

D6.1: Policy Review: Up-scaling (Co)-Benefits, opportunities, and alternatives: Policy review document and institutional feasibility analysis report

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Inclusive Outscaling of Agro-ecosystem
REstoration ACTions for the MEDiterranean

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Executive Summary

The policy review presented here-in summarizes the most relevant EU policy framework for ecosystem restoration including Sustainable Land and Water Management as well as the policies on the food-water-energy and ecosystem nexus for the south and west Mediterranean or MENA subregion with special case of Morocco. One of the main pillars of the EU environmental policy is the EU Green Deal – a roadmap to sustainable economies. This road map includes promoting healthy and sustainable food systems and diets, protecting nature and reversing the degradation of ecosystems, targeting air, water, and soil, reviewing EU waste laws and reducing the EU’s external pollution footprint and curbing deforestation and forest degradation. All these policies and related actions and targets are subject to implementation by the EU partners (Spain, Italy, Greece, Germany, and Cyprus) in the REACT4MED. Nevertheless, the status of implementation differs for each country and is based on the institutional capacities they possess. Overall, MENA countries are often lacking the capacities and personnel to implement and follow policy implementation. For all countries, generating sustainable land use and management systems is critical in the road to food security and to reduce dependance of food imports while adapting to climate change. The policy responses and measures for elevating water poverty and sustaining land management vary among WANA countries. However, a series of ongoing initiatives in the region are making headway to integrated and inclusive governance of water, food, energy and ecosystems and shared policy approach is a must for the stability and resilience of the region. However, tracing progress at various spatial and time scales should be recurrent. The special case of Morocco addressed the issues and policies launched to reduce water scarcity and drought and related fragility of food systems and the shift to green economy and sustainable development. The government is engaged in a transformative approach through a new model of development and a revision of its sustainable development framework including all sectors as well as their integration for a sustainable pathway for the long-term prosperity of the country.

1 Preface

WP6 builds upon on work conducted by all Work Packages and strive to identify gaps in the implementation of existing land restoration and development policy measures at national and regional levels with respect to international agendas (e.g., EU Green Deal targets and SDGs). Based on this comprehensive approach it delivers the results and policy implications of the practices assessed in the context of the project. The first step towards this goal is the policy review within the Ecosystem Restoration Living Labs (ERLL) context that is part of WP3 to assess the level of integration with international agendas. Furthermore, the suitability of policy integration with respect to the land degradation problems faced in the Pilot Areas is assessed.

WP6 focuses on policy recommendations (e.g., selection of an appropriate mix of policy measures for promoting the uptake of the restoration actions i.e., mandatory, incentive, awareness-raising as well as the monitoring, enforcement, and evaluation of these policies. The goal is to provide support to decision-makers at local and regional levels to better address policy and governance issues to cope with land degradation and desertification challenges and help them in planning the implementation of the proposed restoration actions. A cross-cutting policy activity is being undertaken across the Pilot Areas to produce a policy and stakeholder map and analysis report identifying overlaps and common interests where they exist. A final task will engage with policymakers at the national and wider levels including EU, to support the creation of policies and strategies that can promote the best use of restoration measures for adaptation planning and mitigation.

Deliverable 6.1 include a policy review in relation with Sustainable Land and Water Management (SLWM) and offers a comprehensive analysis or feasibility assessment of actions for the perspectives of policy implementation. It also includes proposals of physical and institutional alternatives that derive from the shifting of the baseline status to restored ecosystem. The deliverable also considers the possible risks, trade-offs and costs of land restoration to support the next Task 6.2 on SDGs of the WP.

The results represented by this deliverable are based upon on the work by Task 3.4, 5.2, 5.3, of respective WP3 and WP5. This research work also explains transitions and develop further understanding on conversion and adoption process of restoration actions. This analysis also supports the communication and mainstreaming of actions through policy briefs and publications.

2 The policy framework in the EU and its implications for ecosystem restoration

In June 2022, the European Commission published its proposal for the EU Nature Restoration Regulation, with the overarching objective to implement restoration measures on at least 20% of the EU by 2030, and all ecosystems in need of restoration by 2050. This European Commission's proposal for a Nature Restoration Law is the first continent-wide, comprehensive law of its kind and will have far-reaching implications for European land and seas, for peoples' health and economical activities as well as for different sectors. It is also critical for other existing EU policy objectives, such as the EU's climate neutrality target until 2050.

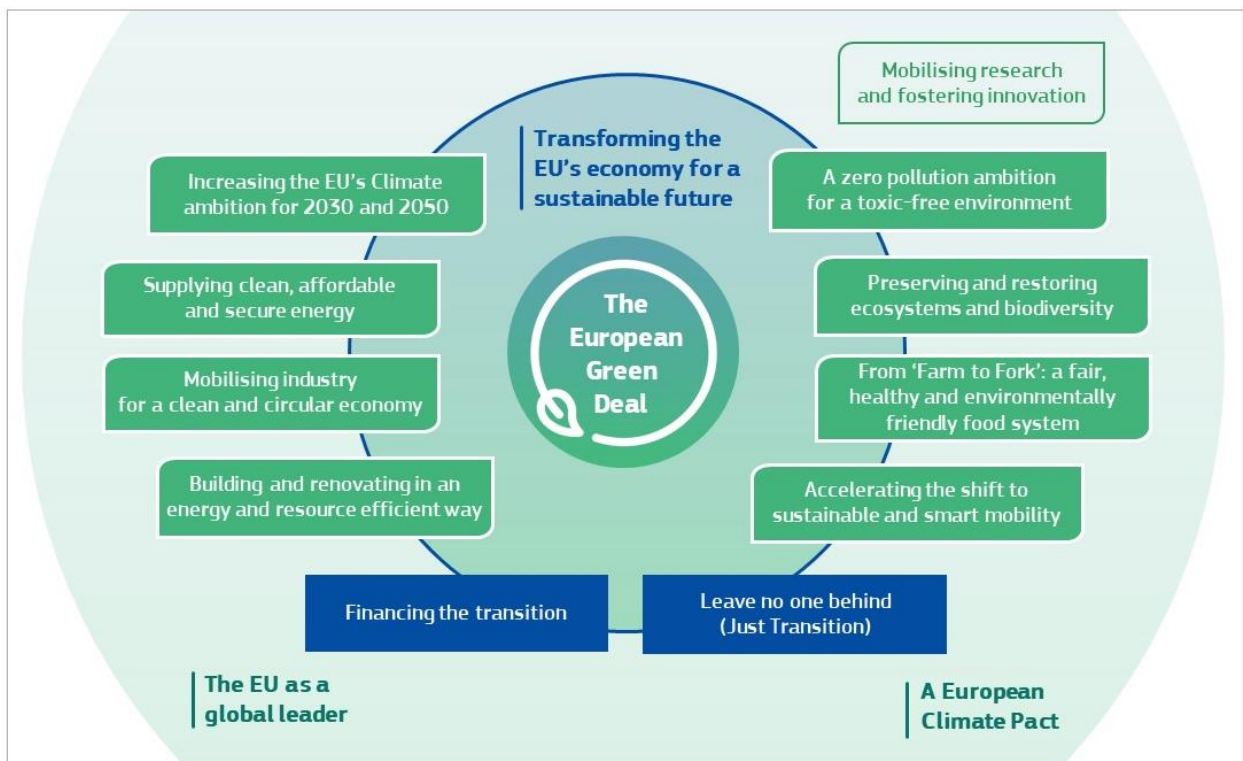
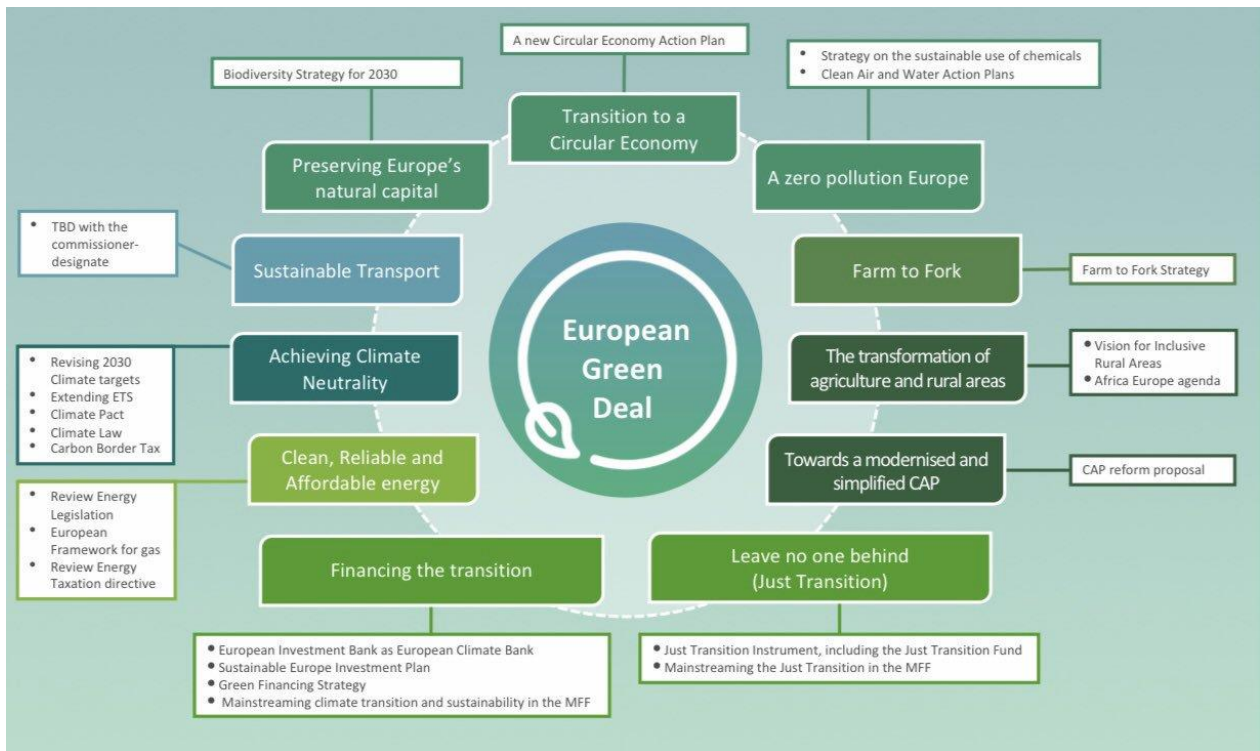
To support and raise awareness for the ambition and aims of this proposal, the Institute for European Environmental Policy (IEEP) and the Ecologic Institute, as part of the Think Sustainable Europe network, have prepared a series of thematic policy briefs to inform policymakers of some of the key benefits of nature restoration. These briefs are based on evidence in the Commission's impact assessment of the proposal and research carried out by IEEP and Ecologic Institute. The links below provide additional information of these targets:

