



MIDDLE EAST AND
NORTH AFRICA

Morocco

Executive Summary

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COUNTRY CLIMATE AND DEVELOPMENT REPORT

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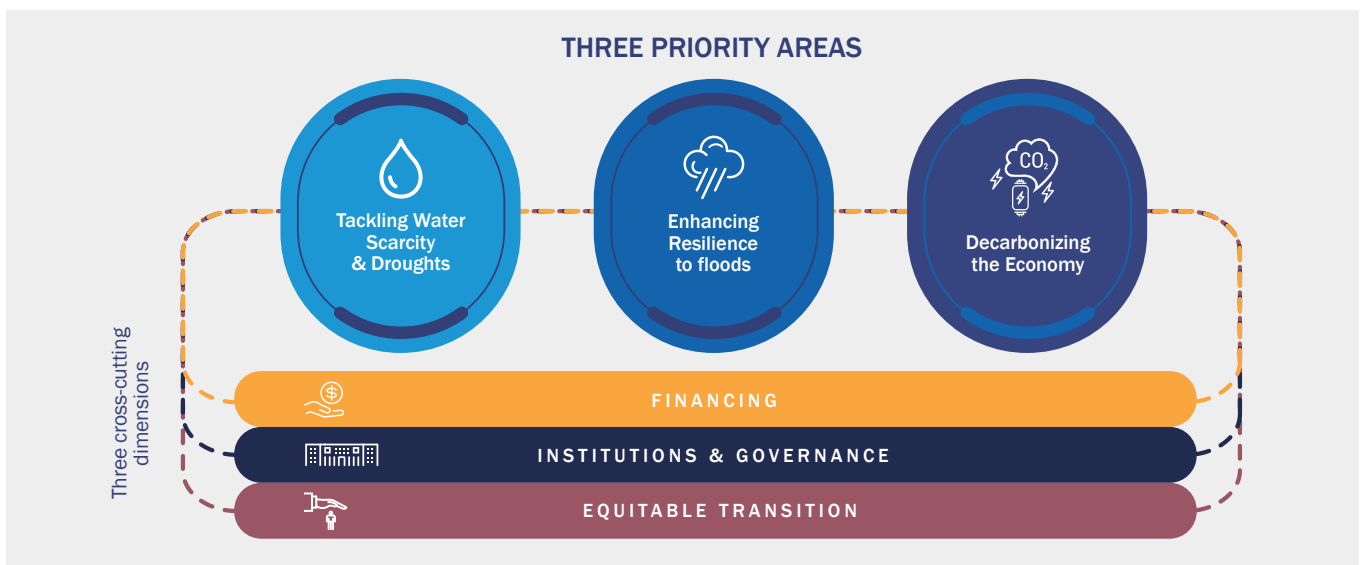
Executive Summary

Morocco is at a critical juncture in its development process. The structural reforms launched two decades ago have given way to a sustained period of economic growth and poverty reduction that is unparalleled in the country’s recent history. However, this model began to exhibit increasing signs of exhaustion even before the COVID-19 pandemic hit, prompting an inclusive national reflection on how Morocco’s path towards more rapid economic growth and social development can be reinvigorated. This resulted in the New Development Model (NDM), which has set ambitious development targets with a 2035 horizon. The country now faces intertwined and compounded challenges in order to implement this vision: (i) heightened vulnerability to a changing climate, as evidenced by the recent string of severe droughts (three in the last four years); (ii) the urgent need to accelerate structural reforms to put the country’s development on a more solid, equitable, and sustainable path; and (iii) achieving all of this within a constrained fiscal space.

This Country Climate and Development Report (CCDR) explores the relationship between Morocco’s development goals and climate change, in terms of both risks and opportunities. Building on an extensive body of quantitative and qualitative studies as well as on novel modeling exercises,¹ this CCDR analyzes the interplay between the country’s development goals and climate change, and examines the risks that climate change poses to the country’s development path, but also the opportunities that can come from the global trend toward decarbonization. And it explores policy and investment options that could achieve both climate and development objectives in a synergistic manner.

