

## MOROCCO

# INTENDED NATIONALLY DETERMINED CONTRIBUTION (INDC) UNDER THE UNFCCC

### Executive Summary

Morocco's Intended Nationally Determined Contribution (INDC) has its institutional roots in the National Strategy for Sustainable Development (NSSD). Morocco has developed its INDC with the conviction that global ambition to counter the effects of climate change calls for a commitment from all parties with regard to mitigation, adaptation and implementation.

In developing its INDC, Morocco undertook a broad stakeholder consultation process. This process allowed for the review of policies and programs that are being implemented by Morocco to combat global warming, and for the determination of the level of ambition to which the country wants to commit within its INDC.

This process culminated in a national conference held on June 2, 2015 in Rabat, chaired by the head of government, to officially present the draft INDC to all stakeholders and to ensure their full support for the implementation of the commitments included in the present document.

Even though Morocco is focusing its efforts in the energy sector, its greenhouse gas (GHG) emission reduction targets will be achieved through economy-wide actions based on strategies and sectoral action plans designed, amongst others, for the following areas of intervention: agriculture, water, waste, forests, energy, industry and housing.

Morocco's commitment is to reduce its GHG emissions **by 32 % by 2030** compared to "business as usual" projected emissions. This commitment is contingent upon gaining access to new sources of finance and enhanced support, compared to that received over the past years, within the context of a new legally-binding agreement under the auspices of the UNFCCC. This target translates into a cumulative reduction of **401 Mt CO<sub>2</sub>eq over the period 2020-2030**. Meeting this target will require an overall investment in the order of **USD 45 billion**, of which USD 35 billion is conditional upon international support through new climate finance mechanisms, such as the Green Climate Fund.

Concerning adaptation, Morocco has already made significant efforts. Over the period 2005-2010, Morocco devoted 64 % of all climate-related spending in the country to adaptation, which represents 9 % of overall investment expenditures.

This considerable part of the national investment budget dedicated to adaptation demonstrates the magnitude of the challenges facing Moroccan society. And this share is certain to rise over the years and decades to come. Morocco expects to dedicate at least 15% of its overall investment budgets to adaptation to climate change.

In conclusion, Morocco, driven by its convictions of common but differentiated responsibility, by its belief that humanity shares a common fate and by its commitment to the principle of equity, wishes to pave the way for a global commitment that is responsible and fair, for the well-being of the entire planet.

## **1. Morocco's national circumstances and its commitment to climate change**

Located on the southern shore of the Mediterranean, at the gates of Europe and northern Africa, Morocco has always been a crossroads of civilizations. In recent decades, Morocco has experienced economic and social development within the context of climate change. Consequently, the pressure on natural resources has increased, affecting the resilience of forest ecosystems and the agriculture sector, particularly because of water scarcity. Water availability per capita was over three times higher in 1960 than it is today.

Aware of this situation, Morocco has voluntarily and resolutely engaged in a process to combat global warming, progressively outlining its own vision while complying with decisions taken collectively at the international level. Morocco's vision to address climate change is as follows:

***Make its territory and civilization more resilient to climate change while ensuring a rapid transition to a low-carbon economy.***

This political will is today enshrined in the Framework Law on the National Charter for Environment and Sustainable Development, which asserts "the rights and duties inherent to the environment and sustainable development accorded to natural and legal persons and proclaim these principles to be respected by the state, local authorities and public institutions and businesses."<sup>1</sup> The operationalization of this policy was undertaken through the preparation of the National Strategy for Sustainable Development (NSSD) that will guide the actions of all public institutions and private actors in furthering a dynamic social and economic development.

Morocco's INDC finds its institutional roots in the NSSD and outlines a vision of Morocco in 2030. Morocco has developed its INDC with the conviction that global ambition to counter the effects of climate change calls for a commitment from all Parties with regards to mitigation, adaptation and implementation.

In this context, Morocco has set a target to limit greenhouse gas (GHG) growth that will be reached through its own means, a target that could be enhanced substantially with support from the international community. This ambition rests, to a large extent, on a major transformation of the energy sector, which requires a great political commitment and aims to reduce the country's major energy dependency and meet the growing demand for energy to support its development, particularly due to increasing water stress. The main objectives behind this transformation are:

---

<sup>1</sup> This is an unofficial translation of the Framework Law for National Charter for Environment and Sustainable Development.

