycling, to address the growing waste challenge.

The Energy, Mining, and Geology Sectors Strategy focuses on three key areas. For energy, the goal is to use the sustainable energy transition as a driver for economic and social development. Key objectives include ensuring energy security, availability, widespread access, demand control, and environmental preservation. Strategic actions

49 See https://faolex.fao.org/docs/pdf/Mor185348.pdf, accessed 7 October 2024.
50 See https://csmd.ma/documents/Rapport_General.pdf, accessed 7 October 2024.
51 See https://siredd.environnement.gov.ma/BeniMellal-Khenifra/Files/Documents/ETUDE%20SNRVD%20-%2016-04-2019%20VF.pdf, accessed 7 October 2024.

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include optimising the energy mix, developing renewable energy, enhancing energy efficiency, and exploring new energy sources including hydrogen and biomass. In the mining sector, the focus is on revitalising the national mining industry, particularly non-phosphate mining. The Morocco Mines Plan (PMM) 2021-2030 aims to build on the 2013 strategy, ensuring responsible and sustainable development at local, regional, and national levels.[52]

Additionally, the Green Generation Plan for Agriculture focuses on promoting sustainable agricultural practices that protect and improve soil health while enhancing productivity and food security.[53] Agriculture in Morocco has long been a strategic sector crucial to the country's socio-economic development. Following the Green Morocco Plan (PMV) (2008-2020), which aimed to make Morocco a major agricultural exporter, the Generation Green Plan (2020-2030) was launched to ensure sustainability and resilience in the sector. The PMV successfully increased agricultural production but led to issues including overexploitation of groundwater and reduced water reserves. The Generation Green plan seeks to address these challenges, reinforcing and expanding the reforms initiated under the PMV. The new strategy, inspired by royal directives, aims to align with national projects including the National Water Plan and vocational training development. It focuses on sustainability, agricultural growth, and strengthening the agricultural middle class, to double agricultural GDP and exports. This vision emphasises giving stakeholders more responsibility for effective resource management.

4.3 General environmental law

Morocco's legal framework for environmental protection and sustainable development lays a foundation for addressing soil management, although specific legislation solely dedicated to soil remains absent. The framework is anchored in Framework Law No. 99.12 of 2014, which establishes a national charter for the environment and sustainable development, defining fundamental objectives for state action to protect natural resources, including soil, within the broader context of sustainability.[54] Law No. 11.03 of 2003 complements this by outlining general principles for environmental protection and development.

52 See https://mtedd.gov.ma/index.php?option=com_content&view=article&id=17&Itemid=295&lang=en, accessed 7 October 2024.

53 See https://www.agriculture.gov.ma/fr/ministere/generation-green-2020-2030, accessed 7 October 2024; https://www.ada.gov.ma/sites/default/files/GG/Nouvelle%20stratégie%20agricole%20-%20Presentation%20projetée.pdf, accessed 7 October 2024.

54 See http://dmp.uae.ma/textes_juridiques/generaux/loi_cadre_99_12.pdf, accessed 7 October 2024.

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Chapter III of Law No. 11.03 focuses on the protection of nature and natural resources, explicitly mentioning soil and subsoil.[55] It emphasises their protection against degradation and calls for their rational exploitation. Article 17 advocates general soil protection, while Article 18 introduces measures to address desertification, erosion, pollution, and other threats. Article 19 requires prior authorisation for activities that could harm soil, such as industrial or agricultural development. Chapter IV addresses pollution and waste management, indirectly protecting soil by regulating harmful discharges and waste disposal. Chapter V introduces environmental quality norms, considering soil's capacity for self-purification and its ecological significance.

In 2011, a draft law specifically targeting soil protection was introduced by the Ministry of Energy Transition and Sustainable Development.[56] This initiative aimed to create a dedicated framework for soil governance, addressing principles such as collective heritage, damage prevention, precautionary measures, and polluter responsibility. It proposed measures for rational land use, contamination prevention, and site rehabilitation, but the draft remains unpublished and unenacted. Existing provisions in Law No. 11.03, while valuable, are broad and lack specificity, treating soil within a generalised environmental context rather than as a unique resource requiring focused attention.

Despite these legislative efforts, several challenges remain. The lack of precise definitions for "soil" and "subsoil" within the legal framework hampers targeted policy implementation. Soil is often overshadowed by other environmental concerns, such as air and water quality, and the existing provisions largely depend on pre-existing laws without introducing enforceable measures tailored to soil-specific issues. Implementation gaps and insufficient regulations further limit the effectiveness of current soil governance.

Opportunities for improvement include enacting the draft soil law to establish a comprehensive legal framework specifically addressing soil's importance. Clarifying and expanding the scope of existing provisions within Law No. 11.03 could also strengthen their application to soil. Developing measurable standards and protocols for soil health, akin to those for air and water, would provide a clear basis for policy enforcement. Enhanced collaboration among agriculture, urban planning, and environmental sectors could integrate soil protection measures into broader sustainable development strategies. Addressing these gaps would strengthen Morocco's capacity to protect its soil resources, ensuring ecological balance, long-term food security, and sustainable development.

55 See https://www.onssa.gov.ma/wp-content/uploads/2022/06/Reglementation/C.Reglementation-Connexe/4.%20Divers/LOI.11-03.FR.pdf, accessed 7 October 2024.

56 See http://www.environnement.gov.ma/fr/sol/114-theme/sol/214-un-projet-de-loi-specifique-pour-la-protection-des-sols, accessed 7 October 2024.

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4.4 Conservation and exploitation of forests

Forest management in Morocco plays a pivotal role in soil conservation, particularly in combating erosion. The Dahir of 10 October 1917 on the conservation and exploitation of forests provides a robust legal framework for this purpose. Article 25 of the Dahir emphasises the necessity of forest conservation in specific cases where it directly impacts soil health and ecosystem stability. This includes maintaining land stability on mountains or slopes, protecting soil against both rain-induced erosion and invasion by running water, safeguarding dam reservoirs from sedimentation, ensuring the sustainability of water sources and watercourses, mitigating wind erosion and sand encroachment, and preserving public health and socio-economic balance. To prevent harmful clearing practices, the Dahir imposes conditions on land use. Article 25a stipulates that clearing activities may only proceed if the landowner commits to implementing soil protection and restoration measures. These measures are predefined in terms of their nature, scope, and timelines within the non-opposition decision. Should the landowner fail to comply, the administration is empowered to carry out the necessary works under the provisions of Article 27. Alternatively, the landowner may renounce the clearing before its commencement. The administration may impose additional conditions to mitigate the impact of clearing. These could include prohibiting the uprooting of certain tree species or mandating the retention of a specified number of trees to preserve the land's ecological integrity.

The Dahir of 20 September 1976 complements these provisions by institutionalising governance structures for forest management. It establishes the National Forestry Council under the Ministry of Agriculture and Agrarian Reform and provincial and municipal councils to oversee the development and enhancement of Morocco's forest heritage. These councils play critical roles in reconciling administrative and user interests, resolving disputes, and proposing legal and regulatory solutions. The National Council specifically addresses conflicts related to the use of arable land within forests and defines guidelines for sustainable resource use. Meanwhile, municipal councils regulate temporary forest land occupations and oversee quarry exploitation through their deliberative processes. This multi-tiered governance system supports soil protection and ensures that forest management contributes to broader environmental, social, and economic goals. By balancing the rights and responsibilities of landowners, users, and the state, these legal instruments reinforce sustainable land-use practices, safeguarding Morocco's soil and forest resources for future generations.

