

Economic Commission for Europe

Committee on Environmental Policy

Twenty-seventh session

Geneva, 3–5 November 2021

Item 6 of the provisional agenda

Environmental performance reviews

Information paper No. 7

25 October 2021

Second Environmental Performance Review of Morocco: recommendations¹

Note by the secretariat

Summary

The document presents the recommendations of the second Environmental Performance Review of Morocco agreed upon by the Expert Group on Environmental Performance Reviews at its meeting conducted in a hybrid format in Geneva and by virtual means from 27 to 29 September 2021.

The Committee is invited to adopt the recommendations.

Chapter 1: Legal, policy and institutional framework

Conclusions and recommendations

Legal coherence

Regulatory impact assessment is a vital tool for legal coherence and informed legislative decisions. However, the passing of a decree on the tool has not resulted in its routine application. Implementing regulations on the new Law on Environmental Assessment are needed to give it effect. Other environmental legislation is being drafted but needs to be completed and adopted. It is difficult to follow the implementation of legislation because of the large number of decrees and orders needed to implement the primary legislation and the extended period taken to adopt them.

Recommendation 1.1:

The Government should:

- (a) *Continues to ensure that regulatory impact assessment is undertaken for major laws, and the results are published;*
- (b) *Rapidly adopt secondary legislation to give full effect to the Law on Environmental Assessment regarding environmental audit and strategic environmental assessment, including by providing for public participation;*
- (c) *Prepare or complete and then adopt legislation on climate change, soils, ecosystems and biodiversity, mountainous areas, noise and other nuisances, chemicals, waste, environmental health and an environmental liability regime;*
- (d) *Accelerate the adoption of the necessary secondary environmental legislation, including on the management of protected areas, emissions of key air pollutants from all the main polluting sectors, discharges into coastal waters and the dredging of marine sand;*

¹ This document was not formally edited; it will undergo editing before being published. In addition, the “chapeaux” of recommendations will be updated to ensure they reflect the recommendations agreed by the Expert Group on EPRs.

- (e) *Introduce a public mechanism to track the adoption of secondary legislation necessary for the implementation of laws, indicating responsibility and the schedule for drafting and the current status, and publish consolidated legal texts and jurisprudence.*

Adoption of strategic documents

In some instances, new national plans such as that for coastal zone management await adoption. In others, national plans have been adopted – for example, the National Strategy for Integrated Management of Natural Risks – but regional plans have yet to follow. The sectoral Sustainable Development Action Plans and the Pact for Exemplary Administration are important mechanisms, though some Government departments have advanced less than others and the online monitoring system is not publicly available.

Recommendation 1.2:

The Government should:

- (a) *Accelerate the process of adoption by decree of the National Plan for the Coastal Zone;*
(b) *Adopt the Roadmap on Sustainable Consumption and Production;*
(c) *Adopt the last version of the National Watershed Management Plan;*
(d) *Review and issue updated versions of other environmental plans that have expired;*
(e) *Roll out regional disaster risk reduction strategies, climate plans, coastal zone management plans and integrated management of natural risks;*
(f) *Encourage all departments to make progress on their Sustainable Development Action Plans and their contributions to the Pact for Exemplary Administration and continue publishing information on progress made.*

Strategic environmental assessment

Though the legal basis for SEA is now in place, regulations (recommendation 1.1(b)) and guidance are lacking. A role in SEA should be given to the public. In addition, the country lacks experience in undertaking SEA of plans and programmes.

Recommendation 1.3:

The Government should:

- (a) *Accelerate the adoption of the legislation and decrees to implement the law regarding environmental assessment;*
(b) *Continue to develop the necessary methodological guidance materials for the strategic environmental assessment of sectoral and local plans and programmes through joint efforts of the ministry responsible for the environment and other authorities concerned, and through pilot assessment exercises involving the public and possibly of plans or programmes recently adopted;*

Recommendation 1.4:

The ministry responsible for the environment should continue assisting and guiding other departments and authorities at national and local levels in their application of the strategic environmental assessment tool.

Alignment between strategies

The lack of alignment between the NSDS and the 2030 Agenda means that there is not clear feedback from Government departments to the National Commission on Sustainable Development on their progress towards the SDGs. The availability of data to underpin environment-related SDG indicators is poor. Implementation of the 2030 Agenda needs to be accelerated including through mobilization of the necessary financial resources.

Recommendation 1.5:

The Government should:

- (a) *Implement the findings of the assessment of the National Sustainable Development Strategy and accelerate the alignment of the Strategy more closely with the 2030 Agenda for Sustainable Development;*
- (b) *Invest further resources in monitoring networks and other means of gathering environmental data needed to monitor progress towards the Sustainable Development Goals;*
- (c) *Implement the recommendations on how to catalyse the necessary funds for the 2030 Agenda as made in the 2019 evaluation of the necessary budget;*
- (d) *Convene a stakeholder group to score SDG indicator 17.14.1 on policy coherence for sustainable development, and implement the identified measures to raise its score;*
- (e) *Employ the conclusions and recommendations of this environmental performance review when preparing the country's next Voluntary National Review.*

Strengthen and simplify the institutional framework for environmental protection

The status of the national environmental authority as a department remains an impediment, including regarding the achievement of the 2030 Agenda. An unnecessarily complex web of numerous councils, committees and commissions has developed with overlapping mandates. The different police forces have differing resource levels and work independently.

Recommendation 1.6:

The Government should:

- (a) *Consider restoring the status of the national environmental authority to that of a ministry;*
- (b) *Review the mandates and activities of councils, committees and commissions related to the environment, terminate those that have not met in the past year or that lack a clear role, enforce the publication of their annual reports and include an automatic termination clause in their mandates;*
- (c) *Review the opportunities for the Environment, Water, Forest and Quarry Police forces to work together and achieve synergies in their environmental protection activities, while increasing resources available to the Environment and Water Police forces.*

Chapter 2: Implementation and compliance mechanisms

Conclusions and recommendations

Environmental permits

Currently, environmental permits for large industrial facilities (e.g., oil refinery, food industry, cement industry, mines) are not based on best available techniques that would prevent or minimise emissions and discharges. An integrated environmental permit system for large industrial installations like those adopted in most industrialised countries does not exist in Morocco.

Recommendation 2.1:

The Government should consider the introduction in due course of integrated environmental permits based on Best Available Technics (BAT) for industrial facilities with a high risk of having negative effects on the environment and the neighbouring populations.

Environmental impact assessment

The absence of implementing legislation for the new Environmental Assessment Law (Law No. 49-17) has prevented its implementation within a reasonable period after its adoption. There are still no provisions for the functioning and constitution of the new National Commission for Environmental Assessment, including cooperation with the unified regional investment commissions. Also, as at 1 June 2021, the revised list of projects subject to EIAs and the list of projects subject to EISs have not been prepared for adoption. Also, the available

sectoral guidelines for conducting EIAs do not cover all major sectoral projects. Another shortcoming of this law is the lack of rules for estimating greenhouse gas emissions for projects subject to EIAs and for establishing measures to monitor and reduce the impact of GHG emissions on the climate. Furthermore, Law No. 49-17 does not specifically require the assessment of the "no action" alternative.

Recommendation 2.2:

The Government should prepare and submit for adoption the implementing legislation for the law on environmental assessments as soon as possible, in particular those concerning:

- (a) The establishment of the modalities for the functioning and constitution of the new National Commission for Environmental Assessment;*
- (b) The elaboration of a new, coherent and effective list characterising the projects that are subject to environmental impact assessments, with a view to incorporating the various types of projects that are not included on the current list, and the creation of a list of projects subject to impact statements;*
- (c) The introduction of the estimation of greenhouse gas emissions for projects and the establishment of measures to reduce the impact of these emissions on the climate; and*
- (d) The introduction of a "no action" alternative in environmental assessments.*

The period for the review of the EIA report is insufficient given the size of some large projects. For example, the 10-day deadline for sending the impact study to the committee seems very short, given that the review of EIAs may take longer because of project size. The deadline for the committee's decision on environmental acceptability, 20 working days, also seems short. Furthermore, the lack of stricter internal quality control procedures (including ISO certification) may compromise the quality of EIAs. The lack of capacity within the ministry responsible for the environment and the EIA review boards in terms of training and human resources, nationally and regionally, can also affect the quality of EIAs.

Recommendation 2.3:

The Government should:

- (a) Review the existing environmental impact assessments' procedure and introduce more adequate time frames for key stages and stricter internal environmental impact assessments quality control procedures;*
- (b) Strengthen capacity of relevant stakeholders to improve the quality of environmental impact assessments.*

Public participation

Regulations for conducting the public inquiry do not require that the EIA be finalised and submitted at the beginning of the inquiry. In addition, the inquiry file does not mention the consideration of the project's socio-economic effects on communities or the need to elaborate an action plan for resettlement for projects that envisage the displacement of populations (e.g., mining and infrastructure projects). There is no indication of how the survey will be conducted or of how observations and proposals from affected communities will be collected (e.g., public meetings or written comments). Finally, the 8-day period for the preparation of the public inquiry report is insufficient.

Recommendation 2.4:

The Government should revise the public inquiry procedure to ensure that public opinion is effectively considered in the environmental impact assessments and in particular:

- (a) Require that the environmental impact assessments be finalised and filed at the time of the commencement of the inquiry;*
- (b) Effectively consider the socio-economic effects of the project on the populations concerned;*
- (c) Introduce modalities for the implementation of a resettlement action plan for the projects concerned;*
- (d) Establish an adequate time frame for the preparation and submission of public inquiry reports.*

Environmental standards

The framework for the consultation and validation process for environmental standards specific to different industrial sectors is inadequate. It lacks detailed procedures and deadlines for implementation, and this slows down the process. The drafting and publishing of implementation decrees is also slow, thus thwarting their purpose. As at 1 June 2021, no standards for noise and soil pollution had been established.