- Reaching over 50 % of installed electricity production capacity from renewable sources by 2025;
- Reducing energy consumption by 15 % by 2030;
- Substantially reducing fossil fuel subsidies, building on reforms already undertaken in recent years;
- Substantially increasing the use of natural gas, through infrastructure projects allowing liquefied natural gas imports.

Even though Morocco is focusing its efforts in the energy sector, its GHG emission reduction targets will be achieved through economy-wide actions based on strategies and sectoral action plans designed, amongst others, for the following areas of intervention: agriculture, water, waste, forests, energy, industry and housing.

In a near future, Morocco also intends to develop a national plan to combat short-lived climate pollutants (SLCPs), with support from the Climate and Clean Air Coalition. As part of this process, Morocco will develop SLCP emission inventories and assess the benefits of reducing SLCPs for climate, health and agricultural production.

The implementation of the INDC requires an unprecedented mobilization of Moroccan society and international financial partners. To facilitate this mobilization, Morocco has set up the Moroccan Competence Centre for Climate Change (4C Maroc), which provides a capacity-building and information-sharing platform on climate change. The platform is available to various stakeholders and has a regional and African outreach. The 4C Maroc will drive this mobilization and will be responsible for the development of a national system for monitoring GHG emissions.

In this context, and as the upcoming President of the Conference of the Parties to the UNFCCC (2016), Morocco reiterates its determination to support the multilateral negotiation process for reaching a new climate deal this year in Paris.

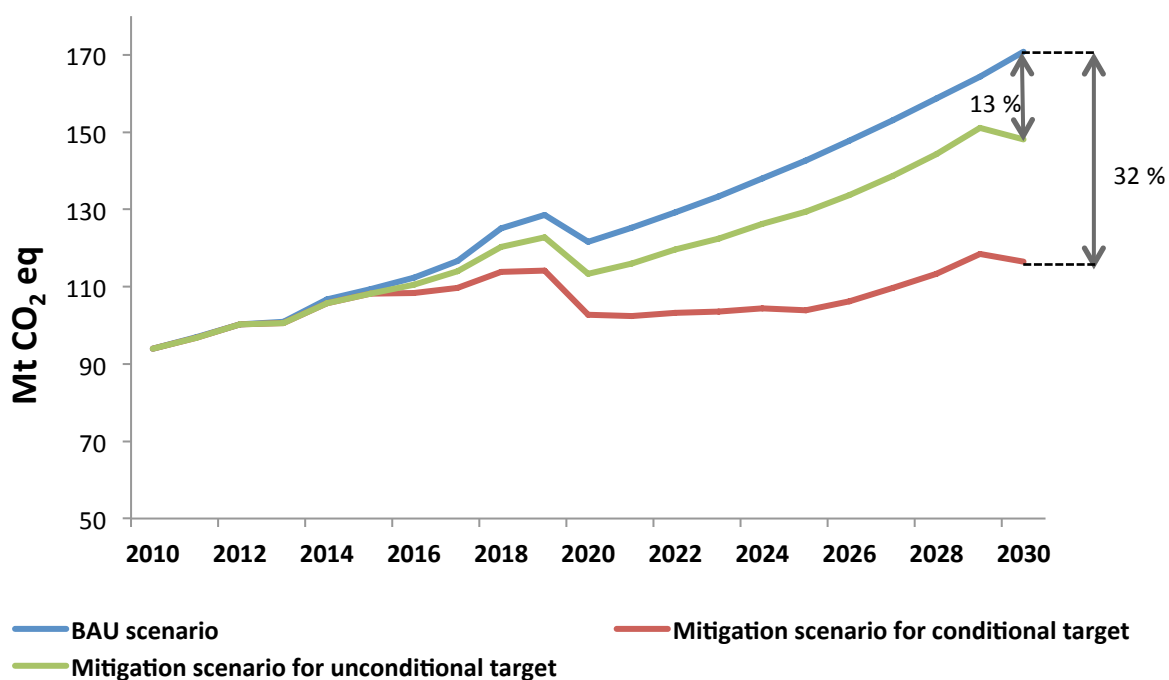
## **2. Morocco's Mitigation Contribution**