4.5 Soil protection and restoration

Article 6 of the Dahir of 25 July 1969, on the defence and restoration of soils, grants the Moroccan administration the authority to establish zones known as "perimeters of

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defence and restoration of soils of national interest." These zones can be created through a decree proposed by the Minister of Agriculture and Agrarian Reform, in consultation with the Ministers of the Interior and Finance. This designation is used in situations where erosion poses significant threats, such as endangering built-up areas, public works, or agricultural regions, or when erosion control measures are required across entire elementary or main watersheds. Within these designated perimeters, the state has the authority to mandate measures and implement works aimed at combating erosion. The specific conditions for these interventions are outlined in the Dahir, ensuring a structured approach to soil conservation within critical areas.

Beyond the designated perimeters, the Dahir also provides for state support in broader soil restoration efforts. This support is offered through agreements with private owners, communities, and legally recognised groups willing to adopt administration-recommended measures for soil protection and restoration. Assistance may take the form of direct involvement in carrying out restoration works or granting subsidies to facilitate these efforts. This dual approach—combining direct state action in high-priority areas with incentivised collaboration outside these zones—underscores Morocco's commitment to addressing soil erosion comprehensively. By integrating regulatory mechanisms with financial and technical support, the framework encourages the widespread adoption of sustainable practices essential for long-term soil conservation and resilience against environmental degradation.

4.6 Combating air pollution

Law No. 13-03 on the fight against air pollution establishes a comprehensive framework to prevent and combat atmospheric emissions that could harm human health, wildlife, soil, climate, cultural heritage, and the environment.[57] It applies to all natural or legal persons, whether under public or private law, who own, hold, use, or operate buildings or installations involved in activities such as mining, industry, commerce, agriculture, craftsmanship, motor vehicle operation, waste incineration, heating, or refrigeration.

The law's implementation is supported by various regulations and directives aimed at ensuring compliance and effective management of air quality. Decree No. 2.18.74 of 21 March 2019, establishes the national greenhouse gas emissions inventory system. Decree No. 286-09-2 of 8 December 2009, sets air quality standards and outlines the procedures for creating security networks, while Decree No. 2.09.631 of 6 July 2010, specifies the permissible limits for discharges and releases of pollutants from persistent sources, along with control methods. Additional joint orders provide sector-specific regulations, such as emissions standards for the ceramics and cement industries, which

57 Dahir No. 1.03.61 of 12 May 2003 establishing Law No. 13-03 relating to the fight against air pollution.

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include the determination of pollutant discharge ceilings and provisions for waste incineration.

The law also addresses the calculation of air quality indices, as detailed in the joint order of 8 May 2014, and establishes notification thresholds, alert protocols, and emergency measures through the joint order of 29 October 2014. Vehicle emissions standards are defined through a series of joint orders, including those of 25 December 2010, 8 October 2012, and subsequent amendments through 2022, which set conditions for vehicle approval based on compliance with pollutant emission and fuel engine requirements.

By integrating these measures, the legislation reflects Morocco's commitment to reducing atmospheric pollution. It underscores the need for inter-ministerial coordination, the establishment of sector-specific standards, and the adaptation of policies to address evolving environmental challenges, ensuring the protection of both human and ecological health.

4.7 The coastline

Law No. 81.12 on the coast establishes the fundamental principles and rules for the integrated and sustainable management of coastal areas to ensure their protection, proper development, and enhancement.[58] This legal framework is complemented by a set of implementing decrees and orders that provide detailed provisions for its application.

Decree No. 2.21.965 of 17 May 2022, approves the National Coastal Plan, which outlines strategies for coastal management, as published in the Official Bulletin No. 7096 of 2 June 2022. Decree No. 2.15.769 of 15 December 2015, defines the composition, membership, mandate, and operational methods of the National Committee for Integrated Coastal Management and regional commissions. It also specifies the processes for developing the national and regional coastal plans, published in the Official Bulletin No. 6428 of 7 January 2016. Decree No. 717-95-2 of 22 November 1996, guides preparing and addressing emergency marine pollution, as detailed in the Official Bulletin No. 4440 of 19 December 1996. Additionally, Decree No. 2.07.253 of 18 July 2008, classifies waste and defines hazardous waste, contributing to environmental protection measures along the coast. The Prime Minister's Order No. 00-3-3 of 16 July 2003, implements the provisions of Decree No. 717-95-2 concerning marine pollution control measures, as reflected in the Official Bulletin No. 5132 of 7 August 2003.

These legislative instruments collectively support Morocco's commitment to safeguarding its coastal zones by integrating environmental sustainability, pollution control, and effective governance. The law underscores the need for a collaborative

58 Dahir No. 1.15.87 published on 16 July 2015 (BO. No. 6384 of 6 August 2015).

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approach involving national and regional authorities to address the multifaceted challenges of coastal management.

5 Legal texts concerning the main factors of soil degradation

Moroccan legislation includes several legal texts that address soil protection, covering a wide range of sectors involved in the preservation of natural resources.[59] These laws, developed over time to meet international obligations and adapt to evolving environmental concerns, are designed to enhance the protection and preservation of biological diversity, with a particular focus on the management of protected areas and biodiversity conservation.

One of the key legal frameworks is Law No. 07-22 on protected areas, which reflects Morocco's commitment to expanding and improving the quality of its network of protected areas. This law aligns Morocco's legal framework with international standards and ensures the protection of areas with biological and environmental significance. It not only includes national parks but also covers other internationally recognised types of protected areas. The law defines five categories of protected areas: national parks, natural parks, environmental reserves, nature reserves, and natural sites. These categories serve various purposes, including preserving biological diversity, protecting ecosystems, and supporting sustainable local development through responsible management.

Additionally, Law No. 05-22, which addresses the protection of wild animal and plant species and controls their trade, aims to conserve Morocco's rich natural wealth, which includes rare species and unique ecosystems. This law responds to the threats posed by overexploitation and international trade, especially of endangered species. It aligns with international agreements, particularly the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), which Morocco ratified in 1975.[60] This law provides a framework for regulating the trade of endangered species and controlling activities that put pressure on wildlife, ensuring that Morocco meets its international obligations.[61]

These legislative initiatives highlight Morocco's efforts to strengthen its legal arsenal in the field of nature protection, focusing on biodiversity conservation and

59 See Moroccohttp://fig.net/resources/proceedings/fig_proceedings/morocco/proceedings/TS4/TS4_5_ghanam.pdf, accessed 7 October 2024; https://www.environnement.gov.ma/fr/sol/114-theme/sol/212-les-processus-de-degradation-des-sols?showall=1&limitstart=, accessed 7 October 2024.

60 Adopted 3 March 1973, United Nations Treaty Series, Vol 993.

61 See http://www.eauxetforets.gov.ma/AccueilAR/SitePages/Contexte-National.aspx, accessed 7 October 2024; Law No. 29-05 relating to the protection of species of wild flora and fauna and the control of their trade.