Recommendation 2.5:

The Government should:

- (a) *Improve the process of setting and adopting specific industrial emission and discharge limit values with a view to establishing standard procedures to be conducted according to a predetermined schedule;*
- (b) *Ensure that noise and soil pollution standards are introduced.*

Self-monitoring

Law 49-17 requires the preparation of an "environmental monitoring and follow-up" programme for a project as part of the EIA. The law does not, however, require the beneficiaries of environmental certification to send periodic reports based on implementation self-monitoring data to the environmental authority, thus rendering the submission of regular environmental reports optional. The information contained in the reports could be entered into a database that would facilitate the planning of environmental monitoring visits by the ministry responsible for the environment.

Recommendation 2.6:

The Government should ensure that environmental reports containing environmental self-monitoring data for projects that have received environmental acceptability are regularly submitted to the relevant authorities.

Environmental audits

At present, the environmental audit is reserved only for the operators of industrial facilities and of other activities that are subject to EIAs but do not have environmental acceptability approval (Law No. 49-17). However, the modalities for environmental audits, the procedure for obtaining environmental compliance determination, and the time frame for mandatory environmental audits have not been defined. Furthermore, the law does not require environmental audits for the renewal of environmental permits or periodic environmental audits. Also missing are essential audit report requirements, such as an environmental management plan which would include an environmental monitoring programme and an assessment of GHG emissions, which are needed to propose appropriate measures to mitigate negative impacts on the climate.

Recommendation 2.7:

The Government should establish provisions for environmental audit procedures, for the procedure for obtaining the environmental compliance determination, and for the time frame for conducting environmental audits by introducing:

- (a) *A requirement to conduct environmental audits for the renewal of environmental permits as well as requiring periodic updating of the project environmental monitoring programme,*
- (b) *A requirement to have in place an environmental management plan that includes an environmental monitoring programme;*
- (c) *A requirement to assess greenhouse gas emissions and establish measures to reduce said emissions to reduce the carbon footprint of the activity in question.*

Monitoring and promoting compliance

The paucity of data on regulated installations whose activities pose a significant risk to the environment and neighbouring communities prevents the implementation of a risk-based inspection programme. There are no descriptions of individual facilities available; these should contain general and technical information, data on the compliance history of the facility, and the results of environmental monitoring. This type of information is not

collected and there is no national register of pollutant releases and transfers that could be used to prioritise environmental inspections. Morocco does not have specialised courts for environmental cases and there is a recognised lack of capacity for the effective implementation of environmental inspections, especially at the regional level.

With regard to voluntary compliance promotion instruments, Morocco has not created an eco-labelling system, probably due to the absence of specific legislation. In addition, there are no incentives for the implementation of ISO 14001 certification for small and medium-sized enterprises (SMEs). Certified companies are for the most part large companies that have the financial means available for the certification process, whereas this is not always the case for SMEs.

Recommendation 2.8:

The Government should:

- (a) *Double its efforts to establish a computerized database containing descriptions of individual industrial facilities so that the information needed to plan risk-based inspections is available;*
- (b) *Establish specialised courts for environmental cases or develop the environmental capacity of regular courts;*
- (c) *Create more voluntary instruments to promote compliance, in particular through the establishment of a legal framework for eco-labelling and of aid/incentives to fund the environmental certification process (ISO 14001) for small and medium enterprises;*
- (d) *Make available the resources needed to build institutional capacity for environmental inspections nationally and regionally.*

Environmental liability

The principle of environmental liability was only recently introduced into the Moroccan legal framework with the Framework Law No. 99-12 on the National Charter on the Environment and Sustainable Development, consequently very few laws address the issue of environmental liability for harm to the environment. Framework Law No. 99-12 provides for the establishment of a legal regime for environmental liability that offers a high level of protection for the environment. However, legislation on the environmental liability regime has yet to be adopted.

Recommendation 2.9:

The Government should establish a legal regime for environmental liability in accordance with the Framework Law on the National Charter for the Environment and Sustainable Development and the Law on the Protection and Improvement of the Environment, which would include, in particular, procedures for the establishment of a financial guarantee for environmental rehabilitation, mechanisms for restoration, and modalities for compensation for environmental harm.

Chapter 3: Greening the economy and financing environmental protection

Conclusions and recommendations

Reinforce pollution abatement and resource conservation through appropriate taxation

As at June 2021, environmental taxation is not developed, in particular with regards to air and water pollution and waste generation. Water extraction fees exist but they have not been updated which hinders incentives for water conservation.

Recommendation 3.1:

The Government should:

- (a) *Revise the existing economic incentives mechanisms and adjust them to give a price signal and stimulate pollution abatement and resource conservation, considering the concerns of poor and vulnerable parts*

- of the population, by creating annually inflation-indexed taxes on air pollution and waste generation, and revising the tax base also annually inflation-indexed for water pollution and water abstraction fees;*
- (b) Operationalise the fee for the management of household solid and similar waste;*
 - (c) Consider additional revenues from this revision to increase environmental protection expenditures.*

Phasing-out of fossil fuels' subsidies

Some indirect subsidies to fossil fuels remain in place: fossil fuels for electricity generation are exempt from excise duties and fossil fuels in general benefit from a reduced VAT rate of 10 per cent. Finally, diesel still benefits from lower excise duties compared to gasoline. The tax expenditures associated with these indirect subsidies and the diesel differential remain high.

Recommendation 3.2:

The Government should continue the phasing-out of fossil fuel subsidies and gradually eliminate the differences in excise duties of gasoline versus diesel, while taking into account social concerns.

Regular reporting of the environmental and financial impact of national programmes related to green economy

Morocco implements a number of national programmes which are likely to have strong environmental impacts. However, the impacts are not regularly assessed and openly reported. Progress is difficult to measure, bearing thus on the possibility to implement revisions.

Recommendation 3.3:

The Government should ensure periodic evaluation reports of the financial costs and environmental impact of national programmes related to green economy and make these reports publicly available.

Green Public Procurement

Green public procurement is a potential major instrument for environmental protection. Moroccan legislation does mention environmental protection and sustainable development as factors to consider during public procurement. However, this is currently not implemented due to the lack of knowledge and concrete guidelines that public administration agents can follow.

Recommendation 3.4:

The Government should ensure that:

- (a) National guidelines for Green Public Procurement are developed and disseminated among all relevant public servants and other stakeholders;*
- (b) Government officials are trained to increase their knowledge on GPP practices.*

Promotion of green markets and private sector green entrepreneurship

Morocco has some initiatives to support green entrepreneurship, but these are not developed and there is room for upscaling them. Environmental awareness is not promoted enough and there are too few information campaigns aimed at the general population. Finally, while green innovation and green growth rely on the development of human capital and education, investments in these areas are too low.

Recommendation 3.5:

The Government should:

- (a) Strengthen the support to green entrepreneurship via facilitated access to funding, dissemination of green market information, tax incentives and green grants;*
- (b) Strengthen the process of environmental awareness raising amongst the population via information campaigns;*

- (c) *Continue to develop the offer of professional and academic training in environment and energy-related areas, and introduce these issues in business management curricula.*

Chapter 4: Environmental monitoring and information

Conclusions and recommendations

Integrated environmental information system

An integrated information system for environmental data that interlinks the environmental databases of all public authorities operating environmental monitoring activities is still not available as of 2021. While the launch of the regional information systems on environment and sustainable development, as an indicator-based system, demonstrates progress since the last EPR, a national information system is missing. Data sharing among the SIREDDs has furthermore proved difficult due to the lack of harmonised procedures related to data collection.

Recommendation 4.1:

The ministry responsible for the environment in cooperation with other relevant public authorities, including regional environmental bodies and other stakeholders, should:

- (a) *Promote the methodologies and procedures of the collection of, access to and protection and uniformity of environmental data and information to relevant institutions and the country as a whole;*
- (b) *Identify a harmonised set of national environmental indicators to support environmental decision-making, preferably in line with the Shared Environmental Information System principles;*
- (c) *Consolidate the governance system to ensure that relevant data and information is shared between the regional observatories for the environment and sustainable development;*
- (d) *Design the integrated environmental information system to allow for the inclusion of Geographic Information System based applications.*

Air monitoring

Morocco has made considerable progress in establishing an air emission monitoring system, including the implementation of an emission cadastre and national ambient air quality standards. However, the targets outlined in the last EPR have not been reached. More specifically, according to the National Programme on Air, the number of automatic air quality monitoring stations was set to be extended to 140 stations by 2030; this target has now been pushed to 2030. It can further be noted that while there are some examples of early warning systems as related to air pollution in some local and urban areas, there is no continuous and integrated monitoring and reporting of air quality data on the national level.

Recommendation 4.2:

The ministry responsible for the environment, in cooperation with the National Monitoring Committee for Air Quality and other relevant public authorities, including regional environmental bodies, should:

- (a) *Ensure that the number of automatic air quality monitoring stations will be extended to 140 stations by 2030 as foreseen by the National Programme on Air;*
- (b) *Develop a national and integrated air quality information system to provide up-to-date and real-time information about air quality in different cities and regions to decision-makers and citizens;*
- (c) *Create a national persistent organic pollutants (POPs) monitoring plans and develop relevant online tool to store and visualize data on levels of POPs.*

Water monitoring

Morocco has improved the water measurements of non-bathing surface waters and groundwaters through the accreditation of relevant laboratories. Moreover, the expansion of monitoring networks is underway. While progress has been made in terms of improving the water monitoring infrastructure, no national and integrated

water information system is in place as of April 2021. The set of indicators recommended for assessing water quality across the respective regional monitoring systems is not harmonized among the regions.

Recommendation 4.3:

The ministry responsible for equipment and water, in cooperation with relevant public authorities, including regional environmental bodies, should develop a national and integrated water information system to provide up-to-date and real-time information on water quality issues on the regional and national level.