Building on a rich body of analytical work, three priority areas were identified for this CCDR. These were considered to capture the most salient nexuses between Morocco’s development prospects and its climate commitments, and to hold the greatest potential for putting Morocco on a climate-resilient and low-carbon (RLC) pathway. These areas are: (i) tackling water scarcity and droughts, notably through the lens of the water-agriculture nexus; (ii) enhancing resilience to floods in order to preserve urban and coastal economies and livelihoods; and (iii) decarbonizing the economy, looking at a zero-net emission pathway by the 2050s. In addition, three cross-cutting areas are seen as critical enablers in order for these priority areas to materialize: (i) financing (from both private and public sources); (ii) institutions and governance; and (iii) equitable transition to ensure that no one is left behind.

Figure - Morocco’s CCDR Framework for a Resilient and Low Carbon (RLC) Pathway



¹ It should be recognized, however, that the economic and social effects associated with climate change are still uncertain in Morocco, as elsewhere. As such, the quantitative tools presented in this report are not intended to generate predictions of such impacts, but to provide a unified analytical framework with which to identify the tradeoffs between various policy choices.

A key message that emerges from this CCDR is that Morocco can pursue a path that contributes to achieving both climate and development objectives in a synergistic manner. The modeling exercises presented in this report show that embarking on a RLC pathway would not compromise Morocco’s macroeconomic stability. They indicate instead that GDP and growth could be higher than in a scenario of inaction. Fiscal and external balances could also improve with the introduction of the right policies. In other words, climate action can have a positive impact on GDP, and can contribute to accelerating progress towards Morocco’s development goals. Such a pathway would, however, be contingent on the private sector playing a central role, with the expectation that it would shoulder a large share of the investments under the mitigation agenda, and potentially on the adaptation front as well, though to a lesser extent. The policies that are needed for these private investments to materialize coincide in many respects with those that would be required to address the structural bottlenecks that have constrained Morocco’s economic growth in recent years. The following section summarizes the sectoral and structural reforms that would back a resilient and low carbon pathway.

Sectoral Policies for a Resilient and Low Carbon Transition

Water scarcity could impact almost every aspect of Morocco’s future socioeconomic development. Morocco is one of the most water-scarce countries in the world: it is quickly approaching the absolute water scarcity threshold of 500 cubic meters (m³) per person per year. The increasing incidence and severity of droughts is already a major source of macroeconomic volatility, and a threat to food security at the national level. With a longer-term perspective, the reduction in water availability and the drop in crop yields due to climate change could reduce GDP by up to 6.5 percent. Rainfed agriculture (bour) is particularly vulnerable to both droughts and water scarcity. Since rainfed agriculture still represents 80 percent of the country’s cultivated area and employs most of the agricultural workforce, climate-induced changes (water availability and crop yield) on rainfed agriculture could result in out-migration to urban areas of up to 1.9 million Moroccans (about 5.4 percent of the total population) by 2050.

The deployment of water infrastructure at a massive scale has been a critical contributor to Morocco’s recent development. Since the late 1960s, the kingdom has built more than 120 large dams, leading to a tenfold increase in the total capacity for water mobilization—from 2 to almost 20 billion cubic meters. It also expanded drip irrigation, which resulted in an increase of water productivity in agriculture, by far the most important water-consuming sector in Morocco. This enabled Morocco to shift to more productive crops and to almost double real agricultural value added over the past two decades. However, these large investments have not avoided the increased pressure on water resources and the overexploitation of underground resources. Moreover, the effectiveness of infrastructure 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.

Investment in infrastructure is a necessary but not sufficient condition for coping with the challenge of water scarcity; and a change of paradigm is needed. Morocco has put forward an ambitious water investment plan for 2020-2050, the Plan National de l’Eau (PNE) (National Water Plan), which aims to close the water demand-supply gap. This CCDR emphasizes that given the high level of vulnerability of Morocco to both droughts and water scarcity, investing in water infrastructure yields positive returns for the economy and should remain a priority. However, based on international experience and an extensive body of academic research, we also argue that these returns will not fully materialize unless infrastructure development is paired with additional “soft” measures, such as water demand management, water governance, and other actions designed to bring about behavioral changes. This is aligned with the NDM, which recommends “reflecting the true value of the water resource and incentivizing a more efficient and rationale use and management of the resource.”