- [How much will the implementation of the Nature Restoration Law cost and how much funding is available?](#)
- [Why is nature restoration critical to improving human health and well-being?](#)
- [How will nature restoration help fulfill EU environmental policy objectives?](#)
- [Why is nature restoration critical for river connectivity?](#)
- [Why is nature restoration critical for the resilience of European cities?](#)
- [Why is peatland rewetting critical for meeting the EU environmental objectives?](#)
- [Why is nature restoration critical for marine areas?](#)
- [Why is nature restoration critical for climate mitigation in the EU?](#)
- [Why is nature restoration critical for climate adaptation in the EU?](#)
- [Why is nature restoration critical to sustaining jobs and economic benefits from healthy ecosystem services?](#)

One of the main pillars of the EU environmental policy is the EU Green Deal – a roadmap to sustainable economies. The Deal presents a roadmap for making the EU's economy sustainable by turning climate and environmental challenges into opportunities across all policy areas and making the transition just and inclusive for all. The European Green Deal aims to boost the efficient use of resources by moving to a clean, circular economy and stopping climate change, revert biodiversity loss, and cut pollution. It outlines investments needed and financing tools available and explains how to ensure a just and inclusive transition. The European Green Deal covers all sectors of the economy, notably transport, energy, agriculture, buildings, and industries such as steel, cement, ICT, textiles, and chemicals.

The European Green Deal provides an action plan to boost the efficient use of resources by moving to a clean, circular economy and to restore biodiversity and cut pollution and it embraces various policy areas.

Policy areas of the EU Green Deal:



2.1 Policies that are more relevant to the REACT4MED project are listed below:

- The [Farm to Fork Strategy](#) lays down a new approach to ensure that agriculture, fisheries and aquaculture, and the food value chain contribute appropriately to the objective for a climate neutral Union in 2050. Food systems remain one of the key drivers of climate change and environmental degradation. The manufacturing, processing, retailing, packaging, and transportation of food make a major contribution to GHG emissions, and air, soil, and water pollution, and have a profound impact on biodiversity. On the other side, consumers also need to be empowered to choose sustainable food. The creation of a favorable environment that makes it easier to choose healthy and sustainable diets will benefit consumers' health and quality of life and reduce health-related costs for society.
- The new [2030 Biodiversity Strategy](#) is a comprehensive, systemic, and ambitious long-term plan for **protecting nature and reversing the degradation of ecosystems**. It is a key pillar of the European Green Deal and of EU leadership on international action for global public goods and sustainable development goals. With an objective to put Europe's biodiversity to recovery by 2030, the Strategy sets out new ways to implement existing legislation more effectively, new commitments, measures, targets, and governance mechanisms.
- The [Zero Pollution Action Plan](#) provides a compass **to mainstream pollution prevention** in all relevant EU policies, to step up implementation of the relevant EU legislation, and to identify possible gaps. It includes targets on air, water, soil, and noise pollution as well as waste generation and biodiversity. The Plan outlines several flagship initiatives and actions, targeting **air, water, and soil** but also reviewing **EU waste laws** and **reducing the EU's external pollution footprint** by restricting the export of products and wastes that have harmful, toxic impacts in third countries (among others).
- [The proposed revision of the EU legislation on Packaging and Packaging Waste](#) aims to put an end to wasteful packaging, boosting reuse and recycling. It has as three main objectives. First, to prevent the generation of packaging waste: reduce it in quantity, **restrict unnecessary packaging**, and **promote reusable and refillable packaging solutions**. Second, to boost high quality ('closed loop') recycling: make **all packaging on the EU market recyclable** in an economically viable way by 2030. And finally, to reduce the need for primary natural resources and create a well-functioning market for secondary raw materials, **increasing the use of recycled plastics** in packaging through mandatory targets. Consumers, will ensure **reusable packaging options**, **get rid of unnecessary packaging**, limit **overpackaging**, and provide clear labels to support correct recycling. For the industry, they will create **new business opportunities**, especially for smaller companies, and decrease the need for **virgin materials**.
- The [Proposal for a new Regulation to curb EU-driven deforestation and forest degradation](#) sets strong mandatory **due diligence rules for companies** that want to place relevant products on the EU market or export them. Operators and traders will have to prove that the products are both deforestation-free (produced on land that was not subject to deforestation after 31 December 2020) and legal (compliant with all relevant applicable laws in force in the country of production). Companies will also be required **to collect precise geographical information** on the farmland where the commodities that they source have been grown so that these commodities can be checked for compliance. The **list of commodities** that are covered will be regularly reviewed and updated, considering new data such as changing deforestation patterns.

2.2 The Green Deal imposes very precise targets for the restoration and maintenance of the ecosystems. They are given in detail below:

- **Ecosystems provide essential services such as food, fresh water and clean air, and shelter.** They mitigate natural disasters, pests, and diseases and help regulate the climate. However, the EU is not meeting some of its most important environmental objectives for 2020, such as the Aichi targets under the Convention on Biological Diversity. The EU and its global partners need to halt biodiversity loss. The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services' 2019 Global Assessment Report showed worldwide erosion of biodiversity, caused primarily by changes in how land and sea are used, direct exploitation of natural resources, and with climate change as the third most important driver of biodiversity loss.
- **The Conference of the Parties to the Convention on Biological Diversity** in Kunming, China, in October 2020 is an opportunity for the world to adopt a robust global framework to halt biodiversity loss. To ensure that the EU plays a key role, the Commission will present a **Biodiversity Strategy by March 2020**, to be followed up by specific action in 2021. The strategy will outline the EU's position for the Conference of the Parties, with global targets to protect biodiversity, as well as commitments to address the main causes of biodiversity loss in the EU, underpinned by measurable objectives that address the main causes of biodiversity loss.
- **The biodiversity strategy will identify specific measures to meet these objectives.** These could include quantified objectives, such as increasing the coverage of protected biodiversity-rich land and sea areas building on the Natura 2000 network. Member States should also reinforce cross-border cooperation to protect and restore more effectively the areas covered by the Natura 2000 network. The Commission will identify which measures, including legislation, would help Member States improve and restore damaged ecosystems to good ecological status, including carbon-rich ecosystems. The biodiversity strategy will also include proposals to green European cities and increase biodiversity in urban spaces. The Commission will consider drafting a nature restoration plan and will look at how provide funding to help Member States to reach this aim.
- **All EU policies should contribute to preserving and restoring Europe's natural capital.** The Farm to Fork Strategy, outlined in section 2.1.6, will address the use of pesticides and fertilisers in agriculture. Work will continue under the common fisheries policy to reduce the adverse impacts that fishing can have on ecosystems, especially in sensitive areas. The Commission will also support more connected and well-managed marine protected areas.
- **Forest ecosystems are under increasing pressure, as a result of climate change. The EU's forested area needs to improve, both in quality and quantity,** for the EU to reach climate neutrality and a healthy environment. Sustainable re- and afforestation and the restoration of degraded forests can increase absorption of CO₂ while improving the resilience of forests and promoting the circular bio-economy. Building on the 2030 biodiversity strategy, the Commission will prepare a new EU forest strategy covering the whole forest cycle and promoting the many services that forests provide.
- **The new EU forest strategy will have as its key objectives effective afforestation, and forest preservation and restoration in Europe,** to help to increase the absorption of CO₂, reduce the incidence and extent of forest fires, and promote the bio-economy, in full respect for ecological principles favourable to biodiversity. The national strategic plans under the common agricultural policy should incentivise forest managers to preserve, grow and manage forests sustainably. Building on the Communication on Stepping up EU Action to Protect and Restore the World's Forests , the Commission will take measures, both regulatory and otherwise, to promote imported products and value chains that do not involve deforestation and forest degradation.