Pollutant Release and Transfer Register

Since 2008, Morocco has been trying to develop a pollutant release and transfer register (PRTR). Efforts have to date been limited to a pilot project launched by the ministry responsible for the environment. No legislative and regulatory framework for reporting systems, including the reporting of industrial emissions and discharges on the national level is set, and the sharing of PRTR data has been limited to some regions as of April 2021.

Recommendation 4.4:

The Government should implement the necessary policy and practical measures to establish a publicly available national pollutant release and transfer register.

Soil monitoring

Soil monitoring has principally been restricted to the monitoring of soil salinization, soil moisture, drought conditions and soil fertility, including the development of a Desertification Sensitivity Index. No integrated information system is developed, and measurement results are not readily available to the public. The number of parameters that are being monitored, remain limited.

Recommendation 4.5:

The ministry responsible for agriculture, maritime fisheries, rural development and waters and forests, in cooperation with relevant authorities, should:

- (a) *Improve soil monitoring by including, for example, regular spatiotemporal monitoring of nitrates and pesticides to complement ongoing efforts to combat desertification;*
- (b) *Develop an integrated web-based geospatial portal to share data on soil quality.*

Radiation monitoring

As of April 2021, no monitoring network of radioactivity is taking place in Morocco. Nevertheless, the Moroccan Agency for Nuclear and Radiological Safety and Security has started the identification of potential stakeholders, monitoring stations and measurement laboratories, as well as the selection of sites for the development of a national telemetry network.

Recommendation 4.6:

The Moroccan Agency for Nuclear and Radiological Safety and Security, in cooperation with relevant authorities, should:

- (a) *Operationalize the policies, strategies, programmes and systems established for the regulatory control of activities and facilities that use ionizing radiation sources and consequently the protection of the population, the environment and the public against the effects of such radiations;*
- (b) *Establish an integrated information system for the management of regulatory and control activities related to nuclear and radiological safety and security in order to centralize information and make it available to the authorities and the public.*

Biodiversity monitoring

While Morocco does not carry out active biodiversity monitoring, steps have been taken to develop monitoring capacities. Despite the creation of the SIREDDs, at present there are no national information system on

biodiversity, nor harmonised procedures related to data collection across the regional observatories. No governance system ensuring that information on biodiversity can be up scaled and aggregated at the national level is established.

Recommendation 4.7:

The Government should:

- (a) *Establish an integrated programme of biodiversity monitoring;*
- (b) *Ensure that new tools are available at the national and regional level for the environment and sustainable development to provide up-to-date information on biodiversity.*

State-of-the-environment report

Morocco published state-of-the-environment reports in 2001, 2010, 2015 and 2020 the latest. The state-of-the-environment reports are expected to be completed every five years. In addition, the access to data on the state-of-the-environment by the public remains difficult.

Recommendation 4.8:

The ministry responsible for the environment, in cooperation with relevant public authorities, should:

- (a) *Make sure that a state-of-the-environment report is published regularly, at least every five years, and that it includes the formulation of specific actions and policy measures to be taken, and complement these reports with additional and regular publications and information to analyse and review emerging threats;*
- (b) *Facilitate the sharing of available data on the state-of-the-environment in relevant repositories, preferably in line with the Shared Environmental Information System principles and ensure that the data become accessible to the public at the regional and national level.*

National forest inventory

The national forest inventory in Morocco has not been updated since 2005. The ministry responsible for agriculture, maritime fisheries, rural development and waters and forests has been modernising applied procedures as related to forest mapping at the national level, such as revising relevant forest cartography and promoting the use of high spatial resolution satellite images in forest mapping. The last forest inventory was revised in 2018 and is not yet publicly available. Further, as part of modernising its national forest monitoring system, no steps have been taken to establish permanent forest plots to facilitate continuous monitoring.

Recommendation 4.9:

The ministry responsible for agriculture, maritime fisheries, rural development and waters and forests, in cooperation with other relevant public authorities, should:

- (a) *Analyse different national forest monitoring systems across the Mediterranean basin to produce comparable data across countries;*
- (b) *Accelerate the process of data collection on permanent plots;*
- (c) *Ensure that the results of the National Forest and Land Use Monitoring System are publicly available, including by making forest inventories available on a platform in line with the principles of the Shared Environmental Information System;*
- (d) *Continue to enhance organizational capacity to develop and analyse forest information, including the organisation of capacity-enhancement activities to increase the use of remote sensing data for forest inventory and to strengthen national capacity in dynamic mapping.*

Noise and vibration monitoring

Morocco is presently not monitoring noise or vibrations. Nevertheless, the National Laboratory of Studies and Pollution Monitoring has equipment that would allow it to start monitoring noise pollution. No equipment is at

present available with regard to monitoring of vibrations. No specific policies and legislation concerning the noise and vibrations monitoring are adopted.

Recommendation 4.10:

The Government should:

- (a) *Take necessary legislative, policy, and practical measures to facilitate the monitoring of noise and vibration;*
- (b) *Develop a monitoring system that would allow relevant stakeholders to self-report on noise and vibration.*

SDG national statistical system

Morocco has, to date, submitted two voluntary national reviews of its progress toward the 2030 Agenda, the latest one in 2020. HCP has furthermore established an online SDG platform to provide data to contextualize the SDG targets and indicators at the national level. Efforts are also underway to harmonise national and regional monitoring platforms with regards to measuring and monitoring sustainable development. Nevertheless, the capacity to monitor SDGs is limited.

Recommendation 4.11:

The High Commission of Planning, in cooperation with relevant public authorities, should:

- (a) *Continue investing in capacity to monitor SDG progress, such as harmonising existing national and regional monitoring platforms;*
- (b) *Further develop the organizational capacity of the national statistical system to support the production of SDG indicators that are missing.*

Chapter 5: Environmental democracy

Conclusions and recommendations

Public access to information on environmental matters

Technical infrastructure of databases and open access data are functional. Data collection and processing at national and regional levels are limited.

A national information system is being defined to consolidate data from SIREDDs and consequently will constitute a national portal for access to environmental information. This programme constitutes a key tool for the ministry responsible for the environment by ensuring the availability, reliability, and quality of environmental data in order to facilitate the preparation of environmental reports in the future.

At the regional level, not all various actors are sufficiently mobilized in providing the data and information they possess to complete and update the SIREDDs. This may be due to insufficient awareness of the contribution of such a system to their institutional monitoring and evaluation processes.

Recommendation 5.1:

The ministry responsible for the environment, in cooperation with the High Commission for Planning and relevant institutions, should accelerate the establishment of the national portal for access to environmental information.

Recommendation 5.2:

The ministry responsible for the environment should promote SIREDDs to regional actors and stakeholders to become a reference source of information in the region, to emphasize the utility of sharing data and information and allow greater support from actors in collecting data and posting information.

Public participation in decision-making on environmental matters

The ministry responsible for the environment has made great strides in mobilizing civil society around the country's environmental issues. A fruitful dialogue between the ministry responsible for the environment and environmental associations is established through their participation in various commissions, committees and official delegations. NGOs benefiting from capacity building programmes and project financing implemented by the ministry responsible for the environment are selected in a transparent manner on the basis of well-defined criteria, and duly shared on the ministry website. However, the NGOs still consider that they are not fully involved in the decision-making processes at the national, regional and local levels. Laws and provisions are most of the time gender neutral.

The civil society forum can be a mechanism of dialogue and consultation to encourage civil society to become a true partner of co-construction and overcome its bystander positioning. Indeed, other government departments are struggling to involve civil society in their sectoral strategic decision-making processes, as the ministry responsible for the environment does it in a methodical manner.

The participation of civil society in projects and strategies is not effective if NGOs do not have the sufficient analytical skills and capabilities to give a relevant technical opinion.

Recommendation 5.3:

The Government should urge the amending of the regulatory texts related to the implementation of the Law on environmental assessment and public survey by ensuring:

- (a) *The strengthening of public participation;*
- (b) *The admissibility of the public sector in taking its comments into account;*
- (c) *The definition of measures to be taken to ensure better consideration of gender in these processes.*

Recommendation 5.4:

The Government should ensure that:

- (a) *The ministry responsible for the environment reactivates the national forum and the regional forums of the civil society to strengthen public participation at national and regional levels;*
- (b) *All relevant sectoral government departments are involved in public participation in decision-making on environmental matters;*
- (c) *The participation of civil society in various structured dialogues, consultations and development of policies, strategies and national programmes, is enhanced;*
- (d) *The ministry responsible for the environment's capacity building programme is strengthened to benefit to NGOs to promote their professionalism and technical capabilities.*

Public access to justice on environmental matters

Although Law No. 31-13 on the right of access to information shows an improvement on the road to participatory democracy, access to environmental justice is still difficult in the country. Environmental associations and the general public are not yet in a position to sue for environmental damage. Very few associations have the legal status of public utility to allow them to file a claim since the procedures are too complicated and too costly.

The National Action Plan for Democracy and Human Rights (2018–2021) adopted by the Government Council in 2017 identified a number of measures that aim to establish a legal framework for environmental liability and control mechanisms as well as to improve environmental justice. However, these measures are not yet achieved.

Recommendation 5.5:

The Government should develop an Action Plan in order to achieve the 26 measures provisioned in the Sub-Area VI "Integrated environmental policy" of the National Action Plan for Democracy and Human Right 2018–2021, specially measures that aim to strengthen access to justice.

Environmental democracy

The Moroccan achievements on the road to environmental democracy are important on for the two pillars of access to environmental information and public participation in environmental decision-making. They deserve to be assessed to identify gaps and strengthen weaknesses. The Aarhus Convention is widely accepted to be the leading example of implementation of Principle 10 of the Rio Declaration.