Floods also represent a threat to development. Floods are the most frequent climate-related natural hazards in Morocco, causing average direct losses estimated at \$450 million per year, with a disproportionate impact on vulnerable households. In addition, given that more than 65 percent of the population and 90 percent of industry is concentrated on the country’s coastline, sea-level rise constitutes another long-term stressor, especially for low-lying areas that will contribute to exacerbating the risk of floods.

Morocco has developed a sophisticated architecture for disaster risk management (DRM) and disaster risk financing (DRF), but the scale of investment in risk reduction and insurance coverage remains insufficient. The

country has developed a DRM system building on innovative schemes, including the Natural Disasters Resilience Fund (FLCN), initially created to finance post-disaster reconstruction, and then turned into a mechanism that co-finances disaster risk reduction and preparedness investments at the local level. It has also strengthened its financial resilience to natural disasters through the establishment of a dual catastrophic risk insurance regime that involves private insurers, and a public Solidarity Fund Against Catastrophic Events (FSEC). The scale of the protection offered by these mechanisms, however, remains insufficient. The quantitative simulations included in this CCDR conclude that an optimal level of DRM investments would cover the equivalent of 15-20 percent of annual average losses (AAL), corresponding to an average annual investment between \$67 and \$90 million. The simulations also emphasize that scaling up the DRF scheme is critical in order to adequately cope with extreme events. In addition, given their high returns, nonstructural investments such as early warning systems, nature-based solutions, risk and climate knowledge, and awareness raising should be more systematically integrated into the DRM approach. On the institutional front, Morocco should continue strengthening cross-sectoral and territorial coordination to increase the effectiveness of the DRM system.

Morocco can decarbonize its economy gradually. The CCDR estimates that 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. Decarbonizing its economy would also contribute to increase its energy independence and reduce the average cost of electricity generation. The power sector would be the cornerstone of the decarbonization strategy: first of all because it is the major contributor to greenhouse gas (GHG) emissions, but also because it would support the decarbonization of end-use sectors such as road transport and industry, which are also major emitters. While Morocco represents only 0.2 percent of global GHG emissions, it has a carbon intensive power sector. Decarbonizing the power sector would require a gradual phase-out of coal-fired generation through the deployment of renewable energy and energy storage technologies, with natural gas as a transition fuel. To switch from reliance on large thermal power plants towards more dispersed solar and wind power plants and to ensure network stability, large investments in the transmission grid would be required. In the medium to long term, Morocco could develop large-scale production of green hydrogen and its derivatives—which could be used for domestic purposes such as the production of green fertilizer, transport, and as a substitute for natural gas in power generation—but also for export (to the European Union (EU), for example). As the fifth largest exporter of fertilizers, Morocco has already taken decisive steps to reduce the footprint of its highly energy- and water-intensive phosphate industry. In addition, efforts to improve energy efficiency across all sectors should be pursued. Investing in renewables and energy efficiency in line with government targets by 2030 could result in around 28,000 net jobs per year, or about 9 percent of the estimated 300,000 annual jobs shortfall facing the economy. In order to achieve those targets, appropriate higher education and vocational training would need to be in place in order to prepare the workforce for these new jobs.

Decarbonizing the economy would require massive investment but would also yield profound reforms. Reaching a net-zero emission target by the 2050s would have an estimated cost of \$52.8 billion². In this CCDR, we estimate that more than 85 percent of the investment needed to decarbonize the economy would be covered by the private sector. However, in order for this to materialize, profound reforms would have to occur, most notably in the power sector. This would include sector unbundling; the creation of wholesale and balancing markets; fully cost-reflective network access and end-user tariffs; and increased market integration with the European Union (EU). Policies and market incentives would also need to be put into place in order to develop e-mobility and green hydrogen.