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addressing factors that contribute to soil degradation, such as the loss of plant and animal species, deforestation, and unsustainable land use practices.

5.1 Urban planning

Urban planning in Morocco is guided by a set of evolving laws designed to manage urbanisation in line with both national and international development trends. At the core of urban planning is Law No. 12-90, which provides the framework for urban development in the country. This law lays the foundation for several urban planning tools, including the urban development master plan, the zoning plan, and the development plan.

The urban development master plan is a long-term planning tool that outlines the general organisation of urban growth over 25 years. Its primary goals include determining the economic and social development strategies for the region, identifying new zones for urbanisation, and preserving agricultural and forest areas by regulating when and where urban development can take place. Additionally, it specifies the allocation of land for various uses, such as agricultural, forest, green spaces, and areas of cultural or historical significance.

The zoning plan, a key component of the urban development master plan, helps local authorities prepare for development by establishing the main functions for different areas. It assigns zones for residential, industrial, commercial, and agricultural uses, ensuring that urban growth occurs in an organised manner and in line with the objectives of the master plan.

Meanwhile, the development plan provides more detailed guidance on land use. It outlines the allocation of zones for specific purposes, such as residential or industrial, and sets regulations for green spaces, public areas, and protected sites. This plan ensures that urban development respects the cultural, historical, and natural heritage of the region.

In addition to these key instruments, other legal texts further guide urban planning in Morocco. For instance, Dahir No. 1.92.7, enacted in 1992, regulates real estate divisions and residential complexes, while Dahir No. 1.60.063 focuses on the enlargement of rural buildings. Decree No. 2-92-832, which implements Law No. 12-90, helps enforce these regulations and manage land use at the local level.

A critical challenge Morocco faces is urban sprawl, particularly the uncontrolled expansion of cities into agricultural areas. This has become a significant issue, prompting the government to prioritise the regulation of land use through the urban planning framework. The urban development master plan plays an essential role in preventing the loss of agricultural and forest land by establishing clear boundaries and zoning laws.

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The law on soil protection should be closely aligned with these urban planning provisions. It should emphasise the importance of maintaining agricultural lands and preventing their conversion for non-agricultural uses. By doing so, Morocco can ensure the long-term sustainability of its agricultural soils, which are vital for food production and ecological health, while also managing urban growth in a way that respects both the environment and the needs of its growing population.

5.2 Pollution and waste management

Law No. 28-00 on waste management and disposal in Morocco aims to protect human health, ecosystems, and the environment by regulating the handling and disposal of waste. The law sets forth measures to prevent soil pollution and the harmful effects of waste on the environment. It emphasises that any individual or entity involved in waste production or handling must ensure that their actions do not harm the soil, fauna, flora, air, water, or landscapes. In cases where waste management might lead to environmental degradation, the law requires that proper elimination methods be employed.

The administration is tasked with drafting national and regional master plans for hazardous and non-hazardous waste management. These plans determine appropriate sites for disposal and storage facilities, ensuring they align with town planning guidelines and environmental protection standards. Special provisions are made for biodegradable agricultural waste, which may be disposed of on the farms where it is produced, provided it is managed in an environmentally responsible way.

Article 50 of the law prohibits the establishment of controlled landfills near sensitive environmental areas such as national parks, wetlands, and areas of high agricultural potential. In cases where a controlled landfill is closed, the operator is required to restore the site to an ecologically acceptable condition.

While the law plays a crucial role in preventing soil pollution related to waste handling, it does not specifically address the rehabilitation of sites contaminated by old landfills. Recent revisions to Law No. 28-00 have not introduced new provisions regarding soil contamination from historic waste disposal sites. To support the law, various decrees and orders provide specific guidelines and procedures for the import, export, and disposal of waste, including hazardous, medical, agricultural, and industrial waste. These regulations also cover the classification of waste and set standards for waste collection, treatment, and recovery methods, ensuring that waste management aligns with environmental protection standards.

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5.3 Cross-cutting issues

5.3.1 Environmental assessment

Morocco has made significant progress in establishing a regulatory framework to manage the environmental impact of economic activities, particularly through Law No. 12-03 on environmental impact studies (EIS) and Law No. 49-17 on environmental assessment.[62] These laws require that any project undergo an evaluation process to determine its environmental acceptability, based on principles of precaution, prevention, and responsibility. This evaluation aims to integrate environmental and social considerations into development projects, helping to minimise adverse impacts, including those on soil.

However, despite the advancement, gaps remain in the current legal framework, especially concerning the treatment of soil.[63] Soil is not fully addressed as a complex ecosystem in the environmental assessment process. The law lacks detailed criteria to assess the full range of impacts on soil quality, leaving certain activities that could negatively affect soil to potentially escape the assessment procedure. This limits the effectiveness of the law in protecting soil resources.

The law introduces several key processes to assess environmental impacts. It includes strategic environmental assessments that integrate environmental considerations into policies, plans, and programs; environmental impact studies to evaluate the effects of projects before implementation; and environmental impact maps that assess and mitigate minor impacts from smaller projects. Environmental inspections are also mandated to ensure existing industrial units and activities comply with environmental standards.

While these provisions represent significant strides forward, their full implementation is hindered by the absence of regulatory texts needed to specify procedures and requirements for different project stages. Many of these regulatory texts remain unpublished, causing delays in ensuring the law is fully operational. Moreover, although Law No. 19-17 attempts to address certain deficiencies by requiring approved design offices for major projects and mandating environmental audits for industrial units, challenges remain. The slow publication of necessary regulations and the lack of specific guidelines for assessing soil impacts indicate a need for stronger measures to ensure effective soil protection within Morocco's environmental assessment system.

62 Saad (2021).

63 Per Art 1 of Law No. 49-17 on environmental assessment, this law is part of the implementation of the requirements of the legal framework 99.12 as the National Charter for the Environment and Sustainable Development published in 2014, this new law replaces the provisions of Law 12.03 relating to environmental impact studies published on 12 May 2003.

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5.3.2 Provisions relating to public participation

In Morocco, civil society associations play a crucial and recognised role in areas related to development, the environment, and human rights. The legal framework governing these associations is rooted in Dahir No. 1,583,376 of 15 November 1958, which was revised in 1973 and amended in 2002. The Constitution of Morocco guarantees the right to form associations and emphasises the importance of establishing participatory mechanisms for dialogue and consultation. It also provides for the creation of the Consultative Council for Youth and Associative Action, which focuses on youth protection and promoting associative life.

Environmental civil society organisations in Morocco have several key roles and objectives.[64] They actively contribute to the work of public bodies in environmental matters by expressing opinions and participating in the formulation of policies and legislation, following the applicable laws. These organisations also have the right to litigation, allowing them to bring legal proceedings before judicial authorities in cases of environmental damage, ensuring accountability and protecting environmental rights. Furthermore, environmental civil society institutions work to consolidate the idea of environmental citizenship, promoting rational behaviour among citizens to preserve natural resources. Through various collective activities, these organisations aim to raise awareness of environmental issues and highlight the serious consequences of environmental degradation for human life and the planet. Finally, these associations support the principle of information and participation, providing citizens with accurate and specific information about environmental issues. This helps individuals better understand the environmental risks they face and empowers them to take informed actions toward safeguarding the environment.