Recommendation 5.6:

The Government should:

- (a) *Assess the country's achievements in strengthening environmental democracy;*
- (b) *Carry out a forecasting exercise within the Mediterranean Action Program within the framework of the flagship initiative of the Mediterranean Strategy for Sustainable Development relating to accession to the Aarhus Convention in order to identify the measures to be taken to complete the prerequisites for joining the Convention;*
- (c) *Take advantage of civil society advocacy for accession to Aarhus Convention to initiate a dialogue at the governmental level for advancing the accession.*

Chapter 6: Education for sustainable development

Conclusions and recommendations

From strategy to practical implementation of education for sustainable development

ESD is included in the National Sustainable Development Strategy 2030 (2017–2030) as a priority for strengthening eco-citizenship, through education, awareness and communication programmes. The implementation of the Strategy's seven actions for promoting ESD and reporting on the four indicators to assess progress is under the responsibility of the ministry responsible for education, as of 2021, and is included in its Action Plan. The four national indicators to measure progress in ESD are limited in scope and will not enable the country to assess the achievement of SDG indicators 4.7.1, 12.8.1 and 13.3.1 as they lack the information to assess the extent of ESD integration. Concrete implementation activities under each action, partners, timelines, resources needed for an adequate implementation of ESD, and comprehensive indicators for monitoring implementation, are lacking. Based on the country's efforts in promoting ESD thus far, starting with the development in 2008 of a national strategy, and not pursuing with its implementation in practice, ESD activities included in the National Sustainable Development Strategy 2030 are not translated into adequate action on the ground.

As of 2021, no policy document includes ESD detailed activities, lead actors and cooperating partners, timeline with deadlines, estimation of resources necessary and their sources, comprehensive indicators to measure progress in implementing activities and a mechanism for regular reporting on progress made.

A multi-stakeholder working group on ESD is not established despite the provisions of the 2019 Framework Law No. 51-17, which provide an opportunity for the establishment of a working group specialized in ESD with the mandate to prepare proposals to integrate ESD into the curricula, programmes and training.

Programmes for an environmental upgrade of rural and koranic schools and mosques, implemented by the ministries responsible for education and for the environment, in partnership with other stakeholders, proved to be successful in advancing environmental education in rural areas.

Regarding ensuring financing for ESD in Morocco, the main responsibility for financing education lies with the State. All ESD stakeholders indicated that ensuring an adequate financing for activities needed to integrate ESD at all levels is a major challenge for the country.

Recommendation 6.1:

The ministry responsible for education, in cooperation with the ministry responsible for the environment, and other relevant ministries and institutions, should develop and mainstream ESD into the education system at all levels, including by:

- (a) Establishing a multi-stakeholder working group on ESD and ensuring a multi-stakeholder process to develop and implement ESD;*
- (b) Mapping all activities on ESD and environmental education carried out since 2008 and those on-going in Morocco, with a view to benefit from their results and acquired experience, and consolidate and increase coherence of future activities on ESD;*
- (c) Developing and implementing a guiding document for concrete action on ESD as a prerequisite measure to support the mainstreaming on the ground of ESD into all levels of formal, non-formal and informal education systems in Morocco;*
- (d) Taking practical steps to integrate ESD into the curricula, including by ensuring that key themes related to sustainable development are addressed at all levels of formal education;*
- (e) Addressing ESD in quality assessment of education and in student assessment;*
- (f) Ensuring continuous monitoring of progress made.*

Recommendation 6.2:

The Government should:

- (a) Mandate the Higher Council for Education, Training and Scientific Research to oversee the development and integration of ESD into the curricula at all levels of education;*
- (b) Ensure adequate financial resources for integrating ESD at all levels of formal, non-formal and informal education and training and in research and development, including by exploring PPPs and other innovative solutions.*

Recommendation 6.3:

The ministry responsible for education, jointly with the ministry responsible for religious endowments and Islamic affairs, the ministry responsible for the environment, and other relevant ministries and institutions, should strengthen ESD through new programmes which build upon former programmes for an environmental upgrade of rural and koranic schools and mosques.

Develop competences for educators and teachers in education for sustainable development

Educators and teachers involved in non-formal and informal ad hoc ESD activities carried out in Morocco show interest in integrating ESD in their classes. However, they lack comprehensive guidance and competences necessary for embracing ESD. The whole-of-institution approach to ESD is lacking in schools and other educational institutions.

Recommendation 6.4:

The ministry responsible for education in cooperation with relevant ministries and institutions, should:

- (a) Integrate ESD in the education of future educators, teachers and other education professionals;*
- (b) Integrate ESD in the in-service training of educators, teachers, school administrators and inspectors, making mandatory such training for all personnel engaged in the education sector;*
- (c) Strengthen cooperation on ESD among teachers;*
- (d) Promote a whole-of-institution approach to ESD in schools and other educational institutions at all levels from preschool to higher education.*

Promoting research and development in education for sustainable development

Research and development programmes have the potential to work on ESD. As of 2021 specific research and development programmes on ESD are lacking in the country, thereby hindering the country's advancement in this area.

Mechanisms to harvest knowledge and engage representatives of indigenous people and from rural areas in developing ESD are lacking in the country.

Recommendation 6.5:

The Government should:

- (a) *Promote and support research and development on ESD and disseminate the results of such research;*
- (b) *Establish mechanisms for fostering conservation, use and promotion of local and traditional knowledge in ESD.*

Supporting the civil society efforts to raise awareness about sustainable development and environmental protection

The Mohammed VI Foundation for the Protection of the Environment is a lead organization promoting ESD for some 15 years. In addition, NGOs active in environmental and social dimensions of sustainable development are key actors in promoting ESD through non-formal and informal education activities. The conditions for a continuing involvement in ESD of a larger number of NGOs are missing in the country.

Reportedly, business is engaged to a varying extent in some projects including environmental education and ESD activities.

Recommendation 6.6:

The Government should:

- (a) *Support the activities of NGOs for promoting ESD, including through eco-schools and other projects conducive to ESD;*
- (b) *Increase efforts to attract business entities, including to support financially the implementation of ESD programmes, with a view to enhance the implementation capacity.*

Achieving Sustainable Development Goals through education for sustainable development

Morocco committed in 2015 to achieve the Sustainable Development Goals, including several targets related to ESD (SDG targets 4.7, 12.8 and 13.3). ESD is not only a means in itself, but also an efficient and effective solution to advance the attainment of other SDGs by changing people's mindsets towards behaviour and choices conducive to the sustainable development of the country.

As of 2021 there is little evidence of concrete practical measures to operationalize ESD towards attainment of the three SDG targets.

Recommendation 6.7:

The High Commission for Planning, in cooperation with the ministries responsible for education and for the environment, and other relevant ministries and institutions, should undertake assessments to ensure reporting in 2030 on the achievement of SDG targets 4.7, 12.8 and 13.3, by providing information on the extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment.

Chapter 7: Implementation of international agreements and commitments

Conclusions and recommendations

Legal framework on biosafety

Morocco has been a party to the Cartagena Protocol on Biosafety to the Convention on Biological Diversity since 2011. However, no legislation in Morocco regarding the introduction, use and marketing of LMOs is in place.

Recommendation 7.1:

The Government should adopt a legal framework on biosafety and develop a programme for the control and eradication of invasive alien species, and a system for assessing and managing the risks associated with the use of LMOs are established.

Missing agreements

Although the country has ratified major MEAs and is Party to more than 100, acceding to some agreements or amendments to major environmental agreements would support the country to implement them. Accessing the Aarhus Convention on Access to Information, Public Participation in Decision Making and Access to Justice in Environmental Matters provides a support to an effective engagement of the public. It is also the only international agreement that has systematised the international recognition of the principles of public participation and access to information and justice in environmental matters as fundamental rights. By ratifying the Convention, the country would have access to support and training possibilities to integrate such principles into national legislation.

Recommendation 7.2:

The Government should accelerate the process of ratification of or accession to:

- (a) *Kigali Amendment to the Montreal Protocol;*
- (b) *Nagoya Protocol on Access and Benefit-sharing;*
- (c) *Nagoya – Kuala Lumpur Supplementary Protocol on Liability and Redress;*
- (d) *the Aarhus Convention on Access to Information, Public Participation in Decision Making and Access to Justice in Environmental Matters and its Protocol on Pollutant Release and Transfer Registers.*

Reporting activity

Recommendation 5.1 of the first EPR recommended to improve the country's reporting activity under MEAs. Despite major improvements, some reports are still missing, such as those regarding the Convention on the Conservation of European Wildlife and Natural Habitats, as many countries provided one for the 2017–2018 period, and the Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal for which reports for the years 2018 and 2019 are missing.

Recommendation 7.3:

The Government should ensure that relevant authorities responsible for various multilateral environmental agreements continue their efforts in the reporting activity, as required under these agreements, to guarantee the country's commitment to the agreements.

Coastal areas protection and management

Protecting coastal areas is important for Morocco. Its coasts host 54 per cent of the population, 80 per cent of industries and 50 per cent of tourist infrastructure. Morocco has not fully made use of instruments provided by international agreements ratified to protect its marine protected areas and to create new ones. For instance, none of the areas in Morocco² has been submitted (by the time of writing) to the International Maritime Organization (for the Marine Particularly Sensitive Sea Areas) or for the UNESCO Convention on World Heritage. By taking such actions, the country would find support in protecting ecosystems (for instance high sea) that under the current legislation are under protected or not protected at all.

Recommendation 7.4:

The Government should ensure that:

- (a) *Continue harmonization of national legislation on integrated coastal management with the Barcelona Convention and its Protocols;*

² www.rac-spa.org/sites/default/files/doc_medmpa_network/morocco/amp_fiche_maroc.pdf.

- (b) *Submit protected areas in coastal regions for listing at the International Maritime Organization (for the Marine Particularly Sensitive Sea Areas) or for the UNESCO Convention on World Heritage to benefit from support to complete coastal management and protection.*

Integrated risk management

Morocco implemented several measures to respond to environmental crises/risks. It has a national contingency plan tested every two years and is participating in projects and activities to reinforce its DRR strategy. Nonetheless, it still lacks a national strategy for integrated risk management. Such a strategy could increase environmental, economic and social resilience to major risks and unify risk management in the country.