### **Mitigation Targets**

Unconditional Target	A <b>13 %</b> reduction in GHG emissions by 2030 compared to a business as usual (BAU) scenario.*
Conditional Target	An additional <b>19 %</b> reduction achievable under certain conditions, which would bring the total GHG reduction to <b>32 %</b> below BAU emission levels by 2030.*
Expected Trajectory	In achieving its unconditional and conditional targets respectively, for reference and guidance purposes only, Morocco expects its emissions trajectory to be the following: <ul style="list-style-type: none"><li>• to reach 113 Mt CO<sub>2</sub>eq in 2020 and 129 Mt CO<sub>2</sub>eq in 2025, decreasing by 7 % and 10 % compared to BAU emissions in 2020 and 2025, respectively.</li><li>• to reach 103 Mt CO<sub>2</sub>eq by 2020 and 104 Mt CO<sub>2</sub>eq by 2025, decreasing by 16 % and 27 % compared to BAU emissions in 2020 and 2025, respectively.</li></ul>
Financial Needs	Meeting the conditional target requires an overall investment estimated at USD 45 billion between 2015 and 2030, of which 35 USD billion is conditional upon: <ul style="list-style-type: none"><li>• access to new sources of finance and enhanced support, compared to that received over the past years, to be mobilised through new climate finance mechanisms, such as the Green Climate Fund;</li><li>• the conclusion of a legally-binding agreement under the auspices of the UNFCCC.</li></ul>

\* Morocco reserves the right to revise said BAU scenario on the basis of new analysis by 2020.

**Figure 1. BAU and Mitigation Scenarios**



### Assumptions and Methodological Approaches

Type of Targets	Emission reductions from projected emissions for the year 2030, according to a BAU scenario
Coverage	Economy-wide
Gases Covered	<ul style="list-style-type: none"> <li>• Carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O)</li> <li>• Fluorinated gases are not covered; they are rarely used in Morocco and their emissions are marginal.</li> </ul>
Sectors covered	<ul style="list-style-type: none"> <li>• Energy                             <ul style="list-style-type: none"> <li>- Energy production</li> <li>- Energy demand (households, transport, industry, services, agriculture and fisheries)</li> </ul> </li> <li>• Industrial Processes                             <ul style="list-style-type: none"> <li>- Cement industry</li> <li>- Steel and metal manufacturing</li> <li>- Other industries</li> </ul> </li> <li>• Agriculture                             <ul style="list-style-type: none"> <li>- Enteric fermentation and manure management</li> </ul> </li> </ul>

- 
- Cropping systems
  - Land-use for agriculture
  - Waste
    - Solid waste
    - Waste water
  - Land-use, land-use change and forestry (LULUCF)
    - Natural forests
    - Afforestation and reforestation
    - Arboriculture
    - Firewood from forests
    - Firewood from orchards
    - Forest fires

---

BAU Scenario	GHG emission projection for 2030, starting in 2010, which is the first year of implementation of the National Plan for the Fight against Global Warming. Projections do not take into account the mitigation measures and actions implemented from 2010.
--------------	--

---

Mitigation Scenarios	GHG emission projections for 2030, starting in 2010. The unconditional mitigation scenario is based on the implementation of 10 actions, while the conditional scenario assumes the implementation 54 actions over the period 2010-2030.
----------------------	--

---

Global Warming Potential (GWP)	<p>The GWP values used are those determined by the Intergovernmental Panel on Climate Change (IPCC), according to Decision 17/CP.8 of the UNFCCC, for the preparation of national emissions inventories:</p> <ul style="list-style-type: none"> <li>- GWP CO<sub>2</sub> = 1 (by convention)</li> <li>- GWP CH<sub>4</sub> = 21</li> <li>- GWP N<sub>2</sub>O = 310</li> </ul>
--------------------------------	--

---

Methodology for Estimating Emissions	<p>The 2010 GHG emissions inventory was completed according to the revised 1996 IPCC Guidelines.</p> <p>The BAU and mitigation scenarios were developed for all sectors using the "Long-range Energy Alternatives Planning System" (LEAP) software. They are based on data from the National Statistics Directory, on data on sectorial activities and on economic, demographic and sectoral prospective analyses.</p>
--------------------------------------	--

---

Methodology for Estimating Emissions from Agricultural, Forestry and other Land Use Sectors	<p>Agricultural sector: GHG emissions that are included are those related to enteric fermentation and manure management, cropping systems and agricultural land (cultivated soils). Agricultural residues are mainly used as animal feed or as fuel in rural areas.</p>
---	---

---

---

Forestry sector and other land-use sectors: taking into account local specific conditions and type of land-use in Morocco, natural forests, reforestation, horticulture, firewood from forests and orchards, and forest fires are the main categories included in the emission assessment from the forestry and other land-use sectors.