5.3.3 Access to environmental information

Since March 2018, Morocco has implemented a legal framework through Law No. 31-13, which establishes the right of access to information. This law aims to enable citizens to access information held by legal entities under public law, such as the House of Representatives, the House of Councillors, public administrations, and courts. It is designed to enhance transparency and promote good governance by responding to the constitutional provision in Article 27, which guarantees citizens the right to access

64 See Arts 12-13 of the Constitution read with Framework Law No. 99-12 as the National Charter for the Environment and Sustainable Development published in the Official Journal of March 2014, which highlighted the need to strengthen the role of associations and institutions of civil society, which are now required to contribute to the achievement of development objectives and the preservation of the environment.

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information held by public institutions, elected bodies, and organisations entrusted with public service missions.

Access to environmental information plays a critical role in environmental protection efforts. It not only facilitates informed decision-making but also strengthens administrative transparency, ensuring that the public is well-informed about matters that affect their environment. As a result, citizens and civil society organisations now have the legal right to request access to information related to public service, except for those pieces of information deemed protected under the law.[65]

5.3.4 Access to the courts

Article 107 of the Moroccan Constitution asserts the independence of the judiciary from the legislative and executive branches, with the King serving as the guarantor of this independence.[66] Furthermore, Article 113 states that the High Council of the Judiciary (CSPJ), chaired by the King, ensures the protection of the rights and guarantees of judges, particularly regarding career management.[67] Article 118 emphasises the right of access to justice, stating that every person is entitled to defend their rights and interests through legal means. It further affirms that administrative actions can be appealed before the competent administrative court. This provision establishes access to state justice as a fundamental right for individuals and legal entities, while also allowing for alternative dispute resolution methods such as arbitration and mediation, which are governed by specific laws, including Law 95-17 on arbitration and conventional mediation.[68]

The judicial organisation in Morocco, as per Law No. 38.15, includes several levels of courts.[69] These range from the courts of first instance, which are spread across the country, to the courts of appeal and the Court of Cassation based in Rabat.[70] The

65 Art 2 of Law 31-13 specifies that within the meaning of this law, it is understood as: "Information: data and statistics expressed in the form of figures, letters, drawings, images, audiovisual recordings or in any other form, and included in documents, documents, reports, studies, decisions, periodicals, brochures, service notes, databases and other documents of a general nature, produced or received by institutions or institutions. The organisations concerned within the framework of the missions of the public establishment, regardless of the medium in which they are found, whether paper, electronic or other."

66 Mrahi (2017).

67 For more details concerning the prerogatives of the Higher Council of the Judiciary: see the provisions of Organic Law No. 100-13, which came into force under Dahir No. 1-16-40 of 24 March 2016.

68 BO 7099 of 13 June 2022 and entered into force on 14 June 2022.

69 For example, Art 5 of Law No. 80.03 establishing administrative courts of appeal provides that: "Administrative courts of appeal are competent to hear, on appeal, judgments rendered by administrative courts and orders of their presidents unless otherwise provided by law."

70 Dahir No. 1.22.38 of 30 June 2022 relating to Law No. 38.15 relating to the judicial organisation (BO No. 7108 of 14 July 2022).

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country's judicial system covers a variety of jurisdictions, including commercial and administrative courts.[71]

In environmental matters, Morocco's judiciary plays a crucial role in safeguarding the environment by addressing violations and ensuring that offenders are held accountable. Courts are expected to protect the environment through judgments that require environmental offenders to pay civil compensation and face punishment according to the law. Moroccan law includes provisions on civil liability for environmental damages, with laws such as Law No. 11.03 on environmental protection, Law No. 13.03 on combating atmospheric pollution, Law No. 28.00 on waste management, and Law No. 36.15 on water.[72] However, these special laws have had limited success in protecting the environment and public health, as they only address certain types of environmental damage. As a result, the judiciary often relies on broader civil liability provisions to fill the gaps and ensure adequate environmental protection.

5.3.5 Instruments specific to foreign investments

Framework Law 03-22, which forms the Investment Charter of Morocco, is designed to achieve several important objectives, with a focus on creating permanent jobs, reducing regional disparities in investment attraction, and directing investments towards priority sectors. One of the central goals is to increase the share of private investment from one-third to two-thirds by 2035.

The law is divided into several parts that address different aspects of the investment environment. It begins with general provisions, setting the foundational principles and definitions. It then outlines systems and mechanisms to support investment, including additional complementary measures. Investors are granted various legal guarantees and protections under the law. Investment governance is also emphasised, detailing how investments will be managed and overseen. To address potential conflicts, the law includes provisions for dispute settlement. Finally, the law contains miscellaneous and transitional provisions, ensuring a smooth implementation of the reforms.

71 Decree No. 2.23.665 of 10 November 2023 establishing the judicial mapping of the kingdom (BO No. 7260 of 28 December 2023).

72 Art 77 of the Moroccan Code of Obligations and Contracts provides that: "Any act whatsoever, of a person who, without the authority of the law, knowingly and voluntarily causes material or moral damage to another, obliges its author to repair said damage, when it is established that this act is the direct cause. Any stipulation to the contrary is without effect."

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5.3.6 Compliance with public law

The principle that "ignorance of the law is no excuse" is a well-established legal doctrine, confirmed by Article 2 of the Moroccan Penal Code. This principle means that individuals cannot avoid responsibility for their actions by claiming ignorance of the law. While there is no formal requirement for citizens to know all laws, the onus is on individuals to inform themselves and abide by the legal rules in place. This obligation extends to all persons on Moroccan soil, including foreigners, as affirmed in Article 6 of the Constitution. The law is considered the highest form of the nation's will, and all individuals and legal entities, including public authorities, are equal before it and must comply. Public authorities are responsible for creating conditions that ensure the freedom, equality, and participation of citizens in various aspects of life, including political, economic, cultural, and social matters. Additionally, the Moroccan legal framework ensures that laws are clear, published, and adhere to the principles of constitutionality, hierarchy, and the non-retroactive effect of legal standards. This means that laws do not apply to actions that occurred before their enactment, offering a measure of fairness and clarity.

5.3.7 The question of the enforcement of foreign judgments

In Morocco, the execution of foreign court decisions is governed by specific provisions in the Code of Civil Procedure, particularly Articles 430-432. While court decisions are typically executed in the country where they are issued, there are exceptions allowing for their enforcement in other countries, including Morocco. To ensure that the execution of foreign judgments does not interfere with the political, economic, or social order, Moroccan law requires that any foreign judicial decision be recognised through a process called "exequatur." The exequatur is a legal procedure by which a foreign judgment or act is formally recognised and made enforceable in Morocco. Before a foreign decision can be executed, it must meet certain requirements in terms of both form and substance.[73] Once the exequatur is granted, the foreign judgment holds the same legal weight as a domestic Moroccan decision and can be executed according to Moroccan law.