Recommendation 7.5:

The Government should:

- (a) *Operationalise the National Strategy for Integrated Risk Management and implement it;*
(b) *Prepare a national disaster risk reduction strategy or plan.*

Sharing information on the implementation of multilateral environmental agreements

The website of the ministry responsible for the environment contains useful information for the public to be informed on its activities. However, pages dedicated to multilateral environmental agreements and other multilateral agreements ratified list the laws with which Morocco ratified or accessed to the instrument. The public lacks information on the actions carried out by the ministry.

Recommendation 7.6:

The ministry responsible for the environment should:

- (a) *Upload on its website the implementation reports of the multilateral environmental agreements that it submits to the secretariat of such agreements;*
(b) *Enhance the sharing of other related information, for instance, on participation in programmes or projects.*

Chapter 8: Air protection

Conclusions and recommendations

Air monitoring system and management

The air quality is difficult to assess due to the limited availability of data. This problem is due to a limited air monitoring system. The PNair set the objective to a total of 140 stations by 2030.

Recommendation 8.1:

The ministry responsible for the environment in cooperation with other stakeholders should:

- (a) *Continue to purchase new measuring stations, maintain or upgrade the existing stations and ensure regular maintenance of equipment, and involve other stakeholders, such as the private sector, in the necessary investment;*
(b) *Strengthen the governance of air quality;*
(c) *Increase capacity for air quality management;*
(d) *Resume the revision of the decree on monitoring and its implementing regulation;*
(e) *Develop scientific research in air quality monitoring in collaboration with universities and research institutes.*

Air protection and health

The impact of air pollution on health is not assessed sufficiently in Morocco although it is expected to increase. However, air pollution and health are not analyzed together due to the lack of data.

Recommendation 8.2:

The Government should:

- (a) *Improve knowledge of the link between air pollution and respiratory diseases linked to pollution;*
- (b) *Take appropriate action to stimulate the achievement of SDG targets 3.9 and 11.6.*

Small particles

The transport sector is huge producer of PM_{2.5} and PM₁₀ emissions and for past ten years the vehicle fleet of Morocco has been growing rapidly. The PM₁₀ emissions exceed the limit values everywhere where it is measured while the PM_{2.5} is not even measured. To find the remedies to air pollution it is important to have full perspective of the issues.

Recommendation 8.3:

The ministry responsible for the environment should:

- (a) *Install analyzers for the measurement of PM_{2.5} and PM₁₀ particles in monitoring stations;*
- (b) *Carry out inventories and cadastres necessary for modelling air quality;*
- (c) *Develop cooperation with some international and national research institutes to gain insight into the opportunities and methodologies of using remote sensing applications to monitor air quality.*

Transport emissions

Both the number of motor vehicles and the amount of passenger kilometres are increasing at a rapid pace, increasing transport air emissions which can be restricted with technical solutions. The transition to a euro 6 standard setting the maximum pollutant discharge limits for new rolling vehicles, is scheduled from January 1, 2023 as part of Morocco's updated NDC (in addition to other actions related to the transport sector).

Recommendation 8.4:

The ministry responsible for transport and logistics should:

- (a) *Consolidate audits process in vehicle technical control centres to strengthen vehicle emissions control;*
- (b) *Revise the regulations for the control of motorcycles in terms of air emissions.*

Recommendation 8.5:

The Government should consider introducing the Euro 6 emissions standard.

Climate change

Morocco is currently taking small steps towards taking climate action, and in particular, action to reduce atmospheric pollutants. But the country does not have enough monitoring stations and data available for the comprehensive analysis of what emissions the country is producing, what the level of emissions is, and where the national emissions hotspots are. Progress in reducing pollution and emissions is also associated with effective consultation with partners and obtaining the commitment of all stakeholders.

Recommendation 8.6:

The Government should:

- (a) *Operationalise national governance to include climate commitments with a view to monitor and make progress on climate actions;*

- (b) *Implement national determined contributions (NDCs) to reduce national air and greenhouse gas (GHG) emissions and adapt to the impacts of climate change;*
- (c) *Encourage universities to conduct scientific and technological research to support the implementation of national strategies related to climate change;*
- (d) *Engage the private sector and civil society in the identification of activities to be taken for climate action.*

Chapter 9: Water management

Conclusions and recommendations

Legal water framework

The main implementing decrees of Law No. 10-95 remain applicable pending an inventory of those rules that would be inconsistent or contradictory with the provisions of the 2016 Law on Water No. 36-15.

Recommendation 9.1:

The ministry responsible for equipment and water should prioritize the adoption and implementation of all the law texts of the Law on Water.

Integrated water resources management

Practical challenges exist for the implementation of a vertical efficient integrated water resources management on the river basin level for all the water sector aspects. These challenges are related to human and financial capacity.

Recommendation 9.2:

The Government, through the ministry responsible for equipment and water, should:

- (a) *Provide support for the water basin agencies to upscale their resources and upgrades the used tools and skills;*
- (b) *Ensure cooperation on the water basin level among the concerned actors and align the priorities among the stakeholders.*

Water sustainability

While the climate change component receives dedicated attention and efforts, no attention is given to the aging hydraulic infrastructure. The agriculture sector uses on average 86 per cent of total water withdrawals, but water losses reach 52 per cent. Water sustainability is not promoted through the efficient use of the existing resources and the development of standards and practices supporting the implementation of related measures.

Additionally, climate change highlights the need for more rigorous and efficient control of water quality due to the known and experienced correlation between droughts events and deterioration of water quality. The revision of the water quality norms and standards is the way forward in addition to upgrading monitoring and control systems.

Recommendation 9.3:

The Government should:

- (a) *Update water quality norms and standards to meet the international standards;*
- (b) *Enforce more frequent control and monitoring especially regarding water resources quality, drinking water quality, and the exploitation of the water resources;*
- (c) *Maintain and upgrade the hydraulic infrastructure to reduce water losses;*
- (d) *Ensure the efficient use of water resources;*
- (e) *Strengthen the measures for artificial recharge of aquifers.*

Sludge treatment

The National Shared Sanitation Programme until 2040 is making significant progress with increasing the rate of sewage connection, WWTPs construction, and thus, the rate of treated urban wastewater; however, the rate of the industrial wastewater treatments remains low as well as compliance with the water quality requirements. While the treated urban wastewater presents a significant potential for substantial water reuse as a non-conventional resource, the actual water reuse is still modest, and more can be done in terms of regulation to promote and encourage water reuse.

Sludge is not valorised for industrial and agricultural uses but presents a danger to the environment and human health if untreated. While sludge treatment is performed for big urban sites, the disposal and valorization are not enforced at the municipal level. No strategic document on sludge management is developed.

Recommendation 9.4:

The Government should:

- (a) *Promote the creation and implementation of national standards for sludge disposal and valorization;*
- (b) *Prepare a technical manual on good practices in sludge management;*
- (c) *Develop a national plan for the management of sludge from WWTPs which sets out the institutional and financial arrangements for all sludge disposal and recovery streams;*
- (d) *Develop a legal and normative framework for the treatment and reuse of sludge from WWTPs and accelerate the revision of the decrees and orders related to sludge reuse further to the Law on Water;*
- (e) *Upgrade information and knowledge of sludge valorization processes and techniques;*
- (f) *Promote agreements between sludge producers and managers of final sludge disposal.*

Water information

Accessibility and quality of data and information remain challenging for the water sector in Morocco, including limited use of data and information to support decision making and lack of access to published studies and statistics for the public. No national water information system aimed at achieving and improving the collaboration between the WBAs, the institutional bodies, and the involved stakeholders is in place.

Recommendation 9.5:

The Government, in cooperation with the High Commission for Planning, should:

- (a) *Develop a national water information system, covering all the data and information aspects of water, to serve as the centralized used system by all decision-makers;*
- (b) *Ensure recent and up-to-date availability, publication, and access to data and reports related to the aspects of water management;*
- (c) *Ensure public access to information on water quality and quantity to increase transparency and awareness.*

Public awareness on water issues

Public awareness of the water sector's challenges is vital for sustainable water management, especially in the rural areas and the agriculture sector. Public access to recent information and the creation of frequent documentation aimed at the public user would increase transparency.

Recommendation 9.6:

The Government should advance and support public education and awareness to increase the efficiency of water use.

Chapter 10: Waste management

Conclusions and recommendations

Waste management data collection and quality

Waste related data are predominantly based on estimations which are not even updated regularly but usually done for the purpose of studies underlining strategic documents. The lack of data based on actual measurements or sampling and reporting by economical subjects in an issue that is hindering the evidence-based decision making and evaluation of progress in the whole spectrum of the different waste sub-sectors and waste streams.

Recommendation 10.1:

The High Commission for Planning and the ministry responsible for internal affairs, in cooperation with the ministry responsible for the environment, should set up a system to collect data on waste management.

Extended producer responsibility schemes

Officials and experts in Morocco are well aware that the key for increasing waste recovery and recycling is the introduction of obligatory extended producer responsibility schemes for those waste streams that are most polluting and which recovery is economically most feasible. However, most of the partnership initiatives between the Government and sectorial associations working in the field that generate or distribute the most part of the related waste have not resulted in the establishment of schemes that could significantly contribute to increase recycling in the country.

Recommendation 10.2:

The Government should accelerate the revision of the Law on Waste and Waste Elimination, including to integrate the extended producer / importer responsibility in order to involve them more in the efficient management of waste.

Collection rate of MSW

Collection rate of MSW has increased, especially in the urban areas in the past decade, as well as waste disposal on controlled landfills. However, this was not followed by increased recycling rate due to the fact that waste collecting and treatment companies are neither obligated, nor motivated to introduce separate waste collection. The tariffing and pricing of waste management services are not redesigned and regulated in order to allow the maintaining of a sound MSW management system with separate collection sustainable on long-term.