---

**Table 1. Summary of Key Mitigation Data**

	<b>2010</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>Total 2020-2030</b>
<b>Emissions – BAU (Mt CO<sub>2</sub>eq)</b>	94	122	143	171	1,585
<b>Emissions – Unconditional scenario (Mt CO<sub>2</sub>eq)</b>	94	113	129	148	1,443
<b>Emissions – Conditional scenario</b>	94	103	104	117	1,184
<b>Expected reductions – Unconditional scenario (Mt CO<sub>2</sub>eq)</b>	0	9	14	23	142
<b>Expected reductions – Conditional scenario</b>	0	19	39	54	401

### Planning for Implementation

In recent years, Morocco has thoroughly reformed its legal and institutional framework to enable the transition to a green economy. The implementation of Morocco’s INDC is based on several laws, strategies and national action plans that include clear and ambitious sectorial targets (Table 2).

The conditional mitigation scenario is based on the implementation of 54 actions covering all sectors, leading to the estimated expected GHG reductions, as shown in Figure 2.



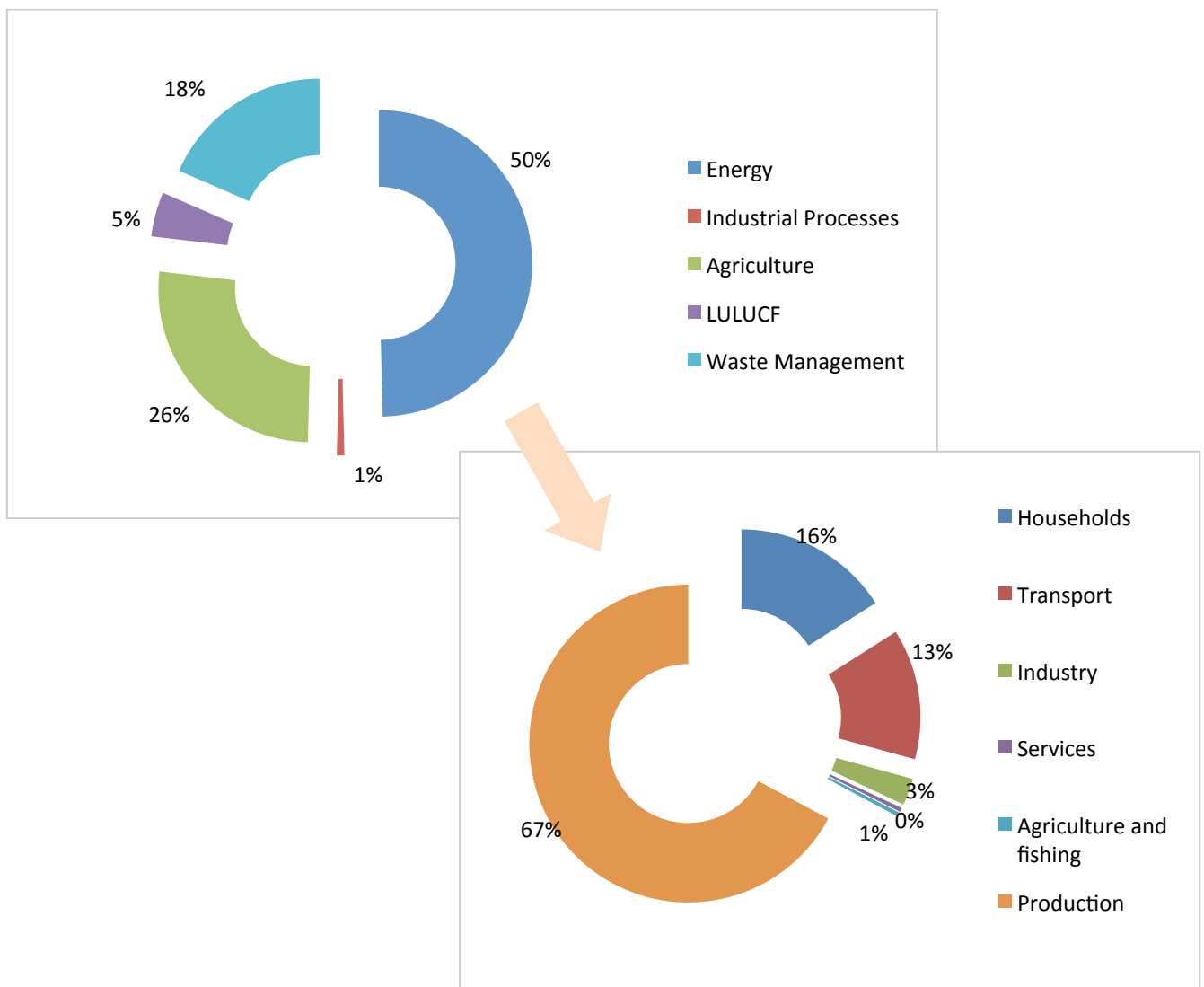
**Table 2. Key sectorial strategies and targets for the implementation of Morocco's INDC**