5.3.8 Fair or legal acquisition of land

In Morocco, the right to property is constitutionally guaranteed, though its exercise may be subject to limitations for reasons related to the country's economic and social

73 Belbachir (2023).

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development. Expropriation is permitted only in the cases and forms specified by law. Article 14 of the Code of Real Rights states that property owners have the exclusive right to use, exploit, and dispose of their property, with limitations only imposed by law or agreement.[74] The land ownership structure in Morocco is diverse, with several categories of property governed by different laws and regulations.

Collective lands are an important category, particularly for ethnic communities. These lands are owned by communities such as tribes, tribal factions, and douars, and are governed by the Dahir of 27 April 2019. These communities are legally recognised under private law, with supervision by the Ministry of the Interior. The total area of collective land is around fifteen million hectares, primarily used for pastures (85%) and agriculture. Collective lands are considered imprescriptible, unseizable, and inalienable, except for transactions with the state, public institutions, local authorities, and other ethnic communities. The governance of these lands is managed by the Naibs (delegates) of ethnic communities, who oversee decisions on transactions and the distribution of collective land benefits.[75] Administrative delimitation and real estate registration are the main procedures used to manage these lands.

Guich lands are a particular type of property granted to tribes by the sovereigns in return for military services. These lands are still under the supervision of the Ministry of the Interior and are considered inalienable, unseizable, and imprescriptible. They can only be expropriated for public utility.

Habous buildings are properties designated for public or charitable purposes, governed by Muslim law (Maliki rite) and subject to the Dahir No. 1.09.236 of 23 February 2010. These properties are inalienable, unseizable, and cannot be used as collateral or transferred, except under specific conditions.

State lands include both the public and private domains. Public lands, such as roads, shores, and ports, are managed by the Ministry of Equipment and are inalienable and unseizable. State private lands can be sold under specific conditions, but as with public lands, they are inalienable and unseizable unless formally altered.

Melk properties are those owned privately, often through inheritance or contract. These properties can be transferred, seized, and expropriated for public utility.

Buildings in the process of being registered are those undergoing the land registration process, which, once completed, results in a definitive land title governed by the Dahir of 12 August 1913.

Agricultural land ownership is restricted for foreigners. To acquire agricultural land, the land must first be reclassified as non-agricultural, a process requiring a "non-agricultural certificate" from the Regional Investment Centre.

74 Dahir No. 1-11-178 of 22 November 2011 promulgating Law No. 39-08 relating to the Code of Real Rights as amended and supplemented.

75 See http://www.terrescollectives.ma/, accessed 7 October 2024.

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Morocco's land ownership system, with its various categories and legal frameworks, reflects the complexity of property management and emphasises the protection of collective and public lands.

5.3.9 Fair taxation

The Moroccan tax system is divided into two main categories: state taxation and local taxation. State taxation is governed by the General Tax Code (CGI), while local taxation is regulated by Law No. 47.06, which covers the taxation of local authorities. State taxes in Morocco include income tax (IR), which applies to the income and profits of individuals and partnerships. Corporate tax (IS) targets the profits of companies and legal entities. Value Added Tax (VAT) is levied on consumer spending, while registration fees (DE) and stamp duties apply to specific documents and transactions, such as contracts and property deeds.

To encourage investment and stimulate growth in certain sectors, Morocco offers tax exemptions in some industries, aiming to promote economic development.[76] The tax system operates on a declarative basis, meaning that taxpayers are responsible for declaring their income and profits. Consequently, tax auditing plays an essential role in ensuring compliance. Audits are conducted by tax inspectors under the General Directorate of Taxes, which operates under the supervision of the Ministry of Economy and Finance. These audits are crucial both as a deterrent against non-compliance and as a means of educating taxpayers about their obligations.

5.3.10 Legal requirements for environmental monitoring

In Morocco, environmental monitoring is primarily the responsibility of the Ministry of Energy Transition and Sustainable Development, under the Secretariat of State responsible for sustainable development. According to Article 10 of the decree that defines the ministry's roles, it ensures the enforcement of environmental legislation by conducting regular checks and inspections, in collaboration with relevant departments.[77] Environmental monitoring involves both technical and legal processes aimed at ensuring compliance with environmental laws, regulations, and technical standards. It includes scheduled and surprise inspections to verify adherence to legal requirements. The importance of these monitoring activities is influenced by factors such as

76 See https://www.tgr.gov.ma/wps/wcm/connect/24173050-c3f5-44c9-8e95-c8f841f03524/levolution_fiscalite_marocaine.pdf?MOD=AJPERES&CACHEID=24173050-c3f5-44c9-8e95-c8f841f03524,https://www.finances.gov.ma/Publication/dgi/2024/Note-Synthetique-MesuresFiscales2024.pdf, accessed 7 October 2024.

77 Decree No. 2.14.758 of 23 December 2014.

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political will, as expressed in the National Charter for the Environment and Sustainable Development.

However, environmental control is not solely the responsibility of the Ministry of Energy Transition. Other government bodies also play key roles in environmental management. For example, the Ministry of the Interior oversees territorial administration and public security, including the supervision of local authorities, and the Ministry of Agriculture is also involved in certain aspects of environmental governance. Several specialised agencies also contribute to environmental monitoring. The National Agency for Water and Forests is responsible for managing and implementing policies related to forests, sylvo-pastoral resources, wildlife conservation, and desertification control.[78] Additionally, the water basin agencies monitor water resources, conducting measurements, and studies, and ensuring integrated management of water resources, particularly considering extreme climatic events such as floods and droughts.[79]

To enforce environmental laws, there are several law enforcement agencies. The judicial police handle general environmental violations under the criminal code. The environmental police, established by Article 35 of the National Charter for the Environment, are specifically tasked with monitoring environmental laws, conducting inspections, investigations, and reporting violations.[80] They work under the government authority responsible for the environment. The water police, meanwhile, focus on violations related to water laws, conducting investigations and reporting breaches in compliance with the water law and its regulations. These police forces, including judicial, environmental, and water police, work together to detect, investigate, and penalise environmental offences.[81]

5.3.11 Availability and accessibility of data

The Moroccan government has made strides in managing environmental data, but significant gaps still exist, especially concerning soil data. While various institutions, including agriculture, urban planning, and water and forest agencies, collect and manage sector-specific data, this information is often confined to internal use and lacks centralisation or wide dissemination. Research institutions such as INRA and ICARDA collect data on land use and degradation, yet much of this work remains limited to the efforts of individual researchers rather than comprehensive national initiatives.

The High Commission for Planning (HCP) is the main producer of official statistics in Morocco, but its publications related to soil are minimal, appearing only in certain

78 Law No. 52-20 establishing the National Water and Forests Agency (BO No. 7014 of 19 August 2021).
79 Art 80 of Law No. 36-15 relating to water (Bo. No. 6506 of 6 October 2016).
80 Bo. No. 6366 of 4 June 2015.
81 Art 131 of Law No. 36-15 relating to water (Bo. No. 6506 of 6 October 2016).