Recommendation 10.3:

The Government should:

- (a) Promote selective sorting and separate collection at the source in urban areas;*
- (b) Develop and enlarge the treatment of waste, including composting and energy recovery;*
- (c) Gradually introduce obligatory waste recovery and recycling rates for companies dealing with waste treatment;*
- (d) Establish a fee for landfilling to cover the post-operational monitoring and rehabilitation of the landfills.*

Waste management services

Municipal solid, medical and radioactive waste management services are performing relatively well in Morocco. However, there is not enough attention is given to the management of the other waste types which at the same time can have serious adverse effects on the environment if not treated properly.

Recommendation 10.4:

The Government should implement the conclusions and recommendations of studies carried out on waste recovery streams, especially those that have serious adverse effects on the environment if not treated properly.

Effects of dumpsites and illegal waste disposal

The unpleasant negative effects of dumpsites and illegal waste disposal are well known for the public opinion and experts due to media coverage. However, the real features and harmful effects of not properly disposed waste are not measured or sampled and researched by any public institution in Morocco. The compliance of operation with the national regulation of newly built landfills is also not performed currently in the country.

Recommendation 10.5:

The ministry responsible for the environment should strengthen the environmental monitoring and inspection performed in and around landfills or rehabilitated dumpsites and accelerate closure and rehabilitation of dumpsites.

Chapter 11: Biodiversity and protected areas

Conclusions and recommendations

Continuous improvement of biodiversity knowledge

Gaps remain in basic knowledge of endemic, threatened, and invasive alien species, and terrestrial and marine ecosystems. Although requested in the First EPR (2014), resources into Morocco's biodiversity research and monitoring capacity are not channelled. Equally important is the actual use of information on biodiversity in public and private-sector decisions, which requires that information is regularly updated and made available in an appropriate format. A clearer institutional mandate to collect, organize and make biodiversity data publicly available could fill this gap.

Recommendation 11.1:

The Government, through the ministry responsible for the environment and the ministry responsible for agriculture, maritime fisheries, rural development and waters and forests, in cooperation with other relevant governmental bodies, the scientific community, and NGOs with possible support from international donors, should:

- (a) Conduct a regular and systematic analysis of knowledge gaps relating to Moroccan biodiversity, which would provide the basis for a research plan to address the gaps identified, and which should be accompanied by comprehensive needs assessment and action plan;*
- (b) Finalize and disseminate the national assessment of biodiversity and ecosystem services, including an updated list of species;*
- (c) Improve the biodiversity monitoring and information sharing system and ensure the collection of data for the indicators as specified in national policies and international commitments.*

Enhancing effectiveness and coverage of protected areas

Progress has been made in expanding the protected area network. However, international protected areas goals, especially for marine protected areas and identified Sites of Biological and Ecological Interest, and management effectiveness, including improved participation of local communities are not achieved.

Recommendation 11.2:

The Government should:

- (a) Increase the number and area of marine protected areas, aligning with the global (post 2020) framework for biodiversity and as a key contribution to the sustainability of fisheries;*
- (b) Ensure that all protected areas have updated management plans and business plans, based on recent diagnosis and evaluation, that effectively incorporate feedback from local communities and other relevant stakeholders;*

- (c) *Build the technical and financial capacity for protected area management (monitoring and evaluation of key performance indicators, including budgets and staff) at the central government level, and for each protected area.*

Mainstreaming biodiversity in the institutional and policy framework and ensuring better coordination

The recent structural reforms, notably the institutionalisation of a Biodiversity sub-committee within the National Commission for Climate Change and Biological Diversity, making biodiversity a priority and allowing for a better coordination between the relevant national strategies (NSDS and NBSAP), represent a substantial improvement in the institutional framework. However, the institutional reform is not finalized, competencies are not clear and coordination between the relevant institutions at all levels is limited. Resources (budget and staff) are limited and their allocation is non optimal. Knowledge, including data, to bridge the gap between high-level biodiversity commitments and practical implementation on the ground are not effectively shared across different sectors and levels.

Recommendation 11.3:

The Government should:

- (a) *Enhance the role of the newly created National Commission for Climate Change and Biological Diversity, by allocating sufficient resources, strengthening cooperation among different stakeholders, both private and public, and ensuring that the results of the Commission's work are properly taken into account and implemented by the relevant authorities;*
- (b) *Ensure biodiversity mainstreaming into national plans, strategies and policies and ensure the sharing of experiences;*
- (c) *Improve the capacity and knowledge of biodiversity aspects within the authorities at all levels through capacity building schemes, exchange programmes and cooperation with international community, while extending and enhancing collaboration with the academic sphere focused on biodiversity conservation.*

Better quality environmental impact assessments

Biodiversity mainstreaming suffers from the inadequate quality of many EIAs, and the lack of monitoring and enforcement of environmental management plans. This is a particular concern for transport infrastructure, wind power projects and power lines which cause ecosystem fragmentation and impose barriers to wildlife movement. Relevant stakeholders (investors, businesses, sectoral government departments, and civil society) are not sensitized on the preparation and uptake of higher EIA standards.

Recommendation 11.4:

The ministry responsible for the environment, in collaboration with relevant government agencies, NGOs and international donors, should raise awareness among the public and economic stakeholders on the consideration of biodiversity in the planning and implementation of investment projects, by

- (a) *Preparing and disseminating guidelines that consider biodiversity in environmental assessments and environmental management plans in accordance with national laws and international good practices;*
- (b) *Raising awareness among various private and public stakeholders of the need to consider natural ecosystems and biodiversity in environmental assessments.*

Enabling environment for research on ecosystem-based adaptation to and investments in nature-based solutions to climate change adaptation

The current policy and economic environment are not conducive to leveraging resources from donors and private-sector investors to help Morocco achieve sustainable development goals, climate and biodiversity targets. The area of regenerative agriculture, forestry and fisheries, and ecosystem restoration are lacking these resources. Some researches on biodiversity are ongoing however, the country lacks research capacity on ecosystem-based adaptation to climate change.

Recommendation 11.5:

The Government, in coordination with relevant partners such as financial institutions, should:

- (a) *Increase national research capacity on ecosystem-based adaptation to climate change through a dedicated programme, building on work already initiated on ecosystem services and nature's contributions to people;*
- (b) *Prepare and implement a roadmap to involve the private sector in investments in projects aligned with national priorities for climate, biodiversity, and to combat desertification.*

Chapter 12: Coastal and marine management

Conclusions and recommendations

Preventing and reducing marine pollution

Considerable efforts have been made to reduce and process inputs of liquid and solid pollutants. The nature of these pollutants varies widely. In addition to excess nutrients resulting from diffuse farm run-off, many toxic, sometimes highly persistent, pollutants issue from industrial activities, concentrated particularly in major urban, port centres such as Casablanca. In 2015, the third REEM estimated that more than 98 per cent of this industrial wastewater was discharged into the sea. Other than the indicator of potential coastal eutrophication, no other indicator charts the evolution of these pollutants in the coastal zone and sea.

Recommendation 12.1:

The Government should:

- (a) *Continue efforts to reduce and process inputs of liquid and solid pollutants to implement the corresponding SDG targets in line with appropriate indicators of eutrophication of coastal wetlands and the density of plastic debris on beaches;*
- (b) *Establish indicators for monitoring persistent organic pollutants.*

Coastal erosion/accretion

There is no systematized approach to knowledge of and responses to the phenomena of submersion and erosion in the most sensitive areas. No national mapping exists of the hazards associated with erosion and submersion, which could identify, on the basis of a common methodology, areas combining serious erosion and the need to preserve the natural, cultural and built heritage, and on which the 2020–2030 National Integrated Risk Management Strategy relating to natural disasters could rely.

Recommendation 12.2:

The Government should:

- (a) *Ensure a systematized approach to knowledge of and responses to the phenomena of submersion and erosion in the most sensitive areas;*
- (b) *Accelerate the completion of national mapping of the hazards associated with erosion and submersion on which the National Integrated Risk Management Strategy relating to natural disasters could rely, and make it available to stakeholders;*
- (c) *Operationalise the National Integrated Risk Management Strategy by proposing mitigation measures.*

Sustainably managing and protecting marine and coastal ecosystems

The National Coastal Plan, like other strategic documents, prioritizes issues of governance. The inter-sectoral and inter-policy complexity of future regional ICZM schemes, in addition to the Regional Coastal Commission, means that for them to be implemented they must be underpinned by a legal framework (use of the PMD), institutional arrangements (intercommunity structures and public/private partnerships) and sustainable,

participatory processes that take account of social networks and how they traditionally operate from regional to local community level.

Recommendation 12.3:

The Government should:

- (a) *Accelerate the development of Regional Coastal Schemes in line with the Law on Coastal Zones and its implementing regulations, and promote intercommunity structures and public/private partnerships for the implementation of Regional Coastal Schemes;*
- (b) *Prepare a national mapping of traditional practices involved in managing the coast and sea for the development of policies to protect and preserve the coastal zone.*

Preserving the coastal and marine zones

As the evolution of SDG indicator 14.5.1 reveals, the extension of marine protected areas, including fishery areas, remains extremely limited in response to Aichi Target 11. As mentioned in the 2016–2020 SPANB, accelerating the extension marine protected areas, including fishery areas, would appear to be a matter of urgency.

Recommendation 12.4:

The Government should consider accelerating the extension of marine protected areas, starting with those sites of biological and ecological interest already identified on the coast, and streamline their management plans in close association with local stakeholders.

Recommendation 12.5:

The regional coastal commissions, under the aegis of the National Coastal Commission, should ensure the integration of the management of marine protected areas in their respective regional coastal schemes.