Strategies and action plans	Targets
National Energy Strategy	<ul style="list-style-type: none"> <li>• Provide 42 % of the installed electrical power from renewable sources, of which 14 % is from solar energy, 14 % is from wind energy and 14 % is from hydraulic energy by 2020.</li> <li>• Achieve 12 % energy savings by 2020 and 15 % by 2030, compared to current trends.</li> <li>• Reduce energy consumption in buildings, industry and transport by 12 % by 2020 and 15 % by 2030. The breakdown of expected savings per sector is 48 % for industry, 23 % for transport, 19 % for residential and 10 % for services.</li> <li>• Install by 2030 an additional capacity of 3,900 MW of combined-cycle technology running on imported natural gas.</li> <li>• Supply major industries with imported and regasified natural gas by pipelines.</li> </ul>
National Waste Recovery Program	<ul style="list-style-type: none"> <li>• Mainstream household waste management master plans and standardize them for all regions and provinces of the Kingdom.</li> <li>• Improve the collection of household waste to achieve an urban collection rate of 90 % by 2020 and 100 % by 2030.</li> <li>• Establish landfill and recycling centres for household waste for the benefit of all urban areas by 2020.</li> <li>• Rehabilitate or close all illegal landfills by 2020.</li> <li>• Make the management of the sector more professional.</li> <li>• Develop chains of “sorting-recycling-recovering” with sorting pilot projects to achieve a 20 % recycling rate by 2020.</li> <li>• Train and raise awareness of stakeholders on waste issues.</li> </ul>
National Liquid Sanitation and Wastewater Treatment Programme (NSP)	<ul style="list-style-type: none"> <li>• Reach an overall urban sewerage connection rate of 75 % by 2016, 80 % by 2020 and 100 % by 2030.</li> <li>• Reach a 50 % volume of treated wastewater by 2016, 60 % by 2020 and 100 % by 2030.</li> <li>• Expand wastewater management to services and reuse 50 % of wastewater by 2020.</li> </ul>
Morocco Green Plan	<ul style="list-style-type: none"> <li>• Modernize the agricultural sector to make it more competitive and integrated in the global market to create wealth over the entire value chain.</li> <li>• Take into account the agricultural sector in all its sociological and territorial components by incorporating human development objectives as a key requirement.</li> <li>• Improve the promotion of natural resources and their sustainable management.</li> <li>• Define the necessary policies to support sustainable growth.</li> </ul>

Preservation and Sustainable Forest Management Strategy

- Develop forestry and surrounding areas.
- Finalize land demarcation and registry of forested areas.
- Complete the suckering, renewal or afforestation of approximately 50,000 hectares per year, with a primary focus on natural species and support for high quality forest research when rehabilitating territory.
- Protect water basins against erosion and siltation of dams.
- Rehabilitate ecosystems and protect and promote natural areas as well as endangered species as resources.