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speeches or studies, underscoring the need for a more robust data collection and dissemination system on soil issues. Recognising this, the Moroccan government has embarked on an ambitious project to enhance data management, particularly in the public sector, including institutions such as ministries and local authorities. This effort aims to unlock large quantities of data that can be reused across various sectors, benefiting researchers, developers, businesses, and the public. As part of these efforts, the government has launched the national open data portal, managed by the Digital Development Agency (ADD), which allows free access to various data sets. This initiative supports Morocco's commitment to Open Government, enhancing transparency and enabling the creation of innovative services. However, soil-related data remains scarce within this platform, reflecting the broader challenge of collecting and disseminating environmental data.

Additionally, the Moroccan government produces regular reports on the state of the environment, such as the State of the Environment Report (REEM). The most recent edition, REEM4 (2020), is based on the DPSIR framework (Driving Forces, Pressures, State, Impacts, and Responses), which provides a comprehensive analysis of key environmental themes.[82] Soil is one of these themes, alongside water, air, climate change, and others.[83] Despite these efforts, more attention needs to be given to improving the collection, integration, and publication of soil-related data to better address environmental challenges and guide policy decisions.

5.3.12 Expertise and support from research institutions

Morocco has developed significant natural resource and soil management expertise, backed by extensive scientific research. Based on a participatory approach, the State of the Environment Reports involve consultations with various sectors and a national multidisciplinary network that includes universities and research institutes.[84] This approach helps assess environmental conditions and trends, highlighting the causes and consequences of environmental changes, including challenges that Morocco will face in the future. The report covers seven major environmental areas, such as water, air, soil, marine environments, climate change, and the circular economy.

82 See https://mtedd.gov.ma/index.php?option=com_content&view=article&id=29:4eme-rapport-sur-l-etat-de-l-environnement-du-maroc-version-integrale&catid=13:publications&Itemid=452&lang=en; https://www.environnement.gov.ma/PDFs/Rapport-reem.pdf, accessed 7 October 2024.

83 See https://mtedd.gov.ma/index.php?option=com_content&view=article&id=29:4eme-rapport-sur-l-etat-de-l-environnement-du-maroc-version-integrale&catid=13:publications&Itemid=452&lang=en, accessed 7 October 2024.

84 See https://www.environnement.gov.ma/ar/etat-d-environnement-ar/119-etatenv/3443-rapport-sur-l-etat-de-l-environnement-au-maroc-ar, accessed 7 October 2024.

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Several public institutions, scientific research bodies, and public companies manage different aspects of soil and natural resource conservation. Many of these are overseen by the government's agriculture authority. For instance, the Regional Offices for Agricultural Development (ORMVAs) are responsible for managing irrigation areas, studying land improvements, and advising farmers on modern cultivation and management techniques. Other key institutions such as the National Seed Marketing Company (SONACOS) are involved in the supply of fertilisers, seeds, and seedlings, contributing to soil fertility.

The National Agency for Land Conservation, Cadastre, and Cartography (ANCFCC) manages land registration, conservation, and mapping, playing an essential role in land management. Institutions such as the National School of Agriculture of Meknes (ENA) and the National Forestry Engineering School of Salé (ENFI) train professionals in agricultural and forestry disciplines, supporting sustainable land and resource management. Furthermore, the National Institute for Agricultural Research (INRA) and Hassan II Agronomic and Veterinary Institute (IAV) are dedicated to agricultural research and innovation, developing techniques to improve soil and agricultural productivity.

Other key players include the National Office of Agricultural Council (ONCA), which provides agricultural advice to farmers, and the National Agency for the Development of Oasis Zones and Argan (ANDZOA), which focuses on integrated development in specific agricultural regions. Similarly, the Agricultural Development Agency (ADA) is instrumental in promoting agricultural modernisation and productivity improvement.

The Official Laboratory for Chemical Analysis and Research (LOARC), established in 1914 and restructured in 1984, ensures the quality of agricultural products, fertilisers, and pesticides through chemical analyses, expert appraisals, and research. It also supports the Customs Administration and aligns with international regulatory standards. The National Office for Food Safety (ONSSA), created in 2009, oversees plant, animal, and food safety. It conducts veterinary and phytosanitary inspections, approves agricultural inputs, and ensures food quality, safeguarding Morocco's supply chain and consumer confidence. The National Interprofessional Office of Cereals and Legumes (ONICL), founded in 1937, manages Morocco's cereal and legume markets, maintains security stocks, regulates imports and exports, and supports sector modernisation through studies and market monitoring.

The International Centre for Agricultural Research in Dry Areas (ICARDA) is another significant partner working with Morocco on innovative projects that aim to create sustainable and resilient livelihoods for farming communities. ICARDA's collaboration with Moroccan institutions, especially INRA, has been instrumental in advancing research, particularly in dryland agriculture. Over the years, ICARDA has invested heavily in the country, helping to develop sustainable agricultural practices and contributing to Morocco's "Generation Green 2020-2030" strategy, which aims to

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modernise the agricultural sector, improve food security, and boost rural employment, especially for women and youth.

5.3.13 Staff and technical equipment

Soil conservation is a critical issue in Morocco, where there is broad recognition that soil is a non-renewable natural resource essential to economic and social well-being. Agriculture, contributing nearly 15% of GDP and employing around 40% of the workforce, depends heavily on healthy soils. In response, the Moroccan state, companies, public institutions, and civil society have prioritised soil protection and sustainable management. Key initiatives include Law No. 11-03, which establishes mechanisms to safeguard soil from harmful human activities and promote sustainable agricultural practices, and the National Sustainable Development Strategy (SNDD), which sets specific soil conservation objectives aimed at reducing degradation and promoting environmentally friendly techniques. The Green Morocco Plan (PMV) emphasises natural resource management, advocating advanced agricultural technologies and resilient crops to improve soil health, while the Desertification Control Programme works to restore degraded lands and prevent desertification through tree planting and sustainable farming practices. Scientific research institutions play a significant role in supporting these efforts, providing technical expertise and aligning public policies with soil health objectives. The National Committee on Climate Change and Biodiversity, comprising expert members, ensures coherence across national policies addressing climate change, biodiversity, and sustainable development. It coordinates Morocco's commitments under the UN Framework Convention on Climate Change, the Convention on Biological Diversity, the Paris Agreement, and the UN Sustainable Development Goals,[85] ensuring effective implementation across sectors.

6 Specific information on the legal framework concerning the main factors of soil degradation

6.1 Agriculture

In Morocco, the Useful Agricultural Area (UAA) spans 9,183,375 hectares, dominated by cereals occupying 6.2 million hectares (68%), followed by fallow land (12.5%), fruit growing (8.8%), fodder (2.2%), legumes (2.8%), market gardening (2.6%), and

85 Adopted 25 September 2015, UN General Assembly Resolution A/RES/70/1.

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smaller shares for oilseeds (1.2%) and industrial plantations (1.9%).[86] Forests cover 12.6% of the national territory, equating to 9,132,500 hectares, with natural forests comprising 63.7%, Alfa grasslands 34.9%, and 1.4% artificial plantations. Rangelands extend over 65 million hectares, primarily collective lands characterised by low productivity and spread across various ecological zones, mainly in arid, semi-arid, and Saharan climates, accounting for over 90% of their area.