All the above policies are subject to implementation by the EU partners (Spain, Italy, Greece, Germany, and Cyprus) in the REACT4MED. Nevertheless, the status of implementation differs between each country and is based on the institutional capacities they possess. Overall, the Southern EU countries are often lacking the capacities and personnel to implement and follow policy implementation. This is best known as the so-called



Mediterranean syndrome which could be described as a lack of policy implementation supported also by corruption and unwillingness to follow the rule of law.

3 Fragility, Food and water security in WANA region

3.1 Introduction: A Region in Motion

The West Asia and North Africa (WANA) region is the center of origin, diversity, and domestication of wheat. Some of WANA countries were the world wheat basket for millennia while now the region is in high state of fragility (FAO, 2018) and is import-dependent but also the hot spot for climate change, water scarcity and land desertification. Fragile situations characterised by weak and ineffective institutions, histories of conflict, unsustainable livelihood systems and decaying or damaged infrastructure (FAO/WB, 2018). Water and food related challenges can amplify fragility risks when policy design and implementation do not adequately promote sustainability, inclusion and resilience.

In the region, groundwater over extraction, desertification, droughts, floods, and freshwater scarcity are among the imminent implications of climate change. In fact, long-lasting climatic changes are underway and pose major threats to development aspirations and to achieving the Sustainable Development Goals (SDGs), making climate change adaptation (CCA) critical for development in WANA region. According to the 2019 UN World population prospects, the total population of WANA countries is about 464.1 million (6% of the world population) and is projected to reach nearly 655 million by 2050 and to more than one billion in 2100 (Figure 1). This high population increase means that demand for food will keep growing while resources are being depleted and production prospects abandoned.

All WANA countries ratified the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol, and the Paris Agreement. However, few assessments of climate change consider WANA as a whole. This makes it considerably more difficult to understand climate change from a regional perspective.

In WANA region, the thrust of agricultural policies over the last 50 years has been to increase productivity, even if at the expense of environmental sustainability. In addition, addressing adaptive strategies to deal with increased hydrological risk remains a low priority in national policies (Abdelfattah, 2021). However, lately a range of integrated agricultural systems are being tested to evaluate synergies between mitigation and adaptation and lead to low-carbon and climate-resilient pathways for sustainable food and water security and ecosystem health. These integrated systems may include agroecology, climate smart agriculture, conservation agriculture, and sustainable intensification, among others (Mrabet et al., 2022; Devkota et al., 2022; Zaidat et al., 2015; FAO et al. 2018; Bengoumi et al., 2018). However, in WANA, effective governance at all levels and sectors is critical to advancing anticipatory actions and policy responses that are sustainable and responsive to the compounding drivers of land crises. In other terms, collective and integrative action and partnerships are essential given the scale and commonality of the challenges, the relatively small size of many of the countries in the region, and the transboundary nature of important issues like climate change, desertification, migration, and shared water resources (FAO, 2018).

The special case of Turkey was discussed by Keskin and Güneş (2023) in its integration to Europe. The authors concluded that considering Turkey’s geographical location, population, agricultural production, and exports, it can be expected that Turkey’s work towards the Green New Deal targets will have also regional implications and may incentivize the other countries in its neighborhood to accelerate the implementation of similar targets.

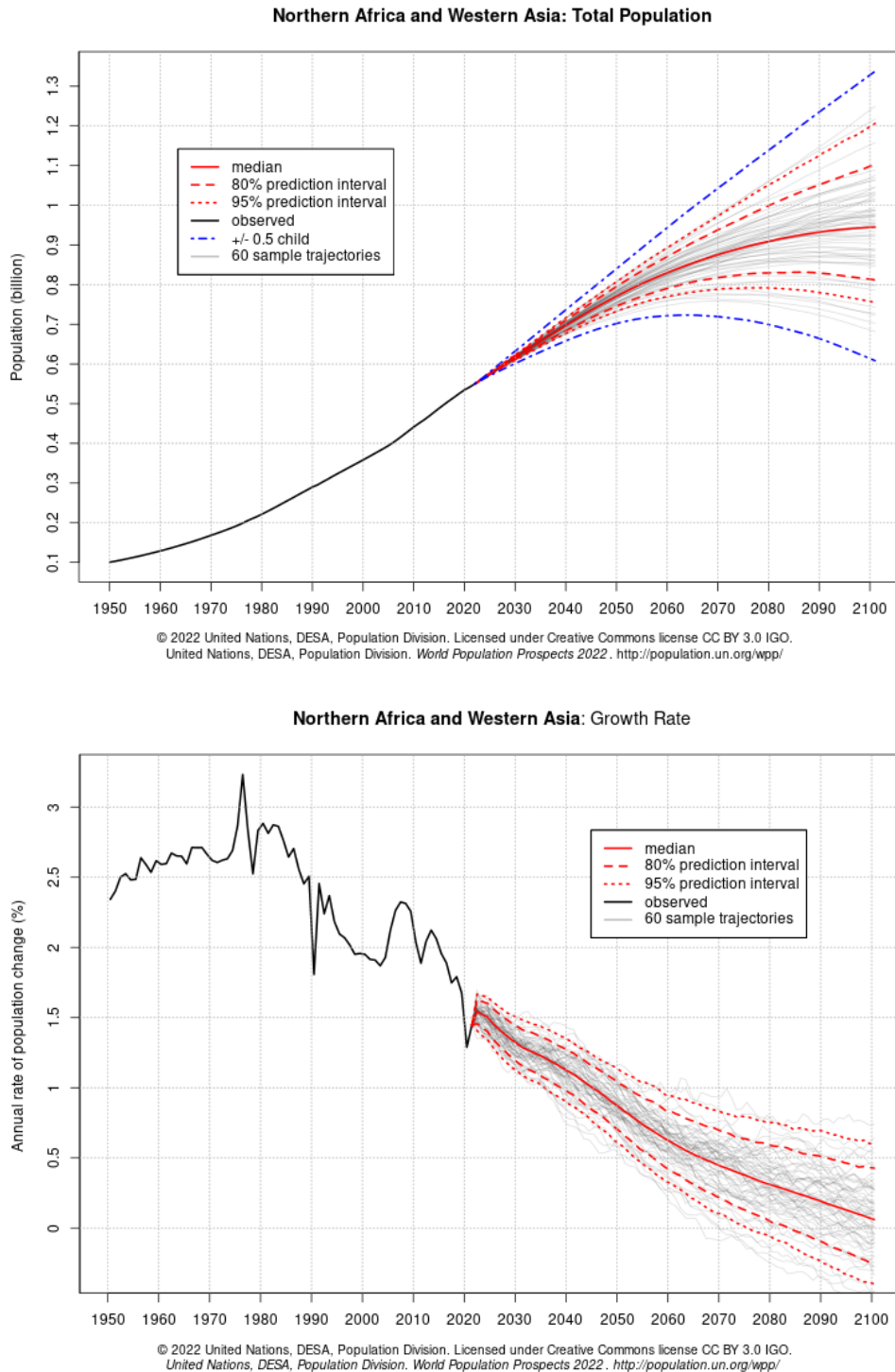


Figure 1: WANA estimates and probabilistic projections of the total population and its growth (DESAPD, 2022).

production, improving water and energy security, macro-economic management, and reform of food subsidy systems, as well as reducing risks in food processing, storage, distribution, retail, and consumption (Jobbins & Henley, 2015). According to Ben Mimoune and El Shehaby (2023), WANA region should focus on increasing its domestic food production capacities and using its resources efficiently. In this regard, new technology, investment, capacity building, and institutional adaptation are needed to raise productivity, diversify crops and incomes, and help farmers adapt to climate change and risks in rainfed areas where irrigation is limited.