**Figure 2. Distribution of the mitigation effort by sector between 2020 and 2030, to achieve the conditional target**



## Other Considerations

---

Perspective on Human Rights and Gender	Respect for human rights and gender balance are two pillars of Morocco's vision for its work on climate change. Morocco's 2011 Constitution brought a new impetus to this momentum by enshrining sustainable development as a citizens' right.
Considerations relating to the other Two Rio Conventions	Morocco's INDC is part of an integrated approach, which fosters biodiversity, recovery and maintenance, whilst integrating sustainable management for both water and land resources in order to combat desertification.
Use of Market Mechanisms	Morocco considers the establishment of an international market mechanism vital to reduce the total costs to achieve the target of limiting the temperature increase to 2°C. Morocco does not exclude the possibility of using these mechanisms to achieve its conditional and/or unconditional targets.
Equity and Ambition	Morocco considers its INDC to be ambitious and fair for three main reasons: <ul style="list-style-type: none"><li>• Morocco makes, for the first time, a formal commitment to limit the growth of its GHG emissions, despite having only emitted 0.2 % of global GHG emissions in 2010.</li><li>• With the conditional target, Morocco's per capita emissions would not exceed 3.1 t CO<sub>2</sub>eq in 2029 and the GHG intensity in relation to the Gross Domestic Product (GDP) would improve by 4 % over the period 2010-2030.</li><li>• Finally, Morocco must focus primarily on minimising the risks of climate change impacts. Certain economic activities, such as agriculture, fisheries, aquaculture, forestry and tourism are significantly vulnerable, as are certain ecosystems, such as oases, the coast and mountains.</li></ul>

---

### **3. Morocco's action on adaptation**

Morocco is very vulnerable to climate change, due to its geographical location, and is prone to water scarcity, declining agricultural production, desertification, floods and rising sea levels. For Morocco, adaptation to climate change is the cornerstone of any program or policy on sustainable development.

#### **Morocco's vision to address the risks of climate change impacts**

Morocco's vision is to:

*Preserve its **territory** and its **civilization** in the most appropriate manner, effectively responding to the vulnerabilities of its territory and implementing an adaptation policy that builds resilience for all of its **population** and its **economic actors** to face these vulnerabilities.*

Morocco implements a sectoral approach, adapted to its varied natural circumstances: mountain regions, the coast, oases, agricultural areas and urban areas. The ultimate objectives of Morocco in addressing climate change, which must also resonate with the international community, are:

- The protection of populations, through a risk-prevention management approach, particularly in the most vulnerable areas (coastal zones, mountainous areas, regions with a high propensity for desertification, and oases). This approach relies on an observation and research system to better understand current and future climate risks.
- The protection of natural heritage, biodiversity, forestry and fishery resources, through an ecosystem-based adaptation approach. Morocco commits to restoring ecosystems and strengthening their resilience, to combat soil erosion and prevent flooding.
- The protection of climate-sensitive production systems, such as agriculture and tourism, as well as high-risk infrastructures. Water resources being the most constraining factor to sustainable development in Morocco, the Kingdom has recently developed a National Water Strategy. The strategy aims to improve integrated and appropriate water resource management and preservation methods, protection against pollution, training, scientific research and awareness around these themes.
- The protection of the cultural heritage of the Kingdom through education and awareness actions, and efforts to preserve ancestral good practices in highly vulnerable sectors, such as water and agriculture.

## Goals to Build Resilience

Morocco's vision for adaptation involves several quantified sectorial goals for 2020 and 2030.

The goals for 2020:

- Substitution of water withdrawal (85 million m<sup>3</sup>/year) from overexploited aquifers by withdrawals from surface water;
- Increase the current area under drip irrigation from 154,000 ha at present to 555,000 ha;
- Reconstitution of forests on 200,000 ha.

The goals for 2030:

- Desalination of 285 million m<sup>3</sup>/year of drinking water supply to several cities and centres;
- Reuse 325 million m<sup>3</sup>/year of treated wastewater;
- Construction of 38 new dams and development of an inventory and the treatment of all sites vulnerable to flooding;
- Connection to the sewerage system and wastewater treatment to reach 100 % of urban areas;
- Wastewater treatment to reach 100 %;
- Savings of 2.4 billion m<sup>3</sup>/year of irrigation water;
- Improved performance of drinking and industrial water systems, with a target of 80 % as a national average, in order to save 120 million m<sup>3</sup>/year of drinking water;
- Artificial refill of aquifers with a potential of 180 million m<sup>3</sup>;
- Massive conversion of surface and sprinkler irrigation to drip irrigation over an area of 920,000 ha, resulting in water savings of 2.4 billion m<sup>3</sup>/year;
- Conversion of nearly one million hectares of grain crops to fruit plantations that are likely to protect agricultural areas from all forms of erosion, especially water erosion;
- Treatment to prevent erosion of 1.5 million ha over a period of 20 years (75,000 ha / year), in 22 priority watersheds.