Morocco's irrigated areas in 2000 totalled 1,004,500 hectares, around 11% of the UAA, with gravity irrigation prevailing (87%) alongside sprinkling systems (13%). Large-scale hydraulics accounted for 672,200 hectares, and small to medium-scale hydraulics covered 332,300 hectares. However, UAA per inhabitant has declined significantly, from 0.732 hectares in 1960 to 0.224 hectares in 2020. This trend, driven by demographic pressures, reduced farm sizes, and land scarcity, compels farmers to seek new lands at the expense of pastoral and forest resources, intensifying cereal cultivation.

Legislation such as Law No. 33-94 addresses soil conservation within bour development areas, aiming for integrated, modern agriculture through participatory planning.[87] The law delineates zones for agricultural development, pastoral improvement, and soil conservation, mandating operations including clearing, erosion control, and vegetation management (Article 37). Specific measures include planting windbreaks, dune stabilisation, and erosion infrastructure. Sanctions for violations include imprisonment and fines, although enforcement challenges hinder effectiveness (Article 48). The challenges in implementing these provisions stem from their lack of a sufficiently mandatory nature, and the enforcement of the prescribed sanctions has proven to be limited in practice. Despite being relatively dated, this law includes valuable measures for the conservation and development of bour soils (rain-fed agriculture).

Law No. 42-95 regulates agricultural pesticide trade, prohibiting unapproved products and requiring verification of their safety for humans, animals, and the environment. This encompasses a range of products, including herbicides, antiseptics, and plant growth regulators. Despite its rigour, the law's practical impact depends on robust implementation and monitoring mechanisms.

The government authority responsible for agriculture plays a central role in shaping and executing policies for agricultural development. Within the framework of its responsibilities, and in coordination with other ministerial sectors, the ministry ensures the formulation and implementation of government policies for agricultural development and preparation, designs strategies to improve and organise real estate structures in the agricultural sector and implements measures to optimise the use of water resources for irrigation purposes. It also encourages agricultural production and supports

86 See https://www.agrimaroc.ma/secteur-agricole-au-maroc/; https://www.ires.ma/sites/default/files/docs_publications/rapport-de-synthese_-avenir-de-lagriculture-au-maroc-_-version-publique.pdf, accessed 7 October 2024.

87 Promulgated by Dahir No. 1-95-10 of 22 February 1995.

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professional agricultural organisations within production chains, establishes mechanisms to promote investment in agriculture, and conducts studies and research essential for regional and national agricultural development. The ministry is tasked with drafting and enacting legal and regulatory frameworks for agricultural activities, collecting, analysing, and disseminating agricultural statistics and information, and developing strategies for higher agricultural education, research, and technical or vocational training. Additionally, it participates in free trade negotiations related to agriculture, explores new markets, and promotes plant and animal products. The ministry is involved in implementing studies and projects to transform and add value to agri-food products, monitors national and international markets, agricultural product prices, and production costs, and proposes appropriate intervention measures. It also shapes and implements policies for plant, animal, and food safety nationwide and at border points, while proposing and coordinating rural development policies and ensuring their execution in collaboration with relevant authorities.[88]

6.2 What is more?

The Green Morocco Plan was accompanied by a series of legal and regulatory reforms, leading to a comprehensive overhaul of the agricultural sector's legislative framework. Between 2008 and 2019, more than 22 legal texts and over 4,850 regulatory texts (decrees and orders) were enacted.[89] The New Green Generation Strategy (2020-2030), with a focus on promoting eco-resilient agriculture, emphasises the adoption of best practices, such as direct seeding on one million hectares, to conserve soil and enhance its sustainability.

Key constitutional and legal reforms in the agricultural sector from 2008 to 2019 include Dahir No. 1-08-85 (2008), which amended Agricultural Credit Law No. 15-99, and Dahir No. 1-09-16 (2009), which established the Agency for Agricultural Development. Other reforms, such as Dahir No. 1-10-187 (2010), led to the creation of the National Agency for the Development of Oasis Zones and Argan Trees, and Dahir No. 1-12-67 (2013) established the National Office of Agricultural Council. Reforms also targeted land status and registration, including Dahir No. 1-11-177 (2011) and Dahir No. 1-19-117 (2019), addressing land registration laws and collective lands in irrigation areas.

88 The mandate of the agricultural sector was determined by Decree No. 2.09.168 issued on 25 Jumada al-Awwal 1430 (21 May 2009) specifying the mandate and organisation of the central directorates of the Ministry of Agriculture, Fisheries, Rural Development, Water and Forests, as amended and supplemented.

89 See the website https://www.agriculture.gov.ma/fr/ministere/cadre-juridique, accessed 7 October 2024.

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In the area of agricultural production chains, significant laws include Dahir No. 1-08-56 (2008), which addressed distinctive signs of origin and quality for foodstuffs, and Dahir No. 1-12-66 (2013), which introduced organic production laws. The legal framework also focused on professional organisations and agricultural advisory services, as seen in Dahir No. 1-12-14 (2012) and Dahir No. 1-14-94 (2014), which regulated agricultural and fishing interprofessional organisations and agricultural advisory professions.

Regarding food safety, Dahir No. 1-10-08 (2010) established laws for the health and safety of food products. Complementing these reforms, several regulatory decrees have been issued to implement these laws, including those relating to agricultural credit reform (Decree No. 1.08.85, 2008), the Agricultural Development Agency (Decree No. 1.09.16, 2009), and the National Office for Food Safety (Decree No. 1.09.20, 2009), among others. These reforms collectively contribute to enhancing the agricultural sector's regulatory framework and fostering sustainable development in agriculture.

6.3 The mining sector

Morocco's new mining plan for 2021-2030 seeks to enhance the country's mining sector significantly, aiming to boost transactions—excluding phosphates—from 6.5 billion dirhams in 2020 to 15 billion dirhams by 2030.[90] This ambitious goal focuses on increasing investments in research and exploration and improving the legal and regulatory framework to attract both foreign and local investments.

Key amendments to Morocco's mining law, introduced in July 2021, are designed to improve the business environment. The changes focus on simplifying procedures for obtaining mining licenses and increasing transparency, making the sector more attractive to investors. Notably, the amendments allow for a second three-year renewal of mining permits, contingent on a program to develop proven mineral resources. This provision is expected to foster more technical studies and advanced exploitation methods.

The law also prioritises the employment of local labour, provided they meet the required qualifications, and encourages the use of locally sourced materials. Additionally, it mandates that local companies be subcontracted under certain conditions, fostering broader economic participation. A significant addition is the creation of a Strategic Minerals Committee, which will determine a list of strategic minerals. This list will be updated annually to reflect both local and global industry needs. To further

90 See https://www.mem.gov.ma/Lists/Lst_rapports/Attachments/30/PPM%20flyer.pdf, accessed 7 October 2024.

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enhance exploration and investment, Morocco has also provided new opportunities for the mining areas in Tafilalet and Figuig.[91]

Additionally, Law No. 27-13, which came into effect in November 2017, regulates quarry exploitation in Morocco. This law, along with its implementing decree, replaces the outdated Law No. 08-01. It adopts a comprehensive approach to quarry management, emphasising resource optimisation, environmental sustainability, and careful regulation of mining practices, especially concerning natural spaces and communities.[92]

In Morocco, the implementation of the legal framework governing the mining sector is overseen by the government authority responsible for Energy Transition. This ministry plays a central role in several aspects of the mining sector, ensuring that the sector's development aligns with national strategies and complies with the relevant legislative and regulatory frameworks. The ministry is tasked with supervising and formulating national strategies for the development of geology, minerals, hydrocarbons, and energy, ensuring a coordinated approach across these sectors.