Decarbonization could bring significant benefits to the Moroccan economy. Morocco is particularly well placed to reap the economic benefits that could emanate from the global decarbonization agenda. Its economy is closely integrated with the EU, which is among the regional blocks that have embraced ambitious climate action targets. In this regard, decarbonization represents an opportunity for the Moroccan industry to not only maintain but even expand its market share in Europe. It would also increase the country's attractiveness for foreign direct investment (FDI), and position Morocco as a hub for green investment and export, with positive spillovers in terms of economic growth and jobs.

² This amount is in net present value applying a 6 percent discount rate. It also comprises all costs related to green hydrogen, including exports.

Structural and Macroeconomic Policies for a Resilient and Low Carbon Transition

This CCDR estimates the total investment needed for a resilient and net zero Morocco by 2050s at about \$78 billion in net present value (NPV) terms⁴. Ultimately the impact of the transition will depend on how these investments are financed, and more broadly on the macroeconomic policy choices that will be made in the years and decades to come. Therefore, beyond the sectoral interventions discussed above, the CCDR also focuses on various structural and macroeconomic policies that could synergistically pursue both the Kingdom's development objectives and its climate adaptation and mitigation ambitions.

The private sector will be central both in the RLC transition and in rebalancing Morocco's growth model. As mentioned above, it is expected that the investments in decarbonization would, by and large, be shouldered by the private sector. On the adaptation front, while most of the investment needs identified in this report are expected to be covered by public financing, there is room for attracting private operators on specific interventions—for example sea-water desalination, but also climate-smart agriculture and insurance. Maximizing private climate investment would help release pressure on public finances and would also have broader positive impacts on the economy. But in order to achieve this, Morocco would need to relieve the structural constraints that have prevented private firms from entering new markets and growing, which is also critical in order to accelerate productivity growth and job creation going forward.

Greening the financial system could also help channel resources toward climate-friendly activities. As a first step, Morocco should consider adopting a green national taxonomy (i.e., a classification scheme). Moreover, a public guarantee or investment vehicle could be put in place to de-risk and crowd in green commercial investments, a role that could be partly played by the newly created Mohammed VI Strategic Investment Fund. This CCDR also considers the financial stability dimension of climate change. It uses a stress-testing methodology developed together with the central bank that shows that the impacts could be significant; this calls for reinforcing of the coverage of climate risks in financial regulation and supervision.

The fiscal dimension will be central for the RLC transition in Morocco, since a significant part of the investments will inevitably have to be led by the public sector. The COVID-19 shock led to a large increase in public debt and may eventually force the authorities to embark on a fiscal consolidation process that could increase competition for scarce public resources. In this context, this CCDR explores various options that could increase fiscal revenues through environmental tax reforms and water valuation policies, while synergistically pursuing climate objectives.

Environmental tax reform and water valuation policies could generate an important flow of public revenues, and could be less harmful to the economy than conventional tax reform. A few options could be considered, including the elimination of "brown" tax expenditures; the removal of explicit butane gas subsidies; and the introduction of a carbon tax. Overall, these reforms could mobilize more than 2 percent of GDP in the short term. They would also trigger behavioral and economic adjustments that would generate climate co-benefits; as a result, the revenues of such environmental taxes would tend to decline over time. In the longer term, the CCDR modeling analysis show that their macroeconomic impacts would be better than those of an equivalent tax reform". Similarly, increasing water tariffs, which have been maintained at low levels despite the growing scarcity of resources, could also have positive fiscal impacts while also encouraging a more rational use of water.

However, such reforms could have disproportionate impacts on the poor and vulnerable; therefore, compensatory measures should be carefully crafted to ensure an equitable transition. Both the environmental tax and the water valuation reforms could reduce private consumption, channeled through the price increases that these policies would cause. A well-targeted cash transfer program could be the best compensation option to offset the negative impacts on the most disadvantaged households. For that purpose, the government could leverage the Unified Social Registry that is currently being deployed. It should be noted that environmental tax reforms are more likely to succeed when implemented in a context of price stability: as such, the timing of the reform, along with its sequencing with the compensatory measure roll out, need to be carefully handled.