Agricultural sectors in the WANA region will have to move to high-value crop production with high-resource efficiency methods, drought resistance, and higher water productivity. This requires a shift to integrated and sustainable land use management concepts. For example, lessons can be drawn from the water-energy-food nexus (WEF nexus) to reuse wastewater for food production or desalinated water using renewable energy to grow cash crops. This will require further investment in agricultural research and technology that can address existing challenges. Egypt's Vision 2030, launched in 2016, details the country's ambitions to enhance its agricultural sector, which employs almost 20% of its overall workforce, by increasing the incorporation of technology. Moving toward a more sustainable future, the Green Generation Strategy of Morocco is also of the same transition to the better and appropriate use of science-based technologies and systems. For all countries, generating sustainable land use and management systems is critical in the road to food security. Research institutions and entrepreneurs around the region are key actors in generating innovative and durable solutions that will optimize yields, increase the sustainability of agricultural practices, and hence combat food insecurity.

3.3 Water security and diplomacy: the urgency of innovative and comprehensive governance reforms

For millennia, societies in the WANA region made innovations to improve water management and deliver water reliability where it was needed. Most governments in the region have taken all affordable measures to capture, store, and augment supplies and have invested heavily in bringing water services to their populations. For years, governments across the region focused incentives and investments on increasing supply and use, so that today there is virtually no more water to be harnessed.

Past incentives and lack of regulation contributed to inefficient use and depletion of the resource. Governments passed water laws to allocate water rights and regulate them but often failed to develop the institutions to implement the laws. Little was done to provide against the rising incidence of extreme climatic events (FAO/WB, 2018). In recent decades, the availability of adequate water resources and their rational utilization is a major issue in the development activity in the region (Figure 1). Quantity shortages are accompanied by quality scarcity. Pollution, salinity, intrusion, and depletion are compromising the available clean water supply in the region (El Kharraz et al., 2012).

According to Abdelfattah (2021) Egypt has reached a unique juncture; its traditional water resources are fully utilized, whilst demands for water continue to grow in response to the increasing population and rising standards of living. Tunisia is among the poorest WANA countries in terms of water availability (450 m³/capita/year) (Ouassar et al., 2021). By 2050, it is estimated that all countries in the WANA region (except Iraq and Turkey) will be subject to water scarcity (Tull, 2020; Figure 2).

The policy responses and measures for elevating water poverty vary between WANA countries. With the exception of Morocco, Water (ground or surface water) in the region is typically shared with other riparian countries. Over 60 percent of this water is shared with others and in some cases (Tigris and Euphrates, the Nile, and the Jordan rivers) this proportion exceeds 85 percent. Water diplomacy is particularly attractive in the WANA region where water scarcity is high and diplomatic relations are often complicated and have profound implications for development and security. This has led to several initiatives geared towards regional approaches to water cooperation. The Blue Peace initiative, for example, looks to harness water resources for peace and socio-economic development and enable more effective political negotiation and efficient water management. However, recent research suggests that transboundary water management

agreements have not fully delivered vis- à-vis expectations, particularly in terms of contributing to socioeconomic development.

In the region, several initiatives were launched by governments and international development organizations. For instance, FAO’s Water Scarcity Regional Initiative (WSI) supports countries in the region to strategically plan their water resource management and allocation, review their water, food security, and energy policies, formulate effective investment plans, modernize governance and institutions, account for transboundary surface and groundwater and adopt good agricultural practices. However, the legacy of past policies persists, and new policies based on nexus approaches and institutional and sectorial integration should be developed and implemented (Hoff et al., 2019).

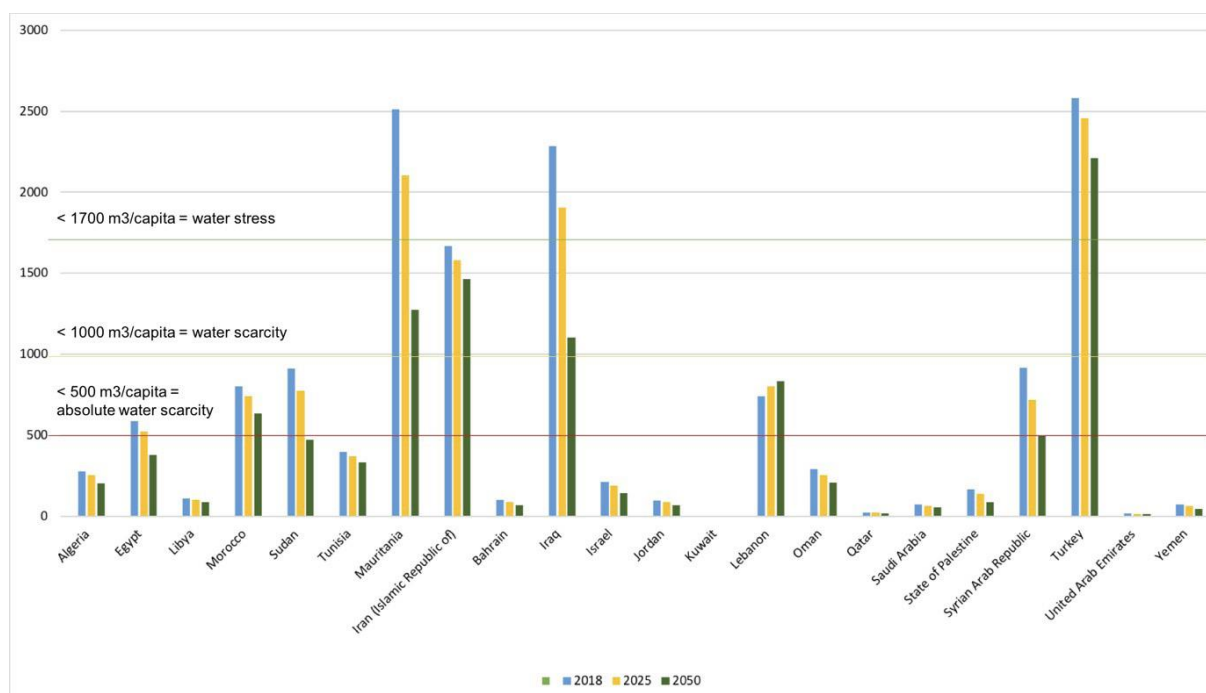


Figure 2: Water availability per capita, 2018, 2025, and 2050 in the region (Keulertz, 2019)

3.4 Conclusion: The Twin Deficits: Water and Food

The state of the art of policies related to water, energy, food and ecosystems in the Middle East and North Africa region is likely to be diverse, as different countries in the region may have different approaches to managing these resources. However, some common themes and challenges are likely to emerge (Table 1).

All WANA countries, share a common threat, which is that they are all highly vulnerable to climate change. However, the WANA region shows remarkable differences between countries’ responses due to their economics. Channeling the bulk of water towards agriculture greatly reduces the region’s ability to diversify the use of its water supplies. With increasing water scarcity and a lack of sufficient arable lands, domestic production is at risk. The region’s rapidly shrinking freshwater resources, exacerbated by climate change, pose major constraints for all dimensions of food security. Much attention was given to irrigated agriculture. Rainfed agriculture is the predominant farming system in the region but is relatively low yielding and vulnerable to shocks so raising productivity and strengthening resilience are priorities for assuring food and livelihood security.

Large increases in net imports are projected, as consumption will continue to outpace production for most basic food commodities. If these issues of water and food security are not adequately addressed, they will

pose risky and terrifying development challenges for the entire region. In other terms, the multidimensionality of both water and food asks for going beyond sector or simplistic approaches toward analytical frameworks able to consider social, political, and economic issues.

Most of the WANA countries have designed National adaptation plans which remained at the sectoral levels. These plans are generally focus on sectoral and project-based activities, without adequate consideration, or coordination, of cross sectoral interactions among key climate-sensitive sectors, such as water, energy, and food, which can be used to minimize trade-offs and promote synergy.

Integrated approaches can, however, provide many opportunities for the WANA region in the decades to come. In essence, countries in the region are recognizing that strong and durable cooperation will be critical as resources diminish and dependence on foreign aid and trade is risky. Cooperation includes mutual agreements between relevant countries on the use of water, energy and biodiversity, and other shared resources to guarantee equitable access and prevent conflict (Ali et al., 2022).