Conservation and sustainable use of oceans and their resources

In the context of enacting Laws No. 37-17 and No. 38-17 and of related deliberations, such as those of the Royal Institute for Strategic Studies on the strategic issues of the maritime space, and of the Economic, Social and Environmental Council on the blue economy, marine and maritime units that support blue economy growth have not yet been established. Such units would complement the integrated management of coastal zones and would enable the public authorities and stakeholders to adopt an ecosystem approach which is coordinated, integrated and cross-border which applies to the whole of the Moroccan Economic Exclusion Zone.

Recommendation 12.6:

The Government should promote marine spatial planning, in a manner similar to integrated coastal zone management, to ensure the sustainable use of ecosystem services and improve the economic profitability of the use of the ocean and its resources.

Chapter 13: Health and the environment

Conclusions and recommendations

National Programme for Health and Environment

Collaboration between ministries is essential when it comes to subjects relating to environmental health. The public authorities have access to the data and expertise of academic staff, scientists and health professionals to enable them to identify significant environmental factors in the country and thus to establish environmental health policy. The National Programme for Health and Environment drawn up in 2010 has not been implemented entirely and no national plan or programme identifies the priorities and measures to take in the area of environmental health. Such a strategic document makes it possible to draw together the different actors and to promote the interdisciplinary and inter-ministerial approach that is indispensable in this area.

Recommendation 13.1:

The ministry responsible for health and the ministry responsible for the environment should sign a partnership agreement for implementing the national environmental health programme.

Recommendation 13.2:

The ministry responsible for health and the ministry responsible for the environment, together with the ministries concerned and relevant actors in the field at national and local level and within civil society, should:

- (a) Update the national environmental health programme, including redefining the national priorities, objectives, allocated budget and actions to take;*
- (b) Integrate indicators to monitor progress and conduct assessments of the progress made in implementing the actions;*
- (c) Establish a national committee and regional committees to monitor the implementation of the national environmental health programme;*
- (d) Underpin the rollout and implementation of regional environmental health programmes with targeted actions to ensure they are effectively realized at local level.*

Environmental health information system

An environmental health information system, which on the one hand incorporates a centralized database with indicators that meet WHO standards and on the other hand includes a documentary and regulatory database that brings together strategic environmental health documents, regulatory texts and information, is currently lacking. Environmental health data are scattered and are often missing, making it difficult to evaluate, guide and implement public environmental health policy.

Recommendation 13.3:

The ministry responsible for health and the ministry responsible for the environment, and the ministry responsible for internal affairs, regional departments and regional health and environmental observatories, in collaboration with the High Commission for Planning, should draw up two environmental health information systems:

- (a) One for internal use by administrative staff at national, regional and local level to facilitate the steering and operational implementation of environmental health policies and the drafting of reviews based on extracted data ;*
- (b) The other for public consultation (for example, via the ministry responsible for health website) in order to share warning and prevention messages, raise the awareness of the population of environmental health, inform regulatory mechanisms and communicate data on environmental health.*

Controlling air pollution

Air pollution, for which an assessment of the health costs is available, remains a significant contributory factor to the deteriorating health of the Moroccan population. The country has measuring stations providing pollution indicators. The regulatory framework provides for suitable local management measures to be deployed to safeguard the health of the population, but these are not implemented. The impact on health of indoor air quality has also been calculated in Morocco at a time when new lifestyles are leading humans to spend the majority of their time in an enclosed environment, such as home, workplace and public buildings, notably those used by children.

Recommendation 13.4:

The ministry responsible for health and the ministry responsible for the environment, in cooperation with relevant stakeholders, should:

- (a) Implement the established regulatory measures, particularly concerning managing spikes in air pollution, in order to safeguard the health of the population;*
- (b) Carry out diagnostics of indoor air quality, assess its impact on health and develop specific actions;*
- (c) Undertake a diagnosis of indoor air quality, especially inside buildings used by children;*

- (d) *Take specific preventative actions concerning risks, especially regarding risks associated with carbon monoxide and fine particulate matter.*

Protecting the water resource

The commitment shown by actors in the water sector has led to a countrywide improvement in the quality of the water supply. Major disparities persist from region to region, however. Access to consistently good quality drinking water remains a significant challenge, particularly in rural areas. Access to water, handwashing facilities and sanitation, especially within schools, is an ongoing public health issue in rural areas. There is also a gender-related aspect to this issue as it has a greater impact on girls.

Work is underway to protect water resources by establishing protective perimeters. However, managing pollutants, such as pesticides and nitrates, does not figure in any overview to ensure they are controlled and to guarantee minimal levels in water destined for human consumption. Drinking-water health inspections are the responsibility of the ministry responsible for health and are undertaken at local level. The data produced do not lead to publication of a national review and do not provide an overall perspective. Although a guide to setting up plans for water management and sanitary safety has been published, the plans have not been implemented.

Recommendation 13.5:

The ministry responsible for health in cooperation with relevant stakeholders, should:

- (a) *Continue the programmes for monitoring and sanitary control of drinking water, especially of zones supplied with water resources contaminated with nitrates and pesticides;*
(b) *Make mandatory the national standard for plans for the management and sanitary safety of drinking water.*

Eliminating lead poisoning and preventing exposure to lead

Morocco has no global health approach to tackling lead poisoning and preventing exposure to lead. The impact of lead poisoning is well known, the sources of exposure have been well documented, and the health costs have been calculated. The presence of lead in the home, particularly in the form of lead paints, makeup products and kitchen utensils, has not been assessed and is not the subject of any specific prevention policy.

Recommendation 13.6:

The ministry responsible for health should:

- (a) *Carry out epidemiological surveys, integrating environmental surveys, to detect cases of lead poisoning, notably in young children, and identify the sources of exposure to lead;*
(b) *Organize prevention measures on the impact of lead poisoning on health directed at the population and at public health actors.*

Industrial, mining and small manufacturing sites

Environmental exposure to harmful substances, such as proximity to industrial, mining or small manufacturing sites, has been specifically highlighted, but this has not prompted either the monitoring of impregnation of the surroundings or medical follow-up of the exposed populations.

Recommendation 13.7:

The ministry responsible for health, together with the relevant stakeholders, should be particularly vigilant as regards these polluted industrial and mining sites and should conduct studies to determine the degree of impregnation in the exposed populations and adapt the medical follow-up of these populations accordingly.

Housing

Housing quality encompasses multiple health determinants and is thus a priority issue. The government employs programmes that are designed to gradually reduce slums and dilapidated and informal housing. These

programmes contain little relating to health determinants – such as societal, environmental, economic and mobility aspects – and tend to relocate these populations some distance from towns and cities. Housing policy needs to assume a multisector dimension.

Recommendation 13.8:

The ministry responsible for national planning, urban planning, housing and city policy, together with the ministry responsible for health, should:

- (a) *Integrate the health component in the inventory and diagnosis of unsanitary housing in the country;*
- (b) *Continue to implement and develop programmes of measures for upgrading urban housing, aimed at reducing the housing and equipment deficit.*

Integrating environmental health into sectoral policies

Morocco is keen to integrate health into sectoral policies. Developing a positively healthy environment demands an integral vision of health and health determinants within urban planning and land-use development projects. Health impact studies are useful tools for assessing in advance the impacts of public works on the health of populations. On a smaller scale, the health components of environmental impact assessments also provide an effective means to assess the impact of a development or infrastructure project on health. Identifying and drawing up advocacy in favour of a development that has a positive impact on health is also a way of raising awareness and providing a framework for local authorities and developers.

Recommendation 13.9:

The Government should:

- (a) *Strengthen the integration of environmental health into sectoral policies;*
- (b) *Include the health component in the environmental assessments.*

Occupational medicine

Only a small proportion of the working population has occupational medicine cover. There are copious amounts of occupational health and safety data, and numerous regulatory texts govern health and safety at work. In 2020, Morocco produced its National Strategy for Occupational Safety and Health, and a 2020–2024 executive programme is currently being drafted.

Several international conventions on health and safety at work have been ratified, but some are still awaiting ratification. The conventions that have not been ratified include the conventions on protection from radiation (C115), safety and health in agriculture (C184) and in construction (C167), occupational health services (C161), worker safety and health (C155), occupational cancer (C139) and the working environment (C148).

Recommendation 13.10:

The ministry responsible for health, together with the ministry responsible for employment and the ministries concerned, should:

- (a) *Finalize and implement the five-year occupational health and safety programme;*
- (b) *Develop an information system for occupational health and safety that incorporates a database of indicators in accordance with international recommendations.*

Recommendation 13.11:

The Government should consider ratifying the international conventions on occupational health and safety, such as those on protection from radiation (C115), safety and health in agriculture (C184) and in construction (C167), occupational health services (C161), worker safety and health (C155), occupational cancer (C139) and the working environment (C148).

Chapter 14: Industry and the environment

Conclusions and recommendations

Modernizing legislation on hazardous facilities

Dahir No. 97 of 1914 on the regulation of unsanitary, inconvenient or dangerous industrial establishments has often been revised but is no longer relevant. Most of the provisions of this law are not adapted to the technological and environmental changes that have occurred in industry since the Dahir was adopted. The facilities in certain cases may pose a threat to public health, safety and sanitation as well as for the protection of natural resources and the environment.

Recommendation 14.1:

The Government should:

- (a) *Accelerate the process of updating the legislation on hazardous facilities, and include a list of these facilities based either on their activity or on the substances they store, use or produce;*
- (b) *Envisage a special status for facilities classified as high-risk facilities.*

Legal and institutional framework for the management of chemical products

The current legislative framework for the management of chemical products encompasses a variety of legal and regulatory provisions currently in force. Implementation requires the commitment of the various institutions involved as well as effective coordination of activities within their special field. This is not always possible due to lack of cooperation in sharing information and data between the different ministries or departments involved.