⁴ With a discount rate of 6 percent, i.e. representing a total undiscounted amount of \$219 billion for the 2022-2050 period.

Principles for Pursuing a Transition to a Resilient and Low Carbon Economy

This CCDR presents a series of principles that could be used to guide the process as Morocco embarks on an ambitious set of policy reforms to synergistically pursue its development objectives and its climate adaptation and mitigation ambitions.

Principle #1: Adopt a “Whole-of-Government” Approach. The level of complexity this challenge represents cannot be tackled through sectoral lenses and under current institutional boundaries. Instead, it requires a “whole of government” approach that will ensure that climate change is recognized as an intrinsic constituent of the development model, at both the macro and sectoral levels, with enhanced articulation between the various levels of jurisdictions. In this context, Morocco needs to strengthen its coordination mechanisms both horizontally and vertically, since local governments will be expected to play an important role in climate actions. In addition, public finance management (PFM) tools, such as a climate-sensitive budget, green procurement, and environmental fiscality have the potential for systematically mainstreaming climate consideration in all public actions and ensuring a full alignment with the Nationally-Determined Contribution (NDC).

Principle #2: Protect the Most Vulnerable. Poor households tend to be systematically more vulnerable to climate events, but also to the impact of climate policies. As Morocco embarks on an overhaul of its social protection system, it has an opportunity to embed climate-responsive features that would allow the system to respond swiftly to protect those who are affected by climate-related events, and to offset their losses in income or assets. In addition, the country could expand its already sophisticated DRF mechanism for flood protection, including the coverage of the risk of floods. Since climate policies could also be harmful to vulnerable households and firms that don’t have the adaptative capacity to quickly adjust, compensatory measures need to be carefully crafted to avoid exacerbating social disparities, and to contribute to an equitable and inclusive transition. While the RLC transition holds prospects for the creation of green jobs, there will be a need to prepare workers for these opportunities by putting into place incentives in the educational and vocational training systems to reorient programs toward the shift in skill that is needed. Public policies should also anticipate the migratory flows that could be triggered by climate change, most notably in the areas of urban planning and development.

Principle #3: Strengthen the System of Climate Information and Analysis. A robust information system is the foundation for effective climate action, when it comes to both preparedness and response to shocks and long-term stressors. Generating, compiling, sharing, and analyzing reliable information on climate indicators is a public good that can inform decision-making processes, both public and private, and can foster climate action by reducing the level of uncertainty.

Principle #4: Unleash Innovation. Innovation and clean technologies are core to addressing the challenges of climate change and can also spur gains in productivity and competitiveness. Morocco has demonstrated its capacity to adopt innovative solutions in renewable energy; however, regulatory barriers have constrained their full deployment. On the adaptation side, recurring droughts and water scarcity challenges call for a transformation of the agriculture sector (most notably its rainfed segment); public/private partnerships (PPPs) could be established to foster agricultural R&D and innovative systems to promote the development of climate-smart technologies and practices. The public and private sectors could also join forces to disseminate such innovations to farmers through extension services in order to sustain productivity growth in the face of climate change.

Principle #5: Stakeholder Engagement. Climate action will necessitate the contribution of all actors of the society (public entities, the private sector, and civil society). Creating space for exchanges and coordination can foster dialogue among actors that can help accelerate the deployment of climate action at both the national and local levels.⁵ Partnerships between the public sector, private operators, and academia have already shown results in terms of innovation in Morocco.⁶ Engaging with all stakeholders and making information on climate change available through a targeted communication campaign will prove essential in order to trigger the behavioral changes that will support the climate transition to a resilient and low carbon Morocco.

⁵ For instance, the 4C Maroc is a platform for dialogue and capacity building on climate change, bringing together public administration, the private sector, civil society, and academia.

⁶ The Euromed University of Fez, the Fez-Meknes Region, the CGEM Fez-Taza, the Alten Maroc Company, the Digital Development Agency, and the Ministry of Industry and Trade have launched the Fez Smart Factory project, which aims to develop an innovation ecosystem for Industry 4.0.