Policies in WANA should shift to and support the transition of agricultural economies to low-resource and high-tech economies. These policies should advise governments with institution-building to regulate water use and wise management of soils in the agricultural sector. A series of ongoing initiatives in the region are making headway in this regard. These policies should also facilitate establishing an agricultural custom among WANA economies to share benefits from resources and develop trading and technology and knowledge transfer for improving the resilience and productivity of food systems. A study from INRA France showed that in order to reduce imports and increase food security in long term, the region should undergo an integrated policy approach (INRA, 2015). Separated actions are not of any relevance.

In fact, producing and selling healthy food, generating stable rural incomes and employment, rebuilding household-level food security, supplying drinking water, and rebuilding social cohesion and institutions from the bottom up is key to the stabilization and development of the rural areas as well as for resilient and recovered urban-rural interfaces. However, all these changes need to be underpinned by strengthened institutions and developing their capacity.

Table 1: Main policies in Non-EU Countries at Mediterranean Region

Water	<p>Mediterranean Action Plan (21 Mediterranean Countries and EU): aimed at protecting the Mediterranean basin from pollution and promoting sustainable development. The plan includes a range of measures to improve water quality, prevent marine pollution, and promote sustainable use of coastal resources.</p> <p>The Arab Strategy for Water Security (2013) and its Action Plan (2014) are based on the principle of the principle of Integrated Water Resources Management (IWRM) and include among their priority objectives the priority objectives include strengthening adaptation to climate change.</p> <p>National Water Resources Management Strategy of Turkey National Water Sector Strategy (NWSS) of Lebanon.</p> <p>In addition to the above-mentioned components, the water policy of Israel includes desalination and reuse.</p> <p>National climate plans in the Maghreb concerning water resources: Water saving, construction of dams and hill reservoirs, adaptation of technical itineraries, introduction of technical practices (direct sowing), reconversion of production systems, fight against erosion and desertification, anti-drought programs, protection, and rehabilitation of steppe lands, development of watersheds, rural projects, diversification of activities, safeguarding and extension of forests, development of agricultural insurance Strategies for responding to water-related disasters.</p>
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Water mobilization (dams, desalination with cogeneration, underground injection, wastewater recycling, inter-regional transfers).
Water saving (supplementary irrigation, optimal techniques, leakage reduction, pricing, training, and awareness).
Flood and drought control (vulnerability map, watershed management and reforestation, flood control, protection of urban areas, development of monitoring and information systems and decision-making tools).

Tunisia:

Sectoral water strategies

Water Code of 1975. Several versions of the draft organic law on the Water Code have been prepared and submitted for consultation. Last version adopted in September 2019.

Water Sector Strategy 2030

Algeria:

Law n° 05-12 of 4 August 2005 on water

National Water Plan 2035

Egypt:

National project to improve irrigation water management to reduce losses and waste and the use of drainage water

Energy & Climate Change	<p>The Mediterranean Strategy for Sustainable Development 2016-2025 The Union for the Mediterranean (UfM) Energy Ministerial Declaration, 2017 The Mediterranean Energy Observatory, The Mediterranean Solar Plan, 2008. The Euro-Mediterranean Energy Efficiency Forum The Eastern Mediterranean Gas Forum The MENA Renewable Energy Strategy 2020 Turkey: The National Energy Efficiency Action Plan, 2017 The National Renewable Energy Action Plan, 2015 The Turkish Energy Strategy 2019-2023 The Turkish Marine Environment Protection Law, 2008 <u>Tunisia</u> National strategy for the adaptation of Tunisian agriculture and ecosystems to climate change Programme for Adaptation to Climate Change in Vulnerable Rural Territories of Tunisia (PACTE) (2017-2022) Nationally Determined Contribution (NDC). National Strategy for Sustainable Development (NSSD) Disaster risk reduction policy 2015-2030 <u>Algeria</u> National Climate Plan 2018. NDC <u>Egypt</u> National Climate Change Strategy 2050 NDC Climate change risk management programme</p>
FOOD	<p>The Mediterranean Strategy for Sustainable Development The Mediterranean Diet The Barcelona Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean The MENA Food Security Strategy, 2014 The MENA Sustainable Agriculture and Rural Development Initiative, 2012 <u>Tunisia</u> Development Plan 2023-2025. "New Tunisian agricultural green deal".</p>

Egypt

2030 Sustainable agricultural development strategy

ECOSYSTEMS

The Mediterranean Action Plan

The MedWet Initiative

The Mediterranean Forest Strategy

The Arab Strategy for Disaster Risk Reduction, adopted in 2018

The Arab Strategy for Sustainable Agricultural Development, adopted in 2007

Algeria

National Action Plan for the Environment and Sustainable Development (PNAE-DD) (2002)

The National Strategy for the Environment and Sustainable Development (SNEDD) for the period 2017-2035.

Forest strategies: The National Forestry Development Plan, the National Reforestation Plan and the National Protected Areas Management Plan.

Conservation strategy for natural ecosystems in arid zones in Algeria

The National Plan to combat desertification.

Tunisia

National strategy for water and soil conservation by 2030

National Plan for Adaptation to Climate Change and Strategy for Resilient Development (SNRCC) under preparation.

Nationally Determined Contribution NDC (September 2015)

National Drought Plan (November 2020)

National Action Programme to Combat Desertification

The National Strategy for the Development and Sustainable Management of Forests and Rangelands 2015- 2024

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4 Analysis of the state-of-art of SLWM policies in Morocco: Inventory and scale

4.1 Introduction: Morocco is at a critical juncture in its development process

The land is a finite and valuable resource that provides a range of economic, social, and environmental benefits. It is a critical asset for human societies as it supports agriculture, forestry, mining, and urban development and construction, among other activities. It is worth noting that according to estimates from the National Statistics Institute (Haut Commissariat au Plan), by 2050, nearly three-quarters of the country's population will be urban. It is clear that well managed urbanization and cities and durable development of rural areas are critical for Morocco's transformation into upper-middle income and beyond.

The sustainable management of land resources is a primordial social conundrum, because increasing agricultural production for burgeoning population can only be achieved through the rational and fair use of land resources. However, human efforts to produce ever-greater amounts of food and feed leave their mark on the land and the environment. The Mediterranean basin is experiencing significant land challenges, the social and economic impacts that citizens and farmers will have to live with over the coming years. This gap, which may become an obstacle to economic and social development, may expand and thus increase adverse effects on the environment including pollution and depletion of natural resources (De Roo et al., 2021; Bisselink et al., 2020). To ensure that land is used in a sustainable and equitable manner, land policies, frameworks and initiatives were and are developed and implemented either nationally or regionally. These policies are crucial for the effective and fair management of natural resources (and globally ecosystems) to meet the increasing demand for food, water, and energy and to mitigate such challenges. In the Mediterranean basin, the relationship or the nexus between the water, energy, and food sectors is and will remain essential in ensuring human life remains safe and comfortable. In addition, population growth and changes in living habits and diets may increase the risks on people's water, energy, and food security.

At the planetary level, 13% of all the soils are already degraded (FAO, 2021) and without any action more than 90% could be degraded by 2050 (Veerman et al., 2020). The consideration of their current or future degradation has led various international, European, national, or local bodies to promote soil knowledge, protection, and restoration on their agenda. For 40 years, soils have gradually taken an important place in international policies, with the publication by the FAO of the World Charter on Soils which lists the main pathways of soil degradation as well as many challenges to be met. This charter was updated in 2015 with the highlighting of ecosystem services provided by the soil other than just production services. The Global Soil Partnership (GSP), created in 2012, aimed to develop/strengthen collaborations between all stakeholders, from soil users to political decision-makers, to promote the sustainable management of soils and their ecosystem services. More and recent initiatives are given in Table 2.