To achieve these goals, much planning has already been undertaken. Resilience to climate change is included in the majority of strategies, policies, action plans and programs, including in the following, cited as examples:

- National Strategy for Sustainable Development (NSSD);
- National Strategy to Combat Global Warming (NSGW), the National Policy to Combat Global Warming (NPGW), the National Plan to Combat Global Warming (NPGW) with its local variations, and the Green Investment Plan (GIP);
- National Water Strategy (NWS), the National Water Plan (NWP);

- National Plan for Water Saving Irrigation (NPWSI);
- National Plan for the Protection Against Floods (NPF);
- National Sanitation Programme (NSP);
- National Rural Sanitation Programme (NRSP);
- Green Morocco Plan (GMP);
- National Action Programme to Combat Desertification;
- Programme for the Conversion of the Gravity-Fed System into Localized Irrigation (PCGSLI);
- National Programme for the Promotion of Household Waste (NPPW);
- National Plan for Watershed Planning (NPWD);
- National Strategy for the Planning and Development of Oases;
- National Strategy for the Planning and Development of Middle Atlas;
- Programme for the Sustainable Development of the High Atlas;
- Programme for the Sustainable Development of the Anti Atlas;
- National Strategy for Integrated Coastal Management;
- Halieutis Plan;
- Initiative for New Energy-Efficient Cities.

Moreover, Morocco is committed to developing, in the short term, a National Adaptation Plan up to 2030, to better coordinate its actions and maximize their impact.

### Morocco's Adaptation Needs

Adaptation needs will have significant budgetary implications for Morocco. Over the period 2005-2010, Morocco devoted 64 % of all climate-related spending in the country to adaptation, which represents 9 % of overall investment expenditures.<sup>2</sup>

This considerable part of the national investment budget dedicated to adaptation demonstrates the magnitude of the challenges facing Moroccan society. And this share is certain to rise over the years and decades to come. Morocco expects to dedicate at least 15% of its overall investment budgets to adaptation to climate change.

More specifically, as an example, the Green Investment Plan presents a few adaptation initiatives to be implemented over the short-term in the water, agriculture and forestry sectors, which would necessitate investments of about USD 2.5 billion.<sup>3</sup>

---

<sup>2</sup> Source: World Bank (2013). *Royaume du Maroc. Revue des Dépenses Publiques et Analyse Institutionnelle de la Politique Climat*. Programme d'Appui Analytique à la Stratégie Changement Climatique du Maroc. P-ESW 113768. Note de Stratégie n. 4.1.

<sup>3</sup> Source: Government of Morocco. *Plan d'investissement vert (PIV)*, 2014. Retrieved from <http://www.maroc.ma/fr/content/plan-maroc-vert>

In this context, Morocco is seeking the support of the international community, which spent only 5 % of climate finance for adaptation.<sup>4</sup> Beyond financial support, Morocco would also benefit from technical and institutional capacity building, particularly regarding the creation of data and knowledge sharing. It would also benefit from legal, financial and engineering support pertaining to designing and implementing projects at the regional and local levels, as well as for the monitoring and evaluation of their socioeconomic impacts.

### **Monitoring and Evaluation System for Adaptation in Morocco**

Morocco has put in place a system to monitor and assess vulnerability and adaptation to climate change. It offers an institutional mechanism that allows for the monitoring of climate vulnerability and the results of adaptation actions, taking into account gender issues. This pilot project was first tested in the regions of Souss-Massa-Drâa and Marrakech Tensift Al Haouz.<sup>5</sup> The adoption of the monitoring and evaluation system by other regions is planned for the medium term, with the implementation of a national governance mechanism to oversee the monitoring and evaluation system.

By launching an advanced regionalization project, Morocco will contribute to this programme through a national vision for land planning which promotes regional potentials and resources, and encourages strategically integrated land planning that is rooted in involving territories to build their resilience to climate change.

---

<sup>4</sup> Source: Climate Funds Update. « Multilateral and Bilateral Project Data. » 2015  
<http://www.climatefundsupdate.org/data>

<sup>5</sup> See: GIZ, OREDD (2014). *Guide relatif au montage du Système de Suivi-Évaluation de la Vulnérabilité et de l'Adaptation au Changement Climatique dans les Régions du Souss Massa Drâa et Marrakech Tensift Al Haouz.*