It also monitors companies and public institutions in the mining and energy sectors to ensure compliance with the applicable laws and regulations. The ministry is responsible for managing the country's energy and mineral resources and promoting sustainable development while optimising their use. Additionally, it is involved in the formulation and implementation of policies related to geological research and exploration, ensuring the preservation of Morocco's geological heritage.

The ministry also ensures the safety of individuals and facilities in the energy and mining sectors, contributing to a safe working environment. It strengthens exchanges and consultations with relevant departments and institutions, integrating various stakeholders into the development process. Furthermore, the ministry has established a system to monitor and collect data in the fields of geology, minerals, hydrocarbons, and energy, which is essential for economic analysis and impact assessments. Finally, the ministry supports research, development, and national engineering in geology and mining by training skilled personnel and preparing the necessary infrastructure to foster innovation and growth in the sector. Through these efforts, the ministry ensures that Morocco's mining industry remains robust, sustainable, and well-regulated, contributing to the country's economic growth.[93]

91 See https://www.mem.gov.ma/ar/Pages/secteur.aspx?e=7, accessed 7 October 2024.

92 Dahir No. 1.15.66 of 9 June 2015 containing Law No. 27-13 relating to the exploitation of quarries (Official Bulletin under No. 6374 dated 2/7/2015).

93 See https://mtedd.gov.ma/index.php?option=com_sppagebuilder&view=page&id=59&Itemid=272&lang=ar, accessed 7 October 2024.

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7 Recommendations

In conclusion, several key recommendations can be made for the preservation and protection of soil in Morocco:

7.1 The legal framework and public policies

The legal framework for environmental protection should be revised and strengthened. While existing laws contain strong provisions for environmental protection, implementation often faces significant obstacles and gaps. The relevant authorities and stakeholders need to review these laws to make them more practical and enforceable.

A participatory approach should be encouraged in the development of legal texts, incorporating scientific studies that have already been conducted on environmental issues. Additionally, it is crucial to prepare the implementing texts for laws before their publication and consider creating an environmental code that consolidates all relevant legislation into a comprehensive framework.

A specialised jurisdiction for environmental disputes should be established, with magistrates and technicians trained specifically in environmental laws. This would ensure that cases related to environmental issues are handled with the expertise and attention they require. Non-governmental environmental organisations should also be granted the right to plead before these courts.

Looking beyond Morocco, successful foreign models for environmental preservation should be studied and adapted to local conditions. These policies can serve as a basis for the development of more effective and innovative approaches to soil and environmental protection.

Public authorities, especially in industrial cities, should be mandated to use clean technologies in industries, with penalties for non-compliance. This would promote sustainable industrial practices and help protect the environment.

A dedicated authority for soil conservation and protection should be established. This authority would be responsible for coordinating policies impacting soil, collecting data from various stakeholders, and ensuring that efforts in agriculture, urban planning, and industry align with soil protection goals. It would need to work closely with government ministries, public institutions, and scientific research bodies.

Finally, legal mechanisms should be created to allow citizens and civil society to challenge public policies and projects that harm the environment or soil. This could include the right to contest decisions in court when such projects threaten public health and the environment, ensuring that communities have a voice in protecting their natural resources

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7.2 Law enforcement, monitoring, access to environmental information, etc.

In terms of law enforcement, monitoring, and access to environmental information, several important actions can be taken. First, World Environment Day should be made a national event to focus on climate change, environmental challenges, and solutions. This occasion can serve as a platform to raise awareness, particularly among children and young people, about critical environmental issues and the need for urgent action.

There is also a need to unify environmental laws into a single, comprehensive legal framework. By making environmental laws easily accessible to researchers, stakeholders, and the public, Morocco can ensure that no one is unaware of their legal responsibilities, thus, promoting legal certainty and better adherence to environmental regulations.

Empowering civil society organisations with sufficient authority is crucial. These organisations play a key role in ensuring environmental protection, preventing pollution, and spreading environmental awareness. Providing them with the tools and support needed to act will help build a more engaged and proactive public.

Finally, creating an institutional and technological system for collecting, disseminating, and utilising data on soil management is essential. This system would allow for a strategic, well-coordinated approach to managing Morocco's soil resources, which are becoming increasingly scarce. By leveraging data effectively, the country can develop a clearer vision of how to protect and sustainably use this vital resource.

7.3 The land

To address the challenges in soil protection and land management, several recommendations can be considered. First, encouraging both domestic and foreign investment in revitalising barren lands could be a key strategy. By offering financial incentives and simplifying procedural requirements, the government can stimulate the restoration of degraded lands, making them productive again while safeguarding soil health.

Next, a review of the collective land management system is crucial. It should incorporate sustainable land management practices and require that any investment project on such lands clearly outline its potential impact on soil. This would ensure that soil protection is integrated into development plans from the start, helping prevent further degradation.

Additionally, there should be a prohibition on the use of forest lands for investment projects, as certain provisions of Moroccan law currently allow such uses. Repealing these provisions would help preserve forested areas, which are essential for maintaining soil health and preventing erosion.

Lastly, the diversity of land tenure systems in Morocco is a significant barrier to creating a unified public policy for soil protection. A mechanism should be developed

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to streamline and harmonise land regimes, ensuring that they all align with national goals for soil conservation and sustainable development.

7.4 Foreign investors

To further strengthen soil protection and environmental sustainability, establishing an environmental protection fund is crucial. This fund would focus on investing in environmental projects, providing financial support for initiatives aimed at preserving natural resources and encouraging private sector involvement in these efforts. By securing dedicated funding, the government can ensure that necessary projects receive the financial backing they need to succeed.

Additionally, it is essential to impose a strict prohibition on investment projects on productive land, whether domestic or foreign. This prohibition should be absolute, with no exceptions unless an investment project directly enhances the land's productivity and contributes to its long-term sustainability. This measure would protect valuable agricultural lands from being diverted for other purposes, ensuring they remain available for food production and vital ecological functions.

7.5 The industry

To advance sustainable development, it is crucial to prioritise the decarbonisation of industry in Morocco. This will align the country with global climate goals while positioning it as an attractive destination for responsible investment and eco-friendly production. By adopting cleaner technologies and promoting greener practices, Morocco can enhance its reputation as a leader in environmental responsibility.

Furthermore, promoting sustainable and inclusive industrial development should remain a key focus. Policies that support the integration of small and medium-sized enterprises (SMEs) into industrial value chains can foster regional equity, create sustainable jobs, and empower young people with opportunities in green sectors. This approach ensures that economic growth is balanced, inclusive, and environmentally responsible.

Finally, identifying and classifying productive lands as protected areas is essential. These areas should be shielded from projects that could degrade soil and environmental health, regardless of whether the projects are industrial, construction, mining, or other types. Such protection will ensure that these vital lands remain intact for future generations and continue to serve as the backbone of agriculture, food security, and ecological balance.

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