Table 2: Recent milestones in land governance and sustainable development (Jacob et al., 2019)

Year	Milestone
1981	2015 FAO World Soil Charter
1988	Intergovernmental Panel on Climate Change IPCC
1992	United Nations Conference on Environment and Development Rio Declaration Agenda 21 Global Environment Facility United Nations Convention to Combat Desertification (UNCCD) United Nations Framework Convention on Climate Change (UNFCCC) Convention on Biological Diversity (CBD)
1997	Kyoto Protocol
2000	Millennium Development Goals (MDGs)
2005	Millennium Ecosystem Assessment

2008	UNCCD's Zero Net Land Degradation and Land Degradation Neutrality Initiative
2011	Global Soil Partnership initiated (FAO/European Union)
2012	Rio+20
2015	Sustainable Development Goals (SDGs) and Post-2015 Development Agenda Intergovernmental Technical Panel on Soils (ITPS) of the Global Soil Partnership (GSP) Land and Soils integrated in the Open Working Group of the Sustainable Development Goals Regional Soil Partnerships of the GSP International Year of Soils declared by the United Nations General Assembly The Economics of Land Degradation UNFCCC Paris Agreement
2017	(United Nations Economic and Social Council) United Nations Strategic Plan for Forests 2017-2030 FAO Voluntary Guidelines for Sustainable Soil Management
2018	UNCCD's Land Degradation Neutrality Fund a public-private partnership for blended finance

Adopting sustainable agriculture techniques, such as lowering water consumption through drip irrigation, enhancing soil health, and encouraging agroecology and agroforestry, may help assure food security while reducing the demand for water and energy resources and preserving biodiversity and ecosystem services. It is also of great importance to minimize food waste and improve supply chain efficiency. Alternatively, farmers might need to be stimulated to change to different crops or crop varieties that are drought resistant, consume less water and require less irrigation. In this regard, integrated and sustainable policies and practices have been proposed and implemented to decrease water losses, reduce pollution and environment degradation, to boost renewable energy sources, and implement sustainable agriculture and forest systems to ameliorate the country, regional and basin's interconnected difficulties.

In a Mediterranean climate change hot spot country like Morocco, if there is any strategic sector that depends directly on the climate and its variability, are undoubtedly agriculture, water and energy. In this regard, the country has signed most global and UN agreements. Morocco has formulated policies and developed strategies and plans such as renewable energy initiatives, low-carbon development strategies, national climate change policies, and forestry and wildlife policies, among others, that have direct relevance to green economy transformation. In fact, climate change and foreseen demographic growth have led to questioning the sustainability of current agricultural production systems which plays a key role in the design of sustainable and healthy food systems. However, according to a recent study by Habib et al. (2023), Morocco is among the group of high level of greening the economy with agriculture.

In this part, the emphasis will be on Morocco and other React4med partners are asked to develop the same synthesis document for their country or for the EU region. Morocco has recently unveiled a New Development Model (NDM) that has given great priority to water sector. From navigating climate change to tackling toxic contaminants – the latest report on monitoring the state of the environment has responded to the biggest and pressing environmental challenges as well as presented the ground-breaking strategies, initiatives and programs developed in Morocco. Morocco's strategy for natural resources and the environment includes several different sectoral programs and strategies (Laouina, 2006; Minsitère de l'Energie, des Mines et de l'Environnement, 2020). In here, policies related to land sectors or challenges are developed. In fact, the country recognized the importance of applying the principles of sustainable development in all sectors of the national economy and in the social sphere. According to Jacob et al. (2019) the policy implications of systemic risks should be to develop and implement an inclusive governance appended by a robust institutional and legal framework for its implementation.

4.2 National Strategy for Sustainable Development (NSSD)

In Morocco, human pressure has reached a level beyond what local ecosystems can bear, with direct costs to the economy: environmental degradation in Morocco was estimated at about 13 billion dirhams, or approximately 3.7% of Morocco's GDP for the year 2000 (Ghalli, 2015). In this regards, Morocco's legal development reflects the significant focus placed on the environment and sustainable development. This process is reflected in the Constitution where the notion of sustainable development is clearly stated. It stipulates the sustainable development as a right of every citizen.

The first environment law dates to 2003 that is law no. 11-03 (2003) concerning the protection and promotion of the environment. However, this law stayed general and addressed primarily water management issues. From the legislative point of view, the 2014 Framework Law No. 99-12 on the National Charter for Environment and Sustainable Development serves as a framework, requiring the adoption of several legislative, institutional, economic, financial, and other measures to further its objectives and principles. The Law No. 49.17 on environmental assessment was adopted in 2020. The government has recently launched a reflection on a draft law on climate change in Morocco with a view to providing a legal and binding basis for climate ambition and international commitments.

For the country to achieve the objectives set by the international community in terms of development, the fight against climate change or the preservation of land and biodiversity, the government has developed its National Strategy for Sustainable Development (NSSD) 2030. This strategy should allow the coherence of programs, plans and sectoral policies in a perspective of sustainability, sustainable economic prosperity, and the well-being of the Moroccan people (Galli, 2015). Adopted in 2017, NSSD recognizes that legislative gaps are impeding the transition to sustainable development and highlights sectors not covered by the law, obsolete regulations, reform projects unfinished and the lack of implementing regulations. Further, certain key laws on environmental protection need to be completed, strengthened, or put in place. In addition, the Charter states that the "legislative and regulatory arsenal must gradually cover all environments, resources and sectors of activity".

Two years later, the 2030 National Climate Plan (2030-NCP) was launched. This plan is organized around five main pillars: (i) Establish strengthened climate governance; (ii) Strengthen resilience to climate risks; (iii) Accelerate the transition to a low-carbon economy; (iv) Include territories in climate dynamics; and (v) Strengthen human, technological, and financial capacities.

The NSSD has a vision of "Implementing the foundations of a green and inclusive economy in Morocco by 2030". The strategy notes a need for sectors to integrate socio-environmental components more thoroughly into their strategic roadmaps and recognizes that the environmental pillar has been "the poor relation" in development, not seen as a source of sustainable development. The Strategy therefore aims to decouple economic growth from pressure on resources, while creating green jobs in the environment sector. The NSSD sets out 7 priority issues, 31 strategic directions and 137 goals.

The strategy addresses a set of 7 issues: governance, green economy, biodiversity, climate change, sensitive areas, social cohesion, and culture, with four being obviously environmental. To improve natural resources management and strengthen biodiversity conservation, the Strategy is focused on water resources, soils (with a new law planned) and biodiversity protection and conservation. In relation to biodiversity, the Strategy foresees national strategies for biodiversity and for the development of marine protected areas, a bio-monitoring program and, as NSSD goal 80, strengthened policies for the conservation and rehabilitation of biodiversity and sensitive areas.

The NSSD is not yet fully aligned with SDGs and recognizes that there are several institutional barriers to sustainable development, including a lack of planning, coordination, and convergence in the implementation of strategies, lengthy procedures, overlapping responsibilities and difficulties in applying regulations at the local level. It therefore calls for the strengthening of the institutional framework for sustainable development

and the role of the various actors. In addition, goal 7 is to strengthen the institutions responsible for sustainable development and improve their synergies; goal 10 is to institutionalize corporate social and environmental responsibility approaches and socially responsible investment.

Launched in May 2021, the evaluation of the NSSD showed that this strategy has made it possible to create the framework to initiate the transition to green growth and to instill the spirit of sustainable development in public policies. However, this evaluation proposed a roadmap for the overhaul of this strategy with the aim of aligning it with the new givens and fundamentals, including the New Development Model (NMD) and Morocco's international commitments, including the 2030 agenda and its 17 SDGs and the Paris Climate Agreement. The new or improved NSSD should capture the most salient nexuses between Morocco's development prospects and its climate and human commitments and hold the greatest potential for putting Morocco on a climate-resilient and low-carbon pathway. It must mobilize all possible levers of action and collective renegotiation without overemphasizing on any sector or system.

4.3 Water security and sustainability: Moving drought resilience up the political agenda

Since 1970s, multiple strategies for maintaining water security have been developed and implemented in Morocco. Such strategies have promoted water-delivery infrastructure and construction of dams and reservoirs and upscaling of water-saving technologies for irrigation as well as water harvesting and reuse and recycling of wastewaters for non-potable purposes, such as urban irrigation or industrial processes. However, such hydraulic infrastructures are also impacted by drought and induce energy recession (Borowski, 2022). In fact, the effectiveness of these infrastructures as a buffer against the macroeconomic volatility induced by rainfall shocks may be decreasing in the context of climate change and declining trend in water inflows (WB, 2022).

The political orientation towards large-scale irrigated agriculture and the severity of droughts in the 1980s forced the government to pass the Water Law in 1995 (Law 10/95). This law was meant to integrate and coordinate the allocation and management of all water sources, also create river basin agencies to decentralize water institutional reforms. The promulgation marked a turning point in the water policy in Morocco, especially through the establishment of the framework of a real Integrated Water Resources Management (IWRM) oriented much more towards "the management of the demand". Thus, the introduction of the concepts of participatory, concerted, and decentralized water management (Machrafi et al., 2022). The law 10-95 of 1995 was promulgated in October 2016 and become 36-15 with 12 chapters and 163 articles. The law 36-15 includes cooperation between users and the public authorities, aims to protect human health through the regulation of exploitation, distribution and sale of drinkable waters, provision for sanctions and the regulation of activities that may pollute water resources (Laamari et al., 2011). Law 36-15 has been elaborated to consolidate the achievements of law 10-95, to fill the legal gap and to accompany the general orientations of the national strategy as well as the national water plan.