Recommendation 14.2:

The Government should:

- (a) *Envisage the realization of an institutional audit to identify weaknesses and strengths in the current institutional framework for the management of chemical substances with a view to improving it;*
- (b) *Finalise and have adopted a law on the management of chemical substances that brings together the rules for the classification, packaging and labelling of chemical substances and also substance registration, evaluation, authorization and restrictions.*

Controlling industrial risks

A major technological risk can cause an accidental event on an industrial site and lead to immediate and serious consequences for employees, neighbouring populations, property and/or the environment. This makes it essential to control industrial risks, which includes the installation of tools that can prevent the occurrence and consequences of an industrial accident, as well as response measures (coordination of rescue) and compensation for damages. Morocco's current legal framework does not include legislation that pools the current tools relating to industrial risk management.

Recommendation 14.3:

The Government should draw up and have adopted a law on industrial risk management designed to reduce risks and limit damage in case of a major industrial accident, which should include the requirement to conduct a risk assessment for all industrial projects presenting high-risk hazards.

Recommendation 14.4:

The Government should ensure that:

- (a) *Tools are available to allow operators to control risks at source, organize emergency resources and ensure that relevant information is made public;*
- (b) *The authority in charge of analyzing industrial risk develops a database to record all events and to use this to learn from incidents and accidents that occur and inform the public about them.*

Accelerating the greening of industry and promoting environmental certification

The industrial sector is counting on the growing use of green technologies through the continuous development of renewable energies and energy efficiency, but the government has not been contributing much to R&D on greening the industry. Meanwhile industry is participating in several initiatives to contribute to the fight against climate change. Some industries have started to carry out their carbon assessment and have developed strategies and action plans to reduce their CO₂ emissions. However, Morocco does not yet have a national framework that could help industries assess their carbon footprints.

Furthermore, the majority of ISO 14001 certified facilities in Morocco are large exporting companies that can afford to pay for the certification process. Currently, there is no subsidy that would enable SMEs to install ISO 14001 environmental management systems.

Recommendation 14.5:

The Government should pursue the greening and decarbonization of industry by increased use of renewable energy and greater energy efficiency in this sector in addition to the implementation of other priority measures such as:

- (a) *Increasing the Government's present contribution to R&D funding for green technologies;*
- (b) *Promoting the preparation of carbon footprint assessments by industries as well as action plans to reduce their greenhouse gas emissions;*
- (c) *Raising awareness of the importance of adopting environmental management systems by the industry.*

Revision of mining law to strengthen environmental obligations

Legislation on the mining sector has been modernized but still does not adequately cover environmental protection and sustainable development. International requirements for the environmental management of mining companies' operations are much stricter than those currently applied in Morocco. Furthermore, Morocco has not yet joined the Extractive Industries Transparency Initiative (EITI).

Recommendation 14.6:

The Government should accelerate the revision of the Law on mines to reinforce the environmental obligations of mine operators, including the creation of a fund for the environmental and social rehabilitation of the mine site.

Recommendation 14.7:

The Government should examine the benefits of joining the Extractive Industries Transparency Initiative (EITI).

Chapter 15: Energy and the environment

Conclusions and recommendations

Diversification of energy sources

Morocco has a potential for renewable energies (mainly solar and wind) which constitutes 37 per cent of the electricity supply in 2021. However, the country still depends on fossil fuels. Electricity demand is expected to triple by 2030. The extensive use of traditional energy (firewood and charcoal) in rural areas poses threats to the environment and has an impact on air emissions.

Recommendation 15.1:

The Government should:

- (a) *Strengthen its efforts to diversify energy sources, especially renewable energies, to meet the growing demand for electricity;*

- (b) *Take action to incentivize in rural areas a rational diversification of energy sources, substituting traditional energy sources with renewable energy sources;*
- (c) *Continue its efforts to reduce the dependency on fossil fuel imports.*

Renewable energies beyond electricity production

Morocco has a consistent but unexpressed potential to exploit renewable energies in transport, heating and cooling, water management and desalinization.

Recommendation 15.2:

The Government should accelerate the integration of renewable energy solutions in the sectors of transport, heating and cooling, water management and desalinization, and encourage their implementation.

Energy efficiency

The transport, residential and industry sectors account for 4/5 of the total final energy consumption, with constant growth rates. Addressing energy efficiency and energy intensity in those sectors would help the country reach its national targets.

Recommendation 15.3:

The Government should:

- (a) *Ensure the decarbonization of the industry sector through energy efficiency and renewable energy;*
- (b) *Improve the energy efficiency in the transport sector;*
- (c) *Accelerate the introduction of the requirements of energy performance to existing buildings;*
- (d) *Incentivize the refurbishment of existing buildings and the installation of renewable energy sources;*
- (e) *Accelerate the implementation of nature-based solutions to improve the energy efficiency at the urban scale to reduce the energy needed to maintain buildings' indoor thermal comfort.*

Climate change

The 2021 updated NDC established climate change mitigation measures and their related costs. Concerning the adaptation measures, the Country has prepared a National Strategic Adaptation Plan. However, the assessment of the economic impacts from climate change on various economic sectors and the estimated costs of adaptation measures are still missing. This assessment would represent a step forward for the implementation of adaptation measures in Morocco.

Recommendation 15.4:

The Government should accelerate the implementation of energy efficiency and renewable energy programmes to contribute to greenhouse gas mitigation.

Chapter 16: Agriculture and the environment

Conclusions and recommendations

Environmental impact assessment

While land consolidation projects, reforestation of more than 100 ha and turning of waste land or semi-natural surfaces to intensive agriculture are subject to EIAs, EIAs are not mandatory for irrigation projects, nor large animal farms. These projects could impact water quality.

Recommendation 16.1:

The Government should ensure that expansion and modification of irrigation schemes and building large cattle units are subject to environmental impact assessments or environmental impact statements.

Agricultural soil protection

Agricultural soils are under pressures resulting from desertification and the intensification of agriculture. While there is a strategy to combat desertification, no strategy exists for the protection of agricultural lands that are not affected by desertification. The soil protection has no clear and visible objective, no coordination on the State level and between the actors at all levels of decision, nor with the local authorities and the local population, who are opposing any measures. Laws and regulations are not enforced on the field and procedures are long and costly. As of February 2021, the ministry responsible for agriculture, maritime fisheries, rural development and waters and forests, in cooperation with governmental institutions and NGOs is drafting a strategy to protect agricultural soils.

Recommendation 16.2:

The Government should pursue its efforts for soil protection, focusing on environmentally friendly farming methods protecting soil, saving water, promoting adaptation to climate change and capable of co-producing food, fodder and energy biomass.

Soil

Morocco has a long and rich agricultural tradition which farmers have developed over centuries of practices in agricultural land use and soil conservation, adapted to local conditions and water availability. The extension service of the ADA puts a large effort in introducing new methods or method combination. Migrant workers also, returning to their villages, bring back new cropping systems. All these methods can be combined and offered in a bulk by the extension service (ADA). However, to convince, they must not only be environmentally more friendly, but above all, reduce work hardship and/or increase yields and profitability.

Knowledge and experience on the improvement of grazing practices exists in the country. However, improved grazing practices have not been implemented on a large scale in the country and the existing knowledge and experience is not widespread among technicians and herders. Animal feeding is a balance on farm level, where grazing is complemented with fodder crops to be introduced in the rotation, distribution of by-products and weeds. The extension service of the ADA has a key role in this matter.

As for irrigation, there are numerous tips and tricks to save water and save the crop simultaneously. For instance, depletion irrigation of palm trees or a single irrigation “shot” at the beginning of the growing season in wheat can ensure the yield with a low investment in water.

Recommendation 16.3:

The Government should:

- (a) *Continue granting financial incentives or rewards for farmers implementing good agricultural practices and in particular the bulk of methods of the conservation agriculture, the maintenance of walls, bankets and terraces, and the correct grazing management;*
- (b) *Promote precision agriculture in large farms.*

Water

Whereas runoff fell by 35 per cent in 30 years, public irrigation grows by 2.3 per cent per year. According to the 2015 National Water Plan (PNE), water demand was estimated as 12.04 billion m³ in 2010 and 14.5 billion m³ in 2020. The demand is expected to increase up to 16 billion m³ in 2050.

Groundwater resources – which provide almost 40 per cent of the total irrigated area and contribute to more than 50 per cent of the economic value-added generated by all irrigated areas - are a particular concern. About 5 billion m³ are abstracted every year against a renewable potential of 3.4 to 4 billion m³, with 1 million m³ groundwater depletion each year. The figure of 441,430 ha land irrigated by groundwater (2004) has not been updated and seems to be grossly underestimated. However, Morocco’s economic dependence on the irrigated agricultural sector will make measures reducing water use difficult to implement.

Recommendation 16.4:

The Government should ensure that:

- (a) *Water meters are installed at all farms in order to promote agricultural practices that are more water efficient;*
- (b) *The granting of financial incentives or rewards for farmers who wish to implement good agricultural practices in regards of water saving practices, use of rain-fed crops as much as possible and drought resistant cereal varieties, and the combination of rain-fed and irrigated crops, is strengthened.*

Pesticides

The type of agriculture that comes with drip irrigation is more intensive, with a higher use of fertilizers and pesticides. Groundwater aquifers are polluted by nitrates and pesticides next to irrigated perimeters. The concentration of nitrates is a good indicator for pollution by pesticides, which are more complicated to analyse. Pollution due to farm inputs and overexploitation affects the quality of a land surface estimated at 500,000 ha.

The websites of the ministry responsible for agriculture, maritime fisheries, rural development and waters and forests provide comprehensive information about the type of pesticides. Inadequate distribution, management and use of agro-chemicals by farmers who do not have the level of training required to use dangerous chemicals is widely spread. Although data on pesticides are not available, with the intensification of the agriculture promoted by PMV, the use of pesticides has increased.

Recommendation 16.5:

The Government should ensure that:

- (a) *The Law on plant protection products and the Law on fertilisers, their additives and growing media, are implemented;*
 - (b) *Continuous training on the use of pesticides is provided to persons in charge of pesticides treatment, farmers, including independent farmers grouped cooperative and members of cooperatives.*
-