The country has been the recipient of several public policy models in the water sector (IWRM, Basin Agency, Demand Management, Groundwater Contract...) which have benefited from the financial and technical support of international organizations (i.e. the World Bank and the FAO). These organizations were also promoting new concepts and technologies to face water scarcity and develop irrigated agriculture (the user-pays and polluter-pays principles, water pricing, integrated basin management, non-conventional water sources, drip irrigation, etc.).

The purpose of the National Irrigation Water Saving Program (PNEEI) is to protect water resources and improve the living conditions of rural populations through a rewarding and sustainable management of these resources. However, the last World Bank report stated that drought frequency, severity and overwhelming impacts are on the rise. According to the thresholds defined by the United Nations, Morocco is one of the top 25 countries in water shortage in the world (WRI, 2022). Morocco has moved over the past two decades from a situation of "water stress" to a situation of "water scarcity". According to current estimates, the average water supply per inhabitant and per year in fresh water currently does not exceed 650 m³ per

inhabitant and per year compared to 1000 m³ at the beginning of the 2000s. In 1960, this figure reached 2500 m³ per capita per year. This situation is aggravated by the decline in water quality due to the pollution generated by the production system. The increasing incidence and severity of droughts is already a major source of macroeconomic volatility, and a threat to food and energy security at the national level (Zaidat et al., 2022).

At a time when the country has adopted a law with a national water strategy and a National Water Plan (2020-250) to rationalize the use of its limited water resources, the Morocco Green Plan (2008-2020) was oriented towards a liberalization of the sector and an intensification of its agriculture, policy which led to a greater demand for water. Moreover, this policy encouraged more fruit plantations, an intensification of dairy farming and an expansion of vegetables and protected crops for export which led to a strong demand on groundwater resources which had hitherto been largely spared but are currently overexploited. As a result, between 2008 and 2018, the area under drip irrigation increased 3.5 times, fueling a 92 percent increase in real agricultural value added. However, integration of water security, climate change and environmental sustainability are gaining traction with Green Generation Strategy, and this later is investigated as a stopgap measure for addressing planetary issues especially water scarcity and ecological intensification.

With an estimated cost of around 383 billion dirhams for the next 30 years, the National Water Plan aims to close the water demand-supply gap. So, the recent actions are investing in desalinization plants for increasing water availability and access for either drinking water or for irrigation. Such trend in technological uses reinforced by strong water allocation policies will likely continue as the water demand increases. A specific attention is and should be also given for rural areas with a poor water supply network and water scarcity problems. In other terms, the plan should respond to the ecological emergency induced by water and climate security, but must also make sense in relation to demands, tensions and crises that are taking place in the societies at large. CESE (2014) reflected on water problems and proposed to create a national institution for water.

4.4 Food security and sovereignty: A need for a transformative approach

Access to quality and healthy food is a driving force of economic development and a cornerstone for providing health—both of which are essential for daily lives and living standards of households in Morocco. In fact, agriculture and food sectors are the backbone of Morocco's economy, which accounts for an average 14% of country's Gross Domestic Product (GDP) and hires about half of the country's workforce. More than 80% of rural families depend on agriculture for their livelihood. The area covered by arable land and permanent crops increased by nearly 30% from 6.9 (in 1961) to 8.7 (in 2021) million hectares (FAOSTAT, 2021). However, for this period, the productivity of cereals and olives, the most produced agricultural products in Morocco (≈40% of the total harvested tonnage), was characterized by extreme variations due to the changes in the availability of internal surface water reflecting variable quantities of rainfall. In other terms, as land and water limitations become more obvious, the opposition between municipal and industrial needs will grow more intensively, and intra-sectoral competition within agriculture between non-food crops, livestock and staples will become more prevailing. Hence, issues of food security (and sovereignty) will be seriously dominant in the political agenda.

Green Morocco Plan (GMP) was structured in two pillars like those of the European Common Agricultural Policy. While GMP focused on structural changes to food supply, the new strategy, Generation Green (GGS), emphasizes human development in rural regions, including creating individual wealth, diversifying employment opportunities and fostering entrepreneurship. The GGS that King Mohammed VI launched in February 2020 is Morocco's most ambitious agricultural program to date. The strategy is built on previous technical, economic, and social achievements of GMP, while renewing the development model to create enabling conditions to farmers and producers to become a game changer for an emerging economy and social inclusion. While GMP was hailed as a paradigm shift in land management policies and practices, GGS can be considered as a hybrid lay-scientific strategy that tries to manage the trade-offs and to capitalize on

the synergies between biological and economic productivity. It aims also to maintain and increase the amount of healthy and productive land resources while achieving national priorities in terms of green growth, food security and well-being. In fact, the main pillars of the strategy are inclusive governance, integrated land use planning, innovation, youth employment through entrepreneurship support, green growth through climate-smart, ecological, and digital transition, human capital, and social cohesion. By marrying grassroots programming with national-level policymaking the GGS can better address such challenges over time. GGS also aims to modernize and diversify traditional agricultural development. Both strategies can be a strong come-back of the state via both ambitious plans and increased resources.

Climate smart agricultural or agroecological or sustainable land management (SLM) practices were promoted along the various agricultural strategies but more under Green Morocco plan and are greatly emphasized under GGS. Government established a Fund for Agricultural Development which provides farmers with subsidies intended to encourage water savings and soil protection. The Government also holds awareness- raising campaigns to improve agricultural productivity, water conservation and the rationalization of the use of fertilizers by farmers.

Tracing progress at various spatial scales is still needed. The government should help to ensure viability of agroecological practices at farm and household level while identifying the lockins and drivers of use of agroecology or climate smart agriculture (Mrabet et al., 2022). It worth saying that the new strategy is giving great importance to optimal use of agricultural lands through innovation-based precision agriculture, digital farming, organic agriculture, conservation agriculture, perennial cropping etc. - and, at the same time, the restoration of degraded lands, revegetation, pastureland improvement and carbon sequestration to preserve the vital functions of the soil. The GGS has enforced introduction of sustainability and security goals as well as bridging science and policy through improved water management, such as doubling water efficiency, reversing soil degradation and a target of 1 million hectares of conservation agriculture (CA) to enhance resilience and productivity of rainfed agriculture (especially cereals, food legumes and oil seed crops) and 100,000 ha of organic agriculture to 2030 Horizon. The GGS has also recognized that soil water conservation and runoff reduction and control as well as enhanced soil health are essential for improved agricultural productivity and environmental sustainability.

GGS is devoted to implement a transformative approach and take strong actions to advance a sustainable and just vision of agriculture that prioritizes the needs of resilient farmers and producers and small businesses, strengthens food supply chains, brings value back to rural people and places, expand economic opportunities, create jobs, and improve the quality of life of rural peoples. Hence, since the GGS will remain the overarching agricultural policy until 2030, there is an urgent need for all actors - farmers, value chains, agricultural officers, NGOs, and academics - to think about and discuss the issues at stake including long-term goals and SDGs. In other terms, the scale of the changes required means that we must move away from perspectives based solely on the food crisis: a broader social and political framework (and responses) must be formulated for food sovereignty and security.

4.5 Energy security and efficiency: Unleash Innovation and green finance

A legislative package was adopted within the framework of environment protection related to green energy: law no. 57-09 (2010) on the creation of the Moroccan Agency for Solar Energy; law no. 16-09 (2010) to turn the Centre for the Development of Renewable Energy (CDER) into the National Agency for the Development of Renewable Energy (ADEREE); law no. 13-09 (2011) on renewable energies; law no. 47-09 (2011) on energy efficiency.

The National Energy Strategy (NES) which replaced Moroccan Solar plan was deployed to increase reliance on renewable energy on all sectors. Kousksou et al. (2015) reported the enormous potential identified in the Moroccan renewable energy sector with favorable CO₂ mitigation draw optimistic expectations to build sustained low-carbon economy. There is also a continuous growing interest in using renewable energy sources to reduce the dependence on fossil fuels and improve energy security in the region as shown in the most recent Moroccan NDC document. Indeed, various flagship solar and wind projects have been developed to tap the country's plentiful renewable energy potential, bringing the share of variable renewables to around 20 % of the power generation energy mix in 2021 , earning Morocco the reputation of an emerging "climate champion".

To support and enable a sustainable energy transition, development and finance institutions and governments should continue to finance more scalable technologies and adopt 'intentional' regulations which are guided by circular principles and a just-transition. According to recent World Bank report, Morocco could reach a net-zero emissions by the 2050s by taking advantage of its abundant competitive renewable energy resources and implementing its ambitious reforestation program (WB, 2022). In fact, the Government has recently launched the revision of the NES that should be finalized by mid-2023. This revised version will notably include concept of carbon neutrality and the deployment of green finance. The ambition of Morocco's NDM to horizon 2035 is to make renewable energy a lever of attractiveness and development.

4.6 Natural resource management, biodiversity, and ecosystem restoration: Developing and disseminating a vision of inclusive ecology

Land and ecological resources are the core of every country's long-term development and wealth and especially the National Action Program to Combat Desertification. The management of watersheds (including forests playing a dual role for soil security and ecological balance (Serbouti et al., 2023)) for soil conservation, the control of water erosion and silting up of dams is closely linked to water, environment, and agriculture especially under the effect of climate change. Lakes, lagoons, and wetlands, which are important ecosystems, can no longer be separated from natural water resources. Thus, they must be protected against pollution and their abusive exploitation. In response of all these issues, the government has newly launched the Green Generation and Forest Governance Strategies for the period 2020-2030.

The Kingdom of Morocco has a National Strategy and Action Plan Biodiversity (SPANB – 2016-2020) . The 159 actions recommended in the NBSAP are grouped into 26 national objectives and 6 Strategic Axes. However, the country is in the process of revising this strategy considering the new targets of the post-2020 Global Biodiversity Framework.

Soil is an essential requirement to sustain life and basic human needs such as food, clean water, clean air, and biodiversity. However, 40% of Moroccan soils are under active water erosion and erosion range from as low as 5 to more than 50 T/ha per year (Dahan et al., 2012). The European Union (EU) puts the concept of healthy soils at the core of the European Green Deal to achieve climate neutrality, zero pollution, sustainable food provision and a resilient environment (Panagos et al., 2022). However, no soil protection or health law is yet available in the country or in the North Africa at large. But the new GGS is giving priority to the control of excessive soil erosion through widespread application of soil conservation and protection practices.

Overgrazing and degradation of pastures are important treats for Moroccan economy and social stability. The pastoral law dates to colonial time but was reviewed and promulgated in April 2016 related to pastoral

transhumance, the development and management of pastoral and silvo-pastoral spaces. This 113-13 law lays down the principles and general rules governing the development and management of pastoral and silvo-pastoral spaces, the use and development of pastoral resources, pastoral transhumance, and the mobility of herds. It sets up the legal framework relating to the organization, development, and rational and sustainable exploitation of pastoral resources, securing the land base of pastoral and sylvo-pastoral areas.

Nearly 9 million hectares of forests, including broadleaved, coniferous, and steppe forests, can be found in Morocco (ANEF, 2021). Ensuring forest durability and conservation of biodiversity were always important aims in country's policy since its first law in 1917. The kingdom signed and ratified a wide range of international conventions, including the international Convention on Trade in Endangered Species of Wild Fauna and Flora (1975), the Ramsar Convention on Wetlands (1971), the Convention on Biological Diversity (1980), the United Nations Framework Convention on Climate Change (1995) and MedWet Framework for Action 2016–2030. Similarly, Morocco has established several national and local strategies, such as the national wetland strategy, and has chosen to adopt a strategy for assessing the state of the forest's health. These international and national efforts are aimed mainly at protecting natural ecosystems and their related biodiversity, their ecological functions, as well as promote governance and sustainable use of natural resources, including forests.

Moroccan forests offer crucial ecosystem services that include controlling desertification and erosion, soil stabilization, water conservation, mitigation of climate change, and providing shelter for wildlife but also a large array of socio-economic benefits (Serbouti et al., 2023). In fact, around 7 million people live or rely directly on forest products for their livelihoods. In February 2022, Morocco created a National Water and Forests Agency (ANEF) as part of the new national strategy named "Forests of Morocco 2020–2030". This strategy seeks to improve the competitiveness and sustainability of the forest sector through an integrated and wealth-creating management paradigm that prioritizes the needs of nearby people (ANEF, 2021). As part of the forest strategy, the ANEF has set itself the goal of reforesting 50,000 ha/year.

The Kingdom of Morocco's adherence to the LDN initiative in 2016 is due to the fact that it reinforces the achievement of its SDGs, in particular goal 15, target 15.3 and indicator 15.3.1 and that it is in harmony with national policies related to SDGs 1, 2, 6, 7, 12, 13 and 15 (Akhtar-Schuster et al., 2017).

The analysis of strategies related to the conservation and development of natural resources and the environment shows that Morocco has strategies, action programs and instruments that can provide a leverage environment for the implementation of the LDN process in many areas. In other terms, LDN initiative could embrace several programs and road maps launched by the government in their climate change actions and sectorial development (Agriculture, Forestry, water, climate actions, desertification plans (PAN-LCD), watershed development (PNABV), protected areas, development of aromatic and medicinal plants (PAM), integration of sustainable land management (SLM) in agricultural and forest strategies and the national human development initiative (INDH).

The Moroccan government's policy on climate was set out in a document published in 2014 . Within the framework of the United Nations Framework Convention on Climate Change, Morocco regularly reports to the United Nations. In fact, Morocco's climate targets and policies are rated as "almost sufficient" by the Climate Action Tracker (CAT). Morocco's climate policies and commitments are not yet consistent with the Paris Agreement's 1.5°C temperature limit, but they could be with moderate improvements. In fact, Morocco will need to develop carbon dioxide removal or storage approaches or implement stringent policies to strengthen the role of AFOLU as a carbon sink and source of negative emissions.

Enhancing UN agreements (i.e., 2021 revised NDC) while reducing their implementation gap through more ambitious and plausible climate, land and biodiversity nexus actions will help to revitalize rural areas, create new jobs and position the Kingdom as a green venture hub, while also helping Morocco to reach its broader development goals (World Bank, 2022). In addition to the NDC, the government has prepared a long-term low

emission development strategy for 2050 (2050-LEDS) in order to determine the modalities to achieve climate neutrality over the course of this century.

The adaptation objectives defined in the NDC are further developed in the National Strategic Adaptation Plan (NSAP), which was adopted in January 2022. NSAP sets a roadmap for 2020-2030, with a concerted and inclusive framework to support adaptation planning and priority actions to strengthen the resilience of the population and the territory to climate change.

4.7 Conclusion: catalyzing political momentum and mobilizing resources

The nation's economies, societies and ecosystems are deeply interconnected, and climate shocks can cascade across sectors, systems, and regions. Scientific consensus is emerging that integrated land policy is a key for the long-term prosperity of the country (Zaidat et al., 2022). In Morocco, if economic growth is not decoupled from climate change variability and environmental degradation, land sustainable use and management requires policy frameworks that better integrate land governance and use planning across sectors. In here, an evaluation of land policy is of paramount importance for Morocco as it will provide significant lessons that can be useful in the refinement of policies and implementation of strategies. In addition, when the government ratified international conventions, it is important that these are backed up with relevant national policies accompanied by baseline indicators to track progress towards reaching policy goals (Jacob et al., 2019). In addition, land interlinked challenges such as drought management and food security must be planned, based on science and experience. The country should embolden and implement policies that promote sustainable water and land management, and climate change adaptation.

To face the challenge of satisfying a growing population that changes its lifestyles and diets while trying to conserve natural resources and to protect biodiversity, an ecosystem-based approach should be implemented in addition to a momentous changeover in using resources based on three main strategies: (1) shifting to climate smart and regenerative agricultural and forest practices, (2) reducing losses and waste throughout the production and processing chains, and (3) promoting healthy and sustainable diets and renewable energy sources (Nabuurs et al., 2022). In addition, benefits through investments in these strategies are tremendous and long-term.

From this synthesis, it seems that there is a legislative inflation in environment and climate change while inadequacy in terms of preservation of soils and fragile ecosystems. Hence, a common macro-level reference framework is needed to ensure that the different sectoral strategies are coherent in their legislation as well as in their goals and quantitative targets – so that all contribute ultimately to the sustainable development of the nation. Morocco's NDM and the new version of NSSD under construction are aspiring for halting environmental degradation and mitigation impacts and ambition to enable better development pathways that can benefit both humans and the ecosystems that support human well-being. Cooperative efforts between decision-makers, conservationists and experts are urgently needed to exchange knowledge, solutions, and other benefits to ensure durability and fair use of natural resources.

4.8 